

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA

2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

F1_RE

NTP Study Number: C20725
Lock Date: 10/11/2012
Cage Range: ALL
Date Range: ALL
Reasons For Removal: ALL
Removal Date Range: ALL
Treatment Groups: Include ALL
Study Gender: Both
TDMSE Version: 3.0.2.3_002
PWG Approval Date: 01/15/2016

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P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
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Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 1

TRT#: 1

SEX: Male

DAY ON TEST: 486

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 60973

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Larynx	* Liver	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Mediastinal	* Mammary Gland	* Thymus
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OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Islets, Pancreatic		Hyperplasia	Minimal
* Kidney		Nephropathy	Minimal
Mesentery	Fat	Necrosis	Minimal
[Necrosis TGLs = 2 - 7]			
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Prostate		Inflammation	Mild
* Spleen	Lymph Follic	Atrophy	Minimal
		Pigmentation	Hemosiderin, Mild

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

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 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 2

TRT#: 1

SEX: Male

DAY ON TEST: 633

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 60974

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Pancreas	* Parathyroid Gland	Peripheral Nerve	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	Skeletal Muscle
Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Liver		Clear Cell Focus	
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 4 - 10]			
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Marked

Note: Marked inflammation associated with ulcerations, mild associated with TGL-3.

[Inflammation TGLs = 1,2,3 - 16+18+19]

[Ulcer TGLs = 1,2 - 18+19]

Spinal Cord

Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.

* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH

- Skin Foot Ulcer

* PROTOCOL REQUIRED TISSUE

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First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 3

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60975

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Mandibular	* Mammary Gland
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OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Mild
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Clear Cell Focus	
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

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 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 4

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60976

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Liver		Clear Cell Focus	
* Lung		Inflammation	Granulomatous, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
* Testes	Germinal Epith	Degeneration	Minimal
		Edema	Minimal
	[Edema TGLs = 1 - 9]		
* Thymus		Atrophy	Mild

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First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 5

TRT#: 1

SEX: Male

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60977

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney	Pelvis	Dilatation	Minimal
	[Dilatation TGLs = 4 - 7]		
* Liver		Basophilic Focus	
	[Eosinophilic Focus TGLs = 3 - 17]	Eosinophilic Focus	
	[Fatty Change TGLs = 1 - 16]	Fatty Change	Focal, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
		Inflammation	Mild
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Testes	Germinal Epith	Degeneration	Minimal
* Thymus		Atrophy	Mild

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 Lab: BNW

ANIMAL ID: 6

TRT#: 1

SEX: Male

DAY ON TEST: 730

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60978

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Moderate
* Kidney		Nephropathy	Mild
* Larynx		Inflammation	Chronic Active, Mild
* Liver		Clear Cell Focus	
* Lung		Alveolar/Bronchiolar Adenoma	
Lymph Node	Lumbar	Infiltration Cellular	Plasma Cell, Moderate
[Infiltration Cellular TGLs = 2-15]			
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
[Hyperplasia TGLs = 3 - 10]			
* Skin	Foot	Inflammation	Acute, Moderate
	Foot	Ulcer	Marked
[Inflammation TGLs = 1 - 16]			
[Ulcer TGLs = 1 - 16]			
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

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First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 7

TRT#: 1

SEX: Male

DAY ON TEST: 379

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 60979

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Lymph Node, Mediastinal		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 3 - 10]			
* Prostate		Inflammation	Mild
* Spleen		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Hypertrophy	Mild

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
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Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
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First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 8

TRT#: 1

SEX: Male

DAY ON TEST: 530

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 60980

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Skin	* Spleen	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fasciata	Hyperplasia	Focal, Mild
* Esophagus		Lymphoma Malignant	
* Heart		Lymphoma Malignant	
* Larynx		Lymphoma Malignant	
* Liver		Hematopoietic Cell Proliferation	Minimal
		Infiltration Cellular	Mixed Cell, Minimal
* Lung		Inflammation	Granulomatous, Minimal
		Lymphoma Malignant	
	[Lymphoma Malignant TGLs = 1 - 15]		
* Lymph Node, Bronchial		Lymphoma Malignant	
* Lymph Node, Mediastinal		Lymphoma Malignant	
* Parathyroid Gland		Lymphoma Malignant	
* Seminal Vesicle		Lymphoma Malignant	
* Thymus		Lymphoma Malignant	
* Thyroid Gland		Lymphoma Malignant	
* Trachea		Lymphoma Malignant	

PRIMARY CAUSE OF DEATH - Heart Lymphoma Malignant

* PROTOCOL REQUIRED TISSUE

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 2,3-Butanedione
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 Lab: BNW

ANIMAL ID: 9

TRT#: 1

SEX: Male

DAY ON TEST: 730

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60981

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Medulla		Hyperplasia	Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Liver		Clear Cell Focus	
* Lung	Bile Duct	Hyperplasia	Mild
	Alveolar Epith	Hyperplasia	Focal, Mild
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Thrombus	
	[Hyperplasia TGLs = 3 - 4]		
* Nose		Inflammation	Suppurative, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Prostate		Inflammation	Minimal
* Spleen		Congestion	Marked
		Hematopoietic Cell Proliferation	Minimal
	[Congestion TGLs = 1,2 - 15]		
* Testes	Germinal Epith	Degeneration	Marked
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Marked

* PROTOCOL REQUIRED TISSUE

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 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 10

TRT#: 1

SEX: Male

DAY ON TEST: 432

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 60982

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

- | | | | |
|-----------------------------|---------------------------|----------------------------|---------------------------|
| * Adrenal Cortex | * Adrenal Medulla | Blood Vessel | * Bone |
| * Brain | * Epididymis | * Esophagus | * Harderian Gland |
| * Heart | * Intestine Large, Cecum | * Intestine Large, Colon | * Intestine Large, Rectum |
| * Intestine Small, Duodenum | * Intestine Small, Ileum | * Intestine Small, Jejunum | * Islets, Pancreatic |
| * Kidney | * Larynx | * Lung | * Lymph Node, Bronchial |
| * Lymph Node, Mandibular | * Lymph Node, Mediastinal | * Lymph Node, Mesenteric | * Nose |
| * Pancreas | * Parathyroid Gland | * Pituitary Gland | * Preputial Gland |
| * Prostate | * Salivary Glands | * Seminal Vesicle | * Stomach, Forestomach |
| * Stomach, Glandular | * Testes | * Thyroid Gland | * Trachea |
| * Urinary Bladder | | | |

MISSING

- * Mammary Gland

OBSERVATIONS

- | | | | |
|-------------|---|----------------------------------|---------|
| Bone Marrow | Myeloid Cell | Hyperplasia | Marked |
| * Eye | Retina | Degeneration | Mild |
| * Liver | | Hematopoietic Cell Proliferation | Minimal |
| * Skin | Subcut Tiss | Fibrous Histiocytoma | |
| | [Fibrous Histiocytoma TGLs = 1 - 15] | | |
| * Spleen | | Hematopoietic Cell Proliferation | Marked |
| | [Hematopoietic Cell Proliferation TGLs = 2 - 6] | | |
| * Thymus | | Atrophy | Mild |

PRIMARY CAUSE OF DEATH - Skin Subcut Tiss Fibrous Histiocytoma

* PROTOCOL REQUIRED TISSUE

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 Lab: BNW

ANIMAL ID: 11

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60983

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Kidney	Renal Tubule	Dilatation	Moderate
		Infarct	Mild
		Nephropathy	Mild
	[Dilatation TGLs = 7 - 7]		
* Liver		Clear Cell Focus	
	[Clear Cell Focus TGLs = 6,9 - 6]		
* Lung		Carcinosarcoma	Metastatic (Prostate)
	[Carcinosarcoma TGLs = 5 - 4+5]		
* Lymph Node, Mediastinal		Ectasia	Moderate
	[Ectasia TGLs = 4 - 3]		
Mesentery		Carcinosarcoma	Metastatic (Prostate)
	[Carcinosarcoma TGLs = 8 - 16]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Pancreas	Acinus	Carcinosarcoma	Metastatic (Prostate)
	[Carcinosarcoma TGLs = 2,8 - 15+16+17+18+19+20+21]		
* Prostate		Carcinosarcoma	
	[Carcinosarcoma TGLs = 2 - 17]		

* PROTOCOL REQUIRED TISSUE

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Lab: BNW

ANIMAL ID: 11

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60983

ORGAN AND ACCOUNTABLE SITE STATUS

* Skin	Prepuce	Inflammation	Acute, Mild
	Prepuce	Ulcer	Focal, Mild
* Spleen		Hematopoietic Cell Proliferation	Moderate
	[Hematopoietic Cell Proliferation TGLs = 3 - 15]		
* Thymus		Atrophy	Marked

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 Lab: BNW

ANIMAL ID: 12

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60984

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Nose	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fasciuli	Hypertrophy	Multifocal, Mild
* Eye	Retina	Degeneration	Mild
* Islets, Pancreatic		Hyperplasia	Minimal
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Clear Cell Focus	
	Bile Duct	Hyperplasia	Minimal
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Testes		Edema	Mild
[Edema TGLs = 1 - 9]			
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 13

TRT#: 1

SEX: Male

DAY ON TEST: 695

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 60985

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Islets, Pancreatic	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Mammary Gland
* Nose	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Multifocal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Heart		Cardiomyopathy	Mild
* Intestine Small, Jejunum		Histiocytic Sarcoma	
	[Histiocytic Sarcoma TGLs = 10 - 20]		
* Kidney		Histiocytic Sarcoma	
	Papilla	Necrosis	Mild
	[Histiocytic Sarcoma TGLs = 6,7 - 7+16]		
	[Necrosis TGLs = 8 - 16]		
* Liver		Fatty Change	Diffuse, Marked
		Hemangioma	
	[Fatty Change TGLs = 5 - 6]		
* Lymph Node, Mesenteric		Histiocytic Sarcoma	
	[Histiocytic Sarcoma TGLs = 9 - 17]		
Mesentery		Histiocytic Sarcoma	
	[Histiocytic Sarcoma TGLs = 4 - 19]		
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
		Inflammation	Minimal
* Skin	Foot	Inflammation	Chronic Active, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 13

TRT#: 1

SEX: Male

DAY ON TEST: 695

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 60985

ORGAN AND ACCOUNTABLE SITE STATUS

	Foot	Ulcer	Mild
	[Inflammation TGLs = 3 - 18]		
	[Ulcer TGLs = 3 - 18]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Kidney Histiocytic Sarcoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 14

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60986

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Mediastinal	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Mild
* Nose		Adenoma	
		Inflammation	Chronic Active, Mild
	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Prostate		Inflammation	Minimal
* Spleen	Lymph Follic	Atrophy	Mild
		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 15

TRT#: 1

SEX: Male

DAY ON TEST: 730

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60987

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Mediastinal	* Thymus
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OBSERVATIONS

* Brain		Glioma Malignant	
* Heart		Cardiomyopathy	Mild
* Liver		Clear Cell Focus	
		Fatty Change	Focal, Minimal
	[Fatty Change TGLs = 1 - 15]		
* Lung	Pleura	Fibrosis	Focal, Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 2 - 10]		
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 16

TRT#: 1

SEX: Male

DAY ON TEST: 523

DOSE: Control

DISP: Natural Death

HISTO: 60988

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Mammary Gland
* Nose	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea			

OBSERVATIONS

* Eye	Retina	Degeneration	Moderate
	[Degeneration TGLs = 4 - 13]		
* Heart	Septum Inter	Cardiomyopathy	Minimal
		Necrosis	Acute, Minimal
	Note: Bacteria present in areas of necrosis.		
	[Necrosis TGLs = 5 - 7]		
* Kidney	Pelvis, Transit Epithe	Hyperplasia	Moderate
	Pelvis	Inflammation	Moderate
	[Inflammation TGLs = 6 - 7]		
* Liver	Centrilobular	Lymphoma Malignant	
		Necrosis	Moderate
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Lymph Node, Mandibular		Lymphoma Malignant	
	[Lymphoma Malignant TGLs = 2 - 14]		
* Lymph Node, Mesenteric		Necrosis	Minimal
* Prostate		Lymphoma Malignant	
* Spleen		Lymphoma Malignant	
* Thymus		Atrophy	Moderate
* Urinary Bladder		Lymphoma Malignant	

PRIMARY CAUSE OF DEATH - Kidney Pelvis Inflammation

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 17

TRT#: 1

SEX: Male

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60989

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Marked
* Heart		Cardiomyopathy	Mild
* Intestine Large, Rectum		Metaplasia	Squamous, Mild
* Kidney		Nephropathy	Mild
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Clear Cell Focus	
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 18

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60990

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Eye	Retina	Degeneration	Mild
* Heart		Cardiomyopathy	Mild
* Liver		Basophilic Focus	
		Clear Cell Focus	
		Infiltration Cellular	Mixed Cell, Minimal
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
* Testes	Germinal Epith	Degeneration	Moderate
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 19

TRT#: 1

SEX: Male

DAY ON TEST: 633

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 60991

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Brain	Cranial Nerve, Glial Cell	Granular Cell Tumor Malignant	
		Hyperplasia	Moderate
Note: Hypercellularity of olfactory nerves, possibly secondary to tumor in cerebrum. [Granular Cell Tumor Malignant TGLs = 3 - 15]			
* Heart		Cardiomyopathy	Minimal
* Int Lg Rectum			
Note: Section at anus.			
* Kidney		Nephropathy	Minimal
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Moderate
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen	Lymph Follic	Atrophy	Mild
		Pigmentation	Hemosiderin, Mild
* Stomach, Forestomach	Epithelium	Hyperplasia	Moderate
		Inflammation	Mild
* Thymus		Atrophy	Marked

PRIMARY CAUSE OF DEATH - Brain Granular Cell Tumor Malignant

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 20

TRT#: 1

SEX: Male

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60992

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Minimal
* Heart		Cardiomyopathy	Minimal
* Islets, Pancreatic		Hyperplasia	Mild
* Kidney		Nephropathy	Moderate
* Liver		Clear Cell Focus	
	[Clear Cell Focus TGLs = 1,2 - 6+15]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 21

TRT#: 1

SEX: Male

DAY ON TEST: 730

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60993

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Prostate	Epithelium, Ventral	Hyperplasia	Marked
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 22

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60994

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Mandibular

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Retina	Degeneration	Moderate
* Kidney	Pelvis	Inflammation	Minimal
* Larynx		Foreign Body	
		Inflammation	Chronic Active, Mild
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Granulomatous, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
[Hyperplasia TGLs = 2 - 10]			
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
		Inflammation	Minimal
* Skin	Foot	Inflammation	Acute, Moderate
	Foot	Ulcer	Marked
[Inflammation TGLs = 1 - 15]			
[Ulcer TGLs = 1 - 15]			
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Testes	Germinal Epith	Degeneration	Moderate
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 23

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60995

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Nose	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Mild
* Heart		Cardiomyopathy	Minimal
* Pancreas		Atrophy	Marked
* Spleen	Lymph Follic	Atrophy	Mild
		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Adenoma	

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 24

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60996

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Lymph Node, Mediastinal	* Mammary Gland	* Parathyroid Gland
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OBSERVATIONS

* Adrenal Cortex [Hypertrophy TGLs = 1 - 7]	Zona Fascult	Hypertrophy	Multifocal, Moderate
* Heart		Cardiomyopathy	Minimal
* Liver		Clear Cell Focus	
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 25

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60997

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Minimal
* Kidney		Nephropathy	Mild
* Liver		Clear Cell Focus	
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Testes		Edema	Mild
	[Edema TGLs = 2 - 16]		
* Thymus		Atrophy	Moderate
* Thyroid Gland	Follicular Cel	Hyperplasia	Mild

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 26

TRT#: 1

SEX: Male

DAY ON TEST: 730

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60998

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Liver	* Lung	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Bronchial	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Kidney		Nephropathy	Moderate
* Larynx		Inflammation	Chronic Active, Minimal
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 27

TRT#: 1

SEX: Male

DAY ON TEST: 730

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60999

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	Peripheral Nerve	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	Skeletal Muscle	Spinal Cord
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Marked
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Liver		Clear Cell Focus	
Lymph Node	Lumbar	Infiltration Cellular	Plasma Cell, Marked
[Infiltration Cellular TGLs = 4 - 15]			
Mesentery	Fat	Necrosis	Minimal
[Necrosis TGLs = 3 - 16]			
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
* Prostate		Inflammation	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
[Inflammation TGLs = 1,2 - 15+16]			
[Ulcer TGLs = 1,2 - 15+16]			
Spinal Cord			

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 27

TRT#: 1

SEX: Male

DAY ON TEST: 730

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 60999

ORGAN AND ACCOUNTABLE SITE STATUS

Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.

* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Adenoma	
	C Cell	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 28

TRT#: 1

SEX: Male

DAY ON TEST: 730

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61000

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Parathyroid Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Spleen	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Trachea	* Urinary Bladder	

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Liver		Hepatodiaphragmatic Nodule	
[Hepatodiaphragmatic Nodule	TGLs = 3 - 6]		
Lymph Node	Lumbar	Infiltration Cellular	Plasma Cell, Moderate
	Popliteal	Inflammation	Chronic Active, Mild
[Infiltration Cellular	TGLs = 4 - 16]		
[Inflammation	TGLs = 5 - 17]		
* Pancreas	Acinus	Hyperplasia	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma	TGLs = 2 - 10]		
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Marked
[Inflammation	TGLs = 1 - 15]		
[Ulcer	TGLs = 1 - 15]		
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 29

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61001

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Esophagus	* Eye	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Moderate
* Brain	[Granular Cell Tumor Benign TGLs = 2 - 1]	Granular Cell Tumor Benign	
* Epididymis		Mesothelioma Malignant	
* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Mild
* Liver	Bile Duct	Clear Cell Focus	
	[Mixed Cell Focus TGLs = 1 - 15]	Hyperplasia	Minimal
		Mixed Cell Focus	
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Testes		Mesothelioma Malignant	
* Thymus		Atrophy	Moderate
* Thyroid Gland	Follicular Cel	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 30

TRT#: 1

SEX: Male

DAY ON TEST: 694

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61002

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Lung	* Lymph Node, Mandibular	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial	* Lymph Node, Mediastinal
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Larynx		Inflammation	Chronic Active, Minimal
* Liver	Bile Duct	Hyperplasia	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
* Prostate		Inflammation	Minimal
* Skin	Epidermis	Hyperplasia	Mild
[Hyperplasia TGLs = 1 - 15]			
* Spleen	Lymph Follic	Atrophy	Mild
* Testes	Interstit Cell	Adenoma	
* Thymus		Atrophy	Marked
* Thyroid Gland	C Cell	Adenoma	

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 31

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61003

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Moderate
		Nephropathy	Minimal
* Liver		Clear Cell Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 32

TRT#: 1

SEX: Male

DAY ON TEST: 730

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61004

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial	* Mammary Gland
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OBSERVATIONS

* Kidney		Nephropathy	Mild
* Larynx		Foreign Body	
		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
	[Clear Cell Focus TGLs = 1 - 15]		
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	[Infiltration Cellular TGLs = 2 - 4+5]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 33

TRT#: 1

SEX: Male

DAY ON TEST: 724

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61005

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	Peripheral Nerve	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	Skeletal Muscle
Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland	* Thymus
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Mild
		Nephropathy	Mild
* Liver		Basophilic Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Mild
	[Infiltration Cellular TGLs = 1 - 4+5]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 2 - 10]		
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Marked
	[Inflammation TGLs = 3,4 - 15+16]		
	[Ulcer TGLs = 3,4 - 15,16]		
Spinal Cord			

Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 33

TRT#: 1

SEX: Male

DAY ON TEST: 724

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61005

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen

Hematopoietic Cell Proliferation

Moderate

PRIMARY CAUSE OF DEATH

- Skin Foot Ulcer

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 34

TRT#: 1

SEX: Male

DAY ON TEST: 633

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61006

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
Peripheral Nerve	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	Skeletal Muscle	Spinal Cord	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Heart		Cardiomyopathy	Minimal
* Islets, Pancreatic		Hyperplasia	Minimal
* Kidney		Nephropathy	Mild
* Liver		Angiectasis	Minimal
		Degeneration	Cystic, Mild
[Angiectasis TGLs = 5 - 15]			
[Degeneration TGLs = 6 - 6]			
* Pituitary Gland	Pars Intermed	Adenoma	
[Adenoma TGLs = 4 - 10]			
* Skin	Epidermis	Hyperplasia	Moderate
	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Marked
[Hyperplasia TGLs = 3 - 19]			
[Inflammation TGLs = 1,2 - 17+18]			
[Ulcer TGLs = 1,2 - 17+18]			

Spinal Cord

Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 34

TRT#: 1

SEX: Male

DAY ON TEST: 633

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61006

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate
* Thyroid Gland	Follicular Cel	Hyperplasia	Minimal

PRIMARY CAUSE OF DEATH - Skin Foot Ulcer

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 35

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61007

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric
* Nose	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

MISSING

* Lymph Node, Mediastinal

OBSERVATIONS

* Brain		Granular Cell Tumor Benign	
* Heart		Cardiomyopathy	Mild
* Intestine Small, Jejunum		Leiomyoma	
[Leiomyoma TGLs = 7 - 15]			
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Mild
* Liver		Mixed Cell Focus	
[Mixed Cell Focus TGLs = 6 - 7]			
* Mammary Gland		Carcinoma	
[Carcinoma TGLs = 3 - 16]			
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 5 - 10]			
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
		Inflammation	Minimal
[Inflammation TGLs = 8 - 15]			
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
[Inflammation TGLs = 1 - 15]			
[Ulcer TGLs = 1 - 15]			

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 35

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61007

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen		Hematopoietic Cell Proliferation	Moderate
* Testes		Edema	Moderate
	Interstit Cell	Hyperplasia	Mild
	[Edema TGLs = 4 - 9]		
* Thymus		Atrophy	Moderate
* Thyroid Gland	Follicular Cel	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 36

TRT#: 1

SEX: Male

DAY ON TEST: 730

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61008

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Mediastinal	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
* Harderian Gland		Metaplasia	Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
Lymph Node	Lumbar	Hyperplasia	Lymphoid, Mild
[Hyperplasia TGLs = 2 - 15]			
* Prostate		Inflammation	Minimal
* Skin	Sebaceous GI	Adenoma	
	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
[Adenoma TGLs = 1 - 16]			
[Inflammation TGLs = 3 - 15]			
[Ulcer TGLs = 3 - 15]			
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 37

TRT#: 1

SEX: Male

DAY ON TEST: 730

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61009

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Retina	Degeneration	Minimal
* Kidney		Nephropathy	Moderate
* Liver		Clear Cell Focus	
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Prostate		Inflammation	Minimal
* Skin	Epidermis	Keratoacanthoma	
	[Keratoacanthoma TGLs = 1 - 16]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Testes	Interstit Cell	Adenoma	
	Interstit Cell	Hyperplasia	Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	Bilateral, C Cell	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 38

TRT#: 1

SEX: Male

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61010

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Kidney		Nephropathy	Minimal
* Liver		Necrosis	Focal, Minimal
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	[Infiltration Cellular TGLs = 3 - 4+5]	Inflammation	Chronic Active, Minimal
* Nose		Foreign Body	
		Inflammation	Suppurative, Minimal
		Polyp, Inflammatory	Mild
* Skin	Epidermis	Keratoacanthoma	
	Subcut Tiss	Myxoma	
	[Keratoacanthoma TGLs = 2 - 15]		
	[Myxoma TGLs = 1 - 16]		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 39

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61011

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Eye	Retina	Degeneration	Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney	Pelvis	Inflammation	Mild
		Nephropathy	Minimal
* Liver		Clear Cell Focus	
* Nose		Inflammation	Suppurative, Minimal
* Prostate	Epithelium, Ventral	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 40

TRT#: 1

SEX: Male

DAY ON TEST: 724

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61012

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Blood Vessel	* Bone	* Brain	* Epididymis
* Esophagus	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lung
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Pancreas	* Parathyroid Gland	Peripheral Nerve	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	Skeletal Muscle
Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex		Adenoma	
[Adenoma TGLs = 6 - 7]			
* Adrenal Medulla		Pheochromocytoma Benign	
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye	Lens	Cataract	Mild
[Cataract TGLs = 1 - 13]			
* Kidney		Nephropathy	Minimal
* Liver		Clear Cell Focus	
Lymph Node	Lumbar	Infiltration Cellular	Plasma Cell, Mild
	Renal	Infiltration Cellular	Plasma Cell, Moderate
[Infiltration Cellular TGLs = 4 - 16]			
[Infiltration Cellular TGLs = 5 - 15]			
* Prostate		Inflammation	Minimal
* Skin	Foot	Inflammation	Acute, Marked
	Foot	Ulcer	Marked
[Inflammation TGLs = 2 - 16]			
[Ulcer TGLs = 2 - 16]			
Spinal Cord			

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 40

TRT#: 1

SEX: Male

DAY ON TEST: 724

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61012

ORGAN AND ACCOUNTABLE SITE STATUS

Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.

* Spleen

Hematopoietic Cell Proliferation

Moderate

[Hematopoietic Cell Proliferation TGLs = 3 - 6]

* Thymus

Atrophy

Moderate

PRIMARY CAUSE OF DEATH

- Skin Foot Ulcer

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 41

TRT#: 1

SEX: Male

DAY ON TEST: 730

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61013

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Spleen	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Liver		Infiltration Cellular	Lymphocyte, Mild
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
Mesentery	Fat	Necrosis	Minimal
	[Necrosis TGLs = 3 - 16]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Epidermis	Keratoacanthoma	
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 2 - 15]		
	[Keratoacanthoma TGLs = 1 - 16]		
	[Ulcer TGLs = 2 - 15]		
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 42

TRT#: 1

SEX: Male

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61014

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	* Bone	* Brain	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Minimal
	Zona Fascult	Hypertrophy	Minimal
Blood Vessel		Inflammation	Moderate
Note: Vascular inflammation involves gastric, epididymal, mediastinal, and rectal arteries.			
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Epididymis		Granuloma Sperm	Moderate
* Eye	Retina	Degeneration	Moderate
* Kidney	Pelvis	Inflammation	Mild
		Nephropathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Lung		Inflammation	Granulomatous, Minimal
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
		Inflammation	Minimal
* Spleen		Hemangiosarcoma	
		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Testes	Interstit Cell	Hyperplasia	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 42

TRT#: 1

SEX: Male

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61014

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus

Atrophy

Marked

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 43

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61015

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Nose	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Liver		Clear Cell Focus	
* Lung	Alveolar Epith	Hyperplasia	Focal, Marked
	[Hyperplasia TGLs = 1 - 5]		
* Lymph Node, Mesenteric		Hemangiosarcoma	
* Prostate		Inflammation	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
		Lymphoma Malignant	
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 44

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61016

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Epididymis
* Esophagus	* Eye	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Brain	Cerebrum, Gray Matter	Hemorrhage	Focal, Minimal
* Heart		Cardiomyopathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Alveolar Epith	Hyperplasia	Mild
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	[Hyperplasia TGLs = 1,3 - 4+5]		
Oral Mucosa		Squamous Cell Carcinoma	
	[Squamous Cell Carcinoma TGLs = 2 - 15]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
	Pars Intermed	Hyperplasia	Mild
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 45

TRT#: 1

SEX: Male

DAY ON TEST: 654

DOSE: Control

DISP: Natural Death

HISTO: 61017

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Liver	Bile Duct	Hyperplasia	Minimal
* Spleen	Lymph Follic	Atrophy	Minimal
		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Testes	Interstit Cell	Hyperplasia	Minimal
* Thymus		Atrophy	Moderate
		Hemorrhage	Moderate
[Hemorrhage TGLs = 2 - 15]			
* Thyroid Gland	C Cell	Adenoma	

PRIMARY CAUSE OF DEATH - Thymus Hemorrhage

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 46

TRT#: 1

SEX: Male

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61018

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Nose	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Eye	Cornea	Inflammation	Chronic Active, Minimal
	Cornea	Mineralization	Minimal
* Harderian Gland		Hyperplasia	Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
		Thymoma Benign	

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 47

TRT#: 1

SEX: Male

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61019

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
	Zona Fascult	Hypertrophy	Focal, Minimal
[Hyperplasia TGLs = 3 - 7]			
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
* Lung	Alveolar Epith	Hyperplasia	Focal, Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
[Infiltration Cellular TGLs = 4 - 4+5]			
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
[Hyperplasia TGLs = 5 - 10]			
* Prostate		Inflammation	Mild
[Inflammation TGLs = 2 - 14]			
* Spleen		Hematopoietic Cell Proliferation	Mild
* Testes	Interstit Cell	Adenoma	
[Adenoma TGLs = 1 - 9]			
* Thymus		Atrophy	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 48

TRT#: 1

SEX: Male

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61020

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Nose	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Brain		Granular Cell Tumor Benign	
* Heart		Cardiomyopathy	Mild
* Islets, Pancreatic		Hyperplasia	Mild
* Kidney		Nephropathy	Mild
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
* Lymph Node, Mesenteric		Hemangiosarcoma	
* Prostate		Inflammation	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Marked
	[Inflammation TGLs = 1 - 7]		
	[Ulcer TGLs = 1 - 7]		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Mild
	Follicular Cel	Hypertrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 49

TRT#: 1

SEX: Male

DAY ON TEST: 729

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61021

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Trachea	* Urinary Bladder		

MISSING

* Lymph Node, Bronchial	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Marked
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Moderate
		Nephropathy	Mild
* Liver		Basophilic Focus	
		Clear Cell Focus	
		Infiltration Cellular	Mixed Cell, Minimal
* Parathyroid Gland		Adenoma	
		Hyperplasia	Focal, Mild
* Pituitary Gland	Pars Intermed	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
		Hyperplasia	Lymphoid, Moderate
* Thyroid Gland	Follicular Cel	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 50

TRT#: 1

SEX: Male

DAY ON TEST: 633

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61022

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lung
* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
Peripheral Nerve	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	Skeletal Muscle	Spinal Cord	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex		Adenoma	
	Zona Fascult	Hypertrophy	Multifocal, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
		Infiltration Cellular	Mixed Cell, Minimal
[Infiltration Cellular TGLs = 8 - 16]			
Lymph Node	Popliteal	Hyperplasia	Lymphoid, Moderate
	Inguinal	Infiltration Cellular	Plasma Cell, Mild
	Lumbar	Infiltration Cellular	Plasma Cell, Mild
	Axillary	Infiltration Cellular	Plasma Cell, Mild
	Renal	Infiltration Cellular	Plasma Cell, Moderate
[Hyperplasia TGLs = 6 - 16]			
[Infiltration Cellular TGLs = 7 - 20]			
[Infiltration Cellular TGLs = 5 - 19]			

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 50

TRT#: 1

SEX: Male

DAY ON TEST: 633

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61022

ORGAN AND ACCOUNTABLE SITE STATUS

[Infiltration Cellular TGLs = 4 - 18]

[Infiltration Cellular TGLs = 3 - 17]

* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Prostate		Inflammation	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate

[Inflammation TGLs = 1-18]

[Ulcer TGLs = 1 - 18]

Spinal Cord

Note: Peripheral nerve, skeletal muscle, nand spinal cord were examined due to clinical signs.

* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Mild

PRIMARY CAUSE OF DEATH - Skin Foot Ulcer

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 201

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61273

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Mild
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Olfactory Epi	Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 1 - 10]		
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 202

TRT#: 3

SEX: Male

DAY ON TEST: 600

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61274

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Nose	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 2 - 10]		
* Prostate		Inflammation	Mild
* Seminal Vesicle		Inflammation	Mild
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Hyperplasia	Mild

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 203

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61275

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Parathyroid Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
	Zona Fascult	Hypertrophy	Focal, Minimal
* Eye	Lens	Cataract	Mild
	Retina	Degeneration	Moderate
	Retina	Melanoma Malignant	
* Heart		Cardiomyopathy	Minimal
		Schwannoma Malignant	
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Moderate
* Liver		Clear Cell Focus	
		Mixed Cell Focus	
* Pancreas	Acinus	Hyperplasia	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 204

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61276

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Parathyroid Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

INSUFFICIENT TISSUE

* Thymus

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Intestine Small, Ileum		Carcinoid Tumor Benign	
Note: Tumor cells are toluidine blue negative.			
* Kidney		Nephropathy	Minimal
* Liver		Clear Cell Focus	
* Nose	Respirat Epith	Hyperplasia	Minimal
* Pancreas		Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 205

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61277

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Mild
* Epididymis		Granuloma Sperm	Marked
	[Granuloma Sperm TGLs = 2 - 15]		
* Eye	Lens	Cataract	Minimal
	Retina	Degeneration	Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Moderate
* Liver		Clear Cell Focus	
* Lung		Inflammation	Granulomatous, Minimal
Lymph Node	Lumbar	Infiltration Cellular	Plasma Cell, Mild
	[Infiltration Cellular TGLs = 3 - 15]		
* Pancreas		Atrophy	Minimal
* Parathyroid Gland	Bilateral	Adenoma	
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 4 - 10]		
* Prostate		Inflammation	Mild
* Skin	Epidermis	Squamous Cell Papilloma	
	[Squamous Cell Papilloma TGLs = 5 - 16]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 205

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61277

ORGAN AND ACCOUNTABLE SITE STATUS

* Testes	Germinal Epith	Degeneration	Marked
[Degeneration TGLs = 1 - 9]			
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 206

TRT#: 3

SEX: Male

DAY ON TEST: 606

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61278

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

- | | | | |
|-----------------------------|--------------------------|----------------------------|---------------------------|
| * Adrenal Cortex | * Adrenal Medulla | Blood Vessel | * Bone |
| * Epididymis | * Esophagus | * Eye | * Harderian Gland |
| * Heart | * Intestine Large, Cecum | * Intestine Large, Colon | * Intestine Large, Rectum |
| * Intestine Small, Duodenum | * Intestine Small, Ileum | * Intestine Small, Jejunum | * Islets, Pancreatic |
| * Kidney | * Larynx | * Lymph Node, Mandibular | * Lymph Node, Mediastinal |
| * Lymph Node, Mesenteric | * Pancreas | * Parathyroid Gland | * Pituitary Gland |
| * Preputial Gland | * Seminal Vesicle | * Skin | * Stomach, Forestomach |
| * Stomach, Glandular | * Testes | * Thyroid Gland | * Trachea |
| * Urinary Bladder | | | |

MISSING

- * Mammary Gland

OBSERVATIONS

- | | | | |
|---|---------------------|-------------------------|--------------------------|
| Bone Marrow | Myeloid Cell | Hyperplasia | Moderate |
| * Brain | | Squamous Cell Carcinoma | Metastatic (Oral Mucosa) |
| * Liver | | Histiocytic Sarcoma | |
| * Lung | | Histiocytic Sarcoma | |
| * Lymph Node, Bronchial | | Atrophy | Moderate |
| * Nose | Olfactory Epi | Metaplasia | Respiratory, Mild |
| Oral Mucosa | | Squamous Cell Carcinoma | |
| * Prostate | Epithelium, Ventral | Hyperplasia | Mild |
| * Salivary Glands | | Inflammation | Mild |
| Note: Most of the enlargement and reddening (TGL-3) is due to acute hemorrhage (diagnosis not available in current LDAS set up).
[Inflammation TGLs = 3 - 15+16] | | | |
| Skeletal Muscle | | Squamous Cell Carcinoma | Metastatic (Oral Mucosa) |
| Note: Metastases involve masticatory muscles. | | | |
| * Spleen | Lymph Follic | Atrophy | Mild |
| | | Histiocytic Sarcoma | |
| | | Pigmentation | Hemosiderin, Minimal |
| [Histiocytic Sarcoma TGLs = 4 - 7] | | | |
| * Thymus | | Atrophy | Moderate |

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 206

TRT#: 3

SEX: Male

DAY ON TEST: 606

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61278

ORGAN AND ACCOUNTABLE SITE STATUS

PRIMARY CAUSE OF DEATH - Spleen Histiocytic Sarcoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 207

TRT#: 3

SEX: Male

DAY ON TEST: 701

DOSE: 12.5 ppm

DISP: Natural Death

HISTO: 61279

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Spleen	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland	* Parathyroid Gland
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OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
* Heart	Pericardium	Mesothelioma Malignant	
	Epicardium	Mesothelioma Malignant	
	[Mesothelioma Malignant TGLs = 3-16]		
	[Mesothelioma Malignant TGLs = 2-15]		
* Kidney		Nephropathy	Minimal
* Lung		Mesothelioma Malignant	
* Lymph Node, Mediastinal		Mesothelioma Malignant	
* Pituitary Gland	Pars Intermed	Adenoma	
Pleura		Mesothelioma Malignant	
	[Mesothelioma Malignant TGLs = 4 - 17]		
Skeletal Muscle		Mesothelioma Malignant	
Note: TGL-5 = Diaphragmatic involvement.			
	[Mesothelioma Malignant TGLs = 5 - 18]		
* Testes	Germinal Epith	Degeneration	Moderate
* Thymus		Atrophy	Marked
* Thyroid Gland	Follicular Cel	Hyperplasia	Marked

PRIMARY CAUSE OF DEATH - Heart Pericardium Mesothelioma Malignant

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 208

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61280

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Parathyroid Gland	* Pituitary Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Brain	Cranial Nerve, Glial Cell	Glioma Malignant Hyperplasia	Moderate
	Note: Hypercellularity along olfactory nerves probably secondary to tumor.		
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Liver		Basophilic Focus	
	[Basophilic Focus TGLs = 2 - 6]		
Lymph Node	Iliac	Ectasia	Mild
	[Ectasia TGLs = 3 - 15]		
* Nose	Olfactory Epi Nerve	Atrophy Hyperplasia Inflammation	Mild Moderate Suppurative, Minimal
	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Pancreas		Basophilic Focus	Minimal
* Preputial Gland		Inflammation	Mild
	[Inflammation TGLs = 1 - 9]		
* Prostate		Adenoma Inflammation	Mild
* Spleen		Hematopoietic Cell Proliferation	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 208

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61280

ORGAN AND ACCOUNTABLE SITE STATUS

* Testes	Interstit Cell	Adenoma	
[Adenoma TGLs = 4 - 9]			
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Adenoma	

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 209

TRT#: 3

SEX: Male

DAY ON TEST: 656

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61281

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Liver
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Nose	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Mandibular	* Mammary Gland
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OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 2 - 10]		
* Prostate		Inflammation	Minimal
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Marked

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 210

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61282

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Kidney		Nephropathy	Mild
* Liver		Basophilic Focus	
	Bile Duct	Cyst	
[Cyst TGLs = 3 - 15]			
Lymph Node	Lumbar	Infiltration Cellular	Plasma Cell, Minimal
[Infiltration Cellular TGLs = 4 - 15]			
* Prostate	Epithelium, Ventral	Hyperplasia	Mild
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
[Inflammation TGLs = 1 - 16]			
[Ulcer TGLs = 1 - 16]			
* Spleen		Hematopoietic Cell Proliferation	Mild
* Testes	Germinal Epith	Degeneration	Marked
[Degeneration TGLs = 2 - 9]			
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 211

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61283

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult Zona Fascult	Hyperplasia Hypertrophy Cardiomyopathy	Focal, Minimal Multifocal, Mild Minimal
* Heart		Calculus Micro Observation Only	
* Kidney		Nephropathy	Mild
* Liver	[Clear Cell Focus TGLs = 2 - 15]	Clear Cell Focus	
* Lung	Alveolar Epith	Hyperplasia	Focal, Mild
* Skin	Epidermis [Keratoacanthoma TGLs = 1 - 16]	Keratoacanthoma	
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 212

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61284

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Blood Vessel	* Bone	* Brain	* Epididymis
* Esophagus	* Eye	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Nose	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Degeneration Hypertrophy Pheochromocytoma Benign	Cystic, Minimal Multifocal, Mild
* Adrenal Medulla	[Pheochromocytoma Benign TGLs = 4 - 7]		
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Lung			
Note: TGLS - 15 = NCL			
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
* Prostate	Epithelium, Ventral	Hyperplasia	Mild
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
[Inflammation TGLs = 1 - 15]			
[Ulcer TGLs = 1 - 15]			
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 213

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61285

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Esophagus	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Epididymis		Mesothelioma Malignant	
* Eye	Cornea	Inflammation	Chronic Active, Mild
	Cornea, Epithelium	Ulcer	Minimal
* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Mild
* Liver		Basophilic Focus	
		Clear Cell Focus	
		Mixed Cell Focus	
	[Mixed Cell Focus TGLs = 1 - 15]		
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Granulomatous, Minimal
* Nose		Foreign Body	
* Pancreas		Atrophy	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
* Testes	Interstit Cell	Hyperplasia	Minimal
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 214

TRT#: 3

SEX: Male

DAY ON TEST: 633

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61286

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lung
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Mammary Gland
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OBSERVATIONS

* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Spleen		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 215

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61287

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Minimal
* Heart	Valve	Cardiomyopathy	Minimal
		Degeneration	Minimal
* Intestine Large, Rectum		Metaplasia	Squamous, Mild
* Kidney		Nephropathy	Moderate
* Liver		Clear Cell Focus	
* Lung	Alveolar Epith	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Mild
		Inflammation	Chronic Active, Minimal
* Nose	Olfactory Epi	Atrophy	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Testes	Germinal Epith	Degeneration	Marked
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 216

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61288

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Glandular	* Thymus	* Thyroid Gland	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Eye	Retina	Degeneration	Mild
* Heart		Cardiomyopathy	Minimal
* Islets, Pancreatic		Adenoma	
[Adenoma TGLs = 4 - 16]			
* Kidney	Pelvis	Dilatation	Mild
	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
[Dilatation TGLs = 5 - 7]			
* Liver	Serosa	Fibrosis	Mild
[Fibrosis TGLs = 3 - 15]			
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
	Respirat Epith	Hyperplasia	Minimal
		Inflammation	Suppurative, Minimal
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Stomach, Forestomach	Epithelium	Hyperplasia	Minimal
* Testes	Interstit Cell	Adenoma	
[Adenoma TGLs = 2 - 9]			

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 217

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61289

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Blood Vessel	* Bone	Bone Marrow	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Multifocal, Mild
* Adrenal Medulla		Hyperplasia	Minimal
* Eye	Cornea	Mineralization	Minimal
Note: TGLS 1 = NCL			
* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Nose	Olfactory Epi	Atrophy	Minimal
* Prostate		Inflammation	Mild
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 2 - 16]		
	[Ulcer TGLs = 2 - 16]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Testes	Interstit Cell	Adenoma	
	Germinal Epith	Degeneration	Mild
	[Adenoma TGLs = 3 - 9]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 217

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61289

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus

Atrophy

Moderate

* Thyroid Gland

C Cell

Hyperplasia

Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 218

TRT#: 3

SEX: Male

DAY ON TEST: 633

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61290

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose	* Parathyroid Gland
Peripheral Nerve	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	Skeletal Muscle	Spinal Cord	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex		Adenoma	
	Zona Fascult	Hypertrophy	Focal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Pancreas		Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Marked
	[Inflammation TGLs = 1 - 15]		
	[Ulcer TGLs = 1 - 15]		
Spinal Cord			
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH

- Skin Foot Ulcer

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 219

TRT#: 3

SEX: Male

DAY ON TEST: 682

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61291

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Epididymis	* Esophagus	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Liver	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Pancreas	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland	* Parathyroid Gland
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OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Brain		Granular Cell Tumor Benign	
* Eye	Retina	Degeneration	Mild
	Cornea	Mineralization	Minimal
		Schwannoma Malignant	Metastatic (Harderian Gland)
[Schwannoma Malignant TGLs = 1 - 15+16]			
* Harderian Gland		Schwannoma Malignant	
[Schwannoma Malignant TGLs = 2 - 13]			
* Heart		Cardiomyopathy	Minimal
* Intestine Large, Rectum		Metaplasia	Squamous, Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 3 - 10]			
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
[Inflammation TGLs = 4 - 7]			
[Ulcer TGLs = 4 - 7]			
* Spleen		Hematopoietic Cell Proliferation	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 219

TRT#: 3

SEX: Male

DAY ON TEST: 682

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61291

ORGAN AND ACCOUNTABLE SITE STATUS

* Testes

Germinal Epith

Degeneration

Minimal

* Thymus

Atrophy

Moderate

PRIMARY CAUSE OF DEATH

- Harderian Gland Schwannoma Malignant

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 220

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61292

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Multifocal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Kidney		Nephropathy	Minimal
* Liver		Clear Cell Focus	
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 221

TRT#: 3

SEX: Male

DAY ON TEST: 711

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61293

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Eye	Retina	Degeneration	Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	[Infiltration Cellular TGLs = 2 - 4]		
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 1 - 10]		
* Spleen		Pigmentation	Hemosiderin, Minimal
* Stomach, Forestomach	Epithelium	Hyperplasia	Minimal
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 222

TRT#: 3

SEX: Male

DAY ON TEST: 611

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61294

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Mammary Gland
* Nose	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Spleen	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Mediastinal

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 3 - 10]			
* Testes	Germinal Epith	Degeneration	Marked
* Thymus		Atrophy	Moderate
* Thyroid Gland	Follicular Cel	Adenoma	
[Adenoma TGLs = 2 - 3]			

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 223

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61295

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	* Bone	* Brain	* Epididymis
* Esophagus	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Spleen	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Minimal
Blood Vessel		Mineralization	Minimal
Note: Mineralization involves glandular stomach vessels.			
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Retina	Degeneration	Mild
* Heart		Cardiomyopathy	Mild
* Kidney	Pelvis	Dilatation	Mild
	Pelvis	Inflammation	Minimal
		Nephropathy	Mild
[Dilatation TGLs = 1 - 7]			
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
		Inflammation	Minimal
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 224

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61296

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Nose	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

MISSING

* Thymus

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
	[Hyperplasia TGLs = 1 - 10]		
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Moderate
		Pigmentation	Hemosiderin, Minimal
* Testes	Germinal Epith	Degeneration	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 225

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61297

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Nose	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Medulla		Hyperplasia	Minimal
* Heart		Cardiomyopathy	Minimal
* Liver		Clear Cell Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	[Infiltration Cellular TGLs = 3 - 4+5]		
* Lymph Node, Mediastinal		Hemangiosarcoma	
* Lymph Node, Mesenteric		Hyperplasia	Lymphoid, Mild
Mesentery	Fat	Necrosis	Mild
	[Necrosis TGLs = 2 - 16]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Skin	Epidermis	Basal Cell Carcinoma	
	[Basal Cell Carcinoma TGLs = 1 - 15]		
* Spleen	Lymph Follic	Atrophy	Minimal
		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 226

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61298

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Trachea	* Urinary Bladder

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Lung	Alveolar Epith	Hyperplasia	Focal, Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Mild
		Inflammation	Granulomatous, Minimal
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Hypertrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 227

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61299

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Eye	Cornea	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 1 - 13]			
* Kidney	Pelvis	Calculus Micro Observation Only	
		Inflammation	Minimal
		Nephropathy	Mild
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Lung	Alveolar Epith	Hyperplasia	Minimal
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
* Prostate		Inflammation	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 228

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61300

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Minimal
* Eye	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	Antr Chamber	Inflammation	Suppurative, Minimal
	Cornea	Mineralization	Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Angiectasis	Minimal
		Basophilic Focus	
		Clear Cell Focus	
		Mixed Cell Focus	
	[Angiectasis TGLs = 1 - 6+15]		
	[Mixed Cell Focus TGLs = 2 - 6]		
* Pituitary Gland	Pars Distalis	Adenoma	
* Seminal Vesicle		Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 228

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61300

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus

Atrophy

Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 229

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61301

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Nose	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex		Adenoma	
* Eye	Retina	Degeneration	Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Liver		Basophilic Focus	
		Hepatocellular Adenoma	
		Mixed Cell Focus	
	[Hepatocellular Adenoma TGLs = 2 - 15]		
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Pituitary Gland	Pars Intermed	Hyperplasia	Minimal
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
		Inflammation	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
* Testes	Germinal Epith	Degeneration	Marked
	[Degeneration TGLs = 1 - 9]		
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 230

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61302

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
* Larynx	Respirat Epith	Metaplasia	Squamous, Minimal
* Liver		Angiectasis	Minimal
		Necrosis	Focal, Minimal
	[Angiectasis TGLs = 4 - 6]		
	[Necrosis TGLs = 5 - 6]		
* Pancreas		Atrophy	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
		Trichoepithelioma	
	Foot	Ulcer	Marked
	[Inflammation TGLs = 2 - 17]		
	[Trichoepithelioma TGLs = 1 - 16]		
	[Ulcer TGLs = 2 - 17]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 230

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61302

ORGAN AND ACCOUNTABLE SITE STATUS

* Thyroid Gland

C Cell

Hyperplasia

Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 231

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61303

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
* Eye	Lens	Cataract	Minimal
* Heart		Cardiomyopathy	Mild
* Kidney	Pelvis, Transit Epithe	Hyperplasia	Minimal
		Nephropathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Hypertrophy	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 232

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61304

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland	* Parathyroid Gland
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OBSERVATIONS

* Adrenal Medulla		Pheochromocytoma Benign	
* Heart		Cardiomyopathy	Mild
* Int Lg Rectum			
Note: Section taken at anus.			
* Kidney		Nephropathy	Minimal
* Lung	Alveolar Epith	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Pancreas		Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Skin	Subcut Tiss	Fibrous Histiocytoma	
	[Fibrous Histiocytoma TGLs = 1 - 15+16+17+18]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 233

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61305

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

OBSERVATIONS

* Adrenal Medulla		Pheochromocytoma Benign	
* Eye	Cornea	Inflammation	Chronic Active, Moderate
	Unilateral	Phthisis Bulbi	Marked
	[Inflammation TGLs = 1 - 13]		
	[Phthisis Bulbi TGLs = 2 - 13]		
* Heart		Cardiomyopathy	Moderate
* Kidney		Nephropathy	Moderate
* Liver		Clear Cell Focus	
* Lung	Alveolar Epith	Hyperplasia	Focal, Moderate
	Alveolus	Infiltration Cellular	Histiocyte, Mild
* Nose	Olfactory Epi	Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Testes	Germinal Epith	Degeneration	Minimal
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 234

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61306

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Islets, Pancreatic	* Liver
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
	Zona Fascult	Hypertrophy	Focal, Minimal
* Eye	Cornea	Inflammation	Chronic Active, Moderate
	Iris	Inflammation	Acute, Minimal
	Cornea	Mineralization	Minimal
	[Inflammation TGLs = 1 - 13]		
* Intestine Small, Jejunum		Inflammation	Marked
	[Inflammation TGLs = 3 - 15]		
* Kidney		Nephropathy	Minimal
* Larynx		Inflammation	Chronic Active, Mild
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
		Inflammation	Suppurative, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
	[Hyperplasia TGLs = 2 - 10]		
* Prostate	Epithelium, Ventral	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 235

TRT#: 3

SEX: Male

DAY ON TEST: 586

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61307

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Glandular
* Testes	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial	* Mammary Gland
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OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Kidney		Liposarcoma	
		Nephropathy	Moderate
	[Liposarcoma TGLs = 4 - 7]		
* Liver	Bile Duct	Hyperplasia	Minimal
* Lung	Interstitialium	Fibrosis	Minimal
	Alveolar Epith	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Metaplasia	Osseous, Minimal
	[Infiltration Cellular TGLs = 5 - 15]		
	[Metaplasia TGLs = 9 - 5]		
Mesentery	Fat	Liposarcoma	Metastatic (Kidney)
	Note: Probably actually extension/invasion, rather than metastasis, from kidney.		
	[Liposarcoma TGLs = 3 - 17+18+19]		
* Nose	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
		Inflammation	Mild
* Spleen	Lymph Follic	Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 235

TRT#: 3

SEX: Male

DAY ON TEST: 586

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61307

ORGAN AND ACCOUNTABLE SITE STATUS

* Stomach, Forestomach	Hematopoietic Cell Proliferation	Moderate
[Squamous Cell Papilloma TGLs = 10 - 16]	Squamous Cell Papilloma	
* Thymus	Atrophy	Moderate
* Thyroid Gland	C Cell	
[Carcinoma TGLs = 2 - 3]	Carcinoma	

PRIMARY CAUSE OF DEATH - Mesentery Fat Liposarcoma Kidney

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 236

TRT#: 3

SEX: Male

DAY ON TEST: 603

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61308

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Mandibular	* Mammary Gland
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OBSERVATIONS

* Brain		Granular Cell Tumor Benign	
[Granular Cell Tumor Benign	TGLs = 1 - 1]		
* Heart	Valve	Inflammation	Chronic, Minimal
* Kidney	Pelvis	Inflammation	Minimal
* Liver	Bile Duct	Hyperplasia	Minimal
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

PRIMARY CAUSE OF DEATH - Brain Granular Cell Tumor Benign

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 237

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61309

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Mandibular	* Mammary Gland
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OBSERVATIONS

* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Minimal
* Liver		Clear Cell Focus	
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 238

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61310

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Glandular	* Testes	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
* Eye	Lens	Cataract	Minimal
	Retina	Degeneration	Minimal
	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Moderate
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Mild
* Liver		Basophilic Focus	
* Parathyroid Gland		Hyperplasia	Focal, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
	Pars Intermed	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Note: TGL-2 (B06) = acquired or congenital deformity (not a diagnosis available in TDMSE and of no toxicologic consequence).	
* Stomach, Forestomach	Epithelium	Hyperplasia	Mild
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 239

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61311

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Liver	* Lung	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Eye	Retina	Degeneration	Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver			
Note: TGL-3 (B06) = congenital deformity (not a choice in TDMSE).			
Lymph Node	Renal	Infiltration Cellular	Plasma Cell, Mild
	Lumbar	Infiltration Cellular	Plasma Cell, Mild
	[Infiltration Cellular TGLs = 4 - 16]		
	[Infiltration Cellular TGLs = 2 - 15]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Marked
	[Inflammation TGLs = 1 - 17]		
	[Ulcer TGLs = 1 - 17]		
* Spleen		Hematopoietic Cell Proliferation	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 239

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61311

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus

Atrophy

Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 240

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61312

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Liver	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Mediastinal	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fasciata	Hypertrophy	Focal, Mild
* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Moderate
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Skin	Epidermis	Keratoacanthoma	
	[Keratoacanthoma TGLs = 1 - 15]		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Testes		Edema	Moderate
	[Edema TGLs = 2 - 9]		
* Thymus		Atrophy	Moderate
		Hyperplasia	Lymphoid, Mild
* Thyroid Gland	C Cell	Adenoma	

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 241

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61313

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mediastinal
* Nose	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Mandibular	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Heart		Schwannoma Malignant	
* Intestine Large, Rectum		Schwannoma Malignant	Metastatic (Heart)
* Intestine Small, Duodenum		Schwannoma Malignant	Metastatic (Heart)
[Schwannoma Malignant	TGLs = 10 - 8]		
* Intestine Small, Ileum		Schwannoma Malignant	Metastatic (Heart)
* Liver	Bile Duct	Cyst	
		Schwannoma Malignant	Metastatic (Heart)
[Schwannoma Malignant	TGLs = 7,8,9 - 6+15]		
* Lung	Mediastinum	Schwannoma Malignant	Metastatic (Heart)
* Lymph Node, Mesenteric		Ectasia	Marked
		Inflammation	Moderate
		Schwannoma Malignant	Metastatic (Heart)
[Ectasia	TGLs = 6 - 16]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
* Stomach, Glandular		Schwannoma Malignant	Metastatic (Heart)
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 241

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61313

ORGAN AND ACCOUNTABLE SITE STATUS

PRIMARY CAUSE OF DEATH - Heart Schwannoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 242

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61314

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Moderate
* Heart		Cardiomyopathy	Moderate
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Clear Cell Focus	
		Eosinophilic Focus	
	[Eosinophilic Focus TGLs = 2 - 15]		
Mesentery	Fat	Necrosis	Mild
	[Necrosis TGLs = 1 - 16]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Pituitary Gland	Pars Intermed	Hyperplasia	Marked
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 243

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61315

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mesenteric	* Nose
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 244

TRT#: 3

SEX: Male

DAY ON TEST: 731

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61316

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Parathyroid Gland	* Preputial Gland
* Prostate	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Heart		Cardiomyopathy	Minimal
* Islets, Pancreatic		Hyperplasia	Minimal
* Kidney		Nephropathy	Mild
* Liver		Pigmentation	Hemosiderin, Mild
* Pancreas		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Salivary Glands		Carcinoma	
	[Carcinoma TGLs = 1 - 14]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA

2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 245

TRT#: 3

SEX: Male

DAY ON TEST: 171

DOSE: 12.5 ppm

DISP: Natural Death

HISTO: 61317

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	

MISSING

* Mammary Gland	* Parathyroid Gland
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OBSERVATIONS

Blood Vessel	Aorta	Mineralization	Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Moderate
* Kidney	Pelvis	Dilatation	Marked
	Pelvis	Infarct	Minimal
		Inflammation	Marked
	[Dilatation TGLs = 4,8 - 7+15]		
	[Infarct TGLs = 6 - 7]		
	[Inflammation TGLs = 2,5 - 7+15]		
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Lung		Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 10 - 5]		
* Nose		Inflammation	Suppurative, Moderate
* Prostate		Inflammation	Minimal
* Spleen	Lymph Follic	Atrophy	Mild
		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Marked
Ureter		Inflammation	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 245

TRT#: 3

SEX: Male

DAY ON TEST: 171

DOSE: 12.5 ppm

DISP: Natural Death

HISTO: 61317

ORGAN AND ACCOUNTABLE SITE STATUS

[Inflammation TGLs = 9 - 16]

* Urinary Bladder

Calculus Gross Observation

Inflammation

Mild

[Calculus Gross Observation TGLs = 1 - 10]

PRIMARY CAUSE OF DEATH - Kidney Pelvis Inflammation

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 246

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61318

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial	* Mammary Gland
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OBSERVATIONS

* Heart	Cardiomyopathy	Minimal
* Kidney	Nephropathy	Mild
* Liver	Basophilic Focus	
	Clear Cell Focus	
* Spleen	Hematopoietic Cell Proliferation	Mild
* Thymus	Atrophy	Moderate

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 247

TRT#: 3

SEX: Male

DAY ON TEST: 640

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61319

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Nose	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Eye	Retina	Degeneration	Moderate
* Kidney		Nephropathy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Prostate		Inflammation	Mild
* Spleen	Lymph Follic	Atrophy	Moderate
		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Marked
* Thyroid Gland	C Cell	Hyperplasia	Mild

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 248

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61320

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
		Hyperplasia	Lymphoid, Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 249

TRT#: 3

SEX: Male

DAY ON TEST: 729

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61321

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Nose	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Mild
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
	[Clear Cell Focus TGLs = 2 - 6]		
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
Mesentery		Hemangiosarcoma	
	[Hemangiosarcoma TGLs = 1 - 15]		
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 250

TRT#: 3

SEX: Male

DAY ON TEST: 730

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61322

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Eye	Lens	Cataract	Moderate
	Retina	Degeneration	Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Liver		Clear Cell Focus	
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 1 - 10]		
* Spleen		Pigmentation	Hemosiderin, Minimal
* Testes		Edema	Moderate
	[Edema TGLs = 2 - 9]		
* Thymus		Atrophy	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 401

TRT#: 5

SEX: Male

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61173

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Minimal
* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Mild
* Larynx	Squam Epithel	Hyperplasia	Mild
* Liver		Angiectasis	Minimal
		Basophilic Focus	
		Eosinophilic Focus	
	Bile Duct	Hyperplasia	Minimal
	[Angiectasis TGLs = 3 - 15]		
	[Eosinophilic Focus TGLs = 7 = 17]		
Lymph Node	Popliteal	Infiltration Cellular	Plasma Cell, Marked
	Lumbar	Infiltration Cellular	Plasma Cell, Moderate
	[Infiltration Cellular TGLs = 5 - 16]		
	[Infiltration Cellular TGLs = 4 - 15]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Minimal
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Mild
	Respirat Epith	Metaplasia	Squamous, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 401

TRT#: 5

SEX: Male

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61173

ORGAN AND ACCOUNTABLE SITE STATUS

* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Marked
	[Inflammation TGLs = 1 - 17]		
	[Ulcer TGLs = 1 - 17]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Testes	Germinal Epith	Degeneration	Marked
	Interstitial Cell	Hyperplasia	Mild
	[Degeneration TGLs = 2 - 9]		
* Thymus		Atrophy	Moderate

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 402

TRT#: 5

SEX: Male

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61174

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Moderate
* Eye	Lens	Cataract	Mild
	Retina	Degeneration	Mild
* Int Lg Rectum			
Note: Section taken from anus.			
* Liver		Angiectasis	Minimal
		Basophilic Focus	
		Clear Cell Focus	
	[Angiectasis TGLs = 3 - 15]		
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 2 - 16]		
	[Ulcer TGLs = 2 - 16]		
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 403

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61175

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Eye	Cornea	Inflammation	Chronic Active, Minimal
	Iris	Inflammation	Acute, Minimal
	Antr Chamber	Inflammation	Suppurative, Mild
* Heart		Cardiomyopathy	Minimal
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
* Liver		Clear Cell Focus	
		Eosinophilic Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Minimal
* Skin	Inguinal	Inflammation	Granulomatous, Moderate
	Inguinal	Ulcer	Focal, Mild
	[Inflammation TGLs = 1 - 9+15]		
	[Ulcer TGLs = 1 - 15]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Inflammation	Mild
		Pigmentation	Hemosiderin, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 403

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61175

ORGAN AND ACCOUNTABLE SITE STATUS

[Inflammation TGLs = 2 - 6]

* Thymus

Atrophy

Moderate

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 404

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61176

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Trachea	* Urinary Bladder

INSUFFICIENT TISSUE

* Eye

OBSERVATIONS

* Eye			
Note: TGL 1 = NCL			
* Kidney		Nephropathy	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Nose		Inflammation	Suppurative, Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
* Thyroid Gland	Follicular Cel	Hypertrophy	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 405

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61177

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Eye	Retina	Degeneration	Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Liver		Clear Cell Focus	
* Lung	Alveolar Epith	Hyperplasia	Focal, Moderate
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	[Hyperplasia TGLs = 1 - 15]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Moderate
	Lamina Propria	Fibrosis	Minimal
* Pancreas		Atrophy	Marked
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Trachea	Epithelium	Regeneration	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 406

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61178

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Kidney		Nephropathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 2 - 15]		
	[Ulcer TGLs = 2 - 15]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Adenoma	Multiple

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 407

TRT#: 5

SEX: Male

DAY ON TEST: 582

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61179

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Degeneration Hypertrophy Cardiomyopathy	Cystic, Minimal Focal, Mild
* Heart		Nephropathy	Minimal
* Kidney		Hyperplasia	Minimal
* Larynx	Squam Epithel	Fibrosis	Minimal
* Nose	Lamina Propria	Inflammation	Suppurative, Mild
	Olfactory Epi	Metaplasia	Respiratory, Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
* Prostate		Inflammation	Mild
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Stomach, Forestomach	Epithelium	Hyperplasia	Minimal
* Thymus		Atrophy	Moderate
* Trachea		Inflammation	Chronic Active, Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 408

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61180

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
* Brain			
Note: Possible minimal polymicrogyria in cingulate region, bilaterally but not symmetrical.			
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Liver		Clear Cell Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Olfactory Epi	Atrophy	Mild
		Inflammation	Suppurative, Moderate
	Respirat Epith	Metaplasia	Squamous, Minimal
* Skin	Epidermis	Squamous Cell Carcinoma	
	[Squamous Cell Carcinoma TGLs = 1 - 16]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 409

TRT#: 5

SEX: Male

DAY ON TEST: 325

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61181

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

Bone Marrow		Lymphoma Malignant	
* Eye	Retina	Lymphoma Malignant	
* Heart		Cardiomyopathy	Minimal
	[Cardiomyopathy TGLs = 4 - 6]		
* Kidney		Infiltration Cellular	Lymphoid, Mild
* Liver		Lymphoma Malignant	
* Lung	Interstitialium	Fibrosis	Minimal
	Alveolar Epith	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Lymph Node, Mandibular		Lymphoma Malignant	
* Lymph Node, Mediastinal		Lymphoma Malignant	
* Lymph Node, Mesenteric		Lymphoma Malignant	
	[Lymphoma Malignant TGLs = 5 - 7]		
* Nose	Olfactory Epi	Atrophy	Mild
		Inflammation	Chronic Active, Mild
* Spleen		Lymphoma Malignant	
	[Lymphoma Malignant TGLs = 3 - 6]		
* Thymus		Hyperplasia	Lymphoid, Moderate

PRIMARY CAUSE OF DEATH - Spleen Lymphoma Malignant

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 410

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61182

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Eye	Lens	Cataract	Minimal
	Retina	Degeneration	Moderate
* Heart		Cardiomyopathy	Minimal
* Islets, Pancreatic		Hyperplasia	Minimal
* Kidney		Nephropathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Clear Cell Focus	
		Hepatodiaphragmatic Nodule	
	Bile Duct	Hyperplasia	Minimal
[Hepatodiaphragmatic Nodule	TGLs = 1 - 15]		
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Prostate	Epithelium, Ventral	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 411

TRT#: 5

SEX: Male

DAY ON TEST: 527

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61183

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lung
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Kidney	Cortex	Cyst	Minimal
	Pelvis	Inflammation	Mild
		Nephropathy	Minimal
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Prostate		Inflammation	Minimal
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 412

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61184

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Trachea	* Urinary Bladder

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Bronchus, Epithelium	Regeneration	Minimal
* Nose	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Prostate		Inflammation	Minimal
* Skin	Subcut Tiss	Hemangioma	
	[Hemangioma TGLs = 3 - 16]		
* Spleen		Cyst	
		Hematopoietic Cell Proliferation	Minimal
	[Cyst TGLs = 4 - 15]		
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Adenoma	
	Follicular Cel	Hypertrophy	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 413

TRT#: 5

SEX: Male

DAY ON TEST: 543

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61185

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Kidney	* Larynx	* Liver
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Islets, Pancreatic		Hyperplasia	Minimal
* Nose	Olfactory Epi	Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Prostate		Inflammation	Minimal
* Skin	Tail	Cyst Epithelial Inclusion	
[Cyst Epithelial Inclusion TGLs = 2 - 15]			
* Spleen	Lymph Follic	Atrophy	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 414

TRT#: 5

SEX: Male

DAY ON TEST: 592

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61186

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Eye	Iris	Inflammation	Acute, Minimal
	Antr Chamber	Inflammation	Suppurative, Minimal
	Cornea	Inflammation	Chronic Active, Minimal
* Kidney	Pelvis	Dilatation	Minimal
		Nephropathy	Mild
	[Dilatation TGLs = 5 - 7]		
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Bronchus, Epithelium	Atrophy	Minimal
		Inflammation	Suppurative, Mild
* Lymph Node, Bronchial		Atrophy	Mild
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Mild
		Inflammation	Suppurative, Marked
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 4 - 10]		
* Prostate		Inflammation	Mild
* Skin	Foot	Inflammation	Chronic Active, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 414

TRT#: 5

SEX: Male

DAY ON TEST: 592

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61186

ORGAN AND ACCOUNTABLE SITE STATUS

	Foot	Ulcer	Mild
	[Inflammation TGLs = 1,3 - 15+16]		
	[Ulcer TGLs = 1,3 - 15+16]		
* Spleen	Lymph Follic	Atrophy	Mild
		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Mild

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 415

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61187

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Lens	Cataract	Minimal
	Retina	Degeneration	Moderate
* Islets, Pancreatic		Hyperplasia	Minimal
* Kidney		Nephropathy	Mild
* Liver		Clear Cell Focus	
* Nose	Olfactory Epi	Atrophy	Minimal
		Inflammation	Suppurative, Minimal
	Respirat Epith	Metaplasia	Squamous, Minimal
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 1 - 15]		
	[Ulcer TGLs = 1 - 15]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 416

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61188

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Kidney	Pelvis	Inflammation	Mild
		Nephropathy	Mild
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
	[Hyperplasia TGLs = 2 - 10]		
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
		Inflammation	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 1 - 16]		
	[Ulcer TGLs = 1 - 16]		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 417

TRT#: 5

SEX: Male

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61189

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Degeneration	Cystic, Minimal
		Hypertrophy	Multifocal, Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Infarct	Minimal
* Liver		Basophilic Focus	
* Nose	Lamina Propria	Fibrosis	Minimal
		Foreign Body	
		Inflammation	Suppurative, Minimal
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Moderate
* Thyroid Gland	Follicular Cel	Hypertrophy	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 418

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61190

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Spleen
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Minimal
* Eye	Cornea	Inflammation	Chronic Active, Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Liver		Clear Cell Focus	
	Bile Duct	Hyperplasia	Minimal
* Nose		Inflammation	Suppurative, Mild
	Respirat Epith	Metaplasia	Squamous, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Prostate		Inflammation	Minimal
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 419

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61191

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

OBSERVATIONS

* Adrenal Cortex	Zona Fasciata	Hyperplasia	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Retina	Degeneration	Minimal
	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Mineralization	Minimal
Note: TGLS 1 = NCL			
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Liver		Clear Cell Focus	
* Lymph Node, Mesenteric		Hemangiosarcoma	
* Nose	Lamina Propria	Fibrosis	Minimal
	Olfactory Epi	Metaplasia	Respiratory, Mild
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Moderate
* Trachea	Epithelium	Regeneration	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 420

TRT#: 5

SEX: Male

DAY ON TEST: 694

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61192

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Glandular	* Testes
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hematopoietic Cell Proliferation	Mild
	TGLs = 5 - 7]	Hypertrophy	Focal, Minimal
[Hematopoietic Cell Proliferation			
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye	Cornea	Inflammation	Chronic Active, Mild
	Unilateral	Phthisis Bulbi	Marked
[Phthisis Bulbi	TGLs = 1 - 13]		
* Liver		Hematopoietic Cell Proliferation	Minimal
		Necrosis	Focal, Moderate
[Necrosis	TGLs = 6,7,8 - 6+15]		
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
[Infiltration Cellular	TGLs = 10,11, 12 - 4+5]		
Lymph Node	Pancreatic	Inflammation	Moderate
[Inflammation	TGLs = 13 - 20]		
* Lymph Node, Mediastinal		Infiltration Cellular	Plasma Cell, Mild
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 420

TRT#: 5

SEX: Male

DAY ON TEST: 694

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61192

ORGAN AND ACCOUNTABLE SITE STATUS

* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Marked
	[Hematopoietic Cell Proliferation TGLs = 4 - 6]		
* Stomach, Forestomach		Sarcoma	
	[Sarcoma TGLs = 9 - 17+18+19]		
* Thymus		Atrophy	Moderate
* Thyroid Gland	Follicular Cel	Hypertrophy	Mild

PRIMARY CAUSE OF DEATH - Stomach, Forestomach Sarcoma

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 421

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61193

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lung
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Prostate	* Seminal Vesicle
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
	Zona Fascult	Hypertrophy	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Liver		Clear Cell Focus	
		Degeneration	Cystic, Minimal
	[Clear Cell Focus TGLs = 8 - 15]		
Lymph Node	Lumbar	Ectasia	Moderate
	Axillary	Infiltration Cellular	Plasma Cell, Moderate
	[Ectasia TGLs = 6 - 17]		
	[Infiltration Cellular TGLs = 4 - 16]		
* Mammary Gland		Galactocele	Mild
	[Galactocele TGLs = 3 - 17]		
* Nose		Inflammation	Suppurative, Moderate
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 7 - 10]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 421

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61193

ORGAN AND ACCOUNTABLE SITE STATUS

* Salivary Glands		Inflammation	Mild
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Marked
	[Inflammation TGLs = 2 - 16]		
	[Ulcer TGLs = 2 - 16]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Carcinoma	
	[Carcinoma TGLs = 5 - 3]		

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 422

TRT#: 5

SEX: Male

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61194

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Brain		Granular Cell Tumor Benign	
* Eye	Lens	Cataract	Minimal
	Cornea, Epithelium	Hyperplasia	Moderate
	Cornea	Inflammation	Chronic Active, Moderate
	Antr Chamber	Inflammation	Suppurative, Minimal
	Cornea, Epithelium	Ulcer	Minimal
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Mild
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Lung	Bronchus, Epithelium	Regeneration	Minimal
* Nose	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
	Pars Intermed	Hyperplasia	Mild
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 422

TRT#: 5

SEX: Male

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61194

ORGAN AND ACCOUNTABLE SITE STATUS

* Trachea

Epithelium

Regeneration

Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 423

TRT#: 5

SEX: Male

DAY ON TEST: 722

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61195

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Mammary Gland
* Parathyroid Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Stomach, Glandular	* Testes	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Mediastinal

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Brain	[Granular Cell Tumor Benign TGLs = 6 - 1]	Granular Cell Tumor Benign	
* Heart		Schwannoma Malignant	
* Kidney		Nephropathy	Moderate
* Liver		Basophilic Focus	
	[Clear Cell Focus TGLs = 5 - 15]	Clear Cell Focus	
* Lung	Alveolar Epith	Hyperplasia	Minimal
	[Hyperplasia TGLs = 4 - 5]		
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Minimal
		Inflammation	Suppurative, Mild
* Pancreas		Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Prostate		Inflammation	Moderate
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 3 - 16]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 423

TRT#: 5

SEX: Male

DAY ON TEST: 722

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61195

ORGAN AND ACCOUNTABLE SITE STATUS

[Ulcer TGLs = 3 - 16]

* Spleen		Hematopoietic Cell Proliferation	Mild
* Stomach, Forestomach		Squamous Cell Papilloma	
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal

PRIMARY CAUSE OF DEATH - Brain Granular Cell Tumor Benign

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 424

TRT#: 5

SEX: Male

DAY ON TEST: 592

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61196

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Skin	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial	* Mammary Gland
-------------------------	-----------------

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
		Lymphoma Malignant	
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Retina	Degeneration	Mild
* Intestine Large, Cecum		Lymphoma Malignant	
* Intestine Large, Colon		Lymphoma Malignant	
* Intestine Small, Ileum		Lymphoma Malignant	
* Kidney		Nephropathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Lymphoma Malignant	
	[Lymphoma Malignant TGLs = 7 - 6]		
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
		Lymphoma Malignant	
* Lymph Node, Mandibular		Lymphoma Malignant	
* Lymph Node, Mediastinal		Lymphoma Malignant	
	[Lymphoma Malignant TGLs = 4 - 3]		
* Lymph Node, Mesenteric		Lymphoma Malignant	
Mesentery		Lymphoma Malignant	
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Minimal
		Inflammation	Suppurative, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 424

TRT#: 5

SEX: Male

DAY ON TEST: 592

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61196

ORGAN AND ACCOUNTABLE SITE STATUS

* Pancreas		Lymphoma Malignant	
	[Lymphoma Malignant TGLs = 8 - 15]		
* Prostate		Lymphoma Malignant	
* Seminal Vesicle		Lymphoma Malignant	
* Spleen		Hematopoietic Cell Proliferation	Mild
		Lymphoma Malignant	
	[Lymphoma Malignant TGLs = 6 - 6]		
* Stomach, Forestomach	Epithelium	Hyperplasia	Moderate
		Lymphoma Malignant	
		Ulcer	Moderate
	[Lymphoma Malignant TGLs = 9 - 7]		
* Stomach, Glandular		Lymphoma Malignant	
* Testes	Germinal Epith	Degeneration	Minimal
* Thymus		Lymphoma Malignant	
	[Lymphoma Malignant TGLs = 5 - 3]		
* Thyroid Gland	C Cell	Hyperplasia	Minimal
	Follicular Cel	Hypertrophy	Moderate

PRIMARY CAUSE OF DEATH - Spleen Lymphoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 425

TRT#: 5

SEX: Male

DAY ON TEST: 617

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61197

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
[Infiltration Cellular	TGLs = 2 - 4+5]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
	Lamina Propria	Fibrosis	Minimal
	Olfactory Epi	Metaplasia	Respiratory, Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma	TGLs = 1 - 10]		
* Spleen		Pigmentation	Hemosiderin, Minimal
* Testes	Germinal Epith	Degeneration	Marked
	Rete Testes	Inflammation	Granulomatous, Mild
* Thymus		Atrophy	Moderate
* Thyroid Gland	Follicular Cel	Hyperplasia	Mild

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 426

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61198

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Parathyroid Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Retina	Degeneration	Mild
* Kidney		Nephropathy	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
		Hepatodiaphragmatic Nodule	
[Hepatodiaphragmatic Nodule	TGLs = 1 - 15]		
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Mild
* Nose	Olfactory Epi	Atrophy	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 427

TRT#: 5

SEX: Male

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61199

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex		Adenoma	
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Cornea	Inflammation	Chronic Active, Mild
[Inflammation TGLs = 1 - 13]			
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Mild
* Larynx	Squam Epithel	Hyperplasia	Mild
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
Lymph Node	Popliteal	Infiltration Cellular	Plasma Cell, Moderate
[Infiltration Cellular TGLs = 5 - 15]			
Mesentery	Fat	Necrosis	Minimal
[Necrosis TGLs = 4 - 16]			
* Nose	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
Skeletal Muscle		Hemangiosarcoma	
[Hemangiosarcoma TGLs = 2 - 16]			
* Spleen		Hematopoietic Cell Proliferation	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 427

TRT#: 5

SEX: Male

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61199

ORGAN AND ACCOUNTABLE SITE STATUS

* Testes	Germinal Epith	Degeneration	Marked
[Degeneration TGLs = 3 - 9]			
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 428

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61200

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fasciult	Hypertrophy	Multifocal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Lens	Cataract	Minimal
	Retina	Degeneration	Moderate
	[Cataract TGLs = 5 - 13]		
* Kidney		Nephropathy	Minimal
* Liver		Clear Cell Focus	
Lymph Node	Lumbar	Infiltration Cellular	Plasma Cell, Moderate
	Renal	Infiltration Cellular	Plasma Cell, Moderate
	[Infiltration Cellular TGLs = 4 - 16]		
	[Infiltration Cellular TGLs = 3 - 15]		
* Nose		Inflammation	Suppurative, Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Marked
	[Inflammation TGLs = 1,2 - 17+18]		
	[Ulcer TGLs = 1,2 - 17+18]		
* Spleen		Hematopoietic Cell Proliferation	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 428

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61200

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus

Atrophy

Marked

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 429

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61201

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult Zona Fascult	Hyperplasia Hypertrophy Metaplasia	Multifocal, Mild Multifocal, Mild Squamous, Minimal
* Intestine Large, Rectum		Nephropathy	Minimal
* Kidney		Basophilic Focus	
* Liver		Pigmentation	Hemosiderin, Mild
	[Basophilic Focus TGLs = 1 - 6]		
* Lung	Bronchus, Epithelium	Regeneration	Minimal
* Nose		Inflammation	Suppurative, Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Trachea	Epithelium	Regeneration	Minimal

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 430

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61202

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Medulla		Pheochromocytoma Benign	
	[Pheochromocytoma Benign TGLs = 1-7]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Liver		Clear Cell Focus	
* Nose	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Stomach, Forestomach		Inflammation	Minimal
* Thymus		Atrophy	Moderate

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 431

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61203

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

- | | | | |
|-----------------------------|--------------------------|----------------------------|---------------------------|
| * Adrenal Medulla | * Bone | * Epididymis | * Esophagus |
| * Harderian Gland | * Intestine Large, Cecum | * Intestine Large, Colon | * Intestine Large, Rectum |
| * Intestine Small, Duodenum | * Intestine Small, Ileum | * Intestine Small, Jejunum | * Islets, Pancreatic |
| * Lymph Node, Bronchial | * Lymph Node, Mandibular | * Lymph Node, Mediastinal | * Lymph Node, Mesenteric |
| * Pancreas | * Preputial Gland | * Prostate | * Salivary Glands |
| * Seminal Vesicle | * Stomach, Forestomach | * Stomach, Glandular | * Thyroid Gland |
| * Urinary Bladder | | | |

MISSING

- * Mammary Gland

OBSERVATIONS

- | | | | |
|---|----------------------|-----------------------|-------------------------|
| * Adrenal Cortex | Zona Fascult | Hypertrophy | Focal, Minimal |
| Blood Vessel | | Mineralization | Minimal |
| Note: Mineralization involves vessels in the glandular stomach. | | | |
| Bone Marrow | Myeloid Cell | Hyperplasia | Marked |
| * Brain | | Glioma Malignant | |
| Note: Probable Malignant Microglial Cell Tumor. | | | |
| * Eye | Cornea | Inflammation | Chronic Active, Mild |
| | Antr Chamber | Inflammation | Suppurative, Mild |
| | Iris | Inflammation | Acute, Minimal |
| | Cornea, Epithelium | Ulcer | Minimal |
| [Inflammation TGLs = 3 - 13] | | | |
| * Heart | | Cardiomyopathy | Minimal |
| * Kidney | | Nephropathy | Mild |
| * Larynx | | Inflammation | Chronic Active, Minimal |
| * Liver | | Clear Cell Focus | |
| | Bile Duct | Hyperplasia | Minimal |
| [Clear Cell Focus TGLs = 4 - 15] | | | |
| * Lung | Bronchus, Epithelium | Hyperplasia | Minimal |
| Lymph Node | Popliteal | Hyperplasia | Lymphoid, Mild |
| | Popliteal | Infiltration Cellular | Plasma Cell, Marked |

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 431

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61203

ORGAN AND ACCOUNTABLE SITE STATUS

	Lumbar	Infiltration Cellular	Plasma Cell, Mild
	[Infiltration Cellular TGLs = 6 - 19]		
	[Infiltration Cellular TGLs = 5 - 18]		
* Nose		Inflammation	Suppurative, Moderate
* Parathyroid Gland		Hyperplasia	Focal, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Marked
	[Inflammation TGLs = 1,2 - 16+17]		
	[Ulcer TGLs = 1,2 - 16+17]		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Testes	Interstit Cell	Hyperplasia	Minimal
* Thymus		Atrophy	Minimal
		Thymoma Benign	
* Trachea	Epithelium	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 432

TRT#: 5

SEX: Male

DAY ON TEST: 715

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61204

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Skin	* Spleen
* Stomach, Glandular	* Testes	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Bronchial	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
Ear		Neural Crest Tumor	
	[Neural Crest Tumor TGLs = 4 - 20+21+22]		
* Eye	Cornea	Inflammation	Chronic Active, Mild
* Harderian Gland		Hyperplasia	Minimal
	[Hyperplasia TGLs = 5 - 13]		
* Heart		Cardiomyopathy	Minimal
	[Cardiomyopathy TGLs = 14 - 16]	Neural Crest Tumor	Metastatic (Ear)
* Kidney		Nephropathy	Minimal
* Liver		Basophilic Focus	
	[Clear Cell Focus TGLs = 9 - 15]	Clear Cell Focus	
	[Mixed Cell Focus TGLs = 10 - 19]	Mixed Cell Focus	
* Lung		Neural Crest Tumor	Metastatic (Ear)
	[Neural Crest Tumor TGLs = 6,7,8,11,12 ,13 - 4+5+15+16+17+18]		
* Lymph Node, Mandibular		Hemorrhage	Mild
Note: Thrombosis also present.			

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 432

TRT#: 5

SEX: Male

DAY ON TEST: 715

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61204

ORGAN AND ACCOUNTABLE SITE STATUS

[Hemorrhage TGLs = 3 - 14]

Mesentery

Fat

Necrosis

Minimal

[Necrosis TGLs = 2 - 18]

* Nose

Olfactory Epi

Atrophy

Minimal

Lamina Propria

Fibrosis

Minimal

Inflammation

Chronic Active, Minimal

Olfactory Epi

Metaplasia

Respiratory, Minimal

* Pituitary Gland

Pars Distalis

Hyperplasia

Minimal

* Stomach, Forestomach

Epithelium

Hyperplasia

Moderate

Inflammation

Minimal

* Thymus

Atrophy

Mild

* Thyroid Gland

C Cell

Adenoma

PRIMARY CAUSE OF DEATH

- Ear Neural Crest Tumor

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 433

TRT#: 5

SEX: Male

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61205

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Moderate
* Liver		Basophilic Focus	
		Clear Cell Focus	
		Infiltration Cellular	Mixed Cell, Minimal
	[Basophilic Focus TGLs = 1 - 15]		
* Lung		Inflammation	Granulomatous, Minimal
* Nose	Olfactory Epi	Atrophy	Minimal
		Foreign Body	
		Inflammation	Suppurative, Minimal
* Prostate		Inflammation	Minimal
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 434

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61206

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Trachea	* Urinary Bladder

OBSERVATIONS

* Adrenal Cortex	Zona Fasciata	Hypertrophy	Multifocal, Mild
* Eye	Unilateral	Phthisis Bulbi	Marked
	[Phthisis Bulbi TGLs = 5 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
		Eosinophilic Focus	
		Infiltration Cellular	Mixed Cell, Minimal
	[Basophilic Focus TGLs = 9,10 - 15+16]		
	[Eosinophilic Focus TGLs = 7 - 6]		
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Moderate
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
	[Hyperplasia TGLs = 6 - 10]		
* Skin	Epidermis	Cyst	
	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 434

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61206

ORGAN AND ACCOUNTABLE SITE STATUS

[Cyst TGLs = 2 - 19]

[Inflammation TGLs = 3,4 - 17+18]

[Ulcer TGLs = 3,4 - 17+18]

* Spleen

Hematopoietic Cell Proliferation

Mild

* Thymus

Atrophy

Mild

* Thyroid Gland

C Cell

Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 435

TRT#: 5

SEX: Male

DAY ON TEST: 695

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61207

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Mediastinal	* Mammary Gland	* Thymus
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OBSERVATIONS

* Eye	Cornea	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 1 - 13]			
* Kidney	Pelvis	Inflammation	Mild
		Nephropathy	Minimal
* Nose	Lamina Propria	Fibrosis	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 3 - 10]			
* Prostate		Inflammation	Minimal
* Spleen	Lymph Follic	Atrophy	Mild
		Pigmentation	Hemosiderin, Mild

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 436

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61208

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Eye	Retina	Degeneration	Moderate
	Cornea	Inflammation	Chronic Active, Minimal
* Heart		Cardiomyopathy	Mild
* Intestine Large, Rectum		Metaplasia	Squamous, Mild
* Kidney		Nephropathy	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
	[Basophilic Focus TGLs = 3,4 - 15+16]		
* Lung	Alveolar Epith	Hyperplasia	Focal, Marked
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	[Infiltration Cellular TGLs = 2 - 4+5]		
* Nose	Respirat Epith	Hyperplasia	Minimal
		Inflammation	Suppurative, Moderate
* Prostate	Epithelium, Ventral	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 437

TRT#: 5

SEX: Male

DAY ON TEST: 25

DOSE: 25 ppm

DISP: Natural Death

HISTO: 61209

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Liver	* Lung	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea			

MISSING

* Mammary Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Inflammation	Suppurative, Marked
* Kidney	Pelvis	Dilatation	Marked
		Fibrosis	Focal, Minimal
	Pelvis	Inflammation	Moderate
		Thrombosis	Minimal
[Dilatation TGLs = 3,4,6,8 - 7]			
[Fibrosis TGLs = 7 - 15]			
[Thrombosis TGLs = 5 - 16]			
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Lymph Node, Bronchial		Atrophy	Marked
* Prostate		Inflammation	Mild
* Spleen	Lymph Follic	Atrophy	Moderate
* Stomach, Forestomach		Inflammation	Mild
* Thymus		Atrophy	Moderate
* Urinary Bladder		Hemorrhage	Moderate
[Hemorrhage TGLs = 2 - 10]			

PRIMARY CAUSE OF DEATH - Kidney Pelvis Inflammation

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 438

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61210

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Eye	Retina	Degeneration	Moderate
	Cornea	Inflammation	Chronic Active, Minimal
	Antr Chamber	Inflammation	Suppurative, Minimal
	[Inflammation TGLs = 2 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Clear Cell Focus	
	[Hepatodiaphragmatic Nodule TGLs = 1 - 15]	Hepatodiaphragmatic Nodule	
* Lung	Alveolar Epith	Hyperplasia	Focal, Minimal
* Nose	Olfactory Epi	Atrophy	Minimal
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate
* Thyroid Gland	Follicular Cel	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 439

TRT#: 5

SEX: Male

DAY ON TEST: 724

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61211

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	Peripheral Nerve
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	Skeletal Muscle	Spinal Cord	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial	* Mammary Gland	* Thymus
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OBSERVATIONS

* Adrenal Cortex		Hematopoietic Cell Proliferation	Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Heart		Cardiomyopathy	Minimal
* Intestine Large, Rectum		Metaplasia	Squamous, Moderate
* Kidney		Nephropathy	Mild
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Liver		Clear Cell Focus	
		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
Lymph Node	Lumbar	Infiltration Cellular	Plasma Cell, Mild
	[Infiltration Cellular TGLs = 2 - 16]		
* Nose	Olfactory Epi	Atrophy	Mild
		Inflammation	Suppurative, Minimal
	Respirat Epith	Metaplasia	Squamous, Minimal
Perph Nerve			
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 439

TRT#: 5

SEX: Male

DAY ON TEST: 724

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61211

ORGAN AND ACCOUNTABLE SITE STATUS

[Inflammation TGLs = 1 - 16]

[Ulcer TGLs = 1 - 16]

* Spleen

Hematopoietic Cell Proliferation

Mild

PRIMARY CAUSE OF DEATH

- Skin Foot Ulcer

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 440

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61212

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Eye	Cornea	Inflammation	Chronic Active, Mild
	Cornea, Epithelium	Ulcer	Mild
	[Inflammation TGLs = 1 - 13]		
* Kidney		Nephropathy	Mild
* Liver		Angiectasis	Minimal
		Basophilic Focus	
		Clear Cell Focus	
		Infiltration Cellular	Mixed Cell, Minimal
	[Angiectasis TGLs = 2 - 16]		
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Olfactory Epi	Atrophy	Minimal
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Stomach, Forestomach		Squamous Cell Carcinoma	
	[Squamous Cell Carcinoma TGLs = 3 - 17]		
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 441

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61213

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Moderate
* Heart		Cardiomyopathy	Moderate
* Islets, Pancreatic		Hyperplasia	Minimal
* Kidney		Nephropathy	Mild
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Liver		Clear Cell Focus	
		Degeneration	Cystic, Mild
Note: Fatty change also present in region of cystic degeneration. [Degeneration TGLs = 4 - 7]			
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Mediastinum	Mesothelioma Malignant	
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
	Olfactory Epi	Atrophy	Minimal
		Inflammation	Suppurative, Moderate
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Skin	Dorsal	Inflammation	Chronic Active, Mild
	Epidermis	Keratoacanthoma	
	Dorsal	Ulcer	Focal, Mild
[Inflammation TGLs = 1-15]			

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 441

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61213

ORGAN AND ACCOUNTABLE SITE STATUS

[Keratoacanthoma TGLs = 2 - 16]

[Ulcer TGLs = 1 - 15]

* Spleen

Hematopoietic Cell Proliferation

Moderate

Pigmentation

Hemosiderin, Minimal

* Thymus

Atrophy

Moderate

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 442

TRT#: 5

SEX: Male

DAY ON TEST: 730

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61214

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Bronchial	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Moderate
* Eye	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	Cornea, Epithelium	Ulcer	Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney	Cortex	Cyst	
		Nephropathy	Mild
	[Cyst TGLs = 1 - 15]		
* Liver		Clear Cell Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
	Lamina Propria	Fibrosis	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 443

TRT#: 5

SEX: Male

DAY ON TEST: 589

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61215

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Kidney	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	Peripheral Nerve	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	Skeletal Muscle	Spinal Cord
* Spleen	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Islets, Pancreatic		Hyperplasia	Minimal
* Liver		Fatty Change	Focal, Minimal
* Nose	Olfactory Epi	Atrophy	Mild
	Olfactory Epi	Inflammation	Suppurative, Moderate
		Metaplasia	Respiratory, Minimal
Perph Nerve			
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Prostate		Inflammation	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 1,2 - 16+17]		
	[Ulcer TGLs = 1,2 - 16+17]		
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 444

TRT#: 5

SEX: Male

DAY ON TEST: 724

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61216

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	Peripheral Nerve	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	Skeletal Muscle	Spinal Cord
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Mammary Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fasciuli	Hypertrophy	Multifocal, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Lens	Cataract	Mild
	Retina	Degeneration	Moderate
	Unilateral	Phthisis Bulbi	Moderate
[Phthisis Bulbi TGLs = 1 - 13]			
* Kidney		Nephropathy	Minimal
* Liver		Angiectasis	Minimal
		Basophilic Focus	
[Angiectasis TGLs = 4 - 16]			
* Nose	Olfactory Epi	Atrophy	Moderate
		Inflammation	Suppurative, Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Marked
[Inflammation TGLs = 2 - 15]			
[Ulcer TGLs = 2 - 15]			
Spinal Cord			

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 444

TRT#: 5

SEX: Male

DAY ON TEST: 724

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61216

ORGAN AND ACCOUNTABLE SITE STATUS

Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.

* Spleen

Hematopoietic Cell Proliferation

Minimal

* Thymus

Atrophy

Moderate

PRIMARY CAUSE OF DEATH

- Skin Foot Ulcer

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 445

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61217

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fasciata	Hypertrophy	Multifocal, Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Liver		Basophilic Focus	
		Clear Cell Focus	
		Tension Lipidosis	Minimal
[Tension Lipidosis TGLs = 3 - 15]			
* Lung	Alveolar Epith	Hyperplasia	Focal, Minimal
* Lymph Node, Mesenteric		Hemangioma	
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
[Inflammation TGLs = 1 - 15]			
[Ulcer TGLs = 1 - 15]			
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 445

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61217

ORGAN AND ACCOUNTABLE SITE STATUS

Lymphoma Malignant

[Lymphoma Malignant TGLs = 2 - 3]

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 446

TRT#: 5

SEX: Male

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61218

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Eye	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 1 - 13]		
* Kidney		Nephropathy	Minimal
* Lung	Bronchus, Epithelium	Regeneration	Minimal
Lymph Node	Lumbar	Infiltration Cellular	Plasma Cell, Moderate
	[Infiltration Cellular TGLs = 4 - 15]		
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Mild
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Epidermis	Pilomatrixoma	
	Foot	Ulcer	Marked
	[Inflammation TGLs = 3 - 15]		
	[Pilomatrixoma TGLs = 2 - 16]		
	[Ulcer TGLs = 3 - 15]		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 446

TRT#: 5

SEX: Male

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61218

ORGAN AND ACCOUNTABLE SITE STATUS

* Trachea

Epithelium

Regeneration

Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 447

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61219

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	Bone Marrow	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult Zona Fascult	Hyperplasia Hypertrophy	Focal, Minimal Multifocal, Mild
* Bone		Hyperostosis	Moderate
* Eye	Cornea Antr Chamber	Inflammation Inflammation	Chronic Active, Minimal Suppurative, Minimal
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Liver		Angiectasis Clear Cell Focus	Minimal
	[Angiectasis TGLs = 3,4 - 6+15]		
* Nose	Olfactory Epi Turbinat Lamina Propria	Atrophy Atrophy Fibrosis Inflammation	Minimal Minimal Minimal Suppurative, Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Testes	Interstit Cell	Hyperplasia	Marked
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 448

TRT#: 5

SEX: Male

DAY ON TEST: 537

DOSE: 25 ppm

DISP: Natural Death

HISTO: 61220

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lung	* Lymph Node, Mandibular	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Spleen	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial * Mammary Gland

OBSERVATIONS

* Lymph Node, Mediastinal	Schwannoma Malignant	Metastatic (Thymus)
Note: The schwannoma in the lymph node is likely invasive, rather than actually metastatic, from the thymic schwannoma.		
[Schwannoma Malignant TGLs = 3 - 3]		
* Nose	Inflammation	Suppurative, Minimal
* Thymus	Schwannoma Malignant	
[Schwannoma Malignant TGLs = 2 - 15]		

PRIMARY CAUSE OF DEATH - Thymus Schwannoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 449

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61221

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Bilateral	Phthisis Bulbi	Marked
Note: Phthisis bulbi with substantial residual inflammation. [Phthisis Bulbi TGLs = 3 - 13]			
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Mild
* Liver		Angiectasis	Minimal
[Angiectasis TGLs = 4 - 6] [Basophilic Focus TGLs = 5 - 15]			
* Lung	Alveolar Epith	Hyperplasia	Focal, Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
Lymph Node	Popliteal	Hyperplasia	Lymphoid, Moderate
	Popliteal	Infiltration Cellular	Plasma Cell, Mild
	Lumbar	Infiltration Cellular	Plasma Cell, Marked
[Hyperplasia TGLs = 7 - 17] [Infiltration Cellular TGLs = 6 - 16]			
* Nose	Olfactory Epi	Atrophy	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 449

TRT#: 5

SEX: Male

DAY ON TEST: 729

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61221

ORGAN AND ACCOUNTABLE SITE STATUS

	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Moderate
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Marked
	[Inflammation TGLs = 1 - 18]		
	[Ulcer TGLs = 1 - 18]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Adenoma	
	[Adenoma TGLs = 2 - 3]		

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 450

TRT#: 5

SEX: Male

DAY ON TEST: 561

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61222

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Liver
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Kidney	Pelvis	Inflammation	Mild
		Nephropathy	Minimal
* Nose	Olfactory Epi	Atrophy	Mild
		Inflammation	Suppurative, Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen		Pigmentation	Hemosiderin, Minimal
* Stomach, Forestomach	Epithelium	Hyperplasia	Minimal
		Inflammation	Mild
* Thymus		Atrophy	Marked

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 601

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61073

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Eye	Retina	Degeneration	Mild
	Cornea	Inflammation	Chronic Active, Minimal
* Heart	Epicardium	Fibrosis	Focal, Mild
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Mild
	Squam Epithel	Ulcer	Focal, Minimal
* Liver		Clear Cell Focus	
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Bronchus, Epithelium	Regeneration	Minimal
	[Infiltration Cellular TGLs = 1 - 4+5]		
* Lymph Node, Mandibular		Infiltration Cellular	Plasma Cell, Mild
* Nose	Turbinate	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 601

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61073

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Metaplasia	Squamous, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Minimal
* Trachea	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Minimal
		Inflammation	Chronic Active, Minimal
	Epithelium	Metaplasia	Squamous, Minimal
	Epithelium	Regeneration	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 602

TRT#: 7

SEX: Male

DAY ON TEST: 586

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61074

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Kidney
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

INSUFFICIENT TISSUE

* Eye

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye			
Note: TGLS 2 = NCL			
* Islets, Pancreatic		Hyperplasia	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
* Lung	Squam Epithel	Ulcer	Focal, Minimal
	Interstitialium	Fibrosis	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
		Inflammation	Suppurative, Mild
	[Inflammation TGLs = 5,6 - 4+5]		
* Lymph Node, Mandibular		Infiltration Cellular	Plasma Cell, Mild
* Nose	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 602

TRT#: 7

SEX: Male

DAY ON TEST: 586

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61074

ORGAN AND ACCOUNTABLE SITE STATUS

* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 4 - 15, 16]		
	[Ulcer TGLs = 3 - 15]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
	[Hematopoietic Cell Proliferation TGLs = 7 - 7]		
* Thymus		Atrophy	Moderate
* Trachea	Epithelium	Hyperplasia	Minimal

PRIMARY CAUSE OF DEATH - Nose Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 603

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61075

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	* Bone	Bone Marrow	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Adenoma Hyperplasia	Focal, Minimal
[Adenoma TGLs = 4 - 7]			
Blood Vessel		Inflammation	Minimal
Note: Vascular inflammation involves the testicular arterioles.			
* Eye	Cornea	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 1 - 13]			
* Kidney		Nephropathy	Moderate
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Mild
* Lung	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Mild
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Olfactory Epi	Atrophy	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Pancreas		Atrophy	Minimal
* Prostate		Inflammation	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 603

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61075

ORGAN AND ACCOUNTABLE SITE STATUS

[Inflammation TGLs = 2 - 14]

* Spleen

* Thymus

* Trachea

Epithelium

Epithelium

Pigmentation

Atrophy

Hyperplasia

Inflammation

Metaplasia

Hemosiderin, Minimal

Minimal

Mild

Chronic Active, Minimal

Squamous, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 604

TRT#: 7

SEX: Male

DAY ON TEST: 642

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61076

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Mild
	Zona Fascult	Hypertrophy	Multifocal, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Antr Chamber	Inflammation	Suppurative, Marked
	[Inflammation TGLs = 3 - 13]		
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
* Lung	Respirat Epith	Metaplasia	Squamous, Mild
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
		Inflammation	Suppurative, Mild
* Nose	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
* Skin	Olfactory Epi	Metaplasia	Respiratory, Marked
	Foot	Inflammation	Acute, Moderate
	[Inflammation TGLs = 4 - 16]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 604

TRT#: 7

SEX: Male

DAY ON TEST: 642

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61076

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus		Atrophy	Mild
* Trachea	Submucosa	Fibrosis	Minimal
		Inflammation	Chronic Active, Minimal
	Epithelium	Metaplasia	Squamous, Minimal
	Epithelium	Necrosis	Minimal
	Epithelium	Regeneration	Mild

PRIMARY CAUSE OF DEATH - Eye Antr Chamber Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 605

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61077

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Eye	Cornea	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 1 - 13]			
* Heart		Cardiomyopathy	Minimal
* Kidney	Pelvis	Inflammation	Mild
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Clear Cell Focus	
* Lung	Pleura	Fibrosis	Minimal
	Bronchiole, Epithelium	Hyperplasia	Mild
	Bronchus, Epithelium	Hyperplasia	Mild
	Alveolus	Infiltration Cellular	Histiocyte, Mild
	Peribronchial	Inflammation	Chronic Active, Mild
[Infiltration Cellular TGLs = 3 - 4+5]			
* Lymph Node, Mandibular		Ectasia	Mild
[Ectasia TGLs = 2 - 14]			
* Nose	Olfactory Epi	Atrophy	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 605

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61077

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Metaplasia	Squamous, Mild
	Olfactory Epi	Metaplasia	Respiratory, Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Minimal
* Trachea	Submucosa	Fibrosis	Mild
	Epithelium	Hyperplasia	Minimal
	Epithelium	Metaplasia	Squamous, Mild
	Epithelium	Necrosis	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 606

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61078

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Lymph Node, Bronchial
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Retina	Degeneration	Mild
	Cornea, Epithelium	Hyperplasia	Mild
	Cornea	Inflammation	Chronic Active, Mild
[Inflammation TGLs = 1 - 13]			
* Heart		Cardiomyopathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Mild
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
* Lymph Node, Mandibular		Infiltration Cellular	Plasma Cell, Mild
* Nose	Olfactory Epi	Atrophy	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 606

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61078

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Mild
* Trachea	Epithelium	Hyperplasia	Minimal
		Inflammation	Chronic Active, Mild
	Epithelium	Metaplasia	Squamous, Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 607

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61079

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder

MISSING

* Lymph Node, Mediastinal

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
	Zona Fascult	Hypertrophy	Multifocal, Mild
* Brain	Cerebrum, Gray Matter	Hemorrhage	Focal, Mild
[Hemorrhage TGLs = 2 - 1]			
* Kidney	Pelvis	Calculus Micro Observation Only	
		Inflammation	Mild
		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Minimal
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Submucosa	Fibrosis	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Bronchus, Epithelium	Regeneration	Minimal
[Infiltration Cellular TGLs = 3 - 4+5]			
* Lymph Node, Mandibular		Infiltration Cellular	Plasma Cell, Mild
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
	Olfactory Epi	Atrophy	Minimal
	Turbinate	Hyperostosis	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 607

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61079

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Testes	Interstit Cell	Adenoma	
	Germinal Epith	Degeneration	Marked
	[Adenoma TGLs = 4 - 9]		
* Thymus		Atrophy	Mild
* Trachea	Epithelium	Metaplasia	Squamous, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 608

TRT#: 7

SEX: Male

DAY ON TEST: 619

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61080

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	Skeletal Muscle	Spinal Cord
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Mild
	Squam Epithel	Ulcer	Focal, Mild
* Liver		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Interstitialium	Fibrosis	Minimal
	Alveolar Epith	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Mild
	Bronchus, Epithelium	Hyperplasia	Mild
		Inflammation	Suppurative, Minimal
	[Inflammation TGLs = 4,5,6 - 4+5+7]		
* Lymph Node, Mediastinal		Atrophy	Moderate
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 608

TRT#: 7

SEX: Male

DAY ON TEST: 619

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61080

ORGAN AND ACCOUNTABLE SITE STATUS

Peripheral Nerve	Respirat Epith Axon	Metaplasia Degeneration	Squamous, Minimal Minimal
Note: Skeletal muscle, nerve, and spinal cord examined due to clinical signs.			
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 2,3 - 16+17]		
	[Ulcer TGLs = 2,3 - 16+17]		
* Spleen	Lymph Follic	Atrophy Hematopoietic Cell Proliferation	Mild Mild
* Thymus		Atrophy	Marked
* Trachea	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Minimal
	Epithelium	Metaplasia	Squamous, Minimal

PRIMARY CAUSE OF DEATH - Lung Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 609

TRT#: 7

SEX: Male

DAY ON TEST: 730

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61081

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Unilateral	Phthisis Bulbi	Moderate
	[Phthisis Bulbi TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney	Pelvis	Inflammation	Mild
		Nephropathy	Mild
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Basophilic Focus	
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Mild
		Inflammation	Granulomatous, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
	[Infiltration Cellular TGLs = 2 - 4+5]		
* Nose	Olfactory Epi	Atrophy	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 609

TRT#: 7

SEX: Male

DAY ON TEST: 730

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61081

ORGAN AND ACCOUNTABLE SITE STATUS

	Olfactory Epi	Metaplasia	Respiratory, Marked
* Prostate		Inflammation	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate
* Trachea	Submucosa	Fibrosis	Mild
	Epithelium	Hyperplasia	Minimal
		Inflammation	Chronic Active, Minimal
	Epithelium	Metaplasia	Squamous, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 610

TRT#: 7

SEX: Male

DAY ON TEST: 628

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61082

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Urinary Bladder	

OBSERVATIONS

* Adrenal Medulla		Pheochromocytoma Benign	
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Minimal
	Cornea, Epithelium	Ulcer	Minimal
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
* Lymph Node, Bronchial		Atrophy	Mild
* Lymph Node, Mandibular		Squamous Cell Carcinoma	Metastatic (Skin)
	[Squamous Cell Carcinoma TGLs = 3 - 16]		
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 610

TRT#: 7

SEX: Male

DAY ON TEST: 628

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61082

ORGAN AND ACCOUNTABLE SITE STATUS

* Pancreas	Respirat Epith	Metaplasia	Squamous, Minimal
* Prostate	Epithelium, Ventral	Atrophy	Minimal
* Skin	Epidermis	Hyperplasia	Minimal
[Squamous Cell Carcinoma	TGLs = 2 - 15+17+18]	Squamous Cell Carcinoma	
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Hypertrophy	Mild
* Trachea	Epithelium	Hyperplasia	Minimal
	Epithelium	Metaplasia	Squamous, Minimal

PRIMARY CAUSE OF DEATH - Skin Epidermis Squamous Cell Carcinoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 611

TRT#: 7

SEX: Male

DAY ON TEST: 541

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61083

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Liver	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial	* Mammary Gland
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OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Cornea	Inflammation	Chronic Active, Minimal
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Mild
	Respirat Epith	Metaplasia	Squamous, Mild
* Lung	Squam Epithel	Ulcer	Multifocal, Moderate
	Bronchus, Epithelium	Atrophy	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
		Inflammation	Suppurative, Mild
	Bronchus, Epithelium	Regeneration	Minimal
[Inflammation TGLs = 2 - 4+5+15]			
* Nose	Lamina Propria	Fibrosis	Minimal
	Turbinate	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Mild
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 611

TRT#: 7

SEX: Male

DAY ON TEST: 541

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61083

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Metaplasia	Squamous, Mild
	Olfactory Epi	Necrosis	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Marked

PRIMARY CAUSE OF DEATH - Lung Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 612

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61084

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 4 - 13]			
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Mild
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Moderate
[Inflammation TGLs = 1 - 7]			
[Ulcer TGLs = 1 - 7]			
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 612

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61084

ORGAN AND ACCOUNTABLE SITE STATUS

* Trachea

Epithelium

Hyperplasia

Minimal

Epithelium

Regeneration

Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 613

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61085

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	* Bone	Bone Marrow	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder

MISSING

* Mammary Gland	* Parathyroid Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Moderate
Blood Vessel		Inflammation	Minimal
Note: Testicular vessels are inflamed.			
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Moderate
* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Clear Cell Focus	
	[Clear Cell Focus TGLs = 5,6 - 6]		
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Interstitialium	Fibrosis	Minimal
	Bronchiole, Epithelium	Hyperplasia	Mild
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Suppurative, Mild
	[Inflammation TGLs = 3,4 - 5+15]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 613

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61085

ORGAN AND ACCOUNTABLE SITE STATUS

* Pituitary Gland		Fibrosis	Mild
* Skin		Cyst Epithelial Inclusion	
	[Cyst Epithelial Inclusion TGLs = 1 - 16]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Testes	Interstit Cell	Hyperplasia	Minimal
* Thymus		Atrophy	Marked
* Trachea	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Minimal
	Epithelium	Regeneration	Minimal

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 614

TRT#: 7

SEX: Male

DAY ON TEST: 589

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61086

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver
* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thymus	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Eye	Antr Chamber	Inflammation	Suppurative, Minimal
* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
* Lung	Respirat Epith	Metaplasia	Squamous, Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
		Inflammation	Suppurative, Moderate
	[Inflammation TGLs = 3 - 4+5]		
* Lymph Node, Bronchial		Inflammation	Suppurative, Moderate
* Lymph Node, Mediastinal		Inflammation	Moderate
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Mild
		Inflammation	Suppurative, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Respirat Epith	Necrosis	Minimal
	Olfactory Epi	Necrosis	Minimal
		Squamous Cell Papilloma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 614

TRT#: 7

SEX: Male

DAY ON TEST: 589

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61086

ORGAN AND ACCOUNTABLE SITE STATUS

* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Mild
	[Inflammation TGLs = 2 -16, 17]		
	[Ulcer TGLs = 2 - 16]		
* Spleen	Lymph Follic	Atrophy	Mild
		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal

PRIMARY CAUSE OF DEATH - Lung Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 615

TRT#: 7

SEX: Male

DAY ON TEST: 499

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61087

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Epididymis	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Urinary Bladder		

MISSING

* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Mammary Gland
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OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Brain	[Granular Cell Tumor Benign TGLs = 1 - 1]	Granular Cell Tumor Benign	
* Eye	Retina	Degeneration	Minimal
* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Regeneration	Minimal
* Nose	Lamina Propria	Fibrosis	Mild
	Respirat Epith	Hyperplasia	Mild
		Inflammation	Suppurative, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
* Spleen	Lymph Follic	Atrophy	Moderate
* Thymus		Atrophy	Mild
* Trachea	Epithelium	Atrophy	Minimal
	Submucosa	Fibrosis	Minimal
	Epithelium	Regeneration	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 615

TRT#: 7

SEX: Male

DAY ON TEST: 499

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61087

ORGAN AND ACCOUNTABLE SITE STATUS

PRIMARY CAUSE OF DEATH - Brain Granular Cell Tumor Benign

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 616

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61088

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Cornea	Inflammation	Chronic Active, Minimal
* Larynx	Respirat Epith	Metaplasia	Squamous, Minimal
* Liver		Angiectasis	Minimal
[Angiectasis TGLs = 2 - 6]			
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
	Lamina Propria	Fibrosis	Minimal
	Turbinate	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Prostate		Inflammation	Minimal
* Spleen	Lymph Follic	Atrophy	Minimal
		Pigmentation	Hemosiderin, Minimal
* Testes	Germinal Epith	Degeneration	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 616

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61088

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Adenoma	
* Trachea	Epithelium	Atrophy	Minimal
	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Minimal
	Epithelium	Regeneration	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 617

TRT#: 7

SEX: Male

DAY ON TEST: 730

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61089

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Salivary Glands	* Seminal Vesicle
* Skin	* Spleen	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Cornea	Inflammation	Chronic Active, Minimal
* Heart		Cardiomyopathy	Mild
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Minimal
* Liver		Clear Cell Focus	
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Interstitialium	Fibrosis	Minimal
	Alveolar Epith	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Moderate
	Peribronchial	Inflammation	Chronic Active, Mild
	[Infiltration Cellular TGLs = 2 - 4+5]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 617

TRT#: 7

SEX: Male

DAY ON TEST: 730

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61089

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Metaplasia	Squamous, Minimal
	Olfactory Epi	Metaplasia	Respiratory, Marked
* Pancreas		Inflammation	Minimal
* Prostate		Inflammation	Minimal
* Thymus		Atrophy	Moderate
* Thyroid Gland	Follicular Cel	Hypertrophy	Moderate
* Trachea	Epithelium	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 618

TRT#: 7

SEX: Male

DAY ON TEST: 610

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61090

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Urinary Bladder	

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Retina	Degeneration	Mild
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
* Lung	Alveolus	Edema	Moderate
	Bronchiole, Epithelium	Hyperplasia	Mild
	Bronchus, Epithelium	Hyperplasia	Minimal
	Peribronchial	Inflammation	Chronic Active, Mild
[Inflammation TGLs = 1 - 4+5]			
* Nose	Lamina Propria	Fibrosis	Minimal
	Turbinate	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
	Olfactory Epi	Necrosis	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
[Inflammation TGLs = 2,3 - 15+16]			
[Ulcer TGLs = 2,3 - 15+16]			

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 618

TRT#: 7

SEX: Male

DAY ON TEST: 610

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61090

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen	Lymph Follic	Atrophy	Mild
		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Marked
* Trachea	Epithelium	Atrophy	Minimal
	Submucosa	Fibrosis	Mild
	Epithelium	Hyperplasia	Mild

PRIMARY CAUSE OF DEATH - Lung Peribronchial Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 619

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61091

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 2 - 13]		
* Heart		Cardiomyopathy	Mild
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Mild
Lacrimal Gland		Metaplasia	Mild
	Note: Lacrimal gland metaplasia to Harderian gland morphology.		
	[Metaplasia TGLs = 1 - 15]		
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Basophilic Focus	
* Lung		Alveolar/Bronchiolar Adenoma	
	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Submucosa	Fibrosis	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 619

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61091

ORGAN AND ACCOUNTABLE SITE STATUS

	Alveolus	Infiltration Cellular Inflammation	Histiocyte, Minimal Granulomatous, Minimal
	Peribronchial Bronchus, Epithelium	Inflammation Regeneration	Chronic Active, Mild Minimal
	[Infiltration Cellular TGLs = 3 - 4+5]		
* Nose	Respirat Epith	Hyperplasia Inflammation	Marked Suppurative, Marked
* Pituitary Gland	Olfactory Epi Pars Distalis	Metaplasia Hyperplasia	Respiratory, Marked Mild
* Spleen		Hematopoietic Cell Proliferation Pigmentation	Minimal Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Hypertrophy	Mild
* Trachea	Submucosa Epithelium Epithelium Epithelium	Fibrosis Hyperplasia Necrosis Regeneration	Minimal Minimal Minimal Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 620

TRT#: 7

SEX: Male

DAY ON TEST: 730

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61092

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Eye	Cornea	Inflammation	Chronic Active, Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Minimal
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Metaplasia	Squamous, Minimal
Lymph Node	Lumbar	Infiltration Cellular	Plasma Cell, Mild
[Infiltration Cellular	TGLs = 3,4 - 15+16]		
* Nose	Turbinate	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
[Inflammation	TGLs = 1.2 - 15+16]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 620

TRT#: 7

SEX: Male

DAY ON TEST: 730

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61092

ORGAN AND ACCOUNTABLE SITE STATUS

[Ulcer TGLs = 1,2 - 15+16]

* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Trachea	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Minimal
	Epithelium	Necrosis	Minimal
	Epithelium	Regeneration	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 621

TRT#: 7

SEX: Male

DAY ON TEST: 710

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61093

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye	Cornea	Inflammation	Chronic Active, Moderate
	Cornea, Epithelium	Ulcer	Mild
	[Inflammation TGLs = 5 - 13]		
* Heart		Cardiomyopathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Mild
	Respirat Epith	Metaplasia	Squamous, Moderate
	Squam Epithel	Ulcer	Focal, Minimal
* Liver	Bile Duct	Dilatation	Marked
		Hepatodiaphragmatic Nodule	
	[Dilatation TGLs = 3 - 20]		
	[Hepatodiaphragmatic Nodule TGLs = 4 - 19]		
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Interstitium	Fibrosis	Minimal
	Alveolar Epith	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Mild
	Peribronchial	Inflammation	Chronic Active, Minimal
	[Infiltration Cellular TGLs = 2 - 4+5]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 621

TRT#: 7

SEX: Male

DAY ON TEST: 710

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61093

ORGAN AND ACCOUNTABLE SITE STATUS

* Lymph Node, Mesenteric		Hemangioma	
* Nose	Lamina Propria	Fibrosis	Minimal
	Turbinat	Hyperostosis	Moderate
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Subcut Tiss	Schwannoma Malignant	
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 7,8 - 17+18]		
	[Schwannoma Malignant TGLs = 1 - 15+16]		
	[Ulcer TGLs = 7,8 - 17+18]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Marked
* Trachea	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Mild
	Epithelium	Regeneration	Minimal

PRIMARY CAUSE OF DEATH - Skin Subcut Tiss Schwannoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 622

TRT#: 7

SEX: Male

DAY ON TEST: 569

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61094

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Bilateral	Necrosis	Multifocal, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Antr Chamber	Inflammation	Suppurative, Minimal
	Cornea	Inflammation	Chronic Active, Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Mild
* Larynx	Squam Epithel	Nephropathy	Minimal
		Hyperplasia	Moderate
		Inflammation	Chronic Active, Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
* Lung	Squam Epithel	Ulcer	Multifocal, Moderate
	Bronchus, Epithelium	Hyperplasia	Moderate
	Bronchiole, Epithelium	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	[Inflammation TGLs = 1 - 4+5]		
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 622

TRT#: 7

SEX: Male

DAY ON TEST: 569

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61094

ORGAN AND ACCOUNTABLE SITE STATUS

		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
* Prostate		Inflammation	Mild
* Spleen	Lymph Follic	Atrophy	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Marked
* Thyroid Gland	Follicular Cel	Hypertrophy	Minimal
* Trachea	Epithelium	Hyperplasia	Mild

PRIMARY CAUSE OF DEATH - Lung Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 623

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61095

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Medulla		Pheochromocytoma Benign	
* Heart		Cardiomyopathy	Minimal
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Mild
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Clear Cell Focus	
	[Clear Cell Focus TGLs = 3,4 - 6+15]		
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
Lymph Node	Iliac	Infiltration Cellular	Plasma Cell, Mild
	Deep Cervical	Infiltration Cellular	Plasma Cell, Minimal
	[Infiltration Cellular TGLs = 5 - 17]		
	[Infiltration Cellular TGLs = 2 - 16]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 623

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61095

ORGAN AND ACCOUNTABLE SITE STATUS

		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Respirat Epith	Metaplasia	Squamous, Mild
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 624

TRT#: 7

SEX: Male

DAY ON TEST: 599

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61096

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 1-13]		
* Kidney	Pelvis	Inflammation	Mild
* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Minimal
	Squam Epithel	Ulcer	Focal, Minimal
* Liver		Clear Cell Focus	
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Mild
	Bronchus, Epithelium	Regeneration	Minimal
	[Infiltration Cellular TGLs = 3 - 4+5]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
	Lamina Propria	Fibrosis	Mild
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Mild
* Prostate	Respirat Epith	Metaplasia	Squamous, Minimal
	Epithelium, Ventral	Hyperplasia	Minimal
* Skin	Subcut Tiss	Fibrosarcoma	
	[Fibrosarcoma TGLs = 2 - 15+16+17+18+19]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 624

TRT#: 7

SEX: Male

DAY ON TEST: 599

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61096

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Minimal
* Trachea	Submucosa	Fibrosis	Minimal

PRIMARY CAUSE OF DEATH - Skin Subcut Tiss Fibrosarcoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 625

TRT#: 7

SEX: Male

DAY ON TEST: 571

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61097

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Epididymis		Mesothelioma Malignant	
* Eye	Retina	Degeneration	Minimal
	Cornea	Inflammation	Chronic Active, Minimal
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
* Lung	Squam Epithel	Ulcer	Focal, Minimal
	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Mild
		Inflammation	Suppurative, Moderate
	[Inflammation TGLs = 5,6,7,8 - 4+5]		
Mesentery	Fat	Necrosis	Minimal
	[Necrosis TGLs = 9 - 7]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
	Olfactory Epi	Necrosis	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 625

TRT#: 7

SEX: Male

DAY ON TEST: 571

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61097

ORGAN AND ACCOUNTABLE SITE STATUS

* Prostate		Inflammation	Minimal
* Skin	Foot	Inflammation	Chronic Active, Mild
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 3,4 - 15+16]		
	[Ulcer TGLs = 3,4 - 15+16]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Lung Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 626

TRT#: 7

SEX: Male

DAY ON TEST: 712

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61098

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Blood Vessel	* Bone	* Brain	* Epididymis
* Esophagus	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Mild
* Adrenal Medulla		Pheochromocytoma Benign	
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Moderate
	Cornea	Necrosis	Minimal
	Cornea, Epithelium	Ulcer	Minimal
	[Inflammation TGLs = 1 - 13]		
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Marked
* Lung	Interstitialium	Fibrosis	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
		Inflammation	Suppurative, Mild
	[Inflammation TGLs = 5,6,7 - 4+5]		
Lymph Node	Popliteal	Infiltration Cellular	Plasma Cell, Moderate
	Iliac	Infiltration Cellular	Plasma Cell, Marked
	[Infiltration Cellular TGLs = 9 - 16]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 626

TRT#: 7

SEX: Male

DAY ON TEST: 712

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61098

ORGAN AND ACCOUNTABLE SITE STATUS

[Infiltration Cellular TGLs = 8 - 15]

* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Respirat Epith	Metaplasia	Squamous, Mild
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Marked
	[Inflammation TGLs = 3,4 - 16+17]		
	[Ulcer TGLs = 3,4 - 16+17]		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Lung Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 627

TRT#: 7

SEX: Male

DAY ON TEST: 626

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61099

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Urinary Bladder	

MISSING

* Thymus

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Lens	Cataract	Mild
	Cornea	Inflammation	Chronic Active, Minimal
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Minimal
	Respirat Epith	Metaplasia	Squamous, Minimal
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Submucosa	Fibrosis	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Mild
* Lymph Node, Mediastinal		Lymphoma Malignant	
	[Lymphoma Malignant TGLs = 1 - 3]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
* Pituitary Gland	Pars Distalis	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 627

TRT#: 7

SEX: Male

DAY ON TEST: 626

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61099

ORGAN AND ACCOUNTABLE SITE STATUS

[Adenoma TGLs = 2 - 10]

* Prostate

Inflammation

Mild

* Skin

Foot

Inflammation

Chronic Active, Mild

Foot

Ulcer

Minimal

[Inflammation TGLs = 4 - 16]

[Ulcer TGLs = 4 - 16]

* Spleen

Lymph Follic

Atrophy

Mild

Pigmentation

Hemosiderin, Mild

* Trachea

Submucosa

Fibrosis

Minimal

PRIMARY CAUSE OF DEATH

- Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 628

TRT#: 7

SEX: Male

DAY ON TEST: 601

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61100

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Eye
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

MISSING

* Lymph Node, Mandibular

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Harderian Gland		Hyperplasia	Mild
* Heart		Cardiomyopathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
	Squam Epithel	Ulcer	Multifocal, Mild
* Liver	Bile Duct	Hyperplasia	Minimal
* Lung	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Suppurative, Mild
	[Inflammation TGLs = 3 - 4+5]		
	Lymph Node	Renal	Mild
		Renal	Plasma Cell, Mild
	[Ectasia TGLs = 4 - 7]		
* Nose	Lamina Propria	Fibrosis	Mild
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 628

TRT#: 7

SEX: Male

DAY ON TEST: 601

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61100

ORGAN AND ACCOUNTABLE SITE STATUS

* Skin	Respirat Epith Olfactory Epi Foot Foot	Metaplasia Metaplasia Inflammation Ulcer	Squamous, Moderate Respiratory, Marked Chronic Active, Marked Moderate
	[Inflammation TGLs = 2 - 15] [Ulcer TGLs = 2 - 15]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thymus		Atrophy	Mild
* Trachea	Epithelium	Hyperplasia Inflammation	Minimal Chronic Active, Mild
	Epithelium	Regeneration	Minimal

PRIMARY CAUSE OF DEATH - Lung Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 629

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61101

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Eye	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	Iris	Inflammation	Acute, Mild
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney	Pelvis	Dilatation	Minimal
		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver	[Hepatodiaphragmatic Nodule TGLs = 3 - 6]	Hepatodiaphragmatic Nodule	
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Interstitialium	Fibrosis	Minimal
	Bronchus, Submucosa	Fibrosis	Minimal
	Alveolar Epith	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 629

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61101

ORGAN AND ACCOUNTABLE SITE STATUS

	Alveolus	Infiltration Cellular	Histiocyte, Mild
	Peribronchial	Inflammation	Chronic Active, Minimal
	Bronchus, Epithelium	Metaplasia	Squamous, Minimal
	[Infiltration Cellular TGLs = 2 - 4+5]		
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Testes		Mesothelioma Malignant	
* Thymus		Atrophy	Mild
* Trachea	Submucosa	Fibrosis	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 630

TRT#: 7

SEX: Male

DAY ON TEST: 570

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61102

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Liver	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	Peripheral Nerve
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
Skeletal Muscle	Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye			
Note: TGL 1 = NCL			
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Mild
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Marked
* Lung	Squam Epithel	Ulcer	Focal, Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Mild
		Inflammation	Granulomatous, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
	[Infiltration Cellular TGLs = 6 - 4+5]		
* Mammary Gland		Galactocele	Mild
	[Galactocele TGLs = 4 - 7]		
* Nose	Lamina Propria	Fibrosis	Mild
	Respirat Epith	Hyperplasia	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 630

TRT#: 7

SEX: Male

DAY ON TEST: 570

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61102

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Squamous, Moderate
	Pars Distalis	Metaplasia	Respiratory, Moderate
* Pituitary Gland		Hyperplasia	Marked
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 2.3 - 16+17]		
	[Ulcer TGLs = 2,3 - 16+17]		
Spinal Cord			
	Note: Peripheral nerve, skeletal muscle, and spinal cord examined due to clinical signs.		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild

PRIMARY CAUSE OF DEATH - Skin Foot Ulcer

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 631

TRT#: 7

SEX: Male

DAY ON TEST: 724

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61103

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	Peripheral Nerve	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	Skeletal Muscle
Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye	Cornea	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 1 - 13]			
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Clear Cell Focus	
		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Pleura	Fibrosis	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Mild
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Mild
[Infiltration Cellular TGLs = 5 - 4+5]			
[Inflammation TGLs = 4 - 4]			
Lymph Node	Renal	Infiltration Cellular	Plasma Cell, Moderate
[Infiltration Cellular TGLs = 6 - 17]			

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 631

TRT#: 7

SEX: Male

DAY ON TEST: 724

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61103

ORGAN AND ACCOUNTABLE SITE STATUS

* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
	Turbinat	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Mild
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 2,3 - 18+19]		
	[Ulcer TGLs = 2,3 - 18+19]		
Spinal Cord			
	Note: Peripheral nerve, skeletal muscle, and spinal cord examined due to clinical signs.		
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Mild
* Trachea	Epithelium	Atrophy	Mild
	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Minimal

PRIMARY CAUSE OF DEATH - Skin Foot Ulcer

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 632

TRT#: 7

SEX: Male

DAY ON TEST: 685

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61104

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Minimal
	Cornea, Epithelium	Ulcer	Minimal
* Intestine Large, Rectum		Metaplasia	Squamous, Mild
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
	Squam Epithel	Ulcer	Focal, Minimal
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Interstitium	Fibrosis	Mild
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
		Inflammation	Suppurative, Moderate
* Nose	Lamina Propria	Fibrosis	Minimal
	Turbinate	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Marked
	Olfactory Epi	Necrosis	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 632

TRT#: 7

SEX: Male

DAY ON TEST: 685

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61104

ORGAN AND ACCOUNTABLE SITE STATUS

* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 1 - 15]		
	[Ulcer TGLs = 1 - 15]		
* Spleen	Lymph Follic	Atrophy	Moderate
		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Marked
* Trachea	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Minimal
	Epithelium	Regeneration	Minimal

PRIMARY CAUSE OF DEATH - Lung Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 633

TRT#: 7

SEX: Male

DAY ON TEST: 549

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61105

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Intestine Large, Cecum	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Salivary Glands	* Seminal Vesicle	* Spleen
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Harderian Gland		Hyperplasia	Minimal
* Heart		Cardiomyopathy	Mild
* Intestine Large, Colon		Carcinoma	
[Carcinoma TGLs = 2 - 7]			
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
[Infiltration Cellular TGLs = 3 - 15]			
* Nose	Lamina Propria	Fibrosis	Moderate
	Respirat Epith	Hyperplasia	Mild
		Inflammation	Suppurative, Moderate
	Respirat Epith	Metaplasia	Squamous, Minimal
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Prostate		Inflammation	Minimal
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Moderate
[Inflammation TGLs = 1 - 16]			
[Ulcer TGLs = 1 - 16]			
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 633

TRT#: 7

SEX: Male

DAY ON TEST: 549

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61105

ORGAN AND ACCOUNTABLE SITE STATUS

* Trachea

Epithelium

Hyperplasia

Minimal

PRIMARY CAUSE OF DEATH

- Intestine Large, Colon Carcinoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 634

TRT#: 7

SEX: Male

DAY ON TEST: 545

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61106

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Lens	Cataract	Mild
	Cornea	Inflammation	Chronic Active, Minimal
* Heart		Cardiomyopathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Mild
	Respirat Epith	Metaplasia	Squamous, Marked
	Squam Epithel	Ulcer	Focal, Mild
* Lung	Bronchiole, Epithelium	Hyperplasia	Mild
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Suppurative, Moderate
	[Inflammation TGLs = 2 - 4+5]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 634

TRT#: 7

SEX: Male

DAY ON TEST: 545

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61106

ORGAN AND ACCOUNTABLE SITE STATUS

	Olfactory Epi	Necrosis	Minimal
	Respirat Epith	Necrosis	Minimal
* Spleen	Lymph Follic	Atrophy	Moderate
* Thymus		Atrophy	Moderate
* Trachea	Submucosa	Fibrosis	Minimal

PRIMARY CAUSE OF DEATH - Lung Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 635

TRT#: 7

SEX: Male

DAY ON TEST: 730

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61107

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult Zona Fascult	Hyperplasia Hypertrophy	Focal, Minimal Multifocal, Mild
* Eye	Lens	Cataract	Minimal
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel Respirat Epith	Hyperplasia Metaplasia	Mild Squamous, Minimal
* Liver		Clear Cell Focus	
* Lung	Bronchus, Epithelium Bronchus, Epithelium	Atrophy Hyperplasia	Minimal Minimal
* Nose	Lamina Propria Respirat Epith	Fibrosis Hyperplasia Inflammation	Minimal Marked Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
* Skin		Cyst Epithelial Inclusion	
	[Cyst Epithelial Inclusion TGLs = 1 - 15]		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Trachea	Epithelium Submucosa	Atrophy Fibrosis	Minimal Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 635

TRT#: 7

SEX: Male

DAY ON TEST: 730

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61107

ORGAN AND ACCOUNTABLE SITE STATUS

Epithelium

Hyperplasia

Minimal

Inflammation

Chronic Active, Minimal

Epithelium

Necrosis

Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 636

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61108

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult Zona Fascult	Hyperplasia Hypertrophy	Focal, Minimal Multifocal, Minimal
* Kidney	Cortex	Calculus Micro Observation Only Cyst	Moderate
[Cyst TGLs = 2 - 7]			
* Larynx	Squam Epithel Respirat Epith	Hyperplasia Inflammation Metaplasia	Minimal Chronic Active, Minimal Squamous, Minimal
* Liver		Eosinophilic Focus	
* Lung	Bronchus, Epithelium Bronchiole, Epithelium Alveolus	Hyperplasia Hyperplasia Infiltration Cellular	Minimal Minimal Histiocyte, Minimal
[Infiltration Cellular TGLs = 3 - 4]			
* Nose	Olfactory Epi Lamina Propria Respirat Epith	Atrophy Fibrosis Hyperplasia Inflammation	Minimal Minimal Marked Suppurative, Marked
* Pituitary Gland	Olfactory Epi Pars Distalis	Metaplasia Hyperplasia	Respiratory, Marked Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 636

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61108

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Trachea	Epithelium	Hyperplasia	Minimal
		Inflammation	Chronic Active, Minimal
	Epithelium	Metaplasia	Squamous, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 637

TRT#: 7

SEX: Male

DAY ON TEST: 730

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61109

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Unilateral	Inflammation	Pyogranulomat, Marked
[Inflammation TGLs = 1,4 - 13]			
* Heart		Cardiomyopathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Submucosa	Fibrosis	Minimal
	Alveolar Epith	Hyperplasia	Mild
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Mild
		Inflammation	Granulomatous, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
	Bronchus, Epithelium	Regeneration	Minimal
[Infiltration Cellular TGLs = 3 - 4+5]			
* Lymph Node, Mandibular		Hyperplasia	Lymphoid, Mild
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 637

TRT#: 7

SEX: Male

DAY ON TEST: 730

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61109

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Mild
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Testes	Germinal Epith	Degeneration	Minimal
* Thymus		Atrophy	Mild
* Trachea	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Minimal
	Epithelium	Necrosis	Minimal
	Epithelium	Regeneration	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 638

TRT#: 7

SEX: Male

DAY ON TEST: 674

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61110

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Moderate
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Alveolar Epith	Hyperplasia	Focal, Minimal
	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 5 - 4+5]		
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 638

TRT#: 7

SEX: Male

DAY ON TEST: 674

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61110

ORGAN AND ACCOUNTABLE SITE STATUS

Olfactory Epi

Metaplasia

Respiratory, Marked

Squamous Cell Carcinoma

Note: Less well-differentiated carcinoma appears to arise from nasolacrimal duct or glands in lateral wall. Resembles an adenosquamous carcinoma.

Note: One side of nasal cavity has a well-differentiated squamous cell carcinoma.

[Squamous Cell Carcinoma TGLs = 4-11+12]

* Skin

Foot

Inflammation

Chronic Active, Moderate

Foot

Ulcer

Moderate

[Inflammation TGLs = 3 - 17]

[Ulcer TGLs = 2 - 16]

* Spleen

Hematopoietic Cell Proliferation

Mild

* Thymus

Atrophy

Mild

PRIMARY CAUSE OF DEATH - Nose Squamous Cell Carcinoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 639

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61111

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Preputial Gland	* Seminal Vesicle	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Urinary Bladder

MISSING

* Mammary Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Minimal
* Islets, Pancreatic		Hyperplasia	Mild
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Mild
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Mild
* Liver		Clear Cell Focus	
	[Clear Cell Focus TGLs = 1 - 6]		
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
* Pituitary Gland	Olfactory Epi	Metaplasia	Respiratory, Mild
	Pars Distalis	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 639

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61111

ORGAN AND ACCOUNTABLE SITE STATUS

* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
		Inflammation	Minimal
* Salivary Glands		Basophilic Focus	Minimal
* Spleen	Lymph Follic	Atrophy	Mild
		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Hyperplasia	Mild
* Trachea	Epithelium	Atrophy	Minimal
	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 640

TRT#: 7

SEX: Male

DAY ON TEST: 725

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61112

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Brain	* Epididymis
* Esophagus	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	Peripheral Nerve	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	Skeletal Muscle	Spinal Cord	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

MISSING

* Lymph Node, Bronchial	* Parathyroid Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Bone		Osteosclerosis	Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye	Cornea	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 1 - 13]			
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Basophilic Focus	
		Hematopoietic Cell Proliferation	Minimal
		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Interstitialium	Fibrosis	Minimal
	Alveolar Epith	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
[Infiltration Cellular TGLs = 6 - 4+5]			
Lymph Node	Popliteal	Infiltration Cellular	Plasma Cell, Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA

2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 640

TRT#: 7

SEX: Male

DAY ON TEST: 725

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61112

ORGAN AND ACCOUNTABLE SITE STATUS

	Lumbar	Infiltration Cellular	Plasma Cell, Marked
	Renal	Infiltration Cellular	Plasma Cell, Mild
	[Infiltration Cellular TGLs = 9 - 20]		
	[Infiltration Cellular TGLs = 8 - 19]		
	[Infiltration Cellular TGLs = 7 - 18]		
* Lymph Node, Mandibular		Infiltration Cellular	Plasma Cell, Mild
	[Infiltration Cellular TGLs = 4 - 14]		
* Nose	Olfactory Epi	Atrophy	Minimal
	Turbinate	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
* Pituitary Gland	Olfactory Epi	Metaplasia	Respiratory, Marked
	Pars Distalis	Hyperplasia	Minimal
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
		Inflammation	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 2,3 - 16+17]		
	[Ulcer TGLs = 2,3 - 16+17]		
Spinal Cord			
	Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.		
* Spleen		Hematopoietic Cell Proliferation	Marked
	[Hematopoietic Cell Proliferation TGLs = 5 - 6]		
* Thymus		Atrophy	Mild
* Trachea	Epithelium	Hyperplasia	Minimal

PRIMARY CAUSE OF DEATH - Skin Foot Ulcer

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 641

TRT#: 7

SEX: Male

DAY ON TEST: 616

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61113

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Liver	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Urinary Bladder	

MISSING

* Thymus

OBSERVATIONS

* Eye	Cornea	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 1 - 13]			
* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Inflammation	Chronic Active, Minimal
	Squam Epithel	Metaplasia	Squamous, Moderate
* Lung	Bronchus, Epithelium	Ulcer	Focal, Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
		Hyperplasia	Minimal
[Inflammation TGLs = 2 - 4+5]		Inflammation	Suppurative, Mild
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Respirat Epith	Metaplasia	Squamous, Minimal
		Squamous Cell Carcinoma	
* Pituitary Gland	Pars Distalis	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 641

TRT#: 7

SEX: Male

DAY ON TEST: 616

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61113

ORGAN AND ACCOUNTABLE SITE STATUS

* Skin	Foot	Inflammation	Chronic Active, Mild
	Foot	Ulcer	Mild
	[Inflammation TGLs = 3 - 15+16]		
	[Ulcer TGLs = 3 - 16]		
* Spleen	Lymph Follic	Atrophy	Mild
		Pigmentation	Hemosiderin, Minimal
* Trachea		Inflammation	Suppurative, Mild

PRIMARY CAUSE OF DEATH - Lung Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 642

TRT#: 7

SEX: Male

DAY ON TEST: 659

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61114

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Liver	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Spleen	* Stomach, Glandular
* Testes	* Thyroid Gland	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial	* Parathyroid Gland
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OBSERVATIONS

* Eye	Cornea	Inflammation	Chronic Active, Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Moderate
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
* Lung	Squam Epithel	Ulcer	Focal, Mild
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Suppurative, Mild
	[Inflammation TGLs = 4,5 - 4+5]		
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Mild
	Olfactory Epi	Metaplasia	Respiratory, Marked
* Pituitary Gland	Pars Nervosa	Schwannoma Malignant	
	[Schwannoma Malignant TGLs = 7 - 10]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 642

TRT#: 7

SEX: Male

DAY ON TEST: 659

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61114

ORGAN AND ACCOUNTABLE SITE STATUS

* Skin	Foot	Inflammation	Chronic Active, Minimal
	Foot	Ulcer	Mild
	[Inflammation TGLs = 3 - 15]		
	[Ulcer TGLs = 3 - 15]		
* Stomach, Forestomach	Epithelium	Hyperplasia	Moderate
* Thymus		Atrophy	Mild
* Trachea	Epithelium	Hyperplasia	Mild

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Nervosa Schwannoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 643

TRT#: 7

SEX: Male

DAY ON TEST: 730

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61115

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

OBSERVATIONS

* Adrenal Medulla		Hyperplasia	Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	Cornea, Epithelium	Ulcer	Minimal
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
* Lung	Respirat Epith	Metaplasia	Squamous, Minimal
	Interstitium	Fibrosis	Mild
	Alveolar Epith	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Mild
	Peribronchial	Inflammation	Chronic Active, Mild
	[Infiltration Cellular TGLs = 4 - 4+5]		
	[Inflammation TGLs = 3 - 15]		
* Nose	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 643

TRT#: 7

SEX: Male

DAY ON TEST: 730

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61115

ORGAN AND ACCOUNTABLE SITE STATUS

* Prostate	Olfactory Epi Epithelium, Ventral	Metaplasia Hyperplasia	Respiratory, Moderate Moderate
[Hyperplasia TGLs = 2 - 14]			
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Trachea	Submucosa Epithelium Epithelium	Fibrosis Hyperplasia Metaplasia	Minimal Minimal Squamous, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 644

TRT#: 7

SEX: Male

DAY ON TEST: 570

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61116

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	Peripheral Nerve	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	Skeletal Muscle	Spinal Cord
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex		Infiltration Cellular	Lipocyte, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Heart		Cardiomyopathy	Minimal
* Kidney	Pelvis	Inflammation	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
	Squam Epithel	Ulcer	Focal, Minimal
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Alveolar Epith	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Mild
	Bronchus, Epithelium	Regeneration	Minimal
	[Infiltration Cellular TGLs = 4 - 4+5]		
Lymph Node	Lumbar	Infiltration Cellular	Plasma Cell, Marked
	Renal	Infiltration Cellular	Plasma Cell, Moderate
	[Infiltration Cellular TGLs = 6 - 17]		
	[Infiltration Cellular TGLs = 5 - 16]		
* Nose	Lamina Propria	Fibrosis	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 644

TRT#: 7

SEX: Male

DAY ON TEST: 570

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61116

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Pituitary Gland	Pars Intermed	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Prostate		Inflammation	Minimal
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Marked
	[Inflammation TGLs = 1,2 - 16+17]		
	[Ulcer TGLs = 1,2 - 16+17]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
	Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.		
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Skin Foot Ulcer

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 645

TRT#: 7

SEX: Male

DAY ON TEST: 633

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61117

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	Peripheral Nerve
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
Skeletal Muscle	Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 1 - 13]			
* Kidney	Pelvis	Inflammation	Mild
* Larynx	Squam Epithel	Hyperplasia	Minimal
		Inflammation	Chronic Active, Minimal
* Lung	Respirat Epith	Metaplasia	Squamous, Mild
	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
[Infiltration Cellular TGLs = 4 - 4+5]			
* Nose	Lamina Propria	Fibrosis	Mild
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Mild
* Pituitary Gland	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Pars Distalis	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 645

TRT#: 7

SEX: Male

DAY ON TEST: 633

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61117

ORGAN AND ACCOUNTABLE SITE STATUS

Foot	Ulcer	Moderate
[Inflammation TGLs = 2,3 - 16+17]		
[Ulcer TGLs = 2,3 - 16+17]		
Spinal Cord		
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.		
* Spleen	Hematopoietic Cell Proliferation	Minimal
* Thymus	Atrophy	Moderate
* Trachea	Fibrosis	Minimal
	Submucosa	
	Epithelium	Hyperplasia
		Minimal

PRIMARY CAUSE OF DEATH - Skin Foot Ulcer

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 646

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61118

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Epididymis	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thyroid Gland	* Urinary Bladder		

MISSING

* Mammary Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
	Squam Epithel	Ulcer	Focal, Minimal
* Liver	Bile Duct	Cyst	
		Hepatodiaphragmatic Nodule	
	[Cyst TGLs = 4 - 7]		
	[Hepatodiaphragmatic Nodule TGLs = 2 - 15]		
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Interstitium	Fibrosis	Mild
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	[Fibrosis TGLs = 3 - 4+5]		
* Nose	Olfactory Epi	Atrophy	Moderate
	Lamina Propria	Fibrosis	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 646

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61118

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
	Olfactory Epi	Metaplasia	Respiratory, Mild
* Prostate	Epithelium, Ventral	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Marked
	Foot	Ulcer	Moderate
	[Inflammation TGLs = 1 - 15]		
	[Ulcer TGLs = 1 - 15]		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate
	Note: Thymus also has moderate extramedullary hematopoiesis (not available for this organ in TDMSE).		
* Trachea	Epithelium	Atrophy	Minimal
	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 647

TRT#: 7

SEX: Male

DAY ON TEST: 649

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61119

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Liver	* Lymph Node, Mandibular	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thyroid Gland	* Urinary Bladder

MISSING

* Lymph Node, Bronchial	* Lymph Node, Mediastinal
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OBSERVATIONS

* Harderian Gland		Hyperplasia	Minimal
* Kidney		Nephropathy	Mild
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Squam Epithel	Ulcer	Focal, Mild
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Bronchus, Epithelium	Regeneration	Minimal
	[Infiltration Cellular TGLs = 3,4 - 4+15]		
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Mild
	Turbinate	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Marked
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 5 - 10]		
* Skin	Foot	Inflammation	Chronic Active, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 647

TRT#: 7

SEX: Male

DAY ON TEST: 649

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61119

ORGAN AND ACCOUNTABLE SITE STATUS

[Inflammation TGLs = 2 - 16]

* Spleen	Lymph Follic	Atrophy Pigmentation	Mild Hemosiderin, Mild
* Thymus		Atrophy	Moderate
* Trachea	Submucosa Epithelium	Fibrosis Metaplasia	Minimal Squamous, Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 648

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61120

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thyroid Gland	* Urinary Bladder	

MISSING

* Lymph Node, Mediastinal	* Mammary Gland
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OBSERVATIONS

* Eye	Retina	Degeneration	Moderate
	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Mild
* Liver		Clear Cell Focus	
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
Mesentery	Fat	Necrosis	Mild
	[Necrosis TGLs = 2 - 7]		
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
* Prostate		Inflammation	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 648

TRT#: 7

SEX: Male

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61120

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Trachea	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 649

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61121

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Parathyroid Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Urinary Bladder	

MISSING

* Mammary Gland

OBSERVATIONS

* Eye	Cornea	Inflammation	Chronic Active, Mild
	Cornea	Necrosis	Minimal
	Cornea, Epithelium	Ulcer	Moderate
	[Inflammation TGLs = 1- 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Minimal
		Nephropathy	Moderate
* Larynx		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Mild
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 649

TRT#: 7

SEX: Male

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61121

ORGAN AND ACCOUNTABLE SITE STATUS

	Olfactory Epi	Metaplasia	Respiratory, Mild
* Pancreas		Squamous Cell Carcinoma	
* Pituitary Gland	Pars Distalis	Atrophy	Minimal
	[Adenoma TGLs = 2 - 10]	Adenoma	
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Hypertrophy	Mild
* Trachea	Submucosa	Fibrosis	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 650

TRT#: 7

SEX: Male

DAY ON TEST: 562

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61122

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Spleen	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Urinary Bladder			

OBSERVATIONS

* Epididymis		Inflammation	Mild
	[Inflammation TGLs = 3 - 7]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Minimal
	Squam Epithel	Ulcer	Focal, Mild
* Liver		Clear Cell Focus	
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
		Inflammation	Suppurative, Moderate
	[Inflammation TGLs = 2 - 4+5]		
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Marked
* Pancreas		Atrophy	Minimal
* Testes	Germinal Epith	Degeneration	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 650

TRT#: 7

SEX: Male

DAY ON TEST: 562

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61122

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus

Atrophy

Moderate

* Trachea

Epithelium

Hyperplasia

Minimal

PRIMARY CAUSE OF DEATH

- Lung Inflammation

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 101

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61023

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Mandibular

OBSERVATIONS

* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
		Clear Cell Focus	
		Cyst	
	[Cyst TGLs = 2 - 14]		
* Lung	Bile Duct		
* Spleen	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Thymus		Pigmentation	Hemosiderin, Minimal
* Uterus		Atrophy	Mild
	Endometrium	Hyperplasia	Cystic, Mild
	[Hyperplasia TGLs = 1 - 10]		

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 102

TRT#: 2

SEX: Female

DAY ON TEST: 733

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61024

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Nose	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Mild
* Eye	Retina	Degeneration	Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Hepatodiaphragmatic Nodule	
[Hepatodiaphragmatic Nodule	TGLs = 4 - 14]		
Lymph Node	Lumbar	Ectasia	Mild
[Ectasia TGLs = 5 - 14]			
* Lymph Node, Mesenteric		Hemangiosarcoma	
* Mammary Gland		Adenoma	
		Fibroadenoma	
		Galactocele	Marked
[Adenoma TGLs = 2 - 15]			
[Fibroadenoma TGLs = 3 - 16]			
* Ovary		Atrophy	Mild
		Cyst	
		Granulosa-Theca Tumor Malignant	
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 6 - 10]			
* Spleen		Pigmentation	Hemosiderin, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 102

TRT#: 2

SEX: Female

DAY ON TEST: 733

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61024

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Adenoma	
	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 103

TRT#: 2

SEX: Female

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61025

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Nose
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
* Lung	Interstitialium	Fibrosis	Minimal
	Alveolar Epith	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
* Lymph Node, Mesenteric		Hemangiosarcoma	
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 1 - 14]		
* Ovary		Atrophy	Moderate
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Skin	Neck	Inflammation	Chronic Active, Moderate
	Neck	Ulcer	Diffuse, Marked
	[Inflammation TGLs = 2 - 15]		
	[Ulcer TGLs = 2 - 15]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 103

TRT#: 2

SEX: Female

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61025

ORGAN AND ACCOUNTABLE SITE STATUS

* Thyroid Gland

C Cell

Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 104

TRT#: 2

SEX: Female

DAY ON TEST: 614

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61026

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

- | | | | |
|---------------------------|-----------------------------|---------------------------|----------------------------|
| * Adrenal Cortex | * Adrenal Medulla | Blood Vessel | * Bone |
| Bone Marrow | * Brain | * Clitoral Gland | * Esophagus |
| * Eye | * Harderian Gland | * Intestine Large, Cecum | * Intestine Large, Colon |
| * Intestine Large, Rectum | * Intestine Small, Duodenum | * Intestine Small, Ileum | * Intestine Small, Jejunum |
| * Islets, Pancreatic | * Kidney | * Larynx | * Lung |
| * Lymph Node, Bronchial | * Lymph Node, Mandibular | * Lymph Node, Mediastinal | * Lymph Node, Mesenteric |
| * Nose | * Ovary | * Pancreas | * Parathyroid Gland |
| * Salivary Glands | * Skin | * Stomach, Forestomach | * Stomach, Glandular |
| * Trachea | * Urinary Bladder | * Uterus | |

OBSERVATIONS

- | | | | |
|-----------------------------------|----------------|------------------|----------------------|
| * Heart | | Cardiomyopathy | Minimal |
| * Liver | | Basophilic Focus | |
| | Bile Duct | Cyst | |
| Note: Liver cyst is multilocular. | | | |
| [Cyst TGLs = 7 - 14] | | | |
| * Mammary Gland | | Adenoma | |
| | | Carcinoma | |
| [Adenoma TGLs = 5 - 14] | | | |
| [Carcinoma TGLs = 4 - 15] | | | |
| Mesentery | Fat | Necrosis | Mild |
| [Necrosis TGLs = 6 - 7] | | | |
| * Pituitary Gland | Pars Distalis | Adenoma | |
| | Pars Intermed | Adenoma | |
| [Adenoma TGLs = 3 - 10] | | | |
| [Adenoma TGLs = 3-10] | | | |
| * Spleen | Lymph Follic | Atrophy | Minimal |
| | | Pigmentation | Hemosiderin, Minimal |
| * Thymus | | Atrophy | Moderate |
| * Thyroid Gland | Follicular Cel | Adenoma | |

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 105

TRT#: 2

SEX: Female

DAY ON TEST: 733

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61027

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Liver		Infiltration Cellular	Mixed Cell, Minimal
		Pigmentation	Hemosiderin, Marked
* Lung		Inflammation	Chronic Active, Minimal
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 1 - 14]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Moderate
* Ovary		Cyst	
	[Cyst TGLs = 2 - 9]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
	[Hyperplasia TGLs = 3 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 106

TRT#: 2

SEX: Female

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61028

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Multifocal, Minimal
	Zona Fascult	Hypertrophy	Focal, Minimal
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
* Ovary		Atrophy	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Metaplasia	Squamous, Minimal
		Polyp Stromal	

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 107

TRT#: 2

SEX: Female

DAY ON TEST: 702

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61029

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	Peripheral Nerve	* Salivary Glands
Skeletal Muscle	* Skin	Spinal Cord	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	* Uterus

MISSING

* Lymph Node, Mediastinal * Thymus

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Minimal
* Kidney		Calculus Micro Observation Only	
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
Spinal Cord			
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
* Spleen		Pigmentation	Hemosiderin, Mild
* Stomach, Forestomach	Epithelium	Hyperplasia	Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 108

TRT#: 2

SEX: Female

DAY ON TEST: 635

DOSE: Control

DISP: Natural Death

HISTO: 61030

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Esophagus	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Ovary	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Clitoral Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye	Cornea	Inflammation	Chronic Active, Mild
* Liver		Basophilic Focus	
		Hematopoietic Cell Proliferation	Minimal
* Lung		Inflammation	Granulomatous, Minimal
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Mild
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
* Spleen	Respirat Epith	Metaplasia	Squamous, Mild
	Lymph Follic	Atrophy	Mild
		Hematopoietic Cell Proliferation	Marked
	[Hematopoietic Cell Proliferation TGLs = 2 - 6]		
* Thymus		Atrophy	Marked
* Uterus		Polyp Stromal	
		Schwannoma Malignant	
	[Schwannoma Malignant TGLs = 3 - 15+16]		

PRIMARY CAUSE OF DEATH - Uterus Schwannoma Malignant

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 109

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61031

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Trachea	* Urinary Bladder

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Heart		Cardiomyopathy	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Chronic Active, Minimal
* Nose		Inflammation	Suppurative, Minimal
* Ovary		Atrophy	Mild
		Cyst	
[Cyst TGLs = 2 - 9]			
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Minimal
* Uterus		Adenocarcinoma	
	Cervix	Hyperplasia	Squamous, Mild
	Endometrium	Hyperplasia	Cystic, Mild
	Endometrium	Metaplasia	Squamous, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 110

TRT#: 2

SEX: Female

DAY ON TEST: 547

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61032

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder	* Uterus		

OBSERVATIONS

* Adrenal Cortex	Zona Fasciata	Hypertrophy	Focal, Minimal
* Eye	Retina	Degeneration	Minimal
	Cornea	Inflammation	Chronic Active, Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
Note: Multinucleate cells in liver (minimal).			
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Mild
* Nose		Inflammation	Suppurative, Minimal
* Ovary		Cyst	
* Pituitary Gland	Pars Distalis	Adenoma	
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Mild

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 111

TRT#: 2

SEX: Female

DAY ON TEST: 710

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61033

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Mandibular	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Lymph Node, Bronchial	* Lymph Node, Mediastinal
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Minimal
* Liver		Basophilic Focus	
* Ovary		Atrophy	Mild
		Cyst	
[Cyst TGLs = 2 - 9]			
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
[Hyperplasia TGLs = 3 - 10]			
* Spleen	Lymph Follic	Atrophy	Minimal
		Pigmentation	Hemosiderin, Minimal
* Stomach, Forestomach	Epithelium	Hyperplasia	Mild
		Inflammation	Moderate
		Ulcer	Moderate
[Ulcer TGLs = 4 - 15]			
* Thymus		Lymphoma Malignant	
[Lymphoma Malignant TGLs = 1 - 14]			
* Uterus	Cervix	Hyperplasia	Squamous, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 111

TRT#: 2

SEX: Female

DAY ON TEST: 710

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61033

ORGAN AND ACCOUNTABLE SITE STATUS

Endometrium

Hyperplasia

Cystic, Minimal

Endometrium

Metaplasia

Squamous, Minimal

Polyp Stromal

PRIMARY CAUSE OF DEATH - Thymus Lymphoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 112

TRT#: 2

SEX: Female

DAY ON TEST: 683

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61034

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Liver	* Lung	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	* Uterus

MISSING

* Lymph Node, Bronchial	* Lymph Node, Mandibular
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OBSERVATIONS

* Eye	Antr Chamber	Inflammation	Suppurative, Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 4 - 14]		
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Spleen	Lymph Follic	Atrophy	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 113

TRT#: 2

SEX: Female

DAY ON TEST: 733

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61035

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Mild
	Zona Fascult	Hypertrophy	Focal, Mild
* Eye	Lens	Cataract	Minimal
	Retina	Degeneration	Mild
* Islets, Pancreatic		Hyperplasia	Mild
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Ovary		Atrophy	Mild
		Cyst	
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 114

TRT#: 2

SEX: Female

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61036

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder	* Uterus	

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Moderate
* Eye	Retina	Degeneration	Mild
* Kidney		Nephropathy	Minimal
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 115

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61037

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Nose	* Ovary	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thymus	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

* Kidney	Cortex	Cyst	Minimal
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Liver		Infiltration Cellular	Mixed Cell, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
[Hyperplasia TGLs = 1- 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 116

TRT#: 2

SEX: Female

DAY ON TEST: 733

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61038

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Ovary	* Pancreas	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder
* Uterus			

MISSING

* Parathyroid Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
		Infiltration Cellular	Mixed Cell, Minimal
* Mammary Gland		Hyperplasia	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Marked

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 117

TRT#: 2

SEX: Female

DAY ON TEST: 579

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61039

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder		

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Kidney	Pelvis	Inflammation	Minimal
Mesentery	Fat	Necrosis	Mild
[Necrosis TGLs = 2 - 7]			
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Stomach, Forestomach		Inflammation	Marked
		Ulcer	Marked
[Inflammation TGLs = 4 - 10]			
[Ulcer TGLs = 5 - 10+14]			
* Thymus		Atrophy	Mild
* Uterus	Cervix	Sarcoma Stromal	

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 118

TRT#: 2

SEX: Female

DAY ON TEST: 733

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61040

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Ovary	* Pancreas	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Mediastinal	* Parathyroid Gland
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OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Mild
* Kidney		Nephropathy	Minimal
* Liver		Basophilic Focus	
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Carcinoma	
* Uterus		Polyp Stromal	

[Polyp Stromal TGLs = 1 - 10]

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 119

TRT#: 2

SEX: Female

DAY ON TEST: 733

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61041

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Ovary	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

OBSERVATIONS

* Adrenal Medulla		Pheochromocytoma Benign	
* Kidney		Calculus Micro Observation Only	
Mesentery	Fat	Necrosis	Minimal
[Necrosis TGLs = 1 - 14]			
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Hyperplasia	Mild
* Uterus		Polyp Stromal	
[Polyp Stromal TGLs = 2 - 10]			

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 120

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61042

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Trachea	* Urinary Bladder
* Uterus			

OBSERVATIONS

* Adrenal Cortex	Zona Fascult Zona Fascult	Hyperplasia Hypertrophy	Multifocal, Mild Focal, Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Infarct	Minimal
* Liver		Basophilic Focus	
* Lymph Node, Mandibular		Hemangioma	
Mesentery	Fat	Necrosis	Minimal
[Necrosis TGLs = 2 - 14]			
* Ovary		Atrophy Cyst	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen	Lymph Follic	Atrophy Hematopoietic Cell Proliferation	Minimal Mild
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 121

TRT#: 2

SEX: Female

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61043

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
		Hematopoietic Cell Proliferation	Mild
	Zona Fascult	Hypertrophy	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
		Cholangioma	
		Eosinophilic Focus	
		Hematopoietic Cell Proliferation	Minimal
	[Cholangioma TGLs = 4 - 18]		
* Mammary Gland		Carcinoma	
		Fibroadenoma	
	[Carcinoma TGLs = 1 - 17]		
	[Fibroadenoma TGLs = 2 - 14+15+16]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 121

TRT#: 2

SEX: Female

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61043

ORGAN AND ACCOUNTABLE SITE STATUS

* Thyroid Gland

C Cell

Hyperplasia

Minimal

* Uterus

Endometrium

Hyperplasia

Cystic, Moderate

Polyp Stromal

[Polyp Stromal TGLs = 5 - 10]

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 122

TRT#: 2

SEX: Female

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61044

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Liver	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Nose	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder	* Uterus	

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
* Eye	Retina	Degeneration	Minimal
* Lung		Inflammation	Granulomatous, Minimal
* Ovary		Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 123

TRT#: 2

SEX: Female

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61045

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Retina	Degeneration	Mild
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
		Infiltration Cellular	Mixed Cell, Minimal
* Ovary		Atrophy	Mild
		Cyst	
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Cervix	Hyperplasia	Squamous, Mild
	Endometrium	Hyperplasia	Cystic, Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 124

TRT#: 2

SEX: Female

DAY ON TEST: 733

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61046

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Mediastinal

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Liver	Bile Duct	Hyperplasia	Mild
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Ovary		Atrophy	Mild
		Cyst	
[Cyst TGLs = 1 - 9]			
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Adenoma	
* Uterus	Endometrium	Hyperplasia	Cystic, Moderate

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 125

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61047

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Nose	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder	* Uterus	

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 1 - 10]		
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 126

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61048

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Blood Vessel	* Bone	* Brain	* Clitoral Gland
* Esophagus	* Eye	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Mediastinal

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Degeneration	Cystic, Minimal
	Zona Fascult	Hyperplasia	Multifocal, Mild
		Hypertrophy	Focal, Moderate
* Adrenal Medulla		Pheochromocytoma Benign	
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
* Lymph Node, Mesenteric		Fibrosis	Focal, Moderate
* Ovary		Atrophy	Moderate
		Cyst	
	Germinal Epith	Tubulostromal Adenoma	
[Cyst TGLs = 2 - 9]			
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 126

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61048

ORGAN AND ACCOUNTABLE SITE STATUS

* Uterus	C Cell	Hyperplasia	Mild
Note: TGLS 3 = NCL	Endometrium	Hyperplasia	Cystic, Moderate

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 127

TRT#: 2

SEX: Female

DAY ON TEST: 647

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61049

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder	* Uterus		

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Multifocal, Mild
* Brain		Granular Cell Tumor Benign	
* Kidney	Pelvis	Inflammation	Minimal
* Liver		Fatty Change	Diffuse, Moderate
	Bile Duct	Hepatodiaphragmatic Nodule	
	[Hepatodiaphragmatic Nodule TGLs = 3 - 14]	Hyperplasia	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
	[Hyperplasia TGLs = 4 - 10]		
* Spleen	Lymph Follic	Atrophy	Moderate
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Moderate

PRIMARY CAUSE OF DEATH - UNCERTAIN

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 128

TRT#: 2

SEX: Female

DAY ON TEST: 417

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61050

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mediastinal
* Mammary Gland	* Nose	* Ovary	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	* Uterus

MISSING

* Lymph Node, Mandibular

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Islets, Pancreatic		Hyperplasia	Minimal
* Kidney	Pelvis	Inflammation	Minimal
* Liver		Basophilic Focus	
* Lymph Node, Mesenteric		Hyperplasia	Lymphoid, Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Mild

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 129

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61051

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Trachea	* Urinary Bladder

OBSERVATIONS

* Adrenal Cortex		Adenoma	
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
Mesentery	Fat	Necrosis	Minimal
[Necrosis TGLs = 1 - 14]			
* Ovary		Cyst	
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
* Uterus		Adenomyosis	Focal, Minimal
	Endometrium	Hyperplasia	Cystic, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 130

TRT#: 2

SEX: Female

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61052

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Blood Vessel	* Bone	Bone Marrow	* Clitoral Gland
* Esophagus	* Eye	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Kidney	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder	* Uterus	

OBSERVATIONS

* Adrenal Cortex	Zona Fasciata	Hypertrophy	Multifocal, Mild
* Adrenal Medulla		Hyperplasia	Minimal
* Brain		Oligodendroglioma Benign	
[Oligodendroglioma Benign	TGLs = 1 - 1]		
* Heart		Cardiomyopathy	Mild
* Islets, Pancreatic		Hyperplasia	Mild
* Liver		Basophilic Focus	
[Clear Cell Focus	TGLs = 2 - 6]	Clear Cell Focus	
* Ovary		Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Stomach, Forestomach		Inflammation	Moderate
		Squamous Cell Papilloma	Multiple
[Squamous Cell Papilloma	TGLs = 3 - 14]		
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 131

TRT#: 2

SEX: Female

DAY ON TEST: 733

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61053

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder	* Uterus		

MISSING

* Lymph Node, Bronchial	* Parathyroid Gland
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OBSERVATIONS

* Kidney		Calculus Micro Observation Only	
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Eosinophilic Focus	
	Bile Duct	Hyperplasia	Mild
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Mammary Gland		Adenoma	
		Fibroadenoma	
	[Fibroadenoma TGLs = 1 - 14]		
* Ovary		Atrophy	Moderate
		Cyst	
	Thecal Cell	Hyperplasia	Moderate
	[Cyst TGLs = 3 - 9]		
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 2 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 132

TRT#: 2

SEX: Female

DAY ON TEST: 614

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61054

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Multifocal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
		Cholangioma	
	[Cholangioma TGLs = 6 - 7]		
* Mammary Gland		Adenoma	Multiple
		Galactocele	Mild
	Note: Mammary adenoma (TGL-3) present also in B09.		
	[Adenoma TGLs = 1,3 - 14+15]		
	[Galactocele TGLs = 2 - 16]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Ovary		Atrophy	Mild
		Cyst	
	[Cyst TGLs = 4 - 9]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
	[Hyperplasia TGLs = 7 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 132

TRT#: 2

SEX: Female

DAY ON TEST: 614

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61054

ORGAN AND ACCOUNTABLE SITE STATUS

* Thyroid Gland

C Cell

Hyperplasia

Mild

* Uterus

Endometrium

Hyperplasia

Cystic, Mild

Endometrium

Metaplasia

Squamous, Mild

Polyp Stromal

[Polyp Stromal TGLs = 5 - 10]

PRIMARY CAUSE OF DEATH

- Mammary Gland Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 133

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61055

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Trachea	* Urinary Bladder

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Lung	Alveolar Epith	Hyperplasia	Focal, Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Mammary Gland		Galactocele	Mild
	[Galactocele TGLs = 3 - 15]		
Mesentery	Fat	Necrosis	Minimal
	[Necrosis TGLs = 2 - 14]		
* Ovary		Atrophy	Mild
		Cyst	
	[Cyst TGLs = 1 - 9]		
* Spleen	Lymph Follic	Atrophy	Minimal
		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Uterus		Adenocarcinoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 133

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61055

ORGAN AND ACCOUNTABLE SITE STATUS

Endometrium

Hyperplasia

Cystic, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 134

TRT#: 2

SEX: Female

DAY ON TEST: 253

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61056

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

- | | | | |
|----------------------------|---------------------------|-----------------------------|---------------------------|
| * Adrenal Cortex | * Adrenal Medulla | Blood Vessel | * Bone |
| Bone Marrow | * Brain | * Clitoral Gland | * Esophagus |
| * Eye | * Harderian Gland | * Heart | * Intestine Large, Cecum |
| * Intestine Large, Colon | * Intestine Large, Rectum | * Intestine Small, Duodenum | * Intestine Small, Ileum |
| * Intestine Small, Jejunum | * Islets, Pancreatic | * Kidney | * Larynx |
| * Lung | * Lymph Node, Bronchial | * Lymph Node, Mandibular | * Lymph Node, Mediastinal |
| * Lymph Node, Mesenteric | * Mammary Gland | * Ovary | * Pancreas |
| * Parathyroid Gland | * Salivary Glands | * Skin | * Stomach, Forestomach |
| * Stomach, Glandular | * Thyroid Gland | * Trachea | * Urinary Bladder |
| * Uterus | | | |

OBSERVATIONS

- | | | | |
|-------------------|---|----------------------------|----------------------|
| * Liver | | Hepatodiaphragmatic Nodule | |
| | [Hepatodiaphragmatic Nodule TGLs = 4 - 6] | | |
| * Nose | | Inflammation | Suppurative, Minimal |
| * Pituitary Gland | Pars Distalis | Adenoma | |
| | [Adenoma TGLs = 3 - 10] | | |
| * Spleen | Lymph Follic | Atrophy | Minimal |
| | | Pigmentation | Hemosiderin, Mild |
| * Thymus | | Atrophy | Moderate |

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 135

TRT#: 2

SEX: Female

DAY ON TEST: 647

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61057

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Ovary	* Pancreas
* Parathyroid Gland	Peripheral Nerve	* Salivary Glands	Skeletal Muscle
* Skin	Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial	* Lymph Node, Mandibular
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OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Kidney		Nephropathy	Minimal
* Liver		Basophilic Focus	
* Mammary Gland		Fibroadenoma	
[Fibroadenoma TGLs = 1 - 14]			
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
Spinal Cord			
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
* Spleen	Lymph Follic	Atrophy	Mild
		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 136

TRT#: 2

SEX: Female

DAY ON TEST: 561

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61058

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Liver
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Ovary	* Pancreas
* Parathyroid Gland	Peripheral Nerve	* Salivary Glands	Skeletal Muscle
* Skin	Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

* Kidney		Nephropathy	Minimal
* Mammary Gland		Fibroadenoma	
[Fibroadenoma TGLs = 1 - 7]			
Mesentery	Fat	Necrosis	Minimal
[Necrosis TGLs = 2 - 14]			
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 3 - 10]			
Spinal Cord			
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
* Spleen	Lymph Follic	Atrophy	Minimal
		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 137

TRT#: 2

SEX: Female

DAY ON TEST: 733

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61059

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Ovary		Atrophy	Mild
		Cyst	
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 1 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Uterus	Serosa	Cyst Multilocular	
	Endometrium	Hyperplasia	Cystic, Minimal

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 138

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61060

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Kidney	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Nose	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Islets, Pancreatic		Hyperplasia	Minimal
* Liver		Basophilic Focus	
* Mammary Gland		Carcinoma	Multiple
		Fibroadenoma	Multiple
Note: B15 also has piece of one of the carcinomas present in B14 (TGL-1 lists 3 masses in two blocks). [Carcinoma TGLs = 1,2,3 - 14+16+18] [Fibroadenoma TGLs = 1,5 - 15+17]			
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 4 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal
	Cervix	Hyperplasia	Squamous, Mild

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 139

TRT#: 2

SEX: Female

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61061

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lung
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thymus	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Eye	Retina	Degeneration	Moderate
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 1 - 14]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal
		Polyp Stromal	

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 140

TRT#: 2

SEX: Female

DAY ON TEST: 667

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61062

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Ovary	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

OBSERVATIONS

* Kidney		Calculus Micro Observation Only	
* Liver	Bile Duct	Hyperplasia	Mild
* Nose	Olfactory Epi	Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 3 - 10]			
* Spleen	Lymph Follic	Atrophy	Moderate
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Mild
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 141

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61063

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Mediastinal

OBSERVATIONS

* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
	[Hyperplasia TGLs = 1 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal
	Cervix	Hyperplasia	Squamous, Moderate
	Endometrium	Metaplasia	Squamous, Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 142

TRT#: 2

SEX: Female

DAY ON TEST: 733

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61064

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

- | | | | |
|---------------------------|-----------------------------|--------------------------|----------------------------|
| * Adrenal Cortex | * Adrenal Medulla | Blood Vessel | * Bone |
| Bone Marrow | * Brain | * Clitoral Gland | * Esophagus |
| * Eye | * Harderian Gland | * Intestine Large, Cecum | * Intestine Large, Colon |
| * Intestine Large, Rectum | * Intestine Small, Duodenum | * Intestine Small, Ileum | * Intestine Small, Jejunum |
| * Islets, Pancreatic | * Larynx | * Lung | * Lymph Node, Bronchial |
| * Lymph Node, Mandibular | * Lymph Node, Mediastinal | * Lymph Node, Mesenteric | * Mammary Gland |
| * Pancreas | * Parathyroid Gland | * Salivary Glands | * Skin |
| * Stomach, Forestomach | * Stomach, Glandular | * Thyroid Gland | * Trachea |
| * Urinary Bladder | | | |

OBSERVATIONS

- | | | | |
|-------------------|---------------|----------------------------------|-------------------|
| * Heart | | Cardiomyopathy | Minimal |
| * Kidney | | Calculus Micro Observation Only | |
| * Liver | | Basophilic Focus | |
| * Nose | Olfactory Epi | Accumulation, Hyaline Droplet | Minimal |
| * Ovary | | Cyst | |
| * Pituitary Gland | Pars Distalis | Hyperplasia | Minimal |
| * Spleen | | Hematopoietic Cell Proliferation | Mild |
| | | Pigmentation | Hemosiderin, Mild |
| * Thymus | | Atrophy | Minimal |
| * Uterus | Endometrium | Hyperplasia | Cystic, Minimal |

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 143

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61065

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Ovary		Cyst	
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
[Hyperplasia TGLs = 1 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Marked
* Uterus		Polyp Stromal	
[Polyp Stromal TGLs = 2 - 10]			

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 144

TRT#: 2

SEX: Female

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61066

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

MISSING

* Parathyroid Gland

OBSERVATIONS

* Clitoral Gland		Ectasia	Mild
[Ectasia TGLs = 1 - 9]			
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Liver		Basophilic Focus	
* Ovary		Atrophy	Mild
* Pancreas		Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal
	Cervix	Hyperplasia	Squamous, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 145

TRT#: 2

SEX: Female

DAY ON TEST: 733

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61067

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Mammary Gland	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Eye	Retina	Degeneration	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
		Eosinophilic Focus	
* Lung	Alveolus	Infiltration Cellular	Mixed Cell, Minimal
* Lymph Node, Mesenteric		Infiltration Cellular	Histiocyte, Minimal
Mesentery	Fat	Inflammation	Mild
[Necrosis TGLs = 1 - 14]		Necrosis	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus		Adenomyosis	Focal, Minimal
	Endometrium	Hyperplasia	Cystic, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 146

TRT#: 2

SEX: Female

DAY ON TEST: 733

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61068

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Multifocal, Mild
* Eye	Retina	Degeneration	Minimal
* Heart		Cardiomyopathy	Minimal
* Liver		Basophilic Focus	
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Moderate
* Uterus	Endometrium	Hyperplasia	Cystic, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 147

TRT#: 2

SEX: Female

DAY ON TEST: 599

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61069

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Blood Vessel	* Bone	* Brain	* Clitoral Gland
* Esophagus	* Eye	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Nose	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Mild
* Adrenal Medulla		Pheochromocytoma Benign	
	[Pheochromocytoma Benign TGLs = 7 - 7]		
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	[Infiltration Cellular TGLs = 11 - 5]		
* Mammary Gland		Carcinoma	Multiple
		Fibroadenoma	
		Galactocele	Mild
	[Carcinoma TGLs = 2,4 - 14+15]		
	[Fibroadenoma TGLs = 3 - 16]		
	[Galactocele TGLs = 1 - 9]		
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 5 - 10]		
* Skin	Ear	Inflammation	Acute, Minimal
	Dermis	Thrombosis	Minimal
	[Inflammation TGLs = 9,10 - 17+18]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 147

TRT#: 2

SEX: Female

DAY ON TEST: 599

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61069

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen		Hematopoietic Cell Proliferation	Moderate
	[Hematopoietic Cell Proliferation TGLs = 6 - 6]		
* Thymus		Atrophy	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal
	Cervix	Hyperplasia	Squamous, Minimal
	[Hyperplasia TGLs = 8 - 10]		

PRIMARY CAUSE OF DEATH - Mammary Gland Carcinoma

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 148

TRT#: 2

SEX: Female

DAY ON TEST: 731

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61070

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Ovary	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thymus	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex	Zona Fascult Zona Fascult	Hyperplasia Hypertrophy Cardiomyopathy Calculus Micro Observation Only Basophilic Focus Cholangioma	Focal, Minimal Focal, Minimal Mild
* Heart			
* Kidney			
* Liver			
[Cholangioma TGLs = 2 - 14]			
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen		Hematopoietic Cell Proliferation Pigmentation	Mild Hemosiderin, Minimal
* Thyroid Gland	C Cell	Hyperplasia	Marked
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 149

TRT#: 2

SEX: Female

DAY ON TEST: 687

DOSE: Control

DISP: Moribund Sacrifice

HISTO: 61071

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder	* Uterus	

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Minimal
* Eye	Retina	Degeneration	Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Angiectasis	Minimal
	[Angiectasis TGLs = 7 - 14]		
* Mammary Gland		Adenoma	
		Fibroadenoma	
	[Adenoma TGLs = 4 - 16]		
	[Fibroadenoma TGLs = 3 - 15]		
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 6 - 10]		
* Skin		Cyst Epithelial Inclusion	
	[Cyst Epithelial Inclusion TGLs = 5 - 14]		
* Spleen	Lymph Follic	Atrophy	Minimal
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 150

TRT#: 2

SEX: Female

DAY ON TEST: 732

DOSE: Control

DISP: Terminal Sacrifice

HISTO: 61072

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Stomach, Glandular	* Trachea	* Urinary Bladder
* Uterus			

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Mild
* Heart		Cardiomyopathy	Minimal
* Intestine Large, Cecum		Inflammation	Moderate
* Kidney		Nephropathy	Minimal
* Liver		Basophilic Focus	
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 2 - 14+15]		
* Ovary		Atrophy	Minimal
		Cyst	
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Skin	Other	Inflammation	Multifocal, Mild
	Epidermis	Ulcer	Multifocal, Minimal
	[Inflammation TGLs = 1 - 16]		
	[Ulcer TGLs = 1 - 16]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Stomach, Forestomach	Epithelium	Hyperplasia	Moderate
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 301

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61323

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Ovary	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Liver	Bile Duct	Hyperplasia	Moderate
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 1 - 14]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 302

TRT#: 4

SEX: Female

DAY ON TEST: 661

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61324

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Kidney	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Pancreas	* Parathyroid Gland
Peripheral Nerve	* Salivary Glands	Skeletal Muscle	* Skin
Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder	* Uterus		

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Islets, Pancreatic		Hyperplasia	Minimal
* Ovary		Atrophy	Minimal
		Cyst	
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
Spinal Cord	Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.		
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 303

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61325

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Parathyroid Gland	* Pituitary Gland	* Salivary Glands
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	[Inflammation TGLs = 5 - 13]		
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
		Cholangioma	
	Bile Duct	Cyst	
		Infiltration Cellular	Mixed Cell, Minimal
	[Cholangioma TGLs = 6 - 14]		
Lymph Node	Popliteal	Inflammation	Moderate
	[Inflammation TGLs = 10 - 14]		
* Mammary Gland		Carcinoma	
		Fibroadenoma	
	Note: TGL-3 and 4 = same inguinal mammary carcinoma.		
	[Carcinoma TGLs = 3,4 - 9+17]		
	[Fibroadenoma TGLs = 9 - 15]		
* Nose		Inflammation	Suppurative, Minimal
* Ovary		Atrophy	Mild
		Cyst	
	[Cyst TGLs = 8 - 9]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 303

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61325

ORGAN AND ACCOUNTABLE SITE STATUS

* Pancreas		Basophilic Focus	Minimal
* Skin	Tail	Inflammation	Chronic Active, Moderate
	Tail	Ulcer	Multifocal, Mild
	[Inflammation TGLs = 2 - 16]		
	[Ulcer TGLs = 2 - 16]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Adenoma	
	C Cell	Hyperplasia	Minimal
* Uterus		Adenomyosis	Moderate
	Endometrium	Hyperplasia	Cystic, Mild
	Cervix	Hyperplasia	Squamous, Minimal
		Polyp Stromal	Multiple
	[Polyp Stromal TGLs = 7 - 10]		

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 304

TRT#: 4

SEX: Female

DAY ON TEST: 519

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61326

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	Skeletal Muscle	* Skin	Spinal Cord
* Stomach, Glandular	* Trachea	* Urinary Bladder	* Uterus

MISSING

* Lymph Node, Bronchial Peripheral Nerve

OBSERVATIONS

* Adrenal Cortex		Angiectasis	Mild
[Angiectasis TGLs = 3 - 7]			
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
Spinal Cord			
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Stomach, Forestomach	Epithelium	Hyperplasia	Moderate
		Inflammation	Marked
		Ulcer	Marked
[Inflammation TGLs = 4 - 10]			
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 304

TRT#: 4

SEX: Female

DAY ON TEST: 519

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61326

ORGAN AND ACCOUNTABLE SITE STATUS

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 305

TRT#: 4

SEX: Female

DAY ON TEST: 654

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61327

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

OBSERVATIONS

* Eye	Retina	Degeneration	Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Alveolar Epith	Hyperplasia	Focal, Minimal
* Mammary Gland		Galactoceles	Mild
	[Galactoceles TGLs = 1,4 - 14+15]		
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Spleen	Lymph Follic	Atrophy	Mild
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Moderate
* Uterus		Leiomyoma	
		Polyp Stromal	
	[Leiomyoma TGLs = 5 - 10]		

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 306

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61328

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	[Infiltration Cellular TGLs = 1 - 4+5]		
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 3 - 14]		
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 2 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Cervix	Granular Cell Tumor Benign	
Vagina		Granular Cell Tumor Benign	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 307

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61329

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

* Liver		Basophilic Focus	
		Clear Cell Focus	
	Bile Duct	Hyperplasia	Minimal
Mesentery	Fat	Necrosis	Minimal
[Necrosis TGLs = 2 - 14]			
* Ovary		Cystadenoma	
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 308

TRT#: 4

SEX: Female

DAY ON TEST: 630

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61330

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Clitoral Gland
* Esophagus	* Eye	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Ovary	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea		

OBSERVATIONS

* Adrenal Cortex		Angiectasis	Marked
		Leukemia Mononuclear	
	[Leukemia Mononuclear TGLs = 9 - 7]		
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Brain		Hemorrhage	Moderate
	[Hemorrhage TGLs = 4,5 - 1]		
* Liver		Leukemia Mononuclear	
	[Leukemia Mononuclear TGLs = 6 - 6]		
* Lung		Leukemia Mononuclear	
* Mammary Gland		Fibroadenoma	Multiple
	[Fibroadenoma TGLs = 3,11 - 15+16]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Spleen		Hematopoietic Cell Proliferation	Mild
		Leukemia Mononuclear	
	Capsule	Thrombosis	Moderate
	Note: Capsular thromboses are due to prior capsule ruptures.		
	[Leukemia Mononuclear TGLs = 7 - 14]		
	[Thrombosis TGLs = 8 - 14]		
* Thymus		Atrophy	Marked
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Urinary Bladder		Hemorrhage	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 308

TRT#: 4

SEX: Female

DAY ON TEST: 630

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61330

ORGAN AND ACCOUNTABLE SITE STATUS

[Hemorrhage TGLs = 10 - 10]

* Uterus

Cervix

Granular Cell Tumor Benign

Polyp Stromal

PRIMARY CAUSE OF DEATH

- Spleen Leukemia Mononuclear

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 309

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61331

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mesenteric	* Nose	* Ovary	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Trachea	* Urinary Bladder
* Uterus			

MISSING

* Lymph Node, Mediastinal

OBSERVATIONS

* Brain		Granular Cell Tumor Benign	
* Eye	Retina	Degeneration	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Infiltration Cellular	Mixed Cell, Minimal
		Mixed Cell Focus	
* Mammary Gland		Hyperplasia	Marked
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 310

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61332

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mediastinal
* Mammary Gland	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

* Eye	Retina	Degeneration	Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Eosinophilic Focus	
		Infiltration Cellular	Mixed Cell, Minimal
* Lymph Node, Mandibular		Hyperplasia	Atypical, Moderate
[Hyperplasia TGLs = 1 - 9]			
* Lymph Node, Mesenteric		Atrophy	Mild
* Ovary		Atrophy	Minimal
		Cyst	
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 311

TRT#: 4

SEX: Female

DAY ON TEST: 731

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61333

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Ovary
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder
* Uterus			

OBSERVATIONS

* Eye	Retina	Degeneration	Moderate
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 1 - 14]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
	[Hyperplasia TGLs = 3 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	Follicular Cel	Carcinoma	
	[Carcinoma TGLs = 2 - 3]		

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 312

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61334

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Nose	* Ovary	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 1 - 14]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Mild
	Follicular Cel	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 313

TRT#: 4

SEX: Female

DAY ON TEST: 731

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61335

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Mediastinal

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
* Eye	Cornea, Epithelium	Hyperplasia	Mild
	Cornea	Inflammation	Chronic Active, Mild
	[Inflammation TGLs = 6 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
	[Basophilic Focus TGLs = 4 - 6]		
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 1 - 14]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Ovary		Cyst	
	[Cyst TGLs = 2,3 - 9]		
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 7 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 313

TRT#: 4

SEX: Female

DAY ON TEST: 731

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61335

ORGAN AND ACCOUNTABLE SITE STATUS

* Uterus

Endometrium

Hyperplasia

Cystic, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 314

TRT#: 4

SEX: Female

DAY ON TEST: 603

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61336

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

- | | | | |
|----------------------------|---------------------------|-----------------------------|--------------------------|
| * Adrenal Cortex | * Adrenal Medulla | Blood Vessel | * Bone |
| Bone Marrow | * Brain | * Clitoral Gland | * Esophagus |
| * Eye | * Harderian Gland | * Heart | * Intestine Large, Cecum |
| * Intestine Large, Colon | * Intestine Large, Rectum | * Intestine Small, Duodenum | * Intestine Small, Ileum |
| * Intestine Small, Jejunum | * Islets, Pancreatic | * Larynx | * Lung |
| * Lymph Node, Bronchial | * Lymph Node, Mandibular | * Lymph Node, Mediastinal | * Lymph Node, Mesenteric |
| * Mammary Gland | * Nose | * Pancreas | * Parathyroid Gland |
| Peripheral Nerve | * Salivary Glands | Skeletal Muscle | * Skin |
| Spinal Cord | * Stomach, Glandular | * Thyroid Gland | * Trachea |
| * Urinary Bladder | | | |

OBSERVATIONS

- | | | | |
|---|---------------|---------------------------------|---------------------|
| * Kidney | | Calculus Micro Observation Only | |
| * Liver | | Basophilic Focus | |
| | | Infiltration Cellular | Mixed Cell, Minimal |
| * Ovary | | Cyst | |
| * Pituitary Gland | Pars Distalis | Adenoma | |
| [Adenoma TGLs = 1 - 10] | | | |
| Spinal Cord | | | |
| Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs. | | | |
| * Spleen | | Pigmentation | Hemosiderin, Mild |
| * Stomach, Forestomach | Epithelium | Hyperplasia | Mild |
| | | Inflammation | Minimal |
| [Hyperplasia TGLs = 2 - 15] | | | |
| * Thymus | | Atrophy | Mild |
| * Uterus | Endometrium | Hyperplasia | Cystic, Minimal |

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 315

TRT#: 4

SEX: Female

DAY ON TEST: 610

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61337

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Kidney		Calculus Micro Observation Only	
* Ovary		Atrophy	Minimal
		Cyst	
[Cyst TGLs = 4 - 9]			
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
* Skin		Cyst Epithelial Inclusion	
	Ear	Inflammation	Acute, Minimal
	Ear	Ulcer	Multifocal, Mild
[Cyst Epithelial Inclusion TGLs = 1 - 14]			
[Inflammation TGLs = 5 - 15]			
[Ulcer TGLs = 5 - 15]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal
		Polyp Stromal	

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 316

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61338

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Retina	Degeneration	Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Ovary		Cyst	
[Cyst TGLs = 2 - 9]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	Follicular Cel	Adenoma	
[Adenoma TGLs = 1 - 3]			
* Uterus	Cervix	Granular Cell Tumor Benign	

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 317

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61339

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Mammary Gland	* Nose	* Ovary	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Salivary Glands	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Minimal
* Intestine Small, Jejunum		Leiomyosarcoma	
	[Leiomyosarcoma TGLs = 2 - 15]		
* Kidney		Calculus Micro Observation Only	
* Liver		Clear Cell Focus	
* Lymph Node, Mesenteric		Hyperplasia	Lymphoid, Mild
* Skin	Epidermis	Hyperplasia	Mild
	Ear	Inflammation	Acute, Minimal
	[Hyperplasia TGLs = 1 - 14]		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 318

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61340

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Mammary Gland	* Ovary
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	* Uterus

MISSING

* Lymph Node, Mediastinal

OBSERVATIONS

* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
		Eosinophilic Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Olfactory Epi	Atrophy	Minimal
* Pancreas		Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 1 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 319

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61341

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Ovary	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	Follicular Cel	Adenoma	
	C Cell	Hyperplasia	Minimal
	[Adenoma TGLs = 1 - 3]		
* Uterus	Endometrial Gl	Hyperplasia	Atypical, Mild
		Polyp Stromal	

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 320

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61342

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
* Heart		Cardiomyopathy	Minimal
* Liver		Basophilic Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Mammary Gland		Adenoma	
		Galactocele	Moderate
	[Adenoma TGLs = 1 - 14]		
Mesentery		Cystadenocarcinoma	Metastatic (Ovary)
Note: Tumor noted on mesentery attached to pancreas in B10.			
* Ovary		Atrophy	Mild
		Cyst	
		Cystadenocarcinoma	
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
	[Hyperplasia TGLs = 2 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Adenoma	
* Uterus	Serosa	Cystadenocarcinoma	Metastatic (Ovary)
	Cervix	Hyperplasia	Squamous, Minimal
	Endometrium	Hyperplasia	Cystic, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 321

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61343

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Mammary Gland
* Nose	* Ovary	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Liver		Basophilic Focus	
		Clear Cell Focus	
	Bile Duct	Hyperplasia	Mild
* Lymph Node, Mesenteric		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Moderate
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Mild
		Polyp Stromal	Multiple

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 322

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61344

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Multifocal, Minimal
* Liver		Basophilic Focus	
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
[Hyperplasia TGLs = 2 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 323

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61345

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Ovary	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Degeneration Hypertrophy	Cystic, Moderate Focal, Mild
[Degeneration TGLs = 5 - 7]			
* Eye	Lens Cornea Unilateral	Cataract Inflammation Phthisis Bulbi	Moderate Chronic Active, Mild Mild
[Cataract TGLs = 2 - 13]			
[Inflammation TGLs = 1 - 13]			
[Phthisis Bulbi TGLs = 3 - 13]			
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only Nephropathy	Mild
* Liver		Clear Cell Focus Mixed Cell Focus	
[Mixed Cell Focus TGLs = 4 - 14]			
* Mammary Gland		Hyperplasia	Moderate
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Hyperplasia	Lymphoid, Moderate
[Hyperplasia TGLs = 6 - 3]			

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 323

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61345

ORGAN AND ACCOUNTABLE SITE STATUS

* Thyroid Gland

C Cell

Hyperplasia

Minimal

* Uterus

Endometrium

Hyperplasia

Cystic, Minimal

Polyp Stromal

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 324

TRT#: 4

SEX: Female

DAY ON TEST: 715

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61346

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	Peripheral Nerve	* Salivary Glands
Skeletal Muscle	* Skin	Spinal Cord	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Trachea	* Urinary Bladder
* Uterus			

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Mild
* Brain		Compression	Moderate
[Compression TGLs = 3 - 1]			
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
	Bile Duct	Dilatation	Mild
[Dilatation TGLs = 1 - 14]		Eosinophilic Focus	
[Eosinophilic Focus TGLs = 4 - 14]			
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
Spinal Cord			
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 325

TRT#: 4

SEX: Female

DAY ON TEST: 418

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61347

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Liver
* Lung	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Nose
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Lymph Node, Mesenteric		Schwannoma Malignant	Metastatic (Uterus)
	[Schwannoma Malignant TGLs = 5 - 15]		
* Mammary Gland		Carcinoma	
		Galactocele	Moderate
	[Carcinoma TGLs = 3 - 14]		
	[Galactocele TGLs = 8 - 20]		
Mesentery	Fat	Schwannoma Malignant	Metastatic (Uterus)
	[Schwannoma Malignant TGLs = 4 - 19]		
* Ovary		Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 2 - 10]		
* Spleen	Lymph Follic	Atrophy	Mild
		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Moderate
* Uterus		Schwannoma Malignant	
	[Schwannoma Malignant TGLs = 6 - 16+17+18]		

PRIMARY CAUSE OF DEATH - Uterus Schwannoma Malignant

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 326

TRT#: 4

SEX: Female

DAY ON TEST: 571

DOSE: 12.5 ppm

DISP: Natural Death

HISTO: 61348

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Liver	* Lymph Node, Bronchial	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea

MISSING

* Lymph Node, Mandibular

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Gross Observation	
	Pelvis	Inflammation	Marked
		Nephropathy	Marked
	[Calculus Gross Observation TGLs = 6 - 7]		
	[Inflammation TGLs = 4 - 7]		
* Lung		Inflammation	Granulomatous, Minimal
* Ovary		Atrophy	Minimal
		Cyst	
* Spleen	Lymph Follic	Atrophy	Moderate
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Marked
Ureter			
	Note: TGL-8 - 14 was a gross observation of calculus. Calculus is not a choice in TDMSE for ureter.		
* Urinary Bladder		Calculus Gross Observation	
		Hyperplasia	Mild
	[Calculus Gross Observation TGLs = 7 - 10]		
* Uterus	Cervix	Hyperplasia	Squamous, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 326

TRT#: 4

SEX: Female

DAY ON TEST: 571

DOSE: 12.5 ppm

DISP: Natural Death

HISTO: 61348

ORGAN AND ACCOUNTABLE SITE STATUS

Endometrium

Metaplasia

Squamous, Minimal

PRIMARY CAUSE OF DEATH

- Kidney Pelvis Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 327

TRT#: 4

SEX: Female

DAY ON TEST: 731

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61349

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Pancreas	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

MISSING

* Parathyroid Gland

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Mild
[Degeneration TGLs = 6 - 7]			
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Retina	Degeneration	Mild
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Mild
* Liver		Angiectasis	Minimal
[Angiectasis TGLs = 4 - 6]		Basophilic Focus	
[Basophilic Focus TGLs = 5 - 14]			
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Mammary Gland		Adenoma	
		Fibroadenoma	
[Adenoma TGLs = 1 - 15]			
[Fibroadenoma TGLs = 2 - 16+17+18]			
* Ovary		Atrophy	Mild
		Cyst	
[Cyst TGLs = 3 - 9]			
* Pituitary Gland	Pars Distalis	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 327

TRT#: 4

SEX: Female

DAY ON TEST: 731

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61349

ORGAN AND ACCOUNTABLE SITE STATUS

[Adenoma TGLs = 7 - 10]

* Spleen	Lymph Follic	Atrophy Hematopoietic Cell Proliferation	Moderate Moderate
* Thymus		Atrophy	Marked
* Thyroid Gland	Follicular Cel C Cell	Adenoma Hyperplasia	Moderate
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 328

TRT#: 4

SEX: Female

DAY ON TEST: 715

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61350

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Ovary	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex		Adenocarcinoma	Metastatic (Uterus)
	Zona Fascult	Hypertrophy	Multifocal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Retina	Degeneration	Mild
* Kidney	Pelvis	Dilatation	Moderate
	Renal Tubule	Dilatation	Moderate
	Papilla	Necrosis	Minimal
	[Dilatation TGLs = 8,9 - 7]	Thrombosis	Mild
* Liver		Adenocarcinoma	Metastatic (Uterus)
	[Adenocarcinoma TGLs = 5,6,7 - 6+14+15]	Necrosis	Multifocal, Mild
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
* Pancreas		Adenocarcinoma	Metastatic (Uterus)
	[Adenocarcinoma TGLs = 4 - 6]	Atrophy	Moderate
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
Skeletal Muscle		Adenocarcinoma	Metastatic (Uterus)
	[Adenocarcinoma TGLs = 10 - 14]		
* Spleen		Hematopoietic Cell Proliferation	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 328

TRT#: 4

SEX: Female

DAY ON TEST: 715

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61350

ORGAN AND ACCOUNTABLE SITE STATUS

* Stomach, Forestomach	Epithelium	Pigmentation	Hemosiderin, Minimal
	Epithelium	Erosion	Minimal
		Hyperplasia	Mild
		Inflammation	Minimal
* Thymus		Atrophy	Marked
* Uterus		Adenocarcinoma	
[Adenocarcinoma TGLs = 11,12 - 10+16]			

PRIMARY CAUSE OF DEATH - Uterus Adenocarcinoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 329

TRT#: 4

SEX: Female

DAY ON TEST: 723

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61351

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Glandular	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex		Hematopoietic Cell Proliferation	Mild
	Zona Fascult	Hypertrophy	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Mild
* Liver		Hematopoietic Cell Proliferation	Minimal
Mesentery	Fat	Necrosis	Moderate
	[Necrosis TGLs = 2,3 - 15+16]		
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 1 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Stomach, Forestomach	Epithelium	Hyperplasia	Mild
		Inflammation	Mild
* Thymus		Atrophy	Marked
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Mild
		Schwannoma Malignant	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 329

TRT#: 4

SEX: Female

DAY ON TEST: 723

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61351

ORGAN AND ACCOUNTABLE SITE STATUS

[Schwannoma Malignant TGLs = 4-14]

PRIMARY CAUSE OF DEATH - Uterus Schwannoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 330

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61352

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder	* Uterus		

OBSERVATIONS

* Heart		Cardiomyopathy	Mild
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Mammary Gland		Fibroadenoma	Multiple
[Fibroadenoma TGLs = 1,2 - 14+15]			
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Adenoma	
	C Cell	Hyperplasia	Mild

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 331

TRT#: 4

SEX: Female

DAY ON TEST: 603

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61353

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Nose	* Pancreas	* Salivary Glands	* Skin
* Stomach, Glandular	* Thyroid Gland	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Mandibular	* Parathyroid Gland
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OBSERVATIONS

* Eye	Cornea	Mineralization	Minimal
* Kidney		Calculus Micro Observation Only	
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
* Spleen	Lymph Follic	Atrophy	Minimal
		Pigmentation	Hemosiderin, Minimal
* Stomach, Forestomach	Epithelium	Hyperplasia	Mild
		Inflammation	Moderate
[Inflammation TGLs = 3 - 7]			
* Thymus		Atrophy	Mild
* Uterus		Polyp Stromal	

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 332

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61354

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

MISSING

* Parathyroid Gland

OBSERVATIONS

* Clitoral Gland		Inflammation	Mild
[Inflammation TGLs = 4 - 9]			
* Eye	Cornea, Epithelium	Hyperplasia	Moderate
	Cornea	Inflammation	Chronic Active, Marked
	Cornea, Endothelium	Rupture	Mild
	Cornea, Epithelium	Ulcer	Mild
Note: Rupture includes Descemet's membrane.			
[Inflammation TGLs = 1,2 - 13]			
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver	Bile Duct	Hyperplasia	Mild
* Mammary Gland		Carcinoma	
[Carcinoma TGLs = 3 - 14]			
Mesentery	Fat	Necrosis	Minimal
[Necrosis TGLs = 6 - 15]			
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
	Lamina Propria	Fibrosis	Minimal
* Ovary		Atrophy	Mild
		Cyst	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 332

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61354

ORGAN AND ACCOUNTABLE SITE STATUS

[Cyst TGLs = 5 - 9]			
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
[Hyperplasia TGLs = 7 - 10]			
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus		Adenocarcinoma	
	Endometrium	Hyperplasia	Cystic, Mild
	Cervix	Hyperplasia	Squamous, Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 333

TRT#: 4

SEX: Female

DAY ON TEST: 137

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61355

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Clitoral Gland	* Esophagus	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Thymus
* Thyroid Gland	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Brain		Schwannoma Malignant	Metastatic (Harderian Gland)
Note: TGL-2 schwannoma extends from the Harderian along the optic nerve caudally into the brain and pituitary, and into the trigeminal nerve on both sides.			
* Eye		Inflammation	Chronic Active, Marked
	Optic Nerve	Schwannoma Malignant	Metastatic (Harderian Gland)
	[Inflammation TGLs = 1 - 13]		
* Harderian Gland		Schwannoma Malignant	
	[Schwannoma Malignant TGLs = 2 - 14]		
Peripheral Nerve	Trigeminal	Schwannoma Malignant	Metastatic (Harderian Gland)
	[Schwannoma Malignant TGLs = 5 - 12]		
* Pituitary Gland		Schwannoma Malignant	Metastatic (Harderian Gland)
	[Schwannoma Malignant TGLs = 4 - 10]		
* Spleen		Pigmentation	Hemosiderin, Minimal

PRIMARY CAUSE OF DEATH - Harderian Gland Schwannoma Malignant

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 334

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61356

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder	* Uterus		

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Mild
* Eye	Cornea	Inflammation	Chronic Active, Minimal
* Kidney	Pelvis	Inflammation	Minimal
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 335

TRT#: 4

SEX: Female

DAY ON TEST: 715

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61357

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Clitoral Gland		Ectasia	Mild
[Ectasia TGLs = 3 - 9]			
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
	Centrilobular	Degeneration	Mild
	Oval Cell	Hyperplasia	Minimal
		Infiltration Cellular	Lymphoid, Mild
		Pigmentation	Hemosiderin, Moderate
* Lymph Node, Mesenteric		Lymphoma Malignant	
[Lymphoma Malignant TGLs = 5 - 8]			
Mesentery	Fat	Necrosis	Minimal
[Necrosis TGLs = 4 - 16]			
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Ovary		Atrophy	Mild
		Cyst	
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
* Spleen	Lymph Follic	Hyperplasia	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 335

TRT#: 4

SEX: Female

DAY ON TEST: 715

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61357

ORGAN AND ACCOUNTABLE SITE STATUS

* Stomach, Forestomach	Epithelium	Pigmentation	Hemosiderin, Minimal
* Thymus		Hyperplasia	Minimal
[Lymphoma Malignant	TGLs = 1 - 14+15]	Lymphoma Malignant	
* Uterus	Endometrium	Hyperplasia	Cystic, Mild

PRIMARY CAUSE OF DEATH - Thymus Lymphoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 336

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61358

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Minimal
* Liver		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Ovary		Cyst	
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus		Polyp Stromal	

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 337

TRT#: 4

SEX: Female

DAY ON TEST: 585

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61359

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Liver
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Nose	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Ovary		Atrophy	Mild
		Cyst	
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal
		Polyp Stromal	

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 338

TRT#: 4

SEX: Female

DAY ON TEST: 718

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61360

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Pancreas	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

MISSING

* Parathyroid Gland

OBSERVATIONS

* Brain		Granular Cell Tumor Benign	
	[Granular Cell Tumor Benign TGLs = 9 - 1]		
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
* Liver		Angiectasis	Minimal
		Basophilic Focus	
		Eosinophilic Focus	
	[Angiectasis TGLs = 3 - 14]		
	[Basophilic Focus TGLs = 10 - 15]		
	[Eosinophilic Focus TGLs = 11 - 16]		
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	[Infiltration Cellular TGLs = 4,5,6 - 4+5]		
Mesentery	Fat	Necrosis	Minimal
	[Necrosis TGLs = 7 - 14]		
* Ovary		Atrophy	Minimal
		Granulosa Cell Tumor Malignant	
* Pituitary Gland	Pars Distalis	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 338

TRT#: 4

SEX: Female

DAY ON TEST: 718

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61360

ORGAN AND ACCOUNTABLE SITE STATUS

[Adenoma TGLs = 2 - 10]

* Spleen

Pigmentation

Hemosiderin, Minimal

* Thymus

Atrophy

Moderate

* Thyroid Gland

C Cell

Hyperplasia

Mild

Follicular Cel

Hyperplasia

Minimal

* Uterus

Polyp Stromal

Multiple

[Polyp Stromal TGLs = 8 - 10]

PRIMARY CAUSE OF DEATH

- Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 339

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61361

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder	* Uterus		

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Larynx		Inflammation	Chronic Active, Minimal
* Liver	Bile Duct	Hyperplasia	Mild
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
Mesentery	Fat	Necrosis	Moderate
[Necrosis TGLs = 1,2 - 14+15]			
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
		Hyperplasia	Lymphoid, Mild
* Thyroid Gland	Follicular Cel	Adenoma	

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 340

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61362

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Esophagus	* Eye	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Ovary
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Mild
	Zona Fascult	Hypertrophy	Focal, Marked
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Clitoral Gland		Ectasia	Moderate
[Ectasia TGLs = 2 - 9]			
* Kidney	Pelvis	Inflammation	Minimal
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 3 - 10]			
* Skin	Inguinal	Inflammation	Pyogranulomat, Marked
[Inflammation TGLs = 1 - 14]			
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Marked
* Uterus		Polyp Stromal	

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 341

TRT#: 4

SEX: Female

DAY ON TEST: 409

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61363

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Ovary	* Pancreas
* Parathyroid Gland	Peripheral Nerve	* Pituitary Gland	* Salivary Glands
Skeletal Muscle	* Stomach, Forestomach	* Stomach, Glandular	* Thymus
* Thyroid Gland	* Trachea		

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Kidney	Pelvis	Inflammation	Minimal
* Skin	Lateral	Inflammation	Acute, Moderate
	Lateral	Ulcer	Focal, Marked
[Ulcer TGLs = 1 - 14]			
Spinal Cord		Gliosis	Moderate
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
Note: Gliosis = microglial, possibly neoplastic.			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Urinary Bladder		Inflammation	Mild
* Uterus	Cervix	Hyperplasia	Squamous, Minimal
	Endometrium	Hyperplasia	Cystic, Minimal
		Polyp Stromal	
[Polyp Stromal TGLs = 2 - 10]			

PRIMARY CAUSE OF DEATH - Skin Lateral Ulcer

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 342

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61364

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder	* Uterus	

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Minimal
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Mammary Gland		Fibroadenoma	Multiple
[Fibroadenoma TGLs = 1,2 - 14+15]			
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	Follicular Cel	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 343

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61365

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Esophagus	* Eye	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thymus	* Thyroid Gland	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex	Zona Fasciata	Hypertrophy	Focal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Clitoral Gland		Inflammation	Minimal
[Inflammation TGLs = 2 - 14]			
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Minimal
* Liver		Basophilic Focus	
* Lung	Peribronchial	Inflammation	Chronic Active, Minimal
Lymph Node	Renal	Adenocarcinoma	Metastatic (Uterus)
	Lumbar	Adenocarcinoma	Metastatic (Uterus)
[Adenocarcinoma TGLs = 8 - 20]			
[Adenocarcinoma TGLs = 5 - 18]			
* Mammary Gland		Carcinoma	
		Fibroadenoma	
[Carcinoma TGLs = 1 - 16]			
[Fibroadenoma TGLs = 3 - 17]			
Mesentery	Fat	Necrosis	Minimal
[Necrosis TGLs = 6 - 19]			
* Nose		Inflammation	Suppurative, Minimal
* Ovary		Atrophy	Moderate
* Pancreas		Basophilic Focus	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 343

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61365

ORGAN AND ACCOUNTABLE SITE STATUS

* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
[Hyperplasia TGLs = 7 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Uterus		Adenocarcinoma	
	Cervix	Cyst	Squamous
	Endometrium	Hyperplasia	Cystic, Mild
[Adenocarcinoma TGLs = 4 -15]			

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 344

TRT#: 4

SEX: Female

DAY ON TEST: 687

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61366

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lymph Node, Mesenteric
* Ovary	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
		Hematopoietic Cell Proliferation	Moderate
	Zona Fasciata	Hypertrophy	Focal, Moderate
	[Hematopoietic Cell Proliferation TGLs = 12 - 7]		
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Heart		Cardiomyopathy	Minimal
* Intestine Small, Ileum		Adenocarcinoma	Metastatic (Uterus)
	[Adenocarcinoma TGLs = 19 - 17]		
* Kidney		Accumulation, Hyaline Droplet	Mild
	Pelvis	Dilatation	Moderate
	Pelvis	Inflammation	Marked
	[Dilatation TGLs = 17 - 7]		
	[Inflammation TGLs = 11 - 7]		
* Liver		Adenocarcinoma	Metastatic (Uterus)
		Basophilic Focus	
		Eosinophilic Focus	
		Hematopoietic Cell Proliferation	Mild
	[Adenocarcinoma TGLs = 8 - 16]		
* Lung		Adenocarcinoma	Metastatic (Uterus)
	[Adenocarcinoma TGLs = 4,5 - 14+16]		
Lymph Node	Renal	Adenocarcinoma	Metastatic (Uterus)

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 344

TRT#: 4

SEX: Female

DAY ON TEST: 687

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61366

ORGAN AND ACCOUNTABLE SITE STATUS

Note: Of two lymph nodes submitted as part of TGL-13, one also has metastatic carcinoma from uterus.

[Adenocarcinoma	TGLs = 16 - 15]		
* Lymph Node, Mandibular		Infiltration Cellular	Plasma Cell, Mild
* Lymph Node, Mediastinal		Infiltration Cellular	Plasma Cell, Mild
[Infiltration Cellular	TGLs = 6 - 3]		
* Mammary Gland		Adenoma	
[Adenoma	TGLs = 1 - 14]		
* Nose		Inflammation	Suppurative, Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma	TGLs = 7 - 10]		
Skeletal Muscle		Adenocarcinoma	Metastatic (Uterus)
[Adenocarcinoma	TGLs = 10,13 - 18+24]		
* Skin	Subcut Tiss	Adenocarcinoma	Metastatic (Uterus)
[Adenocarcinoma	TGLs = 2,3 - 19]		
* Spleen		Hematopoietic Cell Proliferation	Marked
[Hematopoietic Cell Proliferation	TGLs = 9 - 15]		
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Adenoma	
* Uterus		Adenocarcinoma	
[Adenocarcinoma	TGLs = 14+15 - 20+21+22+23]		

PRIMARY CAUSE OF DEATH - Uterus Adenocarcinoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 345

TRT#: 4

SEX: Female

DAY ON TEST: 721

DOSE: 12.5 ppm

DISP: Moribund Sacrifice

HISTO: 61367

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Salivary Glands	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder	* Uterus	

MISSING

* Parathyroid Gland

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
Note: Gross observation of pale foci correlated to calculi not identified grossly as such. [Calculus Micro Observation Only TGLs = 6 - 7]			
* Liver		Fatty Change	Diffuse, Mild
* Mammary Gland		Galactocele	Mild
[Galactocele TGLs = 4 - 15]			
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
* Ovary		Atrophy	Mild
		Cyst	
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 3 - 10]			
* Skin	Subcut Tiss	Lipoma	
[Lipoma TGLs = 1 - 16]			
* Spleen		Pigmentation	Hemosiderin, Moderate
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 346

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61368

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Nose	* Ovary	* Pancreas	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	* Uterus

MISSING

* Parathyroid Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult Zona Fascult	Hyperplasia Hypertrophy	Focal, Mild Multifocal, Mild
* Liver		Basophilic Focus Hepatocellular Adenoma	
	[Hepatocellular Adenoma TGLs = 4 - 14]		
* Lung	Interstitialium Alveolar Epith Alveolus Peribronchial	Fibrosis Hyperplasia Infiltration Cellular Inflammation	Minimal Minimal Histiocyte, Minimal Chronic Active, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
	[Hyperplasia TGLs = 3 - 10]		
* Salivary Glands		Inflammation	Moderate
* Skin	Subcut Tiss Ear, Epidermis Ear	Abscess Hyperplasia Inflammation	Moderate Mild Chronic Active, Minimal
	Note: Abscess beside clitoral gland (B09).		
	[Inflammation TGLs = 1,2 - 15+16]		
* Spleen		Hematopoietic Cell Proliferation Pigmentation	Mild Hemosiderin, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 346

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61368

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus

Atrophy

Minimal

* Thyroid Gland

C Cell

Hyperplasia

Moderate

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 347

TRT#: 4

SEX: Female

DAY ON TEST: 731

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61369

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Ovary	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Thymus
* Trachea	* Urinary Bladder	* Uterus	

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Angiectasis	Minimal
		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
	[Angiectasis TGLs = 1,2,3 - 6+14+15]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 348

TRT#: 4

SEX: Female

DAY ON TEST: 731

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61370

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Nose	* Ovary	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thymus	* Trachea	* Urinary Bladder
* Uterus			

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
Mesentery	Fat	Necrosis	Minimal
[Necrosis TGLs = 1 - 14]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 349

TRT#: 4

SEX: Female

DAY ON TEST: 733

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61371

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
* Mammary Gland		Fibroadenoma	
		Note: Small fibroadenoma in routine section B09.	
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 1 - 10]		
* Spleen	Lymph Follic	Atrophy	Mild
		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 350

TRT#: 4

SEX: Female

DAY ON TEST: 732

DOSE: 12.5 ppm

DISP: Terminal Sacrifice

HISTO: 61372

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Kidney	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thymus	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Minimal
* Islets, Pancreatic		Hyperplasia	Mild
* Liver		Basophilic Focus	
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 1 - 14+15+16]		
* Ovary		Atrophy	Mild
		Cyst	
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
	[Hyperplasia TGLs = 2 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal
	Follicular Cel	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 501

TRT#: 6

SEX: Female

DAY ON TEST: 723

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61223

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea

MISSING

* Lymph Node, Mandibular

OBSERVATIONS

* Adrenal Cortex		Schwannoma Malignant	Metastatic (Uterus)
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Retina	Degeneration	Minimal
* Kidney		Accumulation, Hyaline Droplet	Mild
		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
		Eosinophilic Focus	
		Schwannoma Malignant	Metastatic (Uterus)
	[Eosinophilic Focus TGLs = 4 - 14]		
Mesentery	Fat	Necrosis	Minimal
	[Necrosis TGLs = 2 - 15]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
	Olfactory Epi	Atrophy	Mild
* Ovary		Cyst	
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
	[Hyperplasia TGLs = 3 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Marked
* Thyroid Gland	C Cell	Adenoma	
* Urinary Bladder		Schwannoma Malignant	Metastatic (Uterus)

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 501

TRT#: 6

SEX: Female

DAY ON TEST: 723

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61223

ORGAN AND ACCOUNTABLE SITE STATUS

* Uterus

Schwannoma Malignant

[Schwannoma Malignant TGLs = 1 - 16+17+18]

PRIMARY CAUSE OF DEATH

- Uterus Schwannoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 502

TRT#: 6

SEX: Female

DAY ON TEST: 589

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61224

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Brain	* Clitoral Gland
* Esophagus	* Eye	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Larynx	* Lung	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Mammary Gland	* Ovary	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
* Bone		Osteosclerosis	Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Liver		Basophilic Focus	
* Lymph Node, Mesenteric		Schwannoma Malignant	Metastatic (Uterus)
* Nose	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Minimal
* Pituitary Gland	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Spleen	Pars Distalis	Hyperplasia	Minimal
		Hematopoietic Cell Proliferation	Marked
	[Hematopoietic Cell Proliferation TGLs = 2 - 6]		
* Thymus		Atrophy	Mild
* Uterus		Polyp Stromal	
	Cervix	Schwannoma Malignant	

Note: Cervix involved in tumor (left off diagnosis so would list with other schwannomas).

[Schwannoma Malignant TGLs = 1 - 14]

PRIMARY CAUSE OF DEATH

- Uterus Cervix Schwannoma Malignant

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 503

TRT#: 6

SEX: Female

DAY ON TEST: 617

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61225

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Glandular	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
* Eye	Retina	Degeneration	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
	[Nephropathy TGLs = 3 - 14]		
* Liver		Basophilic Focus	
		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Olfactory Epi	Atrophy	Minimal
	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Ovary		Atrophy	Moderate
		Cyst	
	[Cyst TGLs = 2 - 9]		
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 1 - 10]		
* Spleen		Pigmentation	Hemosiderin, Mild
* Stomach, Forestomach	Epithelium	Hyperplasia	Moderate
		Inflammation	Moderate
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 503

TRT#: 6

SEX: Female

DAY ON TEST: 617

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61225

ORGAN AND ACCOUNTABLE SITE STATUS

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 504

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61226

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Kidney	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Nose	* Ovary	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	* Uterus

MISSING

* Thymus

OBSERVATIONS

* Adrenal Cortex		Amyloid Deposition	Mild
* Islets, Pancreatic		Hyperplasia	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 505

TRT#: 6

SEX: Female

DAY ON TEST: 724

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61227

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	Peripheral Nerve
* Salivary Glands	Skeletal Muscle	* Skin	Spinal Cord
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 1 - 13]			
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
[Basophilic Focus TGLs = 7 - 6]			
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Mammary Gland	Duct	Dilatation	Moderate
[Dilatation TGLs = 3 - 15]			
[Fibroadenoma TGLs = 2 - 16]			
* Nose		Inflammation	Suppurative, Minimal
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 6 - 10]			
Spinal Cord	Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Adenoma	
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 505

TRT#: 6

SEX: Female

DAY ON TEST: 724

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61227

ORGAN AND ACCOUNTABLE SITE STATUS

Cervix

Hyperplasia

Squamous, Mild

Endometrium

Metaplasia

Squamous, Minimal

Cervix

Squamous Cell Carcinoma

[Squamous Cell Carcinoma TGLs = 5 - 14]

PRIMARY CAUSE OF DEATH - Mammary Gland Fibroadenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 506

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61228

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fasciata	Hypertrophy	Focal, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Retina	Degeneration	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Mild
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 2 - 14]		
* Nose	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Minimal
	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Ovary		Atrophy	Mild
		Cyst	
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
	Pars Intermed	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 506

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61228

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Adenoma	
[Adenoma TGLs = 3 - 3]			
* Uterus	Adenocarcinoma		
	Endometrium	Hyperplasia	Cystic, Minimal
	Cervix	Hyperplasia	Squamous, Mild
	Endometrium	Metaplasia	Squamous, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 507

TRT#: 6

SEX: Female

DAY ON TEST: 733

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61229

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Adrenal Medulla

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Cornea	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 1 - 13]			
* Heart		Cardiomyopathy	Minimal
* Int Lg Rectum			
Note: Section taken from anus.			
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Liver		Hepatocellular Adenoma	
[Hepatocellular Adenoma TGLs = 3 - 14]			
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
* Mammary Gland		Fibroadenoma	Multiple
[Fibroadenoma TGLs = 4,5 - 15+16]			
* Nose	Lamina Propria	Fibrosis	Minimal
* Ovary		Atrophy	Mild
		Cyst	
[Cyst TGLs = 2 - 9]			
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 507

TRT#: 6

SEX: Female

DAY ON TEST: 733

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61229

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus

Atrophy

Minimal

* Uterus

Endometrium

Hyperplasia

Cystic, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 508

TRT#: 6

SEX: Female

DAY ON TEST: 614

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61230

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

- | | | | |
|----------------------------|---------------------------|-----------------------------|--------------------------|
| * Adrenal Cortex | * Adrenal Medulla | Blood Vessel | * Bone |
| Bone Marrow | * Brain | * Clitoral Gland | * Esophagus |
| * Eye | * Harderian Gland | * Heart | * Intestine Large, Cecum |
| * Intestine Large, Colon | * Intestine Large, Rectum | * Intestine Small, Duodenum | * Intestine Small, Ileum |
| * Intestine Small, Jejunum | * Islets, Pancreatic | * Larynx | * Liver |
| * Lymph Node, Bronchial | * Lymph Node, Mandibular | * Lymph Node, Mediastinal | * Lymph Node, Mesenteric |
| * Mammary Gland | * Pancreas | * Parathyroid Gland | * Salivary Glands |
| * Stomach, Forestomach | * Stomach, Glandular | * Thyroid Gland | * Trachea |
| * Urinary Bladder | | | |

OBSERVATIONS

- | | | | |
|-------------------|-------------------------------------|---------------------------------|------------------------|
| * Kidney | | Calculus Micro Observation Only | |
| * Lung | | Inflammation | Granulomatous, Minimal |
| | [Inflammation TGLs = 6 - 14] | | |
| * Nose | Lamina Propria | Fibrosis | Minimal |
| | Olfactory Epi | Metaplasia | Respiratory, Mild |
| * Ovary | | Atrophy | Mild |
| * Pituitary Gland | Pars Distalis | Adenoma | |
| | [Adenoma TGLs = 5 - 10] | | |
| * Skin | Subcut Tiss | Lipoma | |
| | [Lipoma TGLs = 3 - 15+16] | | |
| * Spleen | | Pigmentation | Hemosiderin, Minimal |
| * Thymus | | Lymphoma Malignant | |
| | [Lymphoma Malignant TGLs = 4 - 3] | | |
| * Uterus | Endometrium | Metaplasia | Squamous, Mild |

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 509

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61231

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Mild
* Eye	Retina	Degeneration	Moderate
	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Infarct	Minimal
	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Mild
	[Basophilic Focus TGLs = 2 - 6]		
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
* Nose	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Minimal
* Ovary		Atrophy	Moderate
		Cyst	
	[Cyst TGLs = 3 - 9]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 509

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61231

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus

Atrophy

Minimal

* Uterus

Endometrium

Hyperplasia

Cystic, Mild

Cervix

Hyperplasia

Squamous, Mild

[Hyperplasia TGLs = 4 - 10]

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 510

TRT#: 6

SEX: Female

DAY ON TEST: 724

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61232

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Liver	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
Peripheral Nerve	* Salivary Glands	Skeletal Muscle	* Skin
Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder	* Uterus		

MISSING

* Parathyroid Gland

OBSERVATIONS

* Eye	Lens	Cataract	Mild
	Retina	Degeneration	Moderate
	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Marked
	Antr Chamber	Inflammation	Suppurative, Minimal
	Iris	Inflammation	Acute, Minimal
	Iris	Melanoma Malignant	
	Cornea	Necrosis	Minimal
		Retinal Detachment	Moderate
	Cornea, Epithelium	Ulcer	Moderate
	[Melanoma Malignant TGLs = 3 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Gross Observation	
	[Calculus Gross Observation TGLs = 5,6 - 7]		
* Mammary Gland		Fibroadenoma	Multiple
	[Fibroadenoma TGLs = 1,2 - 14+16+17+18+19]		
* Nose	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Ovary		Cyst	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 510

TRT#: 6

SEX: Female

DAY ON TEST: 724

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61232

ORGAN AND ACCOUNTABLE SITE STATUS

* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
[Hyperplasia TGLs = 4 - 10]			
Spinal Cord			
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Moderate
* Thyroid Gland	Follicular Cel	Hyperplasia	Moderate

PRIMARY CAUSE OF DEATH - Mammary Gland Fibroadenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 511

TRT#: 6

SEX: Female

DAY ON TEST: 516

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61233

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Mammary Gland	* Nose	* Pancreas	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

MISSING

* Parathyroid Gland

OBSERVATIONS

* Adrenal Cortex		Hematopoietic Cell Proliferation	Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Heart		Cardiomyopathy	Minimal
* Kidney		Accumulation, Hyaline Droplet	Mild
		Calculus Micro Observation Only	
	Pelvis	Inflammation	Mild
* Liver		Hematopoietic Cell Proliferation	Minimal
		Necrosis	Multifocal, Minimal
	[Necrosis TGLs = 2 - 6]		
Lymph Node	Iliac	Infiltration Cellular	Plasma Cell, Mild
	[Infiltration Cellular TGLs = 3 - 7]		
* Lymph Node, Mesenteric		Infiltration Cellular	Plasma Cell, Mild
	[Infiltration Cellular TGLs = 5 - 8]		
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Marked
	[Hematopoietic Cell Proliferation TGLs = 1 - 6]		
* Thymus		Atrophy	Marked
* Thyroid Gland	C Cell	Hyperplasia	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 511

TRT#: 6

SEX: Female

DAY ON TEST: 516

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61233

ORGAN AND ACCOUNTABLE SITE STATUS

* Uterus

Sarcoma Stromal

[Sarcoma Stromal TGLs = 4 - 14+15+16]

PRIMARY CAUSE OF DEATH

- Uterus Sarcoma Stromal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 512

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61234

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Ovary	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder	* Uterus	

OBSERVATIONS

* Intestine Small, Ileum	Peyers Patch	Hyperplasia	Lymphoid, Moderate
* Liver		Basophilic Focus	
* Nose	Olfactory Epi Lamina Propria	Accumulation, Hyaline Droplet Fibrosis	Mild Minimal
* Pituitary Gland [Adenoma TGLs = 1 - 10]	Pars Distalis	Adenoma	
* Spleen		Hematopoietic Cell Proliferation Pigmentation	Mild Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Marked

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 513

TRT#: 6

SEX: Female

DAY ON TEST: 710

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61235

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mesenteric	* Mammary Gland	* Ovary
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Parathyroid Gland
--------------------------	---------------------------	---------------------

OBSERVATIONS

* Kidney		Calculus Micro Observation Only	
* Liver	Bile Duct	Hyperplasia	Minimal
* Nose	Lamina Propria	Fibrosis	Minimal
	Olfactory Epi	Metaplasia	Respiratory, Mild
* Pancreas		Atrophy	Minimal
		Inflammation	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
* Spleen		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Mild
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 514

TRT#: 6

SEX: Female

DAY ON TEST: 452

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61236

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Liver	* Lung	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	Peripheral Nerve	* Salivary Glands
Skeletal Muscle	* Skin	Spinal Cord	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Bone	Tarsal, Tendon	Inflammation	Moderate
Note: Bursae around tarsal extensor tendons are inflamed.			
[Inflammation TGLs = 1 - 14+15]			
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Kidney		Calculus Micro Observation Only	
* Ovary		Atrophy	Moderate
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
Spinal Cord	Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Metaplasia	Squamous, Mild

PRIMARY CAUSE OF DEATH - Bone Tarsal Tendon Inflammation

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 515

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61237

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Ovary	* Pancreas
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

* Eye	Cornea	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 1 - 13]			
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Liver		Basophilic Focus	
* Nose	Lamina Propria	Fibrosis	Minimal
	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Parathyroid Gland		Adenoma	
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 516

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61238

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

OBSERVATIONS

Blood Vessel		Inflammation	Minimal
Note: Gastric/pancreatic artery inflamed.			
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Moderate
[Inflammation TGLs = 1 - 13]			
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
* Lymph Node, Mandibular		Ectasia	Mild
[Ectasia TGLs = 3 - 9]			
* Mammary Gland		Fibroadenoma	
Note: Fibroadenoma also present in routine section (B09).			
[Fibroadenoma TGLs = 2 - 15]			
* Nose	Olfactory Epi	Atrophy	Minimal
		Inflammation	Suppurative, Mild
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 4 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 516

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61238

ORGAN AND ACCOUNTABLE SITE STATUS

* Uterus

Endometrium

Hyperplasia

Cystic, Minimal

Cervix

Hyperplasia

Squamous, Minimal

Endometrium

Metaplasia

Squamous, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 517

TRT#: 6

SEX: Female

DAY ON TEST: 628

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61239

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Mammary Gland
* Ovary	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye		Inflammation	Chronic Active, Marked
[Inflammation TGLs = 1 - 13]			
* Lymph Node, Mesenteric		Atrophy	Mild
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Minimal
	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus		Sarcoma Stromal	

PRIMARY CAUSE OF DEATH - Eye Inflammation

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 518

TRT#: 6

SEX: Female

DAY ON TEST: 453

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61240

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

- | | | | |
|----------------------------|---------------------------|-----------------------------|---------------------------|
| * Adrenal Cortex | * Adrenal Medulla | Blood Vessel | * Bone |
| Bone Marrow | * Brain | * Clitoral Gland | * Esophagus |
| * Eye | * Harderian Gland | * Heart | * Intestine Large, Cecum |
| * Intestine Large, Colon | * Intestine Large, Rectum | * Intestine Small, Duodenum | * Intestine Small, Ileum |
| * Intestine Small, Jejunum | * Islets, Pancreatic | * Larynx | * Liver |
| * Lung | * Lymph Node, Bronchial | * Lymph Node, Mandibular | * Lymph Node, Mediastinal |
| * Lymph Node, Mesenteric | * Mammary Gland | * Ovary | * Pancreas |
| * Parathyroid Gland | * Salivary Glands | * Skin | * Stomach, Forestomach |
| * Stomach, Glandular | * Thyroid Gland | * Trachea | * Urinary Bladder |
| * Uterus | | | |

OBSERVATIONS

- | | | | |
|---------------------------|---------------|----------------------------------|----------------------|
| * Kidney | | Calculus Micro Observation Only | |
| * Nose | Olfactory Epi | Metaplasia | Respiratory, Minimal |
| * Pituitary Gland | Pars Distalis | Adenoma | |
| [Adenoma TGLs = 3 - 10] | | | |
| * Spleen | | Hematopoietic Cell Proliferation | Minimal |
| | | Pigmentation | Hemosiderin, Minimal |
| * Thymus | | Atrophy | Minimal |

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 519

TRT#: 6

SEX: Female

DAY ON TEST: 723

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61241

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Ovary	* Pancreas
* Parathyroid Gland	Peripheral Nerve	* Salivary Glands	Skeletal Muscle
* Skin	Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder	* Uterus	

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye	Retina	Degeneration	Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
[Calculus Micro Observation Only	TGLs = 4 - 7]		
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
* Lung	Bronchus, Epithelium	Regeneration	Minimal
* Mammary Gland		Fibroadenoma	
[Fibroadenoma	TGLs = 2 - 16+17+18]		
* Nose	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
Spinal Cord			
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Lymphoma Malignant	
[Lymphoma Malignant	TGLs = 1 - 3]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 519

TRT#: 6

SEX: Female

DAY ON TEST: 723

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61241

ORGAN AND ACCOUNTABLE SITE STATUS

* Thyroid Gland

C Cell

Hyperplasia

Minimal

Follicular Cel

Hypertrophy

Moderate

PRIMARY CAUSE OF DEATH

- Mammary Gland Fibroadenoma

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 520

TRT#: 6

SEX: Female

DAY ON TEST: 575

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61242

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Liver	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Ovary	* Pancreas
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	* Uterus

MISSING

* Parathyroid Gland

OBSERVATIONS

* Eye	Cornea	Inflammation	Chronic Active, Minimal
* Heart		Cardiomyopathy	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 521

TRT#: 6

SEX: Female

DAY ON TEST: 733

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61243

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
* Brain		Granular Cell Tumor Benign	
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Mild
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Lymph Node, Mesenteric		Hyperplasia	Lymphoid, Moderate
* Mammary Gland		Galactocele	Mild
		Hyperplasia	Mild
	[Galactocele TGLs = 2 - 15]		
* Nose	Lamina Propria	Fibrosis	Minimal
* Ovary		Atrophy	Mild
		Cyst	
	[Cyst TGLs = 4 - 9]		
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Spleen	Lymph Follic	Atrophy	Mild
		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 521

TRT#: 6

SEX: Female

DAY ON TEST: 733

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61243

ORGAN AND ACCOUNTABLE SITE STATUS

* Uterus

Cervix

Hypertrophy

Stromal, Mild

Polyp Stromal

Sarcoma Stromal

[Hypertrophy TGLs = 5 - 14]

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 522

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61244

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder
* Uterus			

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Mild
	Zona Fasciuli	Hypertrophy	Focal, Marked
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Lens	Cataract	Minimal
	Antr Chamber	Inflammation	Suppurative, Mild
	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 1 - 13]		
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Moderate
	[Basophilic Focus TGLs = 4 - 14]		
* Mammary Gland		Galactocele	Mild
	[Galactocele TGLs = 3 - 14]		
* Nose	Olfactory Epi	Atrophy	Mild
* Ovary		Atrophy	Mild
* Pancreas		Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
	[Hyperplasia TGLs = 2 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 522

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61244

ORGAN AND ACCOUNTABLE SITE STATUS

* Thyroid Gland

C Cell

Hyperplasia

Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANATOMY PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 523

TRT#: 6

SEX: Female

DAY ON TEST: 695

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61245

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Esophagus	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lung
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder	* Uterus		

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Multifocal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Clitoral Gland		Ectasia	Mild
[Ectasia TGLs = 5 - 9]			
* Eye	Cornea	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 3 - 13]			
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
* Nose	Lamina Propria	Fibrosis	Minimal
	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Ovary		Atrophy	Minimal
		Cyst	
		Granulosa Cell Tumor Malignant	
[Cyst TGLs = 6 - 9]			
[Granulosa Cell Tumor Malignant TGLs = 7 - 9]			
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 4 - 10]			
* Spleen	Lymph Follic	Atrophy	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 523

TRT#: 6

SEX: Female

DAY ON TEST: 695

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61245

ORGAN AND ACCOUNTABLE SITE STATUS

Hematopoietic Cell Proliferation

Minimal

Pigmentation

Hemosiderin, Minimal

Atrophy

Marked

* Thymus

PRIMARY CAUSE OF DEATH

- Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 524

TRT#: 6

SEX: Female

DAY ON TEST: 442

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61246

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Ovary	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder	* Uterus		

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Liver		Clear Cell Focus	
* Mammary Gland		Fibroadenoma	
[Fibroadenoma	TGLs = 1 - 14+15+16]		
* Nose	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Mild
* Thyroid Gland	Follicular Cel	Hypertrophy	Mild

PRIMARY CAUSE OF DEATH - Mammary Gland Fibroadenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 525

TRT#: 6

SEX: Female

DAY ON TEST: 528

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61247

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Mammary Gland
* Nose	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex		Hematopoietic Cell Proliferation	Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Liver		Hematopoietic Cell Proliferation	Minimal
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
[Infiltration Cellular	TGLs = 7 - 4+5]		
Lymph Node	Lumbar	Infiltration Cellular	Plasma Cell, Moderate
[Infiltration Cellular	TGLs = 5 - 7]		
* Lymph Node, Mesenteric		Atrophy	Marked
* Ovary		Cyst	
[Cyst	TGLs = 3 - 9]		
* Pancreas		Atrophy	Mild
		Inflammation	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
* Spleen		Hematopoietic Cell Proliferation	Marked
[Hematopoietic Cell Proliferation	TGLs = 1 - 6]		
* Thymus		Atrophy	Moderate
* Uterus	Endometrium	Decidual Reaction	Focal, Minimal
		Inflammation	Chronic Active, Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 525

TRT#: 6

SEX: Female

DAY ON TEST: 528

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61247

ORGAN AND ACCOUNTABLE SITE STATUS

Schwannoma Malignant

[Inflammation TGLs = 8 - 9]

[Schwannoma Malignant TGLs = 2 - 15+16+17+18+19]

Vagina

Schwannoma Malignant

Metastatic (Uterus)

Note: Mass in vagina more likely = invasive from uterus than metastatic (however, invasion is not a term in TDMSE).

[Schwannoma Malignant TGLs = 4 - 14]

PRIMARY CAUSE OF DEATH - Uterus Schwannoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 526

TRT#: 6

SEX: Female

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61248

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder	* Uterus	

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Eye	Retina	Degeneration	Mild
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
	Bile Duct	Eosinophilic Focus	
	[Basophilic Focus TGLs = 3 - 14]	Hyperplasia	Mild
* Mammary Gland		Adenoma	
	[Adenoma TGLs = 1 - 14]		
* Nose		Inflammation	Suppurative, Minimal
* Ovary		Cyst	
	[Cyst TGLs = 2 - 9]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
	[Hyperplasia TGLs = 4 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 527

TRT#: 6

SEX: Female

DAY ON TEST: 509

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61249

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Glandular	* Thyroid Gland	* Trachea	* Urinary Bladder

OBSERVATIONS

* Eye	Cornea	Inflammation	Chronic Active, Mild
* Kidney		Calculus Micro Observation Only	
	Cortex	Cyst	Mild
	[Cyst TGLs = 5 - 14]		
* Liver		Fatty Change	Diffuse, Mild
Mesentery	Fat	Necrosis	Minimal
	[Necrosis TGLs = 4 - 7]		
* Nose	Olfactory Epi	Metaplasia	Respiratory, Mild
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Spleen		Pigmentation	Hemosiderin, Mild
* Stomach, Forestomach	Epithelium	Hyperplasia	Moderate
		Inflammation	Moderate
		Ulcer	Moderate
	[Inflammation TGLs = 6 - 10+14]		
* Thymus		Atrophy	Moderate
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 528

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61250

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

- | | | | |
|--------------------------|----------------------------|---------------------------|-----------------------------|
| * Adrenal Cortex | * Adrenal Medulla | Blood Vessel | * Bone |
| * Brain | * Clitoral Gland | * Esophagus | * Harderian Gland |
| * Intestine Large, Cecum | * Intestine Large, Colon | * Intestine Large, Rectum | * Intestine Small, Duodenum |
| * Intestine Small, Ileum | * Intestine Small, Jejunum | * Islets, Pancreatic | * Lymph Node, Bronchial |
| * Lymph Node, Mandibular | * Lymph Node, Mediastinal | * Lymph Node, Mesenteric | * Pancreas |
| * Parathyroid Gland | * Salivary Glands | * Skin | * Trachea |
| * Urinary Bladder | | | |

OBSERVATIONS

- | | | | |
|------------------------|--------------------------------|----------------------------------|-------------------------|
| Bone Marrow | Myeloid Cell | Hyperplasia | Moderate |
| * Eye | Lens | Cataract | Mild |
| | Retina | Degeneration | Mild |
| | Iris | Inflammation | Acute, Mild |
| | Cornea | Inflammation | Chronic Active, Minimal |
| | [Inflammation TGLs = 1 - 13] | | |
| * Heart | | Cardiomyopathy | Minimal |
| * Kidney | | Calculus Micro Observation Only | |
| * Larynx | Squam Epithel | Hyperplasia | Minimal |
| | | Inflammation | Chronic Active, Minimal |
| * Liver | | Basophilic Focus | |
| | Bile Duct | Hyperplasia | Mild |
| * Lung | Alveolus | Infiltration Cellular | Histiocyte, Minimal |
| * Mammary Gland | | Fibroadenoma | |
| * Nose | Olfactory Epi | Atrophy | Minimal |
| * Ovary | | Atrophy | Mild |
| * Pituitary Gland | Pars Distalis | Hyperplasia | Minimal |
| * Spleen | | Hematopoietic Cell Proliferation | Mild |
| | | Pigmentation | Hemosiderin, Minimal |
| * Stomach, Forestomach | | Mineralization | Minimal |
| * Stomach, Glandular | | Mineralization | Minimal |
| * Thymus | | Atrophy | Mild |

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 528

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61250

ORGAN AND ACCOUNTABLE SITE STATUS

* Thyroid Gland

C Cell

Hyperplasia

Moderate

* Uterus

Endometrium

Hyperplasia

Cystic, Mild

Cervix

Hyperplasia

Squamous, Minimal

Polyp Stromal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 529

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61251

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex		Angiectasis	Moderate
	[Angiectasis TGLs = 5,6 - 7]		
* Eye	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver	Kupffer Cell	Hyperplasia	Mild
	Bile Duct	Hyperplasia	Minimal
		Necrosis	Multifocal, Mild
	[Necrosis TGLs = 4 - 14]		
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 2 - 15]		
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 529

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61251

ORGAN AND ACCOUNTABLE SITE STATUS

* Thyroid Gland

C Cell

Hyperplasia

Moderate

* Uterus

Endometrium

Hyperplasia

Focal, Moderate

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 530

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61252

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
* Eye	Cornea	Inflammation	Chronic Active, Mild
	Antr Chamber	Inflammation	Suppurative, Marked
	Iris	Inflammation	Acute, Moderate
	[Inflammation TGLs = 1 - 13]		
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
	[Clear Cell Focus TGLs = 2 - 14]		
* Ovary		Atrophy	Mild
		Cyst	
	[Cyst TGLs = 3 - 9]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
	[Hyperplasia TGLs = 4 - 10]		
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 531

TRT#: 6

SEX: Female

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61253

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lung	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Eye	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 1 - 13]		
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
		Clear Cell Focus	
	[Basophilic Focus TGLs = 4 - 14]		
* Nose	Olfactory Epi	Atrophy	Minimal
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Marked
	Cervix	Hyperplasia	Squamous, Mild
	[Hyperplasia TGLs = 2,3 - 10]		

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 532

TRT#: 6

SEX: Female

DAY ON TEST: 520

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61254

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder	* Uterus		

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Minimal
* Liver		Eosinophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Ovary		Cyst	
		Granulosa Cell Tumor Malignant	
[Cyst TGLs = 1 - 9]			
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 3 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Moderate
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
Vagina		Polyp	
[Polyp TGLs = 2 - 14]			

PRIMARY CAUSE OF DEATH - Vagina Polyp

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 533

TRT#: 6

SEX: Female

DAY ON TEST: 361

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61255

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Ovary	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
* Liver		Fatty Change	Diffuse, Mild
* Nose	Olfactory Epi	Metaplasia	Respiratory, Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 3 - 10]			
* Spleen	Lymph Follic	Atrophy	Mild
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Moderate

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 534

TRT#: 6

SEX: Female

DAY ON TEST: 698

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61256

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Larynx	* Lung	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex		Hematopoietic Cell Proliferation	Moderate
	Zona Fascult	Hypertrophy	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Liver		Hematopoietic Cell Proliferation	Minimal
* Nose	Lamina Propria	Fibrosis	Minimal
	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Ovary		Atrophy	Mild
		Cyst	
	[Cyst TGLs = 2 - 9]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
	[Hyperplasia TGLs = 1 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
	[Hematopoietic Cell Proliferation TGLs = 4 - 6]		
* Thymus		Atrophy	Marked
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus		Schwannoma Malignant	
	[Schwannoma Malignant TGLs = 3 - 14+15+16]		

PRIMARY CAUSE OF DEATH - Uterus Schwannoma Malignant

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 535

TRT#: 6

SEX: Female

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61257

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Ovary	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Trachea	* Urinary Bladder
* Uterus			

OBSERVATIONS

* Eye	Retina	Degeneration	Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Liver		Basophilic Focus	
		Eosinophilic Focus	
Mesentery	Fat	Necrosis	Mild
[Necrosis TGLs = 2 - 14]			
* Nose	Olfactory Epi	Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
[Hyperplasia TGLs = 1 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 536

TRT#: 6

SEX: Female

DAY ON TEST: 617

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61258

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Ovary	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

MISSING

* Lymph Node, Mandibular

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
* Lung		Inflammation	Granulomatous, Minimal
* Nose	Lamina Propria	Fibrosis	Minimal
	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 3 - 10]			
* Spleen	Lymph Follic	Atrophy	Mild
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Mild
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 537

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61259

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Trachea	* Urinary Bladder	* Uterus	

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Mild
	Zona Fascult	Hypertrophy	Focal, Moderate
* Brain			
Note: Cavitation present lined by portion of pituitary adenoma.			
* Eye	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 2 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Mild
		Nephropathy	Minimal
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Mild
		Infiltration Cellular	Mixed Cell, Minimal
* Mammary Gland		Adenoma	
	[Adenoma TGLs = 1 - 14]		
* Nose	Olfactory Epi	Atrophy	Mild
* Ovary		Atrophy	Mild
		Cyst	
	[Cyst TGLs = 4 - 9]		
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 537

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61259

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen

Hematopoietic Cell Proliferation

Mild

Pigmentation

Hemosiderin, Minimal

* Thymus

Atrophy

Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 538

TRT#: 6

SEX: Female

DAY ON TEST: 684

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61260

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Trachea	* Urinary Bladder	

OBSERVATIONS

* Eye	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
	Cortex	Cyst	Mild
		Nephropathy	Minimal
	[Cyst TGLs = 2 - 7]		
* Liver		Angiectasis	Minimal
		Basophilic Focus	
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Ovary		Atrophy	Mild
* Pancreas		Basophilic Focus	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Spleen		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Mild
* Uterus	Endometrium	Hyperplasia	Cystic, Mild
	Cervix	Hyperplasia	Squamous, Mild
	Endometrium	Metaplasia	Squamous, Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 539

TRT#: 6

SEX: Female

DAY ON TEST: 515

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61261

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Ovary	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Glandular
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Eye	Antr Chamber	Inflammation	Suppurative, Moderate
	Cornea	Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		
* Spleen	Lymph Follic	Atrophy	Moderate
		Pigmentation	Hemosiderin, Mild
* Stomach, Forestomach	Epithelium	Hyperplasia	Mild
		Inflammation	Marked
		Ulcer	Moderate
			[Inflammation TGLs = 4 - 10]
			[Ulcer TGLs = 5 - 14]
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Metaplasia	Squamous, Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 540

TRT#: 6

SEX: Female

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61262

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thymus	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

* Lymph Node, Mandibular

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Degeneration	Cystic, Minimal
* Eye	Cornea, Epithelium	Hypertrophy	Focal, Minimal
	Cornea	Hyperplasia	Mild
	Iris	Inflammation	Chronic Active, Mild
	Antr Chamber	Inflammation	Acute, Minimal
* Kidney		Inflammation	Suppurative, Mild
		Calculus Micro Observation Only	
* Larynx	Pelvis	Inflammation	Minimal
		Foreign Body	
		Inflammation	Chronic Active, Minimal
* Liver		Eosinophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Lung	Alveolar Epith	Hyperplasia	Minimal
* Nose		Inflammation	Suppurative, Minimal
* Ovary		Atrophy	Mild
		Cyst	
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 540

TRT#: 6

SEX: Female

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61262

ORGAN AND ACCOUNTABLE SITE STATUS

* Uterus

Endometrium

Hyperplasia
Polyp Stromal

Cystic, Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 541

TRT#: 6

SEX: Female

DAY ON TEST: 733

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61263

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Lens	Cataract	Minimal
	Retina	Degeneration	Moderate
	Cornea	Inflammation	Chronic Active, Moderate
	[Inflammation TGLs = 2 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
		Eosinophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Mammary Gland		Fibroadenoma	Multiple
	[Fibroadenoma TGLs = 3,6,7,8 - 15+16+17+18]		
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Mild
* Ovary		Atrophy	Mild
		Cyst	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 541

TRT#: 6

SEX: Female

DAY ON TEST: 733

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61263

ORGAN AND ACCOUNTABLE SITE STATUS

* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 4 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Moderate
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Mild
* Uterus	Cervix	Hemangioma	
		Polyp Stromal	

Note: Uterine polyp was prolapsed/intussuscepted.

[Polyp Stromal TGLs = 5 - 14]

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 542

TRT#: 6

SEX: Female

DAY ON TEST: 731

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61264

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Mild
* Eye	Lens	Cataract	Mild
	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Marked
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Nose	Olfactory Epi	Atrophy	Mild
* Ovary		Atrophy	Moderate
		Cyst	
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 2 - 10]		
* Spleen		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 543

TRT#: 6

SEX: Female

DAY ON TEST: 733

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61265

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Clitoral Gland	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Larynx	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Moderate
* Brain	Chor Plexus	Hyperplasia	Moderate
* Eye	Retina	Degeneration	Minimal
* Liver		Basophilic Focus	
* Mammary Gland		Hyperplasia	Mild
* Nose	Olfactory Epi	Atrophy	Mild
* Ovary		Cyst	
[Cyst TGLs = 2 - 9]			
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked
[Hyperplasia TGLs = 4 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Adenoma	
* Uterus	Endometrium	Hyperplasia	Focal, Mild
	Cervix	Hypertrophy	Stromal, Mild
[Hypertrophy TGLs = 3 - 14]			

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 544

TRT#: 6

SEX: Female

DAY ON TEST: 733

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61266

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Ovary	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Marked
* Eye	Lens	Cataract	Minimal
	Cornea, Epithelium	Hyperplasia	Moderate
	Cornea	Inflammation	Chronic Active, Marked
	Iris	Inflammation	Acute, Mild
	Cornea, Epithelium	Ulcer	Mild
	[Inflammation TGLs = 2 - 13]		
* Kidney		Calculus Micro Observation Only	
* Larynx		Inflammation	Chronic Active, Minimal
* Liver		Angiectasis	Minimal
		Basophilic Focus	
		Infiltration Cellular	Mixed Cell, Minimal
	[Basophilic Focus TGLs = 1 - 6]		
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Hyperplasia	Mild
* Uterus		Adenocarcinoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 544

TRT#: 6

SEX: Female

DAY ON TEST: 733

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61266

ORGAN AND ACCOUNTABLE SITE STATUS

Cervix

Hyperplasia
Polyp Stromal

Squamous, Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 545

TRT#: 6

SEX: Female

DAY ON TEST: 647

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61267

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Liver
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Ovary	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Heart		Cardiomyopathy	Minimal
Mesentery	Fat	Necrosis	Minimal
	[Necrosis TGLs = 2 - 16]		
* Nose	Olfactory Epi	Metaplasia	Respiratory, Mild
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Lymphoma Malignant	
	[Lymphoma Malignant TGLs = 1 - 14+15]		
* Uterus	Endometrium	Hyperplasia	Focal, Moderate

PRIMARY CAUSE OF DEATH - Thymus Lymphoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 546

TRT#: 6

SEX: Female

DAY ON TEST: 733

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61268

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	* Bone	Bone Marrow	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Mild
	Zona Fascult	Hyperplasia	Focal, Moderate
	Zona Fascult	Hypertrophy	Focal, Moderate
Blood Vessel	Media	Hypertrophy	Moderate
Note: Pancreatic or mesenteric arteries hypertrophic. [Hypertrophy TGLs = 4 - 14]			
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Mild
		Nephropathy	Moderate
* Lung	Interstitialium	Fibrosis	Mild
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Mammary Gland		Fibroadenoma	
[Fibroadenoma TGLs = 1 - 14]			
* Nose	Olfactory Epi	Atrophy	Mild
* Ovary		Atrophy	Moderate
		Cyst	
[Cyst TGLs = 3 - 9]			
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10]			

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 546

TRT#: 6

SEX: Female

DAY ON TEST: 733

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61268

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen		Hematopoietic Cell Proliferation	Moderate
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Marked
* Uterus		Polyp Stromal	

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA

2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 547

TRT#: 6

SEX: Female

DAY ON TEST: 733

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61269

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

MISSING

* Lymph Node, Mediastinal

OBSERVATIONS

* Adrenal Cortex		Adenoma	
	Zona Fascult	Hyperplasia	Focal, Minimal
	Zona Fascult	Hypertrophy	Focal, Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Granulomatous, Minimal
* Ovary		Cyst	
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 548

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61270

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Esophagus	* Eye	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Clitoral Gland		Ectasia	Moderate
[Ectasia TGLs = 1 - 9]			
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Mild
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
* Mammary Gland		Carcinoma	
[Carcinoma TGLs = 2 - 14]			
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Moderate
	Respirat Epith	Metaplasia	Squamous, Mild
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
[Hyperplasia TGLs = 4 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 548

TRT#: 6

SEX: Female

DAY ON TEST: 732

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 61270

ORGAN AND ACCOUNTABLE SITE STATUS

Cyst

[Cyst TGLs = 3 - 2]

* Thyroid Gland

C Cell

Hyperplasia

Marked

* Uterus

Endometrium

Hyperplasia

Cystic, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 549

TRT#: 6

SEX: Female

DAY ON TEST: 723

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61271

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Ovary	* Pancreas	* Parathyroid Gland	Peripheral Nerve
* Salivary Glands	Skeletal Muscle	* Skin	Spinal Cord
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Mandibular

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hyperplasia	Focal, Minimal
	Zona Fascult	Hypertrophy	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Liver		Basophilic Focus	
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 1 - 14+15+16]		
* Nose		Inflammation	Suppurative, Minimal
	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
Spinal Cord			
	Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

PRIMARY CAUSE OF DEATH - Mammary Gland Fibroadenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 550

TRT#: 6

SEX: Female

DAY ON TEST: 727

DOSE: 25 ppm

DISP: Moribund Sacrifice

HISTO: 61272

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Ovary
* Pancreas	* Parathyroid Gland	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Trachea	* Urinary Bladder	* Uterus

OBSERVATIONS

* Eye	Cornea	Inflammation	Chronic Active, Minimal
	Antr Chamber	Inflammation	Suppurative, Moderate
	[Inflammation TGLs = 1 - 13]		
* Kidney		Calculus Micro Observation Only	
		Infarct	Minimal
		Nephropathy	Minimal
* Liver		Basophilic Focus	
		Eosinophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
* Nose	Respirat Epith	Hyperplasia	Minimal
	Olfactory Epi	Metaplasia	Respiratory, Minimal
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 4 - 10]		
* Salivary Glands		Inflammation	Mild
* Spleen		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Moderate

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 701

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61123

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Urinary Bladder

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Moderate
[Inflammation TGLs = 1 - 13]			
* Heart		Cardiomyopathy	Mild
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Squam Epithel	Ulcer	Focal, Minimal
* Liver		Angiectasis	Minimal
[Angiectasis TGLs = 2 - 6]		Clear Cell Focus	
* Lung	Bronchiole, Epithelium	Hyperplasia	Mild
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Lamina Propria	Fibrosis	Mild
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
	Olfactory Epi	Metaplasia	Respiratory, Moderate
		Squamous Cell Carcinoma	
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 701

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61123

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus		Pigmentation	Hemosiderin, Minimal
* Thyroid Gland	C Cell	Atrophy	Mild
* Trachea	Submucosa	Hyperplasia	Minimal
	Epithelium	Fibrosis	Minimal
		Hyperplasia	Minimal
		Inflammation	Chronic Active, Mild
* Uterus	Endometrium	Hyperplasia	Cystic, Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 702

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61124

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye	Unilateral	Phthisis Bulbi	Marked
[Phthisis Bulbi TGLs = 1 - 13]			
* Heart		Cardiomyopathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Minimal
* Lung	Interstitium	Fibrosis	Minimal
	Alveolar Epith	Hyperplasia	Mild
	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Mild
[Infiltration Cellular TGLs = 2 - 4+5]			
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Mild
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 702

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61124

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Minimal
* Uterus	Cervix	Hyperplasia	Squamous, Mild

Note: TGLS 3 = NCL

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 703

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61125

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Parathyroid Gland	* Pituitary Gland	* Salivary Glands
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder

OBSERVATIONS

Blood Vessel		Inflammation	Minimal
Note: Vasculitis involves a cardiac artery and pulmonary vessels.			
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Retina	Degeneration	Mild
	Cornea	Inflammation	Chronic Active, Moderate
	Antr Chamber	Inflammation	Suppurative, Minimal
Note: Lens absent from inflamed eye.			
[Inflammation TGLs = 1 - 13]			
* Larynx	Squam Epithel	Hyperplasia	Minimal
		Inflammation	Chronic Active, Minimal
	Squam Epithel	Ulcer	Focal, Minimal
* Liver		Basophilic Focus	
* Lung	Interstitialium	Fibrosis	Minimal
	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Mild
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Granulomatous, Minimal
	Peribronchial	Inflammation	Chronic Active, Moderate
* Nose	Olfactory Epi	Atrophy	Mild
	Turbinate	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 703

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61125

ORGAN AND ACCOUNTABLE SITE STATUS

* Ovary	Olfactory Epi	Metaplasia Atrophy Cyst	Respiratory, Moderate Mild
[Cyst TGLs = 3,4 - 9]			
* Pancreas		Atrophy	Minimal
* Skin	Subcut Tiss	Hibernoma	
Note: Benign Hibernoma.			
[Hibernoma TGLs = 2 - 14]			
* Spleen		Hematopoietic Cell Proliferation Pigmentation	Mild Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Trachea	Epithelium	Hyperplasia Inflammation	Mild Chronic Active, Mild
* Uterus	Endometrium	Adenocarcinoma	Cystic, Moderate
	Cervix	Hyperplasia	Squamous, Moderate
[Adenocarcinoma TGLs = 5 - 14]			

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 704

TRT#: 8

SEX: Female

DAY ON TEST: 544

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61126

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Trachea	* Urinary Bladder
* Uterus			

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Cornea	Inflammation	Chronic Active, Minimal
	Cornea, Epithelium	Ulcer	Minimal
	[Inflammation TGLs = 1 - 13]		
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Moderate
* Liver		Basophilic Focus	
* Lung	Bronchus, Epithelium	Hyperplasia	Mild
* Mammary Gland		Adenoma	
		Fibroadenoma	
	[Adenoma TGLs = 3 - 15]		
	[Fibroadenoma TGLs = 4 - 9+14]		
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Mild
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
* Ovary		Atrophy	Minimal
* Pituitary Gland	Pars Distalis	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 704

TRT#: 8

SEX: Female

DAY ON TEST: 544

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61126

ORGAN AND ACCOUNTABLE SITE STATUS

[Adenoma TGLs = 2 - 10]

* Spleen

Hematopoietic Cell Proliferation

Mild

Pigmentation

Hemosiderin, Mild

* Thymus

Atrophy

Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 705

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61127

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland	* Salivary Glands
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Eye	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Mild
		Inflammation	Granulomatous, Minimal
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 4 - 14]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Mild
* Ovary		Atrophy	Mild
		Cyst	
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 3 - 10]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 705

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61127

ORGAN AND ACCOUNTABLE SITE STATUS

* Skin	Subcut Tiss	Hibernoma	
[Hibernoma TGLs = 5 - 15]			
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Moderate
* Uterus	Endometrium	Hyperplasia	Cystic, Mild
		Polyp Stromal	
[Polyp Stromal TGLs = 2 - 10]			

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 706

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61128

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Urinary Bladder	* Uterus	

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Cornea	Inflammation	Chronic Active, Moderate
	Unilateral	Phthisis Bulbi	Moderate
	Cornea, Epithelium	Ulcer	Mild

Note: Phthisis bulbi following perforation of one eye (TGL-2). Other eye has moderate corneal inflammation.

[Inflammation TGLs = 1 - 13]

[Phthisis Bulbi TGLs = 2 - 13]

* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
* Liver	Bile Duct	Hyperplasia	Minimal
* Lung	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
* Nose	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Ovary		Cyst	
	Germinal Epith	Hyperplasia	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 706

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61128

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen	Hematopoietic Cell Proliferation	Mild
* Thymus	Atrophy	Mild
* Trachea	Inflammation	Chronic Active, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 707

TRT#: 8

SEX: Female

DAY ON TEST: 571

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61129

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder
* Uterus			

MISSING

* Lymph Node, Mandibular

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Brain		Oligodendroglioma Benign	
* Kidney	Pelvis	Inflammation	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
* Mammary Gland		Carcinoma	
[Carcinoma TGLs = 1 - 14]			
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Mild
	Turbinate	Hyperostosis	Minimal
		Inflammation	Suppurative, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Respirat Epith	Metaplasia	Squamous, Mild
* Ovary		Cyst	
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 4 - 10]			
* Spleen	Lymph Follic	Atrophy	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 707

TRT#: 8

SEX: Female

DAY ON TEST: 571

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61129

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus		Pigmentation	Hemosiderin, Mild
* Trachea	Epithelium	Atrophy	Mild
		Hyperplasia	Minimal
		Inflammation	Chronic Active, Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 708

TRT#: 8

SEX: Female

DAY ON TEST: 725

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61130

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Clitoral Gland
* Esophagus	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	Peripheral Nerve	* Salivary Glands	Skeletal Muscle
* Skin	Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
	Zona Fascult	Hypertrophy	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Brain		Granular Cell Tumor Benign	
	[Granular Cell Tumor Benign TGLs = 6 - 19]		
* Eye	Retina	Degeneration	Minimal
	Cornea	Inflammation	Chronic Active, Minimal
	Unilateral	Phthisis Bulbi	Moderate
	Note: Phthisis bulbi following perforation in one eye, corneal inflammation in the other.		
	[Inflammation TGLs = 3 - 13]		
	[Phthisis Bulbi TGLs = 4 - 13]		
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Squam Epithel	Ulcer	Focal, Minimal
* Liver		Basophilic Focus	
		Clear Cell Focus	
	Bile Duct	Hyperplasia	Minimal
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Mammary Gland		Fibroadenoma	Multiple

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 708

TRT#: 8

SEX: Female

DAY ON TEST: 725

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61130

ORGAN AND ACCOUNTABLE SITE STATUS

	[Fibroadenoma TGLs = 1,2 - 14+15+16+17+18]		
* Nose	Olfactory Epi	Atrophy	Moderate
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Minimal
	Respirat Epith	Metaplasia	Squamous, Mild
* Ovary		Atrophy	Mild
		Cyst	
	[Cyst TGLs = 7 - 9]		
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 5 - 10]		
Spinal Cord			
	Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.		
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Trachea	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Minimal
		Inflammation	Chronic Active, Mild
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

PRIMARY CAUSE OF DEATH - Mammary Gland Fibroadenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 709

TRT#: 8

SEX: Female

DAY ON TEST: 633

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61131

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Ovary
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Urinary Bladder	* Uterus

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Multifocal, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Mild
	Cornea, Epithelium	Ulcer	Mild
* Heart		Cardiomyopathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
* Liver		Basophilic Focus	
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
		Inflammation	Granulomatous, Minimal
* Mammary Gland		Carcinoma	
	[Carcinoma TGLs = 1 - 15]		
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Moderate
	Turbinate	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Mild
	Respirat Epith	Metaplasia	Squamous, Minimal
* Pituitary Gland	Pars Distalis	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 709

TRT#: 8

SEX: Female

DAY ON TEST: 633

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61131

ORGAN AND ACCOUNTABLE SITE STATUS

[Adenoma TGLs = 2 - 10]

* Spleen		Hematopoietic Cell Proliferation	Moderate
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Moderate
* Trachea	Submucosa	Fibrosis	Mild
	Epithelium	Hyperplasia	Mild
		Inflammation	Chronic Active, Mild

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 710

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61132

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Lens	Cataract	Mild
	Retina	Degeneration	Minimal
	Cornea, Epithelium	Hyperplasia	Mild
	Cornea	Inflammation	Chronic Active, Moderate
	Cornea, Epithelium	Ulcer	Minimal
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
* Liver		Eosinophilic Focus	
* Lung	Interstitialium	Fibrosis	Minimal
	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Mild
	Alveolus	Infiltration Cellular	Histiocyte, Mild
		Inflammation	Granulomatous, Minimal
	Peribronchial	Inflammation	Chronic Active, Mild
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 710

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61132

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Squamous, Mild
* Ovary		Metaplasia	Respiratory, Mild
* Pituitary Gland	Pars Distalis	Atrophy	Moderate
[Adenoma TGLs = 2 - 10]		Adenoma	
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Uterus	Cervix	Hyperplasia	Squamous, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 711

TRT#: 8

SEX: Female

DAY ON TEST: 629

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61133

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Urinary Bladder		

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Hyperplasia	Mild
		Inflammation	Chronic Active, Mild
	Respirat Epith	Metaplasia	Squamous, Moderate
	Squam Epithel	Ulcer	Focal, Mild
* Liver		Basophilic Focus	
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Peribronchial	Inflammation	Chronic Active, Mild
		Inflammation	Suppurative, Mild
	Lymph Node	Hyperplasia	Lymphoid, Mild
	[Hyperplasia TGLs = 1 - 14]		
* Nose	Lamina Propria	Fibrosis	Mild
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
	Respirat Epith	Necrosis	Marked
	Olfactory Epi	Necrosis	Marked
* Ovary		Atrophy	Mild
		Cyst	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 711

TRT#: 8

SEX: Female

DAY ON TEST: 629

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61133

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen	Lymph Follic	Atrophy Hematopoietic Cell Proliferation Pigmentation	Moderate Minimal Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Trachea		Inflammation	Suppurative, Mild
* Uterus	Cervix	Hyperplasia	Squamous, Mild
	Endometrium	Metaplasia	Squamous, Mild

PRIMARY CAUSE OF DEATH - Nose Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 712

TRT#: 8

SEX: Female

DAY ON TEST: 635

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61134

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder	

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
	Pelvis	Dilatation	Mild
		Nephropathy	Minimal
	[Dilatation TGLs = 11 - 7]		
* Larynx	Squam Epithel	Hyperplasia	Marked
		Inflammation	Chronic Active, Mild
	Respirat Epith	Metaplasia	Squamous, Marked
* Liver		Basophilic Focus	
	[Basophilic Focus TGLs = 13 - 14]		
* Lung	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Mild
	Peribronchial	Inflammation	Chronic Active, Mild
	[Inflammation TGLs = 8,9 - 4+5]		
* Lymph Node, Mediastinal		Hyperplasia	Lymphoid, Mild
	[Hyperplasia TGLs = 3 - 3]		
* Mammary Gland		Carcinoma	
		Fibroadenoma	Multiple
	[Carcinoma TGLs = 4 - 15]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 712

TRT#: 8

SEX: Female

DAY ON TEST: 635

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61134

ORGAN AND ACCOUNTABLE SITE STATUS

* Ovary	[Fibroadenoma TGLs = 5,6,7 - 14+16+17]	Atrophy	Mild
		Cyst	
* Pituitary Gland	[Cyst TGLs = 12 - 9]	Adenoma	
	[Adenoma TGLs = 10 - 10]		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Moderate
* Trachea	Submucosa	Fibrosis	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal
	Cervix	Hyperplasia	Squamous, Mild
	Endometrium	Metaplasia	Squamous, Minimal

PRIMARY CAUSE OF DEATH - Mammary Gland Fibroadenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 713

TRT#: 8

SEX: Female

DAY ON TEST: 491

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61135

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Thyroid Gland	* Trachea
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex		Hematopoietic Cell Proliferation	Moderate
	Zona Fascult	Hypertrophy	Focal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
* Liver		Hematopoietic Cell Proliferation	Mild
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
* Mammary Gland		Carcinoma	
	[Carcinoma TGLs = 1 - 14+15]		
* Nose	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Respirat Epith	Metaplasia	Squamous, Minimal
* Ovary		Cyst	
	[Cyst TGLs = 2 - 9]		
* Spleen		Hematopoietic Cell Proliferation	Marked
	[Hematopoietic Cell Proliferation TGLs = 3 - 6]		
* Stomach, Glandular	Epithelium	Necrosis	Minimal
* Thymus		Atrophy	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 713

TRT#: 8

SEX: Female

DAY ON TEST: 491

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61135

ORGAN AND ACCOUNTABLE SITE STATUS

* Uterus

Polyp Stromal

PRIMARY CAUSE OF DEATH

- Mammary Gland Carcinoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 714

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61136

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder

OBSERVATIONS

* Bone		Osteosclerosis	Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Heart		Cardiomyopathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver	Bile Duct	Hyperplasia	Moderate
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Mild
		Inflammation	Granulomatous, Minimal
Lymph Node	Deep Cervical	Infiltration Cellular	Plasma Cell, Moderate
	[Infiltration Cellular TGLs = 2 - 14]		
* Lymph Node, Mandibular		Infiltration Cellular	Plasma Cell, Mild
* Nose	Lamina Propria	Fibrosis	Minimal
	Turbinate	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Mild
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Angiectasis	Focal, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 714

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61136

ORGAN AND ACCOUNTABLE SITE STATUS

	Pars Distalis	Hyperplasia	Minimal
[Angiectasis TGLs = 1 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Trachea	Submucosa	Fibrosis	Mild
		Inflammation	Chronic Active, Mild
* Uterus	Cervix	Hyperplasia	Squamous, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 715

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61137

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye	Retina	Degeneration	Minimal
	Cornea	Inflammation	Chronic Active, Minimal
	Cornea, Epithelium	Ulcer	Mild
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Mild
* Liver		Basophilic Focus	
* Lung	Interstitialium	Fibrosis	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Mild
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Mild
	[Infiltration Cellular TGLs = 3 - 4+5]		
	[Inflammation TGLs = 4 - 4]		
Lymph Node	Renal	Infiltration Cellular	Plasma Cell, Moderate
	[Infiltration Cellular TGLs = 7 - 17]		
* Mammary Gland		Galactocele	Minimal
	[Galactocele TGLs = 2 - 14]		
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 715

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61137

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Mild
	Respirat Epith	Metaplasia	Squamous, Minimal
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Moderate
* Trachea	Submucosa	Fibrosis	Minimal
* Uterus		Adenoma	
	Endometrium	Hyperplasia	Cystic, Moderate
	Endometrium	Metaplasia	Squamous, Minimal
		Schwannoma Malignant	

[Schwannoma Malignant TGLs = 6 - 15+16]

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 716

TRT#: 8

SEX: Female

DAY ON TEST: 711

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61138

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Multifocal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Lens	Cataract	Minimal
	Retina	Degeneration	Moderate
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Larynx	Respirat Epith	Hyperplasia	Minimal
	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Minimal
	Respirat Epith	Regeneration	Minimal
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	[Infiltration Cellular TGLs = 3 - 4+5]		
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 5 - 15]		
Mesentery	Fat	Necrosis	Minimal
	[Necrosis TGLs = 4 - 14]		
* Nose	Olfactory Epi	Atrophy	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 716

TRT#: 8

SEX: Female

DAY ON TEST: 711

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61138

ORGAN AND ACCOUNTABLE SITE STATUS

	Lamina Propria	Fibrosis	Minimal
		Foreign Body	
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Mild
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 6 - 10]		
* Spleen	Lymph Follic	Atrophy	Moderate
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Mild
* Uterus		Adenocarcinoma	
	Endometrium	Hyperplasia	Cystic, Minimal
		Polyp Stromal	

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 717

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61139

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder

MISSING

* Parathyroid Gland

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Focal, Minimal
* Eye	Cornea, Epithelium	Hyperplasia	Mild
	Cornea	Inflammation	Chronic Active, Mild
	Cornea, Epithelium	Ulcer	Minimal
	[Inflammation TGLs = 1 -13]		
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Minimal
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Mild
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Mild
	Respirat Epith	Metaplasia	Squamous, Minimal
* Ovary		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 717

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61139

ORGAN AND ACCOUNTABLE SITE STATUS

		Cyst	
[Cyst TGLs = 2 - 9]			
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Spleen		Hematopoietic Cell Proliferation	Minimal
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Trachea	Epithelium	Hyperplasia	Minimal
		Inflammation	Chronic Active, Minimal
* Uterus	Endometrium	Adenoma	
		Hyperplasia	Cystic, Moderate
		Polyp Stromal	

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 718

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61140

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Ovary	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder	

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Retina	Degeneration	Minimal
	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 1 - 13]		
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Basophilic Focus	
* Lung		Alveolar/Bronchiolar Adenoma	
	Alveolar Epith	Hyperplasia	Focal, Mild
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
	[Infiltration Cellular TGLs = 4 - 4+5+14]		
* Nose	Lamina Propria	Fibrosis	Mild
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Pituitary Gland	Respirat Epith	Metaplasia	Squamous, Minimal
	Pars Distalis	Hyperplasia	Moderate
	[Hyperplasia TGLs = 2 - 10]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 718

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61140

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Trachea		Inflammation	Chronic Active, Minimal
* Uterus		Angiectasis	Focal, Marked
	Endometrium	Hemangioma	
		Hyperplasia	Cystic, Minimal
		Polyp Stromal	

[Hemangioma TGLs = 3 - 15]

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 719

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61141

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Ovary	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Urinary Bladder			

OBSERVATIONS

* Eye	Cornea Cornea, Epithelium	Inflammation Ulcer	Chronic Active, Moderate Mild
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel Respirat Epith	Hyperplasia Metaplasia	Moderate Squamous, Minimal
* Liver		Basophilic Focus Mixed Cell Focus	
	[Mixed Cell Focus TGLs = 3 - 14]		
* Lung	Bronchus, Epithelium Bronchiole, Epithelium Alveolus Peribronchial	Hyperplasia Hyperplasia Infiltration Cellular Inflammation	Mild Mild Histiocyte, Mild Chronic Active, Mild
	[Inflammation TGLs = 2 - 4]		
* Nose	Olfactory Epi Lamina Propria Respirat Epith Respirat Epith Olfactory Epi	Atrophy Fibrosis Hyperplasia Inflammation Metaplasia Metaplasia	Minimal Minimal Moderate Suppurative, Marked Squamous, Minimal Respiratory, Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 719

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61141

ORGAN AND ACCOUNTABLE SITE STATUS

* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Trachea	Submucosa	Fibrosis	Moderate
	Epithelium	Hyperplasia	Mild
		Inflammation	Chronic Active, Moderate
	Epithelium	Metaplasia	Squamous, Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 720

TRT#: 8

SEX: Female

DAY ON TEST: 724

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61142

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Esophagus	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Salivary Glands
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder

MISSING

* Clitoral Gland	* Parathyroid Gland
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OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Lens	Cataract	Moderate
	Cornea	Inflammation	Chronic Active, Mild
	Unilateral	Phthisis Bulbi	Moderate
	[Phthisis Bulbi TGLs = 1 - 13]		
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Minimal
	Respirat Epith	Metaplasia	Squamous, Minimal
* Liver		Basophilic Focus	
* Lung	Interstitialium	Fibrosis	Mild
	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Mild
	[Fibrosis TGLs = 3 - 4]		
* Mammary Gland		Carcinoma	Multiple
		Fibroadenoma	
	[Carcinoma TGLs = 4,5,6,7,8 - 9+15+16+17+18+19]		
* Nose	Olfactory Epi	Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 720

TRT#: 8

SEX: Female

DAY ON TEST: 724

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61142

ORGAN AND ACCOUNTABLE SITE STATUS

	Lamina Propria	Fibrosis	Minimal
	Turbinate	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Respirat Epith	Metaplasia	Squamous, Marked
		Squamous Cell Carcinoma	
* Ovary		Atrophy	Mild
		Cyst	
	[Cyst TGLs = 9 - 9]		
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 2 - 10]		
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Focal, Moderate
	[Ulcer TGLs = 11 - 20]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Moderate
* Trachea	Submucosa	Fibrosis	Mild
	Epithelium	Hyperplasia	Minimal
		Inflammation	Chronic Active, Mild
* Uterus	Endometrium	Hyperplasia	Cystic, Mild
	Cervix	Hyperplasia	Squamous, Moderate
	Endometrial Gl	Hyperplasia	Focal, Moderate
	Endometrium	Metaplasia	Squamous, Minimal
	[Hyperplasia TGLs = 10 - 10]		

PRIMARY CAUSE OF DEATH - Mammary Gland Carcinoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 721

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61143

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Ovary	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Glandular
* Thyroid Gland	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Moderate
* Eye	Retina	Degeneration	Moderate
	Cornea	Inflammation	Chronic Active, Moderate
	Cornea, Endothelium	Rupture	Minimal
	Cornea, Epithelium	Ulcer	Moderate
Note: Rupture includes Descemet's membrane [Inflammation TGLs = 2 - 13]			
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Mild
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Granulomatous, Minimal
* Nose	Peribronchial	Inflammation	Chronic Active, Minimal
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Respirat Epith	Metaplasia	Squamous, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 721

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61143

ORGAN AND ACCOUNTABLE SITE STATUS

* Pituitary Gland [Hyperplasia TGLs = 3 - 10]	Pars Distalis	Hyperplasia	Marked
* Spleen		Hematopoietic Cell Proliferation Pigmentation	Mild Hemosiderin, Mild
* Stomach, Forestomach	Epithelium	Hyperplasia	Minimal
* Thymus		Atrophy	Minimal
* Trachea	Submucosa Epithelium	Fibrosis Hyperplasia	Mild Mild
* Uterus [Hypertrophy TGLs = 1 - 14]	Cervix	Inflammation Hypertrophy	Chronic Active, Mild Stromal, Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 722

TRT#: 8

SEX: Female

DAY ON TEST: 435

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61144

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas	* Salivary Glands
Skeletal Muscle	Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular
* Thymus	* Thyroid Gland	* Urinary Bladder	* Uterus

MISSING

* Parathyroid Gland

OBSERVATIONS

Bone Marrow		Lymphoma Malignant	
* Brain	Meninges	Lymphoma Malignant	
* Kidney		Lymphoma Malignant	
* Larynx	Squam Epithel	Hyperplasia	Moderate
* Liver		Lymphoma Malignant	
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
* Lymph Node, Bronchial		Lymphoma Malignant	
* Lymph Node, Mandibular		Lymphoma Malignant	
* Lymph Node, Mediastinal		Lymphoma Malignant	
* Nose	Lamina Propria	Fibrosis	Minimal
		Inflammation	Suppurative, Moderate
		Lymphoma Malignant	
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
* Ovary		Atrophy	Mild
		Cyst	
Peripheral Nerve		Lymphoma Malignant	
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
		Lymphoma Malignant	

[Lymphoma Malignant TGLs = 1 - 10]

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 722

TRT#: 8

SEX: Female

DAY ON TEST: 435

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61144

ORGAN AND ACCOUNTABLE SITE STATUS

* Skin	Inguinal	Inflammation	Acute, Moderate
[Inflammation TGLs = 3 - 15]			
Spinal Cord			
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
* Spleen		Hematopoietic Cell Proliferation Lymphoma Malignant	Mild
[Lymphoma Malignant TGLs = 2 - 14]			
* Trachea	Epithelium	Hyperplasia	Minimal

PRIMARY CAUSE OF DEATH - Spleen Lymphoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 723

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61145

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Ovary	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Urinary Bladder	* Uterus	

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
* Eye	Retina	Degeneration	Moderate
* Larynx		Inflammation	Chronic Active, Minimal
* Liver	Respirat Epith	Metaplasia	Squamous, Minimal
	Bile Duct	Cyst	
		Eosinophilic Focus	
	[Cyst TGLs = 5 - 15]		
	[Eosinophilic Focus TGLs = 4 - 14]		
* Lung	Interstitialium	Fibrosis	Minimal
	Alveolar Epith	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Mild
	[Infiltration Cellular TGLs = 3 - 4+5]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Minimal
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
* Pituitary Gland	Respirat Epith	Metaplasia	Squamous, Minimal
	Pars Distalis	Hyperplasia	Moderate
	[Hyperplasia TGLs = 2 - 10]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 723

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61145

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Adenoma	
	C Cell	Hyperplasia	Mild
* Trachea	Epithelium	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 724

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61146

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Ovary
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Urinary Bladder	

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
* Eye	Lens	Cataract	Minimal
	Retina	Degeneration	Minimal
	Cornea	Inflammation	Chronic Active, Moderate
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Basophilic Focus	
		Eosinophilic Focus	
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Mammary Gland		Fibroadenoma	Multiple
	[Fibroadenoma TGLs = 2,4 - 14+15]		
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Respirat Epith	Metaplasia	Squamous, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 724

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61146

ORGAN AND ACCOUNTABLE SITE STATUS

* Pituitary Gland [Adenoma TGLs = 3 - 10]	Pars Distalis	Adenoma	
* Spleen	Lymph Follic	Atrophy Hematopoietic Cell Proliferation	Minimal Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Moderate
* Trachea	Epithelium	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia Polyp Stromal	Cystic, Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 725

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61147

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Urinary Bladder	

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye	Retina	Degeneration	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	Cornea, Epithelium	Ulcer	Mild
	[Inflammation TGLs = 1 - 13]		
* Kidney	Pelvis	Inflammation	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Marked
* Liver		Basophilic Focus	
	[Hepatodiaphragmatic Nodule TGLs = 6 - 7]	Hepatodiaphragmatic Nodule	
* Lung	Pleura	Fibrosis	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Moderate
		Inflammation	Granulomatous, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
	[Infiltration Cellular TGLs = 5 - 4+5]		
* Lymph Node, Mandibular		Ectasia	Mild
	[Ectasia TGLs = 2 - 9]		
* Nose	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 725

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61147

ORGAN AND ACCOUNTABLE SITE STATUS

* Ovary	Respirat Epith Olfactory Epi	Metaplasia Metaplasia Atrophy Cyst	Squamous, Minimal Respiratory, Marked Moderate
[Cyst TGLs = 3 - 9]			
* Spleen		Hematopoietic Cell Proliferation Pigmentation	Mild Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Moderate
* Trachea	Submucosa Epithelium	Fibrosis Hyperplasia	Mild Mild
* Uterus	Cervix Endometrium	Hyperplasia Hyperplasia Polyp Stromal	Squamous, Mild Cystic, Minimal
[Polyp Stromal TGLs = 4 - 14]			

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 726

TRT#: 8

SEX: Female

DAY ON TEST: 697

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61148

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Liver	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas	* Parathyroid Gland
Peripheral Nerve	* Salivary Glands	Skeletal Muscle	* Skin
Spinal Cord	* Stomach, Forestomach	* Stomach, Glandular	* Trachea
* Urinary Bladder			

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
[Hypertrophy TGLs = 2 - 14]			
* Kidney	Pelvis	Calculus Micro Observation Only	
	Squam Epithel	Inflammation	Minimal
* Larynx		Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Minimal
	Respirat Epith	Metaplasia	Squamous, Mild
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 1 - 10]			
Spinal Cord			
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
* Spleen		Pigmentation	Hemosiderin, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 726

TRT#: 8

SEX: Female

DAY ON TEST: 697

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61148

ORGAN AND ACCOUNTABLE SITE STATUS

* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus		Fibrosis	Focal, Minimal
	Endometrium	Hyperplasia	Cystic, Minimal
		Polyp Stromal	

[Polyp Stromal TGLs = 3 - 10]

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 727

TRT#: 8

SEX: Female

DAY ON TEST: 633

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61149

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Ovary
* Salivary Glands	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland

MISSING

* Parathyroid Gland

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Kidney		Calculus Micro Observation Only	
	Pelvis	Dilatation	Mild
		Nephropathy	Minimal
[Dilatation TGLs = 7 - 7]			
* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Mild
	Respirat Epith	Regeneration	Minimal
* Lung	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Granulomatous, Minimal
	Bronchus, Epithelium	Regeneration	Minimal
		Schwannoma Malignant	Metastatic (Uterus)
[Infiltration Cellular TGLs = 9 - 15]			
[Schwannoma Malignant TGLs = 8 - 14]			
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Moderate
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 727

TRT#: 8

SEX: Female

DAY ON TEST: 633

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61149

ORGAN AND ACCOUNTABLE SITE STATUS

* Pancreas		Schwannoma Malignant	Metastatic (Uterus)
* Pituitary Gland	Pars Distalis	Hyperplasia	Minimal
* Skin	Foot	Inflammation	Chronic Active, Moderate
	Foot	Ulcer	Focal, Moderate
	[Inflammation TGLs = 3,4 - 14+19]		
	[Ulcer TGLs = 3 - 19]		
* Spleen		Hematopoietic Cell Proliferation	Moderate
* Thymus		Atrophy	Moderate
* Trachea	Epithelium	Atrophy	Minimal
* Urinary Bladder		Schwannoma Malignant	Metastatic (Uterus)
	[Schwannoma Malignant TGLs = 6 - 18]		
* Uterus		Schwannoma Malignant	
	[Schwannoma Malignant TGLs = 5 - 16+17]		

PRIMARY CAUSE OF DEATH - Uterus Schwannoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 728

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61150

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Ovary
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Urinary Bladder			

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 3 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney	Pelvis	Inflammation	Minimal
		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Minimal
* Liver		Basophilic Focus	
		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Granulomatous, Minimal
	[Infiltration Cellular TGLs = 2 - 4+5]		
* Mammary Gland		Carcinoma	
	[Carcinoma TGLs = 4 - 14]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 728

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61150

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen	Olfactory Epi	Metaplasia Hematopoietic Cell Proliferation Pigmentation	Respiratory, Marked Mild Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Trachea	Epithelium	Hyperplasia	Minimal
* Uterus		Polyp Stromal	

[Polyp Stromal TGLs = 1 - 10]

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 729

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61151

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Salivary Glands
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Eye	Unilateral	Phthisis Bulbi	Marked
[Phthisis Bulbi TGLs = 3 - 13]			
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Marked
* Liver		Basophilic Focus	
[Hepatodiaphragmatic Nodule TGLs = 4 - 14]		Hepatodiaphragmatic Nodule	
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
* Mammary Gland		Fibroadenoma	
[Fibroadenoma TGLs = 2 - 16]		Hyperplasia	Mild
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Mild
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Respirat Epith	Metaplasia	Squamous, Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 729

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61151

ORGAN AND ACCOUNTABLE SITE STATUS

* Ovary			Squamous Cell Carcinoma	
	[Cyst TGLs = 5 - 9]		Cyst	
* Skin		Inguinal	Inflammation	Pyogranulomat, Marked
	[Inflammation TGLs = 1 - 15]			
* Spleen			Hematopoietic Cell Proliferation	Mild
			Pigmentation	Hemosiderin, Mild
* Thymus			Atrophy	Mild
* Trachea		Epithelium	Hyperplasia	Mild
* Uterus		Endometrium	Hyperplasia	Cystic, Moderate
			Polyp Stromal	

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 730

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61152

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Heart
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Ovary	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Urinary Bladder	* Uterus	

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hyperplasia	Multifocal, Mild
	Zona Fascult	Hypertrophy	Focal, Mild
	[Degeneration TGLs = 3 - 7]		
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Lens	Cataract	Mild
	Iris	Inflammation	Acute, Minimal
	Cornea	Inflammation	Chronic Active, Minimal
	[Cataract TGLs = 2 - 13]		
	[Inflammation TGLs = 1 - 13]		
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Minimal
	Squam Epithel	Ulcer	Focal, Minimal
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
Mesentery	Fat	Necrosis	Mild
	[Necrosis TGLs = 4 - 14]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Turbinate	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 730

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61152

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Squamous, Minimal
* Pituitary Gland	Pars Distalis	Metaplasia	Respiratory, Moderate
[Hyperplasia TGLs = 5 = 10]		Hyperplasia	Moderate
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Minimal
* Thyroid Gland	C Cell	Adenoma	
* Trachea	Epithelium	Atrophy	Minimal
	Epithelium	Hyperplasia	Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 731

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61153

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Ovary	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex		Adenoma	
		Degeneration	Cystic, Mild
	Zona Fascult	Hypertrophy	Focal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Minimal
* Liver		Basophilic Focus	
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	[Infiltration Cellular TGLs = 4 - 4+5]		
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 2 - 14+15]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 731

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61153

ORGAN AND ACCOUNTABLE SITE STATUS

* Pancreas	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Pituitary Gland	Pars Distalis	Basophilic Focus	Minimal
[Adenoma TGLs = 3 - 10]		Adenoma	
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Trachea	Submucosa	Fibrosis	Mild
	Epithelium	Hyperplasia	Mild
* Uterus	Endometrium	Hyperplasia	Cystic, Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 732

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61154

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Urinary Bladder		

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Lens	Cataract	Mild
	Iris	Inflammation	Acute, Minimal
	[Cataract TGLs = 1 - 13]		
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Basophilic Focus	
	[Basophilic Focus TGLs = 5 - 6]		
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Mild
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
	Bronchus, Epithelium	Metaplasia	Squamous, Minimal
	Bronchus, Epithelium	Regeneration	Minimal
	[Infiltration Cellular TGLs = 4 - 4+5]		
Lymph Node	Deep Cervical	Infiltration Cellular	Plasma Cell, Mild
	[Infiltration Cellular TGLs = 2 - 14]		
* Nose	Olfactory Epi	Accumulation, Hyaline Droplet	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 732

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61154

ORGAN AND ACCOUNTABLE SITE STATUS

	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Marked
	Respirat Epith	Metaplasia	Squamous, Mild
* Ovary		Cyst	
* Pancreas		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Adenoma	
* Trachea	Epithelium	Atrophy	Minimal
	Epithelium	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Mild

[Hyperplasia TGLs = 3 - 10]

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 733

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61155

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Parathyroid Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder	* Uterus

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Unilateral	Phthisis Bulbi	Mild
	[Phthisis Bulbi TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Int Lg Rectum			
	Note: Rectal section is actually anus.		
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Basophilic Focus	
	[Basophilic Focus TGLs = 4 - 14]		
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
* Nose	Olfactory Epi	Atrophy	Moderate
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Minimal
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
	Olfactory Epi	Metaplasia	Respiratory, Mild
* Ovary		Atrophy	Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 733

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61155

ORGAN AND ACCOUNTABLE SITE STATUS

		Cyst	
[Cyst TGLs = 3 - 9]			
* Pancreas		Basophilic Focus	Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
[Hyperplasia TGLs = 2 - 10]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Trachea	Submucosa	Fibrosis	Minimal
		Inflammation	Chronic Active, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 734

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61156

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Mammary Gland	* Ovary	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Urinary Bladder			

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hyperplasia	Multifocal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Mild
	Respirat Epith	Metaplasia	Squamous, Mild
* Liver		Basophilic Focus	
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
* Lymph Node, Mesenteric		Atrophy	Moderate
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Marked
* Trachea	Epithelium	Hyperplasia	Minimal
* Uterus		Polyp Stromal	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 735

TRT#: 8

SEX: Female

DAY ON TEST: 711

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61157

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Urinary Bladder			

MISSING

* Parathyroid Gland

OBSERVATIONS

* Adrenal Medulla		Pheochromocytoma Malignant	
[Pheochromocytoma Malignant	TGLs = 2 - 14]		
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Mild
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver	Bile Duct	Hyperplasia	Minimal
		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Granulomatous, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
* Nose	Olfactory Epi	Atrophy	Moderate
	Lamina Propria	Fibrosis	Mild
	Turbinate	Hyperostosis	Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 735

TRT#: 8

SEX: Female

DAY ON TEST: 711

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61157

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Mild
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	
	[Adenoma TGLs = 1 - 10]		
* Spleen	Lymph Follic	Atrophy	Mild
		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Minimal
* Thyroid Gland	Follicular Cel	Hyperplasia	Moderate
* Trachea	Epithelium	Hyperplasia	Mild
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal
	Endometrium	Metaplasia	Squamous, Minimal

PRIMARY CAUSE OF DEATH - Adrenal Medulla Pheochromocytoma Malignant

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 736

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61158

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder

OBSERVATIONS

* Eye	Cornea	Inflammation	Chronic Active, Mild
	Cornea, Epithelium	Ulcer	Moderate
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Minimal
* Liver		Basophilic Focus	
* Lung	Interstitium	Fibrosis	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
* Mammary Gland		Carcinoma	
	[Carcinoma TGLs = 3 - 14]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Ovary		Atrophy	Mild
* Pituitary Gland	Pars Distalis	Adenoma	

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 736

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61158

ORGAN AND ACCOUNTABLE SITE STATUS

[Adenoma TGLs = 2 - 10]

* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Minimal
* Trachea	Submucosa	Fibrosis	Mild
		Inflammation	Chronic Active, Mild
	Epithelium	Regeneration	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 737

TRT#: 8

SEX: Female

DAY ON TEST: 537

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61159

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Larynx
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	Peripheral Nerve
* Salivary Glands	Skeletal Muscle	* Skin	Spinal Cord
* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland	* Trachea
* Urinary Bladder	* Uterus		

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Retina	Degeneration	Minimal
	Cornea	Inflammation	Chronic Active, Moderate
	Antr Chamber	Inflammation	Suppurative, Mild
	[Inflammation TGLs = 2 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Liver		Basophilic Focus	
* Lung	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Mild
		Inflammation	Suppurative, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Ovary	Respirat Epith	Metaplasia	Squamous, Mild
		Atrophy	Mild
		Granulosa-Theca Tumor Malignant	
	[Granulosa-Theca Tumor Malignant TGLs = 4 - 9]		

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 737

TRT#: 8

SEX: Female

DAY ON TEST: 537

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61159

ORGAN AND ACCOUNTABLE SITE STATUS

* Pituitary Gland

Pars Distalis

Adenoma

[Adenoma TGLs = 3 - 10]

Spinal Cord

Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.

* Spleen

Pigmentation

Hemosiderin, Mild

* Thymus

Atrophy

Mild

PRIMARY CAUSE OF DEATH

- Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 738

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61160

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Urinary Bladder		

MISSING

* Parathyroid Gland

OBSERVATIONS

* Eye	Unilateral	Phthisis Bulbi	Marked
	[Phthisis Bulbi TGLs = 1 - 13]		
* Kidney		Calculus Micro Observation Only	
	Pelvis	Inflammation	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Mild
	Alveolus	Infiltration Cellular	Histiocyte, Mild
	Peribronchial	Inflammation	Chronic Active, Mild
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Ovary		Cyst	
	[Cyst TGLs = 2 - 9]		
* Pituitary Gland	Pars Distalis	Hyperplasia	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 738

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61160

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Trachea	Submucosa	Fibrosis	Minimal
		Inflammation	Chronic Active, Mild
	Epithelium	Regeneration	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 739

TRT#: 8

SEX: Female

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61161

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver	* Lymph Node, Bronchial
* Lymph Node, Mediastinal	* Mammary Gland	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Urinary Bladder	* Uterus		

OBSERVATIONS

* Adrenal Cortex	Zona Fascult	Hypertrophy	Focal, Mild
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Retina	Degeneration	Minimal
	Unilateral	Phthisis Bulbi	Mild
Note: TGL-2 coded as atrophy probably = extreme phthisis bulbi (not an available diagnosis in TDMSE). [Phthisis Bulbi TGLs = 2 - 13]			
* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
* Lung	Respirat Epith	Metaplasia	Squamous, Mild
	Alveolar Epith	Hyperplasia	Minimal
	Bronchiole, Epithelium	Hyperplasia	Mild
	Bronchus, Epithelium	Hyperplasia	Mild
	Alveolus	Infiltration Cellular	Histiocyte, Mild
	Peribronchial	Inflammation	Chronic Active, Minimal
[Inflammation TGLs = 3 - 4+5]			
* Lymph Node, Mandibular		Infiltration Cellular	Plasma Cell, Mild
[Infiltration Cellular TGLs = 1 - 9]			
* Lymph Node, Mesenteric		Atrophy	Marked
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 739

TRT#: 8

SEX: Female

DAY ON TEST: 729

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61161

ORGAN AND ACCOUNTABLE SITE STATUS

		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
* Ovary		Cyst	
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 4 - 10]			
* Spleen		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Trachea	Submucosa	Fibrosis	Minimal
	Epithelium	Hyperplasia	Minimal

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 740

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61162

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Mandibular	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Stomach, Glandular	* Trachea	* Urinary Bladder

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hyperplasia	Focal, Minimal
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 2 - 13]		
* Heart		Cardiomyopathy	Mild
* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver	Bile Duct	Hyperplasia	Minimal
* Lung	Interstitialium	Fibrosis	Mild
	Bronchiole, Epithelium	Hyperplasia	Mild
	Bronchus, Epithelium	Hyperplasia	Mild
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
		Inflammation	Granulomatous, Minimal
* Lymph Node, Mediastinal		Infiltration Cellular	Plasma Cell, Mild
* Mammary Gland		Carcinoma	
	[Carcinoma TGLs = 1 - 14]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 740

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61162

ORGAN AND ACCOUNTABLE SITE STATUS

* Ovary	Respirat Epith Olfactory Epi Olfactory Epi	Inflammation Metaplasia Metaplasia Necrosis Atrophy Cyst Thecoma Benign	Suppurative, Marked Squamous, Mild Respiratory, Mild Minimal Mild
* Pituitary Gland [Hyperplasia TGLs = 3 - 10]	Pars Distalis	Hyperplasia	Mild
* Spleen		Hematopoietic Cell Proliferation Pigmentation	Minimal Hemosiderin, Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 741

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61163

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Salivary Glands	* Stomach, Forestomach
* Stomach, Glandular	* Urinary Bladder	* Uterus	

MISSING

* Parathyroid Gland

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
* Eye	Retina	Degeneration	Minimal
	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	Antr Chamber	Inflammation	Suppurative, Minimal
	Iris	Inflammation	Acute, Minimal
	Cornea	Mineralization	Minimal
	Cornea, Epithelium	Ulcer	Mild
* Kidney	Pelvis	Inflammation	Mild
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Basophilic Focus	
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Mild
	Peribronchial	Inflammation	Chronic Active, Minimal
		Inflammation	Granulomatous, Minimal
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Mild
	Respirat Epith	Hyperplasia	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 741

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61163

ORGAN AND ACCOUNTABLE SITE STATUS

	Olfactory Epi	Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Respiratory, Marked
* Ovary		Metaplasia	Squamous, Moderate
* Pituitary Gland	Pars Distalis	Sertoli Cell Tumor Benign	
[Adenoma TGLs = 1 - 10]		Adenoma	
* Skin	Inguinal	Inflammation	Pyogranulomat, Moderate
[Inflammation TGLs = 2 - 14]			
* Spleen		Hematopoietic Cell Proliferation	Mild
		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Mild
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Trachea	Epithelium	Hyperplasia	Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 742

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61164

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	Bone Marrow
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Pancreas	* Salivary Glands
* Skin	* Stomach, Glandular	* Urinary Bladder	

MISSING

* Lymph Node, Bronchial	* Parathyroid Gland
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OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hypertrophy	Focal, Minimal
* Eye	Cornea	Inflammation	Chronic Active, Minimal
	[Inflammation TGLs = 10 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Minimal
	Respirat Epith	Metaplasia	Squamous, Minimal
* Lung	Bronchus, Epithelium	Hyperplasia	Mild
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Granulomatous, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
	[Infiltration Cellular TGLs = 9 - 4+5]		
* Lymph Node, Mesenteric		Atrophy	Marked
* Mammary Gland		Carcinoma	
	[Carcinoma TGLs = 1 - 14]		
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Mild
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Mild

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 742

TRT#: 8

SEX: Female

DAY ON TEST: 731

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61164

ORGAN AND ACCOUNTABLE SITE STATUS

* Ovary	Olfactory Epi	Metaplasia	Respiratory, Mild
* Pituitary Gland	Pars Distalis	Atrophy	Mild
[Adenoma TGLs = 2 - 10]		Adenoma	
* Spleen		Pigmentation	Hemosiderin, Mild
* Stomach, Forestomach	Epithelium	Hyperplasia	Mild
* Thymus		Atrophy	Marked
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Trachea	Epithelium	Hyperplasia	Mild
* Uterus	Endometrium	Hyperplasia	Cystic, Moderate
[Hyperplasia TGLs = 3 - 10]			

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 743

TRT#: 8

SEX: Female

DAY ON TEST: 625

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61165

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Liver	* Lymph Node, Mandibular	* Mammary Gland	* Ovary
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Salivary Glands
* Skin	* Stomach, Forestomach	* Stomach, Glandular	* Thyroid Gland
* Urinary Bladder	* Uterus		

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

* Eye	Lens	Cataract	Mild
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
* Lung	Bronchiole, Epithelium	Hyperplasia	Mild
		Inflammation	Suppurative, Moderate
	Bronchus, Submucosa	Inflammation	Suppurative, Moderate
	Bronchus, Epithelium	Necrosis	Moderate
	Bronchus, Submucosa	Necrosis	Mild
	[Inflammation TGLs = 1 - 4+5]		
* Lymph Node, Mediastinal		Atrophy	Marked
* Lymph Node, Mesenteric		Atrophy	Moderate
* Nose	Lamina Propria	Fibrosis	Moderate
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Minimal
	Olfactory Epi	Necrosis	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 743

TRT#: 8

SEX: Female

DAY ON TEST: 625

DOSE: 50 ppm

DISP: Natural Death

HISTO: 61165

ORGAN AND ACCOUNTABLE SITE STATUS

* Spleen	Respirat Epith Lymph Follic	Necrosis Atrophy Pigmentation	Marked Marked Hemosiderin, Minimal
* Thymus		Atrophy	Marked
* Trachea	Epithelium Epithelium Submucosa	Hyperplasia Inflammation Necrosis Necrosis	Mild Chronic Active, Moderate Mild Mild

PRIMARY CAUSE OF DEATH - Lung Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 744

TRT#: 8

SEX: Female

DAY ON TEST: 635

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61166

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Skin
* Stomach, Glandular	* Urinary Bladder		

OBSERVATIONS

* Adrenal Medulla		Hyperplasia	Marked
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Retina	Degeneration	Minimal
	Cornea, Epithelium	Hyperplasia	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	Cornea, Epithelium	Ulcer	Minimal
* Heart		Cardiomyopathy	Minimal
* Kidney	Renal Tubule	Necrosis	Marked
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
	Squam Epithel	Ulcer	Multifocal, Marked
* Lung	Bronchiole, Epithelium	Hyperplasia	Moderate
	Bronchus, Epithelium	Hyperplasia	Moderate
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Suppurative, Mild
	[Inflammation TGLs = 2 - 4+5]		
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 744

TRT#: 8

SEX: Female

DAY ON TEST: 635

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61166

ORGAN AND ACCOUNTABLE SITE STATUS

	Olfactory Epi	Metaplasia	Respiratory, Marked
	Respirat Epith	Necrosis	Mild
	Olfactory Epi	Necrosis	Mild
* Ovary		Cyst	
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Spleen	Lymph Follic	Atrophy	Marked
		Pigmentation	Hemosiderin, Mild
* Stomach, Forestomach		Inflammation	Moderate
		Ulcer	Moderate
* Thymus		Atrophy	Marked
* Thyroid Gland	Follicular Cel	Hyperplasia	Moderate
	C Cell	Hyperplasia	Mild
* Trachea	Submucosa	Fibrosis	Marked
	Epithelium	Hyperplasia	Mild
		Inflammation	Chronic Active, Marked
	Epithelium	Metaplasia	Squamous, Moderate
	Epithelium	Ulcer	Marked
* Uterus	Endometrium	Hyperplasia	Focal, Mild

PRIMARY CAUSE OF DEATH - Trachea Inflammation

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 745

TRT#: 8

SEX: Female

DAY ON TEST: 642

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61167

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	Peripheral Nerve	* Salivary Glands
Skeletal Muscle	* Skin	Spinal Cord	* Stomach, Forestomach
* Stomach, Glandular	* Urinary Bladder		

MISSING

* Lymph Node, Mandibular

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Moderate
	Antr Chamber	Inflammation	Suppurative, Moderate
	Iris	Inflammation	Acute, Minimal
	Cornea	Mineralization	Minimal
	Cornea, Epithelium	Ulcer	Minimal
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Infiltration Cellular	Mixed Cell, Minimal
* Lung	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Peribronchial	Inflammation	Chronic Active, Mild
	[Inflammation TGLs = 4,5,6 - 4]		
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Mild
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 745

TRT#: 8

SEX: Female

DAY ON TEST: 642

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61167

ORGAN AND ACCOUNTABLE SITE STATUS

* Ovary	Respirat Epith Olfactory Epi	Metaplasia Metaplasia Atrophy Cyst	Squamous, Moderate Respiratory, Marked Minimal
[Cyst TGLs = 7,8 - 9]			
* Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 3 - 10]			
Spinal Cord			
Note: Peripheral nerve, skeletal muscle, and spinal cord were examined due to clinical signs.			
* Spleen		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Moderate
* Thyroid Gland	C Cell	Hyperplasia	Minimal
* Trachea	Submucosa	Fibrosis	Mild
	Epithelium	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
* Uterus	Endometrium	Hyperplasia	Cystic, Mild
	Cervix	Hyperplasia	Squamous, Mild
		Polyp Stromal	

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 746

TRT#: 8

SEX: Female

DAY ON TEST: 687

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61168

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Eye	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Mammary Gland
* Parathyroid Gland	* Pituitary Gland	* Salivary Glands	* Skin
* Stomach, Forestomach	* Thyroid Gland	* Urinary Bladder	

OBSERVATIONS

* Adrenal Cortex		Adenocarcinoma	Metastatic (Uterus)
	Zona Fascult	Hyperplasia	Focal, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Mild
* Liver		Adenocarcinoma	Metastatic (Uterus)
	Bile Duct	Hyperplasia	Moderate
* Lung	Mediastinum	Adenocarcinoma	Metastatic (Uterus)
	Bronchus, Epithelium	Atrophy	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
		Thrombus	
	[Thrombus TGLs = 4 - 4]		
* Lymph Node, Mediastinal		Adenocarcinoma	Metastatic (Uterus)
	[Adenocarcinoma TGLs = 1 - 3]		
Mesentery		Adenocarcinoma	Metastatic (Uterus)
	[Adenocarcinoma TGLs = 3 - 14]		
* Nose	Olfactory Epi	Atrophy	Minimal
	Lamina Propria	Fibrosis	Mild
	Turbinate	Hyperostosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 746

TRT#: 8

SEX: Female

DAY ON TEST: 687

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61168

ORGAN AND ACCOUNTABLE SITE STATUS

* Ovary	Olfactory Epi	Metaplasia Adenocarcinoma	Respiratory, Moderate Metastatic (Uterus)
* Pancreas	Acinus	Sertoli Cell Tumor Benign Adenocarcinoma	Metastatic (Uterus)
[Adenocarcinoma TGLs = 3 - 14]			
* Spleen		Adenocarcinoma Hematopoietic Cell Proliferation	Metastatic (Uterus) Mild
* Stomach, Glandular		Pigmentation Adenocarcinoma	Hemosiderin, Minimal Metastatic (Uterus)
* Thymus		Atrophy	Mild
* Trachea	Epithelium	Atrophy	Minimal
	Epithelium	Hyperplasia	Minimal
	Epithelium	Regeneration	Minimal
* Uterus		Adenocarcinoma	
[Adenocarcinoma TGLs = 2 - 15]			

PRIMARY CAUSE OF DEATH - Uterus Adenocarcinoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 747

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61169

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Mammary Gland	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Urinary Bladder	* Uterus	

MISSING

* Lymph Node, Bronchial

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Lens	Cataract	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Basophilic Focus	
* Lung	Interstitialium	Fibrosis	Minimal
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Mild
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
* Lymph Node, Mesenteric		Atrophy	Mild
* Nose	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Marked
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Minimal

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 747

TRT#: 8

SEX: Female

DAY ON TEST: 733

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61169

ORGAN AND ACCOUNTABLE SITE STATUS

* Ovary	Olfactory Epi	Metaplasia Atrophy Cyst	Respiratory, Moderate Mild
* Pituitary Gland [Adenoma TGLs = 2 - 10]	Pars Distalis	Adenoma	
* Spleen		Hematopoietic Cell Proliferation Pigmentation	Mild Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Trachea	Submucosa Epithelium Epithelium	Fibrosis Hyperplasia Inflammation Metaplasia	Marked Minimal Chronic Active, Moderate Squamous, Mild

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 748

TRT#: 8

SEX: Female

DAY ON TEST: 642

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61170

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Ovary
* Pancreas	* Parathyroid Gland	* Salivary Glands	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder	* Uterus

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hyperplasia	Focal, Minimal
	Zona Fascult	Hypertrophy	Multifocal, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Moderate
* Eye	Cornea	Inflammation	Chronic Active, Moderate
	[Inflammation TGLs = 3 - 13]		
* Heart		Cardiomyopathy	Mild
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Mild
* Lung	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Mild
	Peribronchial	Inflammation	Chronic Active, Mild
	[Inflammation TGLs = 6 - 4+5]		
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 4 - 14]		
Mesentery	Fat	Necrosis	Minimal
	[Necrosis TGLs = 7 - 16]		
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Minimal
	Respirat Epith	Hyperplasia	Moderate

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 748

TRT#: 8

SEX: Female

DAY ON TEST: 642

DOSE: 50 ppm

DISP: Moribund Sacrifice

HISTO: 61170

ORGAN AND ACCOUNTABLE SITE STATUS

* Pituitary Gland [Adenoma TGLs = 8 - 10]	Pars Distalis	Inflammation Adenoma	Suppurative, Marked
* Skin [Ulcer TGLs = 5 - 15]	Foot Foot	Inflammation Ulcer	Chronic Active, Mild Focal, Mild
* Spleen		Pigmentation	Hemosiderin, Mild
* Thymus		Atrophy	Marked
* Trachea	Submucosa	Fibrosis Inflammation	Minimal Chronic Active, Mild

PRIMARY CAUSE OF DEATH - Pituitary Gland Pars Distalis Adenoma

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 749

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61171

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Medulla	Blood Vessel	* Bone	* Brain
* Clitoral Gland	* Esophagus	* Harderian Gland	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Urinary Bladder		

OBSERVATIONS

* Adrenal Cortex		Degeneration	Cystic, Minimal
	Zona Fascult	Hyperplasia	Multifocal, Minimal
	Zona Fascult	Hypertrophy	Focal, Moderate
Bone Marrow	Myeloid Cell	Hyperplasia	Mild
* Eye	Lens	Cataract	Minimal
	Cornea	Inflammation	Chronic Active, Mild
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Moderate
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Minimal
* Liver		Basophilic Focus	
	Bile Duct	Hyperplasia	Minimal
* Lung	Bronchus, Epithelium	Hyperplasia	Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
* Mammary Gland		Inflammation	Moderate
	[Inflammation TGLs = 4 - 14]		
* Nose	Olfactory Epi	Atrophy	Mild
	Lamina Propria	Fibrosis	Mild
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/12/2016
Time Report Requested: 16:27:55
First Dose M/F: 08/17/09 / 08/17/09
Lab: BNW

ANIMAL ID: 749

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61171

ORGAN AND ACCOUNTABLE SITE STATUS

* Ovary	Respirat Epith Olfactory Epi	Metaplasia Metaplasia Atrophy Cyst	Squamous, Mild Respiratory, Moderate Mild
[Cyst TGLs = 3 - 9] * Pituitary Gland	Pars Distalis	Adenoma	
[Adenoma TGLs = 2 - 10] * Spleen		Hematopoietic Cell Proliferation Pigmentation	Minimal Hemosiderin, Minimal
* Thymus		Atrophy	Mild
* Trachea	Epithelium	Hyperplasia	Mild
* Uterus	Endometrium	Hyperplasia	Cystic, Minimal

Experiment Number: 20725 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/12/2016
 Time Report Requested: 16:27:55
 First Dose M/F: 08/17/09 / 08/17/09
 Lab: BNW

ANIMAL ID: 750

TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61172

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Clitoral Gland	* Esophagus	* Harderian Gland
* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum
* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Stomach, Forestomach	* Stomach, Glandular
* Thyroid Gland	* Urinary Bladder		

OBSERVATIONS

Bone Marrow	Myeloid Cell	Hyperplasia	Marked
* Eye	Retina	Degeneration	Moderate
	Cornea	Inflammation	Chronic Active, Mild
	Antr Chamber	Inflammation	Suppurative, Mild
	[Inflammation TGLs = 1 - 13]		
* Heart		Cardiomyopathy	Minimal
* Kidney		Calculus Micro Observation Only	
* Larynx	Squam Epithel	Hyperplasia	Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
* Liver		Eosinophilic Focus	
	[Eosinophilic Focus TGLs = 10 - 14]		
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
	Alveolus	Infiltration Cellular	Histiocyte, Minimal
	Peribronchial	Inflammation	Chronic Active, Minimal
Lymph Node	Lumbar	Infiltration Cellular	Plasma Cell, Mild
	[Infiltration Cellular TGLs = 9 - 17]		
* Mammary Gland		Fibroadenoma	
	[Fibroadenoma TGLs = 6 - 18]		
* Nose	Olfactory Epi	Atrophy	Marked
	Lamina Propria	Fibrosis	Mild
	Respirat Epith	Hyperplasia	Marked

* PROTOCOL REQUIRED TISSUE

Experiment Number: 20725 - 03
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TRT#: 8

SEX: Female

DAY ON TEST: 732

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 61172

ORGAN AND ACCOUNTABLE SITE STATUS

	Respirat Epith	Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Squamous, Mild
* Ovary		Metaplasia	Respiratory, Mild
		Atrophy	Mild
		Cyst	
* Pituitary Gland	Pars Distalis	Hyperplasia	Mild
* Skin	Epidermis	Hyperplasia	Mild
	Foot	Inflammation	Chronic Active, Moderate
	Dorsal	Inflammation	Acute, Mild
	Foot	Ulcer	Focal, Marked
	Epidermis	Ulcer	Multifocal, Minimal
	[Inflammation TGLs = 2,3 - 14+15]		
	[Inflammation TGLs = 4 - 16]		
	[Ulcer TGLs = 2,3- 14+15]		
	[Ulcer TGLs = 4-16]		
* Spleen		Hematopoietic Cell Proliferation	Mild
* Thymus		Atrophy	Mild
* Trachea	Epithelium	Hyperplasia	Minimal
* Uterus	Cervix	Hyperplasia	Squamous, Mild
	Endometrium	Hyperplasia	Cystic, Mild
	Endometrium	Metaplasia	Squamous, Minimal
		Polyp Stromal	
	[Polyp Stromal TGLs = 8 - 10]		

*** END OF REPORT ***