

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS

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

Date Report Requested: 04/15/2016
Time Report Requested: 10:33:43
First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

F1_Mice

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: 01/25/2016

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SUMMARY OF STATISTICALLY SIGNIFICANT (P<=.05) RESULTS IN THE ANALYSIS OF 2,3-BUTANEDIONE

MALE MICE

Organ

Adrenal Cortex: Zona Fasciculata
Adrenal Medulla
Bone Marrow: Myeloid Cell
Epididymis
Esophagus: Periesophageal Tissue
Eye: Anterior Chamber
Eye: Cornea

Eye: Cornea, Epithelium

Heart

Intestine Large, Cecum
Intestine Small, Ileum
Kidney
Larynx
Larynx: Lumen
Larynx: Respiratory Epithelium

Larynx: Squamous Epithelium
Lung
Lung: Alveolus
Lung: Bronchus, Epithelium

Lung: Mediastinum

Lung: Pleura
Lymph Node, Bronchial

Morphology

Hypertrophy Focal
Hyperplasia
Hyperplasia
Exfoliated Germ Cell
Inflammation Chronic
Inflammation
Inflammation Acute
Mineralization
Hyperplasia
Ulcer
Inflammation Chronic
Necrosis
Polyarteritis
Inflammation
Inflammation
Nephropathy
Inflammation Chronic
Exudate
Hyperplasia
Metaplasia
Necrosis
Regeneration
Hyperplasia
Inflammation
Infiltration Cellular Histiocyte
Necrosis
Regeneration
Inflammation
Inflammation Chronic
Inflammation
Inflammation Chronic
Pigmentation

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SUMMARY OF STATISTICALLY SIGNIFICANT (P<=.05) RESULTS IN THE ANALYSIS OF 2,3-BUTANEDIONE

Lymph Node, Mandibular	Ectasia Hematopoietic Cell Proliferation Hyperplasia Lymphoid Infiltration Cellular Plasma Cell
Lymph Node, Mediastinal	Hyperplasia Lymphoid Infiltration Cellular Plasma Cell Inflammation Chronic
Lymph Node, Mesenteric	Hematopoietic Cell Proliferation Hyperplasia Lymphoid
Lymph Node: Deep Cervical	Hyperplasia Lymphoid
Nose	Foreign Body Inflammation
Nose: Glands, Respiratory Epithelium	Cyst
Nose: Lamina Propria	Fibrosis
Nose: Mucosa	Regeneration
Nose: Olfactory Epithelium	Atrophy Metaplasia Respiratory Necrosis
Nose: Respiratory Epithelium	Accumulation, Hyaline Droplet Hyperplasia Metaplasia Necrosis
Nose: Septum	Perforation
Nose: Sinus, Glands	Metaplasia Respiratory
Nose: Turbinate	Atrophy Necrosis
Preputial Gland	Inflammation
Spleen	Hematopoietic Cell Proliferation Hyperplasia Lymphoid Necrosis
Spleen: Lymphoid Follicle	Atrophy
Testes: Seminiferous Tubule	Degeneration
Thymus	Atrophy Inflammation Chronic
Trachea	Inflammation Chronic Necrosis

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Trachea: Epithelium

Hyperplasia
Metaplasia
Regeneration
Exudate
Fibrosis
Fibrosis
Inflammation Chronic
Mineralization

Trachea: Lumen

Trachea: Submucosa

Trachea: Submucosa, Carina

FEMALE MICE

Organ

Adrenal Cortex

Bone Marrow: Myeloid Cell

Bone

Brain

Esophagus: Periesophageal Tissue

Eye: Anterior Chamber

Eye: Cornea

Eye: Cornea, Epithelium

Eye: Lens

Gallbladder

Heart

Kidney

Larynx

Larynx: Lumen

Larynx: Respiratory Epithelium

Morphology

Angiectasis
Hypertrophy
Hyperplasia
Fibro-osseous Lesion
Infiltration Cellular Lymphocyte
Inflammation Chronic
Inflammation
Inflammation Acute
Mineralization
Necrosis
Hyperplasia
Ulcer
Cataract
Inflammation
Inflammation Chronic
Polyarteritis
Infarct
Nephropathy
Inflammation Chronic
Exudate
Hyperplasia
Metaplasia
Necrosis
Regeneration

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Larynx: Squamous Epithelium	Hyperplasia
Liver	Clear Cell Focus
	Eosinophilic Focus
	Hyperplasia Lymphoid
Lung	Inflammation
Lung: Alveolar Epithelium	Hyperplasia Focal
Lung: Bronchus	Inflammation
Lung: Bronchus, Epithelium	Degeneration
	Necrosis
	Regeneration
Lung: Bronchus, Smooth Muscle	Mineralization
Lung: Mediastinum	Inflammation
	Inflammation Chronic
Lung: Pleura	Inflammation
Lung: Submucosa, Bronchus	Fibrosis
Lymph Node, Bronchial	Hyperplasia Lymphoid
	Inflammation Chronic
Lymph Node, Mandibular	Ectasia
	Hyperplasia
	Hyperplasia Lymphoid
	Infiltration Cellular Plasma Cell
Lymph Node, Mediastinal	Inflammation Chronic
Lymph Node, Mesenteric	Hematopoietic Cell Proliferation
Lymph Node: Deep Cervical	Hyperplasia Lymphoid
Nose	Foreign Body
	Inflammation
Nose: Glands, Respiratory Epithelium	Cyst
Nose: Lamina Propria	Fibrosis
Nose: Mucosa	Regeneration
Nose: Olfactory Epithelium	Accumulation, Hyaline Droplet
	Atrophy
	Metaplasia Respiratory
	Necrosis
Nose: Respiratory Epithelium	Accumulation, Hyaline Droplet
	Metaplasia
	Necrosis

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SUMMARY OF STATISTICALLY SIGNIFICANT ($P \leq .05$) RESULTS IN THE ANALYSIS OF 2,3-BUTANEDIONE

Nose: Septum	Perforation
Nose: Sinus, Glands	Metaplasia Respiratory
Nose: Turbinate	Atrophy
	Necrosis
Ovary	Inflammation
Pituitary Gland: Pars Distalis	Hyperplasia
Salivary Glands	Inflammation Chronic
Skin: Subcutaneous Tissue	Necrosis
Spleen	Hyperplasia Lymphoid
	Necrosis
Stomach, Glandular	Inflammation
	Mineralization
Thymus	Atrophy
	Inflammation Chronic
Thyroid Gland	Inflammation Chronic
Trachea	Inflammation Chronic
	Necrosis
Trachea: Epithelium	Metaplasia
	Regeneration
Trachea: Lumen	Exudate
Trachea: Submucosa	Fibrosis
Trachea: Submucosa, Carina	Fibrosis
	Mineralization
Uterus	Inflammation
Uterus: Endometrium	Hyperplasia Cystic

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Adrenal Cortex				
Angiectasis				
<hr/>				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.70	0/45.12	0/45.68	0/38.16
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	---
<hr/>				
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Adrenal Cortex Hypertrophy				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.70	0/45.12	0/45.68	0/38.16
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Adrenal Cortex: Zona Fasciculata Hypertrophy Focal				
LESION RATES				
OVERALL (a)	23/50 (46%)	26/49 (53%)	35/50 (70%)	9/50 (18%)
POLY-3 RATE (b)	23/45.15	26/45.79	35/46.91	9/39.87
POLY-3 PERCENT (g)	50.9%	56.8%	74.6%	22.6%
TERMINAL (d)	21/35 (60%)	23/39 (59%)	30/37 (81%)	4/25 (16%)
FIRST INCIDENCE	666	653	554	477
STATISTICAL TESTS				
POLY 3	P=0.009N**	P=0.362	P=0.012*	P=0.005N**
POLY 1.5	P=0.006N**	P=0.334	P=0.011*	P=0.004N**
POLY 6	P=0.009N**	P=0.410	P=0.015*	P=0.005N**
COCH-ARM / FISHERS	P=0.002N**	P=0.308	P=0.013*	P=0.002N**
MAX-ISO-POLY-3	P<0.001N**	P=0.288	P=0.007**	P=0.004N**

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 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Adrenal Medulla Hyperplasia				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/48 (0%)	3/50 (6%)	0/50 (0%)
POLY-3 RATE (b)	0/44.70	0/44.83	3/46.30	0/38.16
POLY-3 PERCENT (g)	0%	0%	6.5%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	2/37 (5%)	0/25 (0%)
FIRST INCIDENCE	---	---	527	---
STATISTICAL TESTS				
POLY 3	P=0.425	(e)	P=0.125	(e)
POLY 1.5	P=0.461	(e)	P=0.122	(e)
POLY 6	P=0.397	(e)	P=0.130	(e)
COCH-ARM / FISHERS	P=0.547	(e)	P=0.121	(e)
MAX-ISO-POLY-3	P=0.209	(e)	P=0.043*	(e)

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 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Blood Vessel Inflammation				
LESION RATES				
OVERALL (a)	2/50 (4%)	0/50 (0%)	0/50 (0%)	1/50 (2%)
POLY-3 RATE (b)	2/44.88	0/45.60	0/45.68	1/38.98
POLY-3 PERCENT (g)	4.5%	0%	0%	2.6%
TERMINAL (d)	1/35 (3%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	683	---	---	407
STATISTICAL TESTS				
POLY 3	P=0.447N	P=0.234N	P=0.233N	P=0.549N
POLY 1.5	P=0.451N	P=0.235N	P=0.236N	P=0.536N
POLY 6	P=0.444N	P=0.231N	P=0.230N	P=0.558N
COCH-ARM / FISHERS	P=0.456N	P=0.247N	P=0.247N	P=0.500N
MAX-ISO-POLY-3	P=0.188N	P=0.076N	P=0.076N	P=0.333N

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 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Bone Marrow: Myeloid Cell Hyperplasia				
LESION RATES				
OVERALL (a)	9/48 (19%)	8/47 (17%)	20/50 (40%)	39/49 (80%)
POLY-3 RATE (b)	9/46.30	8/46.16	20/49.24	39/46.62
POLY-3 PERCENT (g)	19.4%	17.3%	40.6%	83.7%
TERMINAL (d)	2/35 (6%)	2/39 (5%)	13/37 (35%)	21/25 (84%)
FIRST INCIDENCE	519	589	320	141
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.503N	P=0.019*	P<0.001**
POLY 1.5	P<0.001**	P=0.509N	P=0.019*	P<0.001**
POLY 6	P<0.001**	P=0.495N	P=0.020*	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.519N	P=0.018*	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.396N	P=0.012*	P<0.001**

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 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Bone				
Fibro-osseous Lesion				
LESION RATES				
OVERALL (a)	1/50 (2%)	1/50 (2%)	3/50 (6%)	2/50 (4%)
POLY-3 RATE (b)	1/44.70	1/45.60	3/45.68	2/38.45
POLY-3 PERCENT (g)	2.2%	2.2%	6.6%	5.2%
TERMINAL (d)	1/35 (3%)	1/39 (3%)	3/37 (8%)	1/25 (4%)
FIRST INCIDENCE	729 (T)	729 (T)	729 (T)	650
STATISTICAL TESTS				
POLY 3	P=0.253	P=0.756N	P=0.313	P=0.448
POLY 1.5	P=0.272	P=0.758N	P=0.309	P=0.461
POLY 6	P=0.242	P=0.753N	P=0.320	P=0.440
COCH-ARM / FISHERS	P=0.327	P=0.753N	P=0.309	P=0.500
MAX-ISO-POLY-3	P=0.353	P=0.494N	P=0.162	P=0.253

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 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Brain				
Infiltration Cellular Lymphocyte				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	2/50 (4%)	0/50 (0%)
POLY-3 RATE (b)	0/44.70	0/45.60	2/45.68	0/38.16
POLY-3 PERCENT (g)	0%	0%	4.4%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	2/37 (5%)	0/25 (0%)
FIRST INCIDENCE	---	---	729 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.499	(e)	P=0.242	(e)
POLY 1.5	P=0.528	(e)	P=0.239	(e)
POLY 6	P=0.476	(e)	P=0.246	(e)
COCH-ARM / FISHERS	P=0.599	(e)	P=0.247	(e)
MAX-ISO-POLY-3	P=0.288	(e)	P=0.081	(e)

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 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Epididymis				
Exfoliated Germ Cell				
LESION RATES				
OVERALL (a)	32/49 (65%)	23/49 (47%)	25/50 (50%)	26/49 (53%)
POLY-3 RATE (b)	32/46.15	23/46.26	25/47.17	26/44.46
POLY-3 PERCENT (g)	69.3%	49.7%	53%	58.5%
TERMINAL (d)	26/35 (74%)	20/39 (51%)	22/37 (60%)	12/25 (48%)
FIRST INCIDENCE	555	589	554	141
STATISTICAL TESTS				
POLY 3	P=0.276N	P=0.039N*	P=0.075N	P=0.191N
POLY 1.5	P=0.267N	P=0.043N*	P=0.081N	P=0.184N
POLY 6	P=0.274N	P=0.036N*	P=0.068N	P=0.187N
COCH-ARM / FISHERS	P=0.225N	P=0.051N	P=0.090N	P=0.152N
MAX-ISO-POLY-3	P=0.104N	P=0.024N*	P=0.049N*	P=0.140N

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 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Epididymis				
Granuloma Sperm				
LESION RATES				
OVERALL (a)	1/49 (2%)	2/49 (4%)	0/50 (0%)	1/49 (2%)
POLY-3 RATE (b)	1/44.07	2/45.32	0/45.68	1/37.40
POLY-3 PERCENT (g)	2.3%	4.4%	0%	2.7%
TERMINAL (d)	1/35 (3%)	2/39 (5%)	0/37 (0%)	1/25 (4%)
FIRST INCIDENCE	729 (T)	729 (T)	---	729 (T)
STATISTICAL TESTS				
POLY 3	P=0.521N	P=0.510	P=0.493N	P=0.723
POLY 1.5	P=0.519N	P=0.505	P=0.495N	P=0.733
POLY 6	P=0.521N	P=0.515	P=0.490N	P=0.716
COCH-ARM / FISHERS	P=0.505N	P=0.500	P=0.495N	P=0.753N
MAX-ISO-POLY-3	P=0.454N	P=0.291	P=0.157N	P=0.456

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Epididymis Inflammation				
LESION RATES				
OVERALL (a)	3/49 (6%)	2/49 (4%)	1/50 (2%)	1/49 (2%)
POLY-3 RATE (b)	3/44.25	2/45.71	1/46.60	1/37.63
POLY-3 PERCENT (g)	6.8%	4.4%	2.2%	2.7%
TERMINAL (d)	2/35 (6%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	683	676	320	666
STATISTICAL TESTS				
POLY 3	P=0.225N	P=0.485N	P=0.287N	P=0.365N
POLY 1.5	P=0.219N	P=0.492N	P=0.291N	P=0.349N
POLY 6	P=0.228N	P=0.476N	P=0.282N	P=0.376N
COCH-ARM / FISHERS	P=0.198N	P=0.500N	P=0.301N	P=0.309N
MAX-ISO-POLY-3	P=0.296N	P=0.314N	P=0.146N	P=0.215N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Esophagus: Periesophageal Tissue Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	3/50 (6%)
POLY-3 RATE (b)	0/44.70	0/45.60	0/45.68	3/39.22
POLY-3 PERCENT (g)	0%	0%	0%	7.7%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	551
STATISTICAL TESTS				
POLY 3	P=0.010**	(e)	(e)	P=0.097
POLY 1.5	P=0.010**	(e)	(e)	P=0.102
POLY 6	P=0.010**	(e)	(e)	P=0.095
COCH-ARM / FISHERS	P=0.012*	(e)	(e)	P=0.121
MAX-ISO-POLY-3	P=0.009**	(e)	(e)	P=0.037*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Eye: Anterior Chamber Inflammation				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/49 (0%)	0/50 (0%)	5/50 (10%)
POLY-3 RATE (b)	0/44.34	0/45.32	0/45.68	5/38.16
POLY-3 PERCENT (g)	0%	0%	0%	13.1%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	5/25 (20%)
FIRST INCIDENCE	---	---	---	729 (T)
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P=0.020*
POLY 1.5	P<0.001**	(e)	(e)	P=0.023*
POLY 6	P<0.001**	(e)	(e)	P=0.018*
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.030*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.009**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Eye: Cornea				
Inflammation Acute				
LESION RATES				
OVERALL (a)	2/49 (4%)	0/49 (0%)	1/50 (2%)	17/50 (34%)
POLY-3 RATE (b)	2/44.57	0/45.32	1/45.68	17/39.14
POLY-3 PERCENT (g)	4.5%	0%	2.2%	43.4%
TERMINAL (d)	1/35 (3%)	0/39 (0%)	1/37 (3%)	14/25 (56%)
FIRST INCIDENCE	667	---	729 (T)	409
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.233N	P=0.491N	P<0.001**
POLY 1.5	P<0.001**	P=0.235N	P=0.493N	P<0.001**
POLY 6	P<0.001**	P=0.231N	P=0.488N	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.247N	P=0.492N	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.076N	P=0.275N	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Eye: Cornea Mineralization				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/49 (0%)	0/50 (0%)	5/50 (10%)
POLY-3 RATE (b)	0/44.34	0/45.32	0/45.68	5/38.31
POLY-3 PERCENT (g)	0%	0%	0%	13.1%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	4/25 (16%)
FIRST INCIDENCE	---	---	---	690
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P=0.020*
POLY 1.5	P<0.001**	(e)	(e)	P=0.023*
POLY 6	P<0.001**	(e)	(e)	P=0.018*
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.030*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.009**

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
Time Report Requested: 10:33:43
First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
<hr/>				
Eye: Cornea Necrosis				
<hr/>				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/49 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.34	0/45.32	0/45.68	0/38.16
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	---
<hr/>				
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Eye: Cornea, Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	1/49 (2%)	0/49 (0%)	0/50 (0%)	9/50 (18%)
POLY-3 RATE (b)	1/44.57	0/45.32	0/45.68	9/38.29
POLY-3 PERCENT (g)	2.2%	0%	0%	23.5%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	8/25 (32%)
FIRST INCIDENCE	667	---	---	695
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.497N	P=0.495N	P=0.003**
POLY 1.5	P<0.001**	P=0.498N	P=0.496N	P=0.004**
POLY 6	P<0.001**	P=0.494N	P=0.493N	P=0.003**
COCH-ARM / FISHERS	P<0.001**	P=0.500N	P=0.495N	P=0.009**
MAX-ISO-POLY-3	P<0.001**	P=0.159N	P=0.157N	P=0.002**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Eye: Cornea, Epithelium Ulcer				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/49 (0%)	0/50 (0%)	3/50 (6%)
POLY-3 RATE (b)	0/44.34	0/45.32	0/45.68	3/38.31
POLY-3 PERCENT (g)	0%	0%	0%	7.8%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	2/25 (8%)
FIRST INCIDENCE	---	---	---	690
STATISTICAL TESTS				
POLY 3	P=0.010**	(e)	(e)	P=0.095
POLY 1.5	P=0.010**	(e)	(e)	P=0.102
POLY 6	P=0.010**	(e)	(e)	P=0.090
COCH-ARM / FISHERS	P=0.013*	(e)	(e)	P=0.125
MAX-ISO-POLY-3	P=0.009**	(e)	(e)	P=0.038*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Eye: Lens Cataract				
LESION RATES				
OVERALL (a)	1/49 (2%)	1/49 (2%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	1/44.34	1/45.32	0/45.68	2/38.16
POLY-3 PERCENT (g)	2.3%	2.2%	0%	5.2%
TERMINAL (d)	1/35 (3%)	1/39 (3%)	0/37 (0%)	2/25 (8%)
FIRST INCIDENCE	729 (T)	729 (T)	---	729 (T)
STATISTICAL TESTS				
POLY 3	P=0.340	P=0.756N	P=0.494N	P=0.448
POLY 1.5	P=0.348	P=0.758N	P=0.495N	P=0.464
POLY 6	P=0.336	P=0.752N	P=0.491N	P=0.437
COCH-ARM / FISHERS	P=0.372	P=0.753N	P=0.495N	P=0.508
MAX-ISO-POLY-3	P=0.248	P=0.493N	P=0.157N	P=0.254

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
Time Report Requested: 10:33:43
First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Gallbladder Inflammation				
LESION RATES				
OVERALL (a)	0/45 (0%)	0/42 (0%)	0/43 (0%)	1/43 (2%)
POLY-3 RATE (b)	0/42.30	0/39.11	0/39.45	1/34.31
POLY-3 PERCENT (g)	0%	0%	0%	2.9%
TERMINAL (d)	0/35 (0%)	0/34 (0%)	0/34 (0%)	0/24 (0%)
FIRST INCIDENCE	---	---	---	718
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Harderian Gland Hyperplasia				
LESION RATES				
OVERALL (a)	2/50 (4%)	3/49 (6%)	1/50 (2%)	2/50 (4%)
POLY-3 RATE (b)	2/44.70	3/45.32	1/45.68	2/38.34
POLY-3 PERCENT (g)	4.5%	6.6%	2.2%	5.2%
TERMINAL (d)	2/35 (6%)	3/39 (8%)	1/37 (3%)	1/25 (4%)
FIRST INCIDENCE	729 (T)	729 (T)	729 (T)	680
STATISTICAL TESTS				
POLY 3	P=0.545N	P=0.506	P=0.492N	P=0.637
POLY 1.5	P=0.535N	P=0.499	P=0.497N	P=0.652
POLY 6	P=0.548N	P=0.516	P=0.486N	P=0.629
COCH-ARM / FISHERS	P=0.501N	P=0.490	P=0.500N	P=0.691N
MAX-ISO-POLY-3	P=0.552N	P=0.331	P=0.276N	P=0.441

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Heart				
Cardiomyopathy				
LESION RATES				
OVERALL (a)	4/50 (8%)	1/50 (2%)	8/50 (16%)	3/49 (6%)
POLY-3 RATE (b)	4/45.39	1/45.79	8/46.52	3/38.91
POLY-3 PERCENT (g)	8.8%	2.2%	17.2%	7.7%
TERMINAL (d)	2/35 (6%)	0/39 (0%)	5/37 (14%)	1/25 (4%)
FIRST INCIDENCE	624	681	527	506
STATISTICAL TESTS				
POLY 3	P=0.381	P=0.176N	P=0.189	P=0.583N
POLY 1.5	P=0.412	P=0.178N	P=0.183	P=0.564N
POLY 6	P=0.357	P=0.173N	P=0.197	P=0.598N
COCH-ARM / FISHERS	P=0.496	P=0.181N	P=0.178	P=0.511N
MAX-ISO-POLY-3	P=0.223	P=0.083N	P=0.119	P=0.431N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Heart Inflammation Acute				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/50 (0%)	1/50 (2%)	3/49 (6%)
POLY-3 RATE (b)	1/44.94	0/45.60	1/46.24	3/39.77
POLY-3 PERCENT (g)	2.2%	0%	2.2%	7.5%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	666	---	554	409
STATISTICAL TESTS				
POLY 3	P=0.083	P=0.497N	P=0.754N	P=0.263
POLY 1.5	P=0.085	P=0.499N	P=0.757N	P=0.271
POLY 6	P=0.081	P=0.495N	P=0.750N	P=0.259
COCH-ARM / FISHERS	P=0.095	P=0.500N	P=0.753N	P=0.301
MAX-ISO-POLY-3	P=0.075	P=0.158N	P=0.491N	P=0.138

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Heart				
Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	1/50 (2%)	5/49 (10%)
POLY-3 RATE (b)	0/44.70	0/45.60	1/45.68	5/39.37
POLY-3 PERCENT (g)	0%	0%	2.2%	12.7%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	1/37 (3%)	2/25 (8%)
FIRST INCIDENCE	---	---	729 (T)	477
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P=0.504	P=0.021*
POLY 1.5	P<0.001**	(e)	P=0.502	P=0.023*
POLY 6	P<0.001**	(e)	P=0.508	P=0.020*
COCH-ARM / FISHERS	P=0.002**	(e)	P=0.500	P=0.027*
MAX-ISO-POLY-3	P<0.001**	(e)	P=0.164	P=0.009**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Heart Necrosis				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/50 (0%)	0/50 (0%)	3/49 (6%)
POLY-3 RATE (b)	1/44.87	0/45.60	0/45.68	3/38.94
POLY-3 PERCENT (g)	2.2%	0%	0%	7.7%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	1/25 (4%)
FIRST INCIDENCE	686	---	---	560
STATISTICAL TESTS				
POLY 3	P=0.077	P=0.497N	P=0.496N	P=0.256
POLY 1.5	P=0.078	P=0.498N	P=0.498N	P=0.266
POLY 6	P=0.076	P=0.494N	P=0.493N	P=0.251
COCH-ARM / FISHERS	P=0.084	P=0.500N	P=0.500N	P=0.301
MAX-ISO-POLY-3	P=0.037*	P=0.158N	P=0.158N	P=0.136

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Heart				
Polyarteritis				
LESION RATES				
OVERALL (a)	3/50 (6%)	0/50 (0%)	0/50 (0%)	1/49 (2%)
POLY-3 RATE (b)	3/45.51	0/45.60	0/45.68	1/38.11
POLY-3 PERCENT (g)	6.6%	0%	0%	2.6%
TERMINAL (d)	1/35 (3%)	0/39 (0%)	0/37 (0%)	1/25 (4%)
FIRST INCIDENCE	519	---	---	729 (T)
STATISTICAL TESTS				
POLY 3	P=0.238N	P=0.118N	P=0.118N	P=0.371N
POLY 1.5	P=0.241N	P=0.119N	P=0.119N	P=0.354N
POLY 6	P=0.234N	P=0.117N	P=0.116N	P=0.385N
COCH-ARM / FISHERS	P=0.246N	P=0.121N	P=0.121N	P=0.316N
MAX-ISO-POLY-3	P=0.083N	P=0.038N*	P=0.038N*	P=0.220N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Intestine Large, Cecum Inflammation				
LESION RATES				
OVERALL (a)	7/46 (15%)	0/48 (0%)	2/47 (4%)	0/48 (0%)
POLY-3 RATE (b)	7/43.13	0/44.83	2/44.02	0/37.35
POLY-3 PERCENT (g)	16.2%	0%	4.5%	0%
TERMINAL (d)	7/35 (20%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	729 (T)	---	554	---
STATISTICAL TESTS				
POLY 3	P=0.006N**	P=0.006N**	P=0.073N	P=0.013N*
POLY 1.5	P=0.005N**	P=0.006N**	P=0.075N	P=0.010N**
POLY 6	P=0.006N**	P=0.006N**	P=0.069N	P=0.015N*
COCH-ARM / FISHERS	P=0.005N**	P=0.005N**	P=0.074N	P=0.005N**
MAX-ISO-POLY-3	P=0.002N**	P=0.002N**	P=0.036N*	P=0.007N**

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

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Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Intestine Small, Duodenum Inflammation				
LESION RATES				
OVERALL (a)	1/45 (2%)	0/47 (0%)	0/44 (0%)	0/44 (0%)
POLY-3 RATE (b)	1/42.93	0/44.30	0/40.65	0/34.63
POLY-3 PERCENT (g)	2.3%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	555	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Intestine Small, Ileum Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	1/45 (2%)	1/47 (2%)	2/44 (5%)	0/46 (0%)
POLY-3 RATE (b)	1/42.37	1/44.37	2/41.18	0/35.90
POLY-3 PERCENT (g)	2.4%	2.3%	4.9%	0%
TERMINAL (d)	1/35 (3%)	0/39 (0%)	2/37 (5%)	0/25 (0%)
FIRST INCIDENCE	729 (T)	713	729 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.432N	P=0.750N	P=0.490	P=0.533N
POLY 1.5	P=0.413N	P=0.751N	P=0.489	P=0.522N
POLY 6	P=0.446N	P=0.748N	P=0.495	P=0.540N
COCH-ARM / FISHERS	P=0.364N	P=0.742N	P=0.491	P=0.495N
MAX-ISO-POLY-3	P=0.345N	P=0.486N	P=0.274	P=0.200N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Intestine Small, Ileum Inflammation				
LESION RATES				
OVERALL (a)	3/45 (7%)	0/47 (0%)	1/44 (2%)	0/46 (0%)
POLY-3 RATE (b)	3/42.37	0/44.30	1/41.18	0/35.90
POLY-3 PERCENT (g)	7.1%	0%	2.4%	0%
TERMINAL (d)	3/35 (9%)	0/39 (0%)	1/37 (3%)	0/25 (0%)
FIRST INCIDENCE	729 (T)	---	729 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.090N	P=0.110N	P=0.315N	P=0.151N
POLY 1.5	P=0.088N	P=0.111N	P=0.317N	P=0.140N
POLY 6	P=0.091N	P=0.109N	P=0.310N	P=0.159N
COCH-ARM / FISHERS	P=0.083N	P=0.113N	P=0.317N	P=0.117N
MAX-ISO-POLY-3	P=0.052N	P=0.036N*	P=0.163N	P=0.067N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Islets, Pancreatic Hyperplasia				
LESION RATES				
OVERALL (a)	1/48 (2%)	1/48 (2%)	4/49 (8%)	0/50 (0%)
POLY-3 RATE (b)	1/43.71	1/44.83	4/45.18	0/38.16
POLY-3 PERCENT (g)	2.3%	2.2%	8.9%	0%
TERMINAL (d)	1/35 (3%)	1/39 (3%)	3/37 (8%)	0/25 (0%)
FIRST INCIDENCE	729 (T)	729 (T)	588	---
STATISTICAL TESTS				
POLY 3	P=0.534N	P=0.755N	P=0.189	P=0.527N
POLY 1.5	P=0.503N	P=0.757N	P=0.186	P=0.517N
POLY 6	P=0.558N	P=0.751N	P=0.193	P=0.534N
COCH-ARM / FISHERS	P=0.426N	P=0.753N	P=0.187	P=0.490N
MAX-ISO-POLY-3	P=0.256N	P=0.492N	P=0.092	P=0.194N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Kidney Cyst				
LESION RATES				
OVERALL (a)	1/49 (2%)	2/50 (4%)	1/50 (2%)	0/50 (0%)
POLY-3 RATE (b)	1/44.07	2/45.60	1/45.68	0/38.16
POLY-3 PERCENT (g)	2.3%	4.4%	2.2%	0%
TERMINAL (d)	1/35 (3%)	2/39 (5%)	1/37 (3%)	0/25 (0%)
FIRST INCIDENCE	729 (T)	729 (T)	729 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.285N	P=0.512	P=0.753N	P=0.529N
POLY 1.5	P=0.276N	P=0.509	P=0.755N	P=0.520N
POLY 6	P=0.291N	P=0.516	P=0.749N	P=0.535N
COCH-ARM / FISHERS	P=0.247N	P=0.508	P=0.747N	P=0.495N
MAX-ISO-POLY-3	P=0.294N	P=0.293	P=0.489N	P=0.195N

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Kidney				
Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/50 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.07	0/45.60	0/45.68	0/38.16
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Kidney Infarct				
LESION RATES				
OVERALL (a)	2/49 (4%)	1/50 (2%)	2/50 (4%)	1/50 (2%)
POLY-3 RATE (b)	2/44.07	1/45.60	2/46.24	1/38.16
POLY-3 PERCENT (g)	4.5%	2.2%	4.3%	2.6%
TERMINAL (d)	2/35 (6%)	1/39 (3%)	1/37 (3%)	1/25 (4%)
FIRST INCIDENCE	729 (T)	729 (T)	554	729 (T)
STATISTICAL TESTS				
POLY 3	P=0.487N	P=0.488N	P=0.677N	P=0.550N
POLY 1.5	P=0.474N	P=0.491N	P=0.682N	P=0.534N
POLY 6	P=0.495N	P=0.484N	P=0.669N	P=0.561N
COCH-ARM / FISHERS	P=0.436N	P=0.492N	P=0.684N	P=0.492N
MAX-ISO-POLY-3	P=0.532N	P=0.273N	P=0.480N	P=0.335N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Kidney Inflammation				
LESION RATES				
OVERALL (a)	1/49 (2%)	0/50 (0%)	2/50 (4%)	1/50 (2%)
POLY-3 RATE (b)	1/44.31	0/45.60	2/46.24	1/38.45
POLY-3 PERCENT (g)	2.3%	0%	4.3%	2.6%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	1/37 (3%)	0/25 (0%)
FIRST INCIDENCE	666	---	554	650
STATISTICAL TESTS				
POLY 3	P=0.436	P=0.494N	P=0.515	P=0.728
POLY 1.5	P=0.457	P=0.495N	P=0.511	P=0.738
POLY 6	P=0.422	P=0.493N	P=0.521	P=0.721
COCH-ARM / FISHERS	P=0.510	P=0.495N	P=0.508	P=0.747N
MAX-ISO-POLY-3	P=0.408	P=0.157N	P=0.296	P=0.462

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Kidney				
Metaplasia Osseous				
LESION RATES				
OVERALL (a)	2/49 (4%)	2/50 (4%)	4/50 (8%)	2/50 (4%)
POLY-3 RATE (b)	2/44.07	2/45.60	4/45.77	2/38.16
POLY-3 PERCENT (g)	4.5%	4.4%	8.7%	5.2%
TERMINAL (d)	2/35 (6%)	2/39 (5%)	3/37 (8%)	2/25 (8%)
FIRST INCIDENCE	729 (T)	729 (T)	706	729 (T)
STATISTICAL TESTS				
POLY 3	P=0.447	P=0.682N	P=0.355	P=0.641
POLY 1.5	P=0.476	P=0.684N	P=0.350	P=0.658
POLY 6	P=0.425	P=0.678N	P=0.362	P=0.629
COCH-ARM / FISHERS	P=0.553	P=0.684N	P=0.349	P=0.684N
MAX-ISO-POLY-3	P=0.509	P=0.486N	P=0.218	P=0.444

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Kidney Nephropathy				
LESION RATES				
OVERALL (a)	34/49 (69%)	26/50 (52%)	25/50 (50%)	10/50 (20%)
POLY-3 RATE (b)	34/45.91	26/47.52	25/46.34	10/38.54
POLY-3 PERCENT (g)	74.1%	54.7%	53.9%	25.9%
TERMINAL (d)	29/35 (83%)	21/39 (54%)	23/37 (62%)	8/25 (32%)
FIRST INCIDENCE	519	396	527	666
STATISTICAL TESTS				
POLY 3	P<0.001N**	P=0.036N*	P=0.030N*	P<0.001N**
POLY 1.5	P<0.001N**	P=0.044N*	P=0.034N*	P<0.001N**
POLY 6	P<0.001N**	P=0.027N*	P=0.026N*	P<0.001N**
COCH-ARM / FISHERS	P<0.001N**	P=0.059N	P=0.039N*	P<0.001N**
MAX-ISO-POLY-3	P<0.001N**	P=0.023N*	P=0.018N*	P<0.001N**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx Inflammation				
LESION RATES				
OVERALL (a)	2/49 (4%)	0/49 (0%)	0/49 (0%)	0/50 (0%)
POLY-3 RATE (b)	2/45.44	0/45.12	0/44.77	0/38.16
POLY-3 PERCENT (g)	4.4%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	442	---	---	---
STATISTICAL TESTS				
POLY 3	P=0.101N	P=0.239N	P=0.240N	P=0.278N
POLY 1.5	P=0.104N	P=0.239N	P=0.240N	P=0.265N
POLY 6	P=0.098N	P=0.237N	P=0.239N	P=0.289N
COCH-ARM / FISHERS	P=0.111N	P=0.247N	P=0.247N	P=0.242N
MAX-ISO-POLY-3	P=0.071N	P=0.077N	P=0.079N	P=0.116N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx				
Inflammation Chronic				
LESION RATES				
OVERALL (a)	4/49 (8%)	2/49 (4%)	11/49 (22%)	42/50 (84%)
POLY-3 RATE (b)	4/45.07	2/46.24	11/46.35	42/48.02
POLY-3 PERCENT (g)	8.9%	4.3%	23.7%	87.5%
TERMINAL (d)	2/35 (6%)	0/39 (0%)	6/37 (16%)	20/25 (80%)
FIRST INCIDENCE	555	396	527	266
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.325N	P=0.049*	P<0.001**
POLY 1.5	P<0.001**	P=0.331N	P=0.046*	P<0.001**
POLY 6	P<0.001**	P=0.318N	P=0.054	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.339N	P=0.045*	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.195N	P=0.028*	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx: Lumen Exudate				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/49 (0%)	0/49 (0%)	2/50 (4%)
POLY-3 RATE (b)	0/44.34	0/45.12	0/44.77	2/38.25
POLY-3 PERCENT (g)	0%	0%	0%	5.2%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	717
STATISTICAL TESTS				
POLY 3	P=0.041*	(e)	(e)	P=0.206
POLY 1.5	P=0.043*	(e)	(e)	P=0.215
POLY 6	P=0.040*	(e)	(e)	P=0.200
COCH-ARM / FISHERS	P=0.048*	(e)	(e)	P=0.253
MAX-ISO-POLY-3	P=0.033*	(e)	(e)	P=0.076

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx: Respiratory Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	1/49 (2%)	0/49 (0%)	0/49 (0%)	11/50 (22%)
POLY-3 RATE (b)	1/44.51	0/45.12	0/44.77	11/42.03
POLY-3 PERCENT (g)	2.3%	0%	0%	26.2%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	1/25 (4%)
FIRST INCIDENCE	686	---	---	340
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.497N	P=0.499N	P<0.001**
POLY 1.5	P<0.001**	P=0.499N	P=0.500N	P<0.001**
POLY 6	P<0.001**	P=0.495N	P=0.496N	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.500N	P=0.500N	P=0.002**
MAX-ISO-POLY-3	P<0.001**	P=0.159N	P=0.159N	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx: Respiratory Epithelium Metaplasia				
LESION RATES				
OVERALL (a)	3/49 (6%)	0/49 (0%)	6/49 (12%)	50/50 (100%)
POLY-3 RATE (b)	3/45.25	0/45.12	6/46.32	50/50.00
POLY-3 PERCENT (g)	6.6%	0%	13%	100%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	2/37 (5%)	25/25 (100%)
FIRST INCIDENCE	555	---	588	141
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.119N	P=0.254	P<0.001**
POLY 1.5	P<0.001**	P=0.119N	P=0.247	P<0.001**
POLY 6	P<0.001**	P=0.118N	P=0.266	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.121N	P=0.243	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.038N*	P=0.158	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx: Respiratory Epithelium Necrosis				
LESION RATES				
OVERALL (a)	2/49 (4%)	1/49 (2%)	9/49 (18%)	34/50 (68%)
POLY-3 RATE (b)	2/45.59	1/45.96	9/46.80	34/44.65
POLY-3 PERCENT (g)	4.4%	2.2%	19.2%	76.1%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	3/37 (8%)	17/25 (68%)
FIRST INCIDENCE	442	396	527	320
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.497N	P=0.028*	P<0.001**
POLY 1.5	P<0.001**	P=0.499N	P=0.026*	P<0.001**
POLY 6	P<0.001**	P=0.494N	P=0.031*	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.500N	P=0.025*	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.279N	P=0.013*	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx: Respiratory Epithelium Regeneration				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/49 (0%)	0/49 (0%)	32/50 (64%)
POLY-3 RATE (b)	0/44.34	0/45.12	0/44.77	32/43.66
POLY-3 PERCENT (g)	0%	0%	0%	73.3%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	20/25 (80%)
FIRST INCIDENCE	---	---	---	320
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx: Squamous Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	3/49 (6%)	7/49 (14%)	15/49 (31%)	42/50 (84%)
POLY-3 RATE (b)	3/44.88	7/47.35	15/45.98	42/49.33
POLY-3 PERCENT (g)	6.7%	14.8%	32.6%	85.1%
TERMINAL (d)	1/35 (3%)	2/39 (5%)	8/37 (22%)	20/25 (80%)
FIRST INCIDENCE	624	480	600	141
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.180	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P=0.170	P<0.001**	P<0.001**
POLY 6	P<0.001**	P=0.195	P=0.002**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.159	P=0.002**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.111	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Liver				
Basophilic Focus				
LESION RATES				
OVERALL (a)	7/50 (14%)	5/50 (10%)	7/50 (14%)	6/50 (12%)
POLY-3 RATE (b)	7/44.73	5/45.60	7/45.68	6/38.41
POLY-3 PERCENT (g)	15.7%	11%	15.3%	15.6%
TERMINAL (d)	6/35 (17%)	5/39 (13%)	7/37 (19%)	5/25 (20%)
FIRST INCIDENCE	722	729 (T)	729 (T)	660
STATISTICAL TESTS				
POLY 3	P=0.480	P=0.365N	P=0.597N	P=0.617N
POLY 1.5	P=0.511	P=0.372N	P=0.606N	P=0.587N
POLY 6	P=0.462	P=0.354N	P=0.583N	P=0.603
COCH-ARM / FISHERS	P=0.512N	P=0.380N	P=0.613N	P=0.500N
MAX-ISO-POLY-3	P=0.612	P=0.259N	P=0.482N	P=0.498N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Liver				
Clear Cell Focus				
LESION RATES				
OVERALL (a)	2/50 (4%)	5/50 (10%)	5/50 (10%)	0/50 (0%)
POLY-3 RATE (b)	2/44.70	5/45.60	5/45.68	0/38.16
POLY-3 PERCENT (g)	4.5%	11%	11%	0%
TERMINAL (d)	2/35 (6%)	5/39 (13%)	5/37 (14%)	0/25 (0%)
FIRST INCIDENCE	729 (T)	729 (T)	729 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.241N	P=0.224	P=0.225	P=0.274N
POLY 1.5	P=0.218N	P=0.220	P=0.220	P=0.264N
POLY 6	P=0.258N	P=0.230	P=0.232	P=0.281N
COCH-ARM / FISHERS	P=0.160N	P=0.218	P=0.218	P=0.247N
MAX-ISO-POLY-3	P=0.119N	P=0.127	P=0.128	P=0.111N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Liver Cyst				
LESION RATES				
OVERALL (a)	1/50 (2%)	1/50 (2%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	1/45.04	1/45.60	0/45.68	0/38.16
POLY-3 PERCENT (g)	2.2%	2.2%	0%	0%
TERMINAL (d)	0/35 (0%)	1/39 (3%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	634	729 (T)	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Liver				
Eosinophilic Focus				
LESION RATES				
OVERALL (a)	4/50 (8%)	6/50 (12%)	4/50 (8%)	4/50 (8%)
POLY-3 RATE (b)	4/44.70	6/45.79	4/46.13	4/38.20
POLY-3 PERCENT (g)	9%	13.1%	8.7%	10.5%
TERMINAL (d)	4/35 (11%)	5/39 (13%)	3/37 (8%)	3/25 (12%)
FIRST INCIDENCE	729 (T)	681	597	717
STATISTICAL TESTS				
POLY 3	P=0.556	P=0.385	P=0.626N	P=0.555
POLY 1.5	P=0.542N	P=0.377	P=0.635N	P=0.579
POLY 6	P=0.541	P=0.397	P=0.612N	P=0.539
COCH-ARM / FISHERS	P=0.471N	P=0.370	P=0.643N	P=0.643N
MAX-ISO-POLY-3	P=0.629	P=0.268	P=0.481N	P=0.413

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Liver Fatty Change				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.70	0/45.60	0/45.68	0/38.16
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Liver				
Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.70	0/45.60	0/45.68	0/38.16
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Liver				
Mixed Cell Focus				
LESION RATES				
OVERALL (a)	4/50 (8%)	7/50 (14%)	2/50 (4%)	1/50 (2%)
POLY-3 RATE (b)	4/44.70	7/45.60	2/45.68	1/38.16
POLY-3 PERCENT (g)	9%	15.4%	4.4%	2.6%
TERMINAL (d)	4/35 (11%)	7/39 (18%)	2/37 (5%)	1/25 (4%)
FIRST INCIDENCE	729 (T)	729 (T)	729 (T)	729 (T)
STATISTICAL TESTS				
POLY 3	P=0.083N	P=0.272	P=0.327N	P=0.230N
POLY 1.5	P=0.076N	P=0.267	P=0.333N	P=0.216N
POLY 6	P=0.086N	P=0.281	P=0.318N	P=0.240N
COCH-ARM / FISHERS	P=0.058N	P=0.262	P=0.339N	P=0.181N
MAX-ISO-POLY-3	P=0.115N	P=0.179	P=0.195N	P=0.133N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Liver				
Tension Lipidosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	2/50 (4%)	0/50 (0%)	1/50 (2%)
POLY-3 RATE (b)	0/44.70	2/45.60	0/45.68	1/38.39
POLY-3 PERCENT (g)	0%	4.4%	0%	2.6%
TERMINAL (d)	0/35 (0%)	2/39 (5%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	729 (T)	---	666
STATISTICAL TESTS				
POLY 3	P=0.485	P=0.242	(e)	P=0.470
POLY 1.5	P=0.496	P=0.239	(e)	P=0.478
POLY 6	P=0.480	P=0.245	(e)	P=0.465
COCH-ARM / FISHERS	P=0.531	P=0.247	(e)	P=0.500
MAX-ISO-POLY-3	P=0.332	P=0.080	(e)	P=0.158

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Liver: Hepatocyte Degeneration				
LESION RATES				
OVERALL (a)	2/50 (4%)	0/50 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	2/45.57	0/45.60	0/45.68	0/38.16
POLY-3 PERCENT (g)	4.4%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	519	---	---	---
STATISTICAL TESTS				
POLY 3	P=0.103N	P=0.237N	P=0.237N	P=0.279N
POLY 1.5	P=0.106N	P=0.238N	P=0.238N	P=0.267N
POLY 6	P=0.100N	P=0.236N	P=0.235N	P=0.288N
COCH-ARM / FISHERS	P=0.112N	P=0.247N	P=0.247N	P=0.247N
MAX-ISO-POLY-3	P=0.070N	P=0.076N	P=0.076N	P=0.115N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Liver: Hepatocyte Necrosis				
LESION RATES				
OVERALL (a)	4/50 (8%)	5/50 (10%)	1/50 (2%)	3/50 (6%)
POLY-3 RATE (b)	4/46.09	5/47.41	1/46.30	3/39.94
POLY-3 PERCENT (g)	8.7%	10.6%	2.2%	7.5%
TERMINAL (d)	1/35 (3%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	442	574	527	407
STATISTICAL TESTS				
POLY 3	P=0.348N	P=0.518	P=0.177N	P=0.577N
POLY 1.5	P=0.337N	P=0.508	P=0.179N	P=0.558N
POLY 6	P=0.355N	P=0.534	P=0.174N	P=0.590N
COCH-ARM / FISHERS	P=0.301N	P=0.500	P=0.181N	P=0.500N
MAX-ISO-POLY-3	P=0.338N	P=0.381	P=0.083N	P=0.426N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung Inflammation				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	3/50 (6%)
POLY-3 RATE (b)	0/44.70	0/45.12	0/45.68	3/39.64
POLY-3 PERCENT (g)	0%	0%	0%	7.6%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	1/25 (4%)
FIRST INCIDENCE	---	---	---	409
STATISTICAL TESTS				
POLY 3	P=0.010**	(e)	(e)	P=0.098
POLY 1.5	P=0.010**	(e)	(e)	P=0.103
POLY 6	P=0.010**	(e)	(e)	P=0.096
COCH-ARM / FISHERS	P=0.012*	(e)	(e)	P=0.121
MAX-ISO-POLY-3	P=0.009**	(e)	(e)	P=0.037*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung Inflammation Chronic				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/49 (0%)	2/50 (4%)	0/50 (0%)
POLY-3 RATE (b)	1/44.73	0/45.12	2/45.68	0/38.16
POLY-3 PERCENT (g)	2.2%	0%	4.4%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	2/37 (5%)	0/25 (0%)
FIRST INCIDENCE	722	---	729 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.509N	P=0.498N	P=0.507	P=0.532N
POLY 1.5	P=0.494N	P=0.501N	P=0.503	P=0.523N
POLY 6	P=0.520N	P=0.494N	P=0.514	P=0.537N
COCH-ARM / FISHERS	P=0.454N	P=0.505N	P=0.500	P=0.500N
MAX-ISO-POLY-3	P=0.391N	P=0.160N	P=0.289	P=0.197N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung Thrombosis				
LESION RATES				
OVERALL (a)	2/50 (4%)	1/49 (2%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	2/45.05	1/45.53	0/45.68	2/39.34
POLY-3 PERCENT (g)	4.4%	2.2%	0%	5.1%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	683	611	---	266
STATISTICAL TESTS				
POLY 3	P=0.566	P=0.496N	P=0.234N	P=0.644
POLY 1.5	P=0.573	P=0.501N	P=0.236N	P=0.658
POLY 6	P=0.561	P=0.489N	P=0.231N	P=0.634
COCH-ARM / FISHERS	P=0.594	P=0.508N	P=0.247N	P=0.691N
MAX-ISO-POLY-3	P=0.379	P=0.279N	P=0.076N	P=0.447

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Alveolar Epithelium Hyperplasia Focal				
LESION RATES				
OVERALL (a)	3/50 (6%)	3/49 (6%)	4/50 (8%)	0/50 (0%)
POLY-3 RATE (b)	3/44.88	3/45.32	4/45.71	0/38.16
POLY-3 PERCENT (g)	6.7%	6.6%	8.8%	0%
TERMINAL (d)	2/35 (6%)	2/39 (5%)	3/37 (8%)	0/25 (0%)
FIRST INCIDENCE	683	676	723	---
STATISTICAL TESTS				
POLY 3	P=0.167N	P=0.658N	P=0.510	P=0.150N
POLY 1.5	P=0.151N	P=0.660	P=0.504	P=0.141N
POLY 6	P=0.179N	P=0.648N	P=0.519	P=0.157N
COCH-ARM / FISHERS	P=0.113N	P=0.651	P=0.500	P=0.121N
MAX-ISO-POLY-3	P=0.156N	P=0.494N	P=0.357	P=0.066N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Alveolus Infiltration Cellular Histiocyte				
LESION RATES				
OVERALL (a)	7/50 (14%)	2/49 (4%)	3/50 (6%)	9/50 (18%)
POLY-3 RATE (b)	7/44.91	2/45.40	3/45.68	9/39.96
POLY-3 PERCENT (g)	15.6%	4.4%	6.6%	22.5%
TERMINAL (d)	5/35 (14%)	1/39 (3%)	3/37 (8%)	7/25 (28%)
FIRST INCIDENCE	683	653	729 (T)	332
STATISTICAL TESTS				
POLY 3	P=0.132	P=0.076N	P=0.150N	P=0.296
POLY 1.5	P=0.142	P=0.080N	P=0.155N	P=0.321
POLY 6	P=0.124	P=0.070N	P=0.143N	P=0.276
COCH-ARM / FISHERS	P=0.173	P=0.085N	P=0.159N	P=0.393
MAX-ISO-POLY-3	P=0.052	P=0.038N*	P=0.087N	P=0.221

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Bronchiole, Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/49 (0%)	1/50 (2%)	2/50 (4%)
POLY-3 RATE (b)	1/44.70	0/45.12	1/45.68	2/38.82
POLY-3 PERCENT (g)	2.2%	0%	2.2%	5.2%
TERMINAL (d)	1/35 (3%)	0/39 (0%)	1/37 (3%)	1/25 (4%)
FIRST INCIDENCE	729 (T)	---	729 (T)	506
STATISTICAL TESTS				
POLY 3	P=0.219	P=0.498N	P=0.756N	P=0.451
POLY 1.5	P=0.228	P=0.501N	P=0.758N	P=0.463
POLY 6	P=0.214	P=0.494N	P=0.752N	P=0.444
COCH-ARM / FISHERS	P=0.253	P=0.505N	P=0.753N	P=0.500
MAX-ISO-POLY-3	P=0.213	P=0.160N	P=0.493N	P=0.255

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Bronchus Inflammation				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	1/50 (2%)
POLY-3 RATE (b)	0/44.70	0/45.12	0/45.68	1/38.20
POLY-3 PERCENT (g)	0%	0%	0%	2.6%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	717
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Bronchus, Epithelium Degeneration				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.70	0/45.12	0/45.68	0/38.16
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Bronchus, Epithelium Necrosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	0/44.70	0/45.12	0/45.68	2/38.41
POLY-3 PERCENT (g)	0%	0%	0%	5.2%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	1/25 (4%)
FIRST INCIDENCE	---	---	---	660
STATISTICAL TESTS				
POLY 3	P=0.041*	(e)	(e)	P=0.205
POLY 1.5	P=0.042*	(e)	(e)	P=0.213
POLY 6	P=0.040*	(e)	(e)	P=0.200
COCH-ARM / FISHERS	P=0.047*	(e)	(e)	P=0.247
MAX-ISO-POLY-3	P=0.032*	(e)	(e)	P=0.075

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Bronchus, Epithelium Regeneration				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	34/50 (68%)
POLY-3 RATE (b)	0/44.70	0/45.12	0/45.68	34/42.61
POLY-3 PERCENT (g)	0%	0%	0%	79.8%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	20/25 (80%)
FIRST INCIDENCE	---	---	---	407
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Bronchus, Smooth Muscle Mineralization				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.70	0/45.12	0/45.68	0/38.16
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Mediastinum Inflammation				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	3/50 (6%)
POLY-3 RATE (b)	0/44.70	0/45.12	0/45.68	3/40.19
POLY-3 PERCENT (g)	0%	0%	0%	7.5%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	266
STATISTICAL TESTS				
POLY 3	P=0.010**	(e)	(e)	P=0.100
POLY 1.5	P=0.010**	(e)	(e)	P=0.105
POLY 6	P=0.010**	(e)	(e)	P=0.098
COCH-ARM / FISHERS	P=0.012*	(e)	(e)	P=0.121
MAX-ISO-POLY-3	P=0.009**	(e)	(e)	P=0.037*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Mediastinum Inflammation Chronic				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/49 (0%)	0/50 (0%)	8/50 (16%)
POLY-3 RATE (b)	1/44.88	0/45.12	0/45.68	8/40.66
POLY-3 PERCENT (g)	2.2%	0%	0%	19.7%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	2/25 (8%)
FIRST INCIDENCE	683	---	---	477
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.499N	P=0.496N	P=0.010**
POLY 1.5	P<0.001**	P=0.501N	P=0.498N	P=0.011*
POLY 6	P<0.001**	P=0.495N	P=0.493N	P=0.010**
COCH-ARM / FISHERS	P<0.001**	P=0.505N	P=0.500N	P=0.015*
MAX-ISO-POLY-3	P<0.001**	P=0.160N	P=0.158N	P=0.005**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Pleura Inflammation				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	0/44.70	0/45.12	0/45.68	2/39.93
POLY-3 PERCENT (g)	0%	0%	0%	5%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	266
STATISTICAL TESTS				
POLY 3	P=0.042*	(e)	(e)	P=0.213
POLY 1.5	P=0.043*	(e)	(e)	P=0.219
POLY 6	P=0.041*	(e)	(e)	P=0.209
COCH-ARM / FISHERS	P=0.047*	(e)	(e)	P=0.247
MAX-ISO-POLY-3	P=0.032*	(e)	(e)	P=0.075

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
Time Report Requested: 10:33:43
First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Submucosa, Bronchus Fibrosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.70	0/45.12	0/45.68	0/38.16
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Bronchial Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	0/34 (0%)	1/43 (2%)	3/38 (8%)	2/31 (6%)
POLY-3 RATE (b)	0/31.33	1/40.02	3/36.11	2/25.41
POLY-3 PERCENT (g)	0%	2.5%	8.3%	7.9%
TERMINAL (d)	0/27 (0%)	1/35 (3%)	2/31 (7%)	2/18 (11%)
FIRST INCIDENCE	---	729 (T)	719	729 (T)
STATISTICAL TESTS				
POLY 3	P=0.087	P=0.549	P=0.144	P=0.191
POLY 1.5	P=0.097	P=0.548	P=0.141	P=0.199
POLY 6	P=0.077	P=0.550	P=0.147	P=0.182
COCH-ARM / FISHERS	P=0.117	P=0.558	P=0.141	P=0.224
MAX-ISO-POLY-3	P=0.137	P=0.203	P=0.055	P=0.069

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Bronchial Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/34 (0%)	0/43 (0%)	0/38 (0%)	2/31 (6%)
POLY-3 RATE (b)	0/31.33	0/40.02	0/36.07	2/26.53
POLY-3 PERCENT (g)	0%	0%	0%	7.5%
TERMINAL (d)	0/27 (0%)	0/35 (0%)	0/31 (0%)	0/18 (0%)
FIRST INCIDENCE	---	---	---	409
STATISTICAL TESTS				
POLY 3	P=0.028*	(e)	(e)	P=0.200
POLY 1.5	P=0.029*	(e)	(e)	P=0.205
POLY 6	P=0.028*	(e)	(e)	P=0.194
COCH-ARM / FISHERS	P=0.031*	(e)	(e)	P=0.224
MAX-ISO-POLY-3	P=0.020*	(e)	(e)	P=0.069

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Bronchial Pigmentation				
LESION RATES				
OVERALL (a)	0/34 (0%)	0/43 (0%)	0/38 (0%)	3/31 (10%)
POLY-3 RATE (b)	0/31.33	0/40.02	0/36.07	3/27.96
POLY-3 PERCENT (g)	0%	0%	0%	10.7%
TERMINAL (d)	0/27 (0%)	0/35 (0%)	0/31 (0%)	0/18 (0%)
FIRST INCIDENCE	---	---	---	340
STATISTICAL TESTS				
POLY 3	P=0.005**	(e)	(e)	P=0.096
POLY 1.5	P=0.005**	(e)	(e)	P=0.098
POLY 6	P=0.005**	(e)	(e)	P=0.092
COCH-ARM / FISHERS	P=0.006**	(e)	(e)	P=0.103
MAX-ISO-POLY-3	P=0.004**	(e)	(e)	P=0.032*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mandibular Ectasia				
LESION RATES				
OVERALL (a)	0/36 (0%)	0/33 (0%)	0/30 (0%)	4/32 (13%)
POLY-3 RATE (b)	0/33.59	0/30.98	0/27.54	4/22.27
POLY-3 PERCENT (g)	0%	0%	0%	18%
TERMINAL (d)	0/28 (0%)	0/29 (0%)	0/23 (0%)	3/12 (25%)
FIRST INCIDENCE	---	---	---	690
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P=0.021*
POLY 1.5	P<0.001**	(e)	(e)	P=0.027*
POLY 6	P<0.001**	(e)	(e)	P=0.017*
COCH-ARM / FISHERS	P=0.003**	(e)	(e)	P=0.044*
MAX-ISO-POLY-3	P=0.002**	(e)	(e)	P=0.013*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mandibular Hematopoietic Cell Proliferation				
LESION RATES				
OVERALL (a)	0/36 (0%)	0/33 (0%)	0/30 (0%)	3/32 (9%)
POLY-3 RATE (b)	0/33.59	0/30.98	0/27.54	3/22.38
POLY-3 PERCENT (g)	0%	0%	0%	13.4%
TERMINAL (d)	0/28 (0%)	0/29 (0%)	0/23 (0%)	1/12 (8%)
FIRST INCIDENCE	---	---	---	666
STATISTICAL TESTS				
POLY 3	P=0.007**	(e)	(e)	P=0.059
POLY 1.5	P=0.007**	(e)	(e)	P=0.069
POLY 6	P=0.007**	(e)	(e)	P=0.052
COCH-ARM / FISHERS	P=0.010**	(e)	(e)	P=0.099
MAX-ISO-POLY-3	P=0.007**	(e)	(e)	P=0.030*

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
Time Report Requested: 10:33:43
First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mandibular Hyperplasia				
LESION RATES				
OVERALL (a)	0/36 (0%)	0/33 (0%)	0/30 (0%)	0/32 (0%)
POLY-3 RATE (b)	0/33.59	0/30.98	0/27.54	0/22.12
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/28 (0%)	0/29 (0%)	0/23 (0%)	0/12 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mandibular Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	2/36 (6%)	5/33 (15%)	11/30 (37%)	10/32 (31%)
POLY-3 RATE (b)	2/33.59	5/30.98	11/27.54	10/25.05
POLY-3 PERCENT (g)	6%	16.1%	40%	39.9%
TERMINAL (d)	2/28 (7%)	5/29 (17%)	11/23 (48%)	5/12 (42%)
FIRST INCIDENCE	729 (T)	729 (T)	729 (T)	266
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.180	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P=0.178	P<0.001**	P=0.002**
POLY 6	P<0.001**	P=0.187	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P=0.004**	P=0.180	P=0.002**	P=0.006**
MAX-ISO-POLY-3	P<0.001**	P=0.098	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mandibular Infiltration Cellular Plasma Cell				
LESION RATES				
OVERALL (a)	1/36 (3%)	0/33 (0%)	2/30 (7%)	14/32 (44%)
POLY-3 RATE (b)	1/33.59	0/30.98	2/27.54	14/30.02
POLY-3 PERCENT (g)	3%	0%	7.3%	46.6%
TERMINAL (d)	1/28 (4%)	0/29 (0%)	2/23 (9%)	2/12 (17%)
FIRST INCIDENCE	729 (T)	---	729 (T)	266
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.516N	P=0.431	P<0.001**
POLY 1.5	P<0.001**	P=0.518N	P=0.433	P<0.001**
POLY 6	P<0.001**	P=0.512N	P=0.427	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.522N	P=0.431	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.173N	P=0.234	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mediastinal Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	0/37 (0%)	0/33 (0%)	0/38 (0%)	2/32 (6%)
POLY-3 RATE (b)	0/32.20	0/29.89	0/35.91	2/24.28
POLY-3 PERCENT (g)	0%	0%	0%	8.2%
TERMINAL (d)	0/24 (0%)	0/26 (0%)	0/30 (0%)	1/14 (7%)
FIRST INCIDENCE	---	---	---	688
STATISTICAL TESTS				
POLY 3	P=0.034*	(e)	(e)	P=0.177
POLY 1.5	P=0.034*	(e)	(e)	P=0.183
POLY 6	P=0.034*	(e)	(e)	P=0.173
COCH-ARM / FISHERS	P=0.039*	(e)	(e)	P=0.211
MAX-ISO-POLY-3	P=0.024*	(e)	(e)	P=0.066

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mediastinal Infiltration Cellular Plasma Cell				
LESION RATES				
OVERALL (a)	0/37 (0%)	0/33 (0%)	1/38 (3%)	2/32 (6%)
POLY-3 RATE (b)	0/32.20	0/29.89	1/35.91	2/24.17
POLY-3 PERCENT (g)	0%	0%	2.8%	8.3%
TERMINAL (d)	0/24 (0%)	0/26 (0%)	1/30 (3%)	1/14 (7%)
FIRST INCIDENCE	---	---	729 (T)	717
STATISTICAL TESTS				
POLY 3	P=0.046*	(e)	P=0.522	P=0.176
POLY 1.5	P=0.049*	(e)	P=0.515	P=0.182
POLY 6	P=0.045*	(e)	P=0.531	P=0.172
COCH-ARM / FISHERS	P=0.058	(e)	P=0.507	P=0.211
MAX-ISO-POLY-3	P=0.064	(e)	P=0.183	P=0.066

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mediastinal Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/37 (0%)	0/33 (0%)	0/38 (0%)	2/32 (6%)
POLY-3 RATE (b)	0/32.20	0/29.89	0/35.91	2/24.95
POLY-3 PERCENT (g)	0%	0%	0%	8%
TERMINAL (d)	0/24 (0%)	0/26 (0%)	0/30 (0%)	0/14 (0%)
FIRST INCIDENCE	---	---	---	560
STATISTICAL TESTS				
POLY 3	P=0.035*	(e)	(e)	P=0.182
POLY 1.5	P=0.035*	(e)	(e)	P=0.185
POLY 6	P=0.035*	(e)	(e)	P=0.181
COCH-ARM / FISHERS	P=0.039*	(e)	(e)	P=0.211
MAX-ISO-POLY-3	P=0.024*	(e)	(e)	P=0.066

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mesenteric Hematopoietic Cell Proliferation				
LESION RATES				
OVERALL (a)	4/47 (9%)	1/47 (2%)	0/49 (0%)	2/47 (4%)
POLY-3 RATE (b)	4/43.41	1/44.11	0/45.16	2/37.60
POLY-3 PERCENT (g)	9.2%	2.3%	0%	5.3%
TERMINAL (d)	2/35 (6%)	0/38 (0%)	0/37 (0%)	1/25 (4%)
FIRST INCIDENCE	674	653	---	506
STATISTICAL TESTS				
POLY 3	P=0.279N	P=0.173N	P=0.055N	P=0.405N
POLY 1.5	P=0.278N	P=0.176N	P=0.055N	P=0.386N
POLY 6	P=0.279N	P=0.171N	P=0.055N	P=0.423N
COCH-ARM / FISHERS	P=0.273N	P=0.181N	P=0.054N	P=0.339N
MAX-ISO-POLY-3	P=0.122N	P=0.082N	P=0.018N*	P=0.269N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mesenteric Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	7/47 (15%)	1/47 (2%)	2/49 (4%)	0/47 (0%)
POLY-3 RATE (b)	7/43.03	1/43.83	2/45.72	0/36.93
POLY-3 PERCENT (g)	16.3%	2.3%	4.4%	0%
TERMINAL (d)	7/35 (20%)	1/38 (3%)	1/37 (3%)	0/25 (0%)
FIRST INCIDENCE	729 (T)	729 (T)	554	---
STATISTICAL TESTS				
POLY 3	P=0.006N**	P=0.027N*	P=0.065N	P=0.013N*
POLY 1.5	P=0.005N**	P=0.029N*	P=0.067N	P=0.011N*
POLY 6	P=0.006N**	P=0.026N*	P=0.061N	P=0.015N*
COCH-ARM / FISHERS	P=0.005N**	P=0.029N*	P=0.070N	P=0.006N**
MAX-ISO-POLY-3	P=0.003N**	P=0.011N*	P=0.033N*	P=0.007N**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node: Deep Cervical Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	0/5 (0%)	0/1 (0%)	0/3 (0%)	4/8 (50%)
POLY-3 RATE (b)	0/3.11	0/0.72	0/2.91	4/7.02
POLY-3 PERCENT (g)	0%	0%	0%	57%
TERMINAL (d)	0/0 (0%)	0/0 (0%)	0/2 (0%)	4/5 (80%)
FIRST INCIDENCE	---	---	---	729 (T)
STATISTICAL TESTS				
POLY 3	P=0.029*	(e)	(e)	P=0.152
POLY 1.5	P=0.021*	(e)	(e)	P=0.103
POLY 6	P=0.052	(e)	(e)	P=0.278
COCH-ARM / FISHERS	P=0.028*	(e)	(e)	P=0.098
MAX-ISO-POLY-3	P=0.045*	(e)	(e)	P=0.080

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
Time Report Requested: 10:33:43
First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node: Renal Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	0/5 (0%)	0/1 (0%)	0/3 (0%)	0/8 (0%)
POLY-3 RATE (b)	0/3.11	0/0.72	0/2.91	0/7.02
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/0 (0%)	0/0 (0%)	0/2 (0%)	0/5 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Mesentery: Fat Necrosis				
LESION RATES				
OVERALL (a)	1/4 (25%)	1/1 (100%)	2/5 (40%)	0/0 (0%)
POLY-3 RATE (b)	1/2.55	1/1.00	2/4.80	0/0.00
POLY-3 PERCENT (g)	39.2%	100%	41.7%	0%
TERMINAL (d)	1/1 (100%)	1/1 (100%)	1/2 (50%)	0/0 (0%)
FIRST INCIDENCE	729 (T)	729 (T)	588	---
STATISTICAL TESTS				
POLY 3	(e)	P=0.575	P=0.735	(e)
POLY 1.5	(e)	P=0.483	P=0.668	(e)
POLY 6	(e)	P=0.791	P=0.692N	(e)
COCH-ARM / FISHERS	P=0.602	P=0.400	P=0.595	(e)
MAX-ISO-POLY-3	(e)	P=0.123	P=0.481	(e)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose				
Foreign Body				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/48 (0%)	3/50 (6%)	0/50 (0%)
POLY-3 RATE (b)	0/44.07	0/44.83	3/45.77	0/38.16
POLY-3 PERCENT (g)	0%	0%	6.6%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	2/37 (5%)	0/25 (0%)
FIRST INCIDENCE	---	---	706	---
STATISTICAL TESTS				
POLY 3	P=0.428	(e)	P=0.125	(e)
POLY 1.5	P=0.465	(e)	P=0.124	(e)
POLY 6	P=0.399	(e)	P=0.128	(e)
COCH-ARM / FISHERS	P=0.551	(e)	P=0.125	(e)
MAX-ISO-POLY-3	P=0.208	(e)	P=0.043*	(e)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose Inflammation				
LESION RATES				
OVERALL (a)	2/49 (4%)	4/48 (8%)	47/50 (94%)	50/50 (100%)
POLY-3 RATE (b)	2/44.85	4/44.83	47/49.97	50/50.00
POLY-3 PERCENT (g)	4.5%	8.9%	94.1%	100%
TERMINAL (d)	1/35 (3%)	4/39 (10%)	35/37 (95%)	25/25 (100%)
FIRST INCIDENCE	442	729 (T)	320	141
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.337	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P=0.332	P<0.001**	P<0.001**
POLY 6	P<0.001**	P=0.344	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.329	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.202	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Glands, Respiratory Epithelium Cyst				
LESION RATES				
OVERALL (a)	0/49 (0%)	1/48 (2%)	0/50 (0%)	5/50 (10%)
POLY-3 RATE (b)	0/44.07	1/44.83	0/45.68	5/38.16
POLY-3 PERCENT (g)	0%	2.2%	0%	13.1%
TERMINAL (d)	0/35 (0%)	1/39 (3%)	0/37 (0%)	5/25 (20%)
FIRST INCIDENCE	---	729 (T)	---	729 (T)
STATISTICAL TESTS				
POLY 3	P=0.003**	P=0.503	(e)	P=0.020*
POLY 1.5	P=0.003**	P=0.500	(e)	P=0.023*
POLY 6	P=0.003**	P=0.508	(e)	P=0.018*
COCH-ARM / FISHERS	P=0.004**	P=0.495	(e)	P=0.030*
MAX-ISO-POLY-3	P=0.002**	P=0.164	(e)	P=0.009**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Lamina Propria Fibrosis				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/48 (0%)	44/50 (88%)	50/50 (100%)
POLY-3 RATE (b)	0/44.07	0/44.83	44/48.25	50/50.00
POLY-3 PERCENT (g)	0%	0%	91.2%	100%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	35/37 (95%)	25/25 (100%)
FIRST INCIDENCE	---	---	320	141
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Lateral Wall Inflammation Chronic				
LESION RATES				
OVERALL (a)	5/49 (10%)	8/48 (17%)	5/50 (10%)	2/50 (4%)
POLY-3 RATE (b)	5/44.78	8/44.83	5/46.01	2/38.16
POLY-3 PERCENT (g)	11.2%	17.8%	10.9%	5.2%
TERMINAL (d)	3/35 (9%)	8/39 (21%)	4/37 (11%)	2/25 (8%)
FIRST INCIDENCE	590	729 (T)	637	729 (T)
STATISTICAL TESTS				
POLY 3	P=0.164N	P=0.276	P=0.613N	P=0.286N
POLY 1.5	P=0.142N	P=0.270	P=0.616N	P=0.262N
POLY 6	P=0.182N	P=0.282	P=0.608N	P=0.306N
COCH-ARM / FISHERS	P=0.095N	P=0.263	P=0.617N	P=0.210N
MAX-ISO-POLY-3	P=0.189N	P=0.187	P=0.481N	P=0.188N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Mucosa Regeneration				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/48 (0%)	47/50 (94%)	47/50 (94%)
POLY-3 RATE (b)	0/44.07	0/44.83	47/49.53	47/49.55
POLY-3 PERCENT (g)	0%	0%	94.9%	94.9%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	35/37 (95%)	24/25 (96%)
FIRST INCIDENCE	---	---	320	141
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Olfactory Epithelium Accumulation, Hyaline Droplet				
LESION RATES				
OVERALL (a)	1/49 (2%)	0/48 (0%)	1/50 (2%)	2/50 (4%)
POLY-3 RATE (b)	1/44.54	0/44.83	1/45.68	2/38.39
POLY-3 PERCENT (g)	2.3%	0%	2.2%	5.2%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	1/37 (3%)	1/25 (4%)
FIRST INCIDENCE	590	---	729 (T)	666
STATISTICAL TESTS				
POLY 3	P=0.219	P=0.499N	P=0.755N	P=0.448
POLY 1.5	P=0.230	P=0.501N	P=0.756N	P=0.465
POLY 6	P=0.212	P=0.496N	P=0.753N	P=0.437
COCH-ARM / FISHERS	P=0.259	P=0.505N	P=0.747N	P=0.508
MAX-ISO-POLY-3	P=0.214	P=0.160N	P=0.492N	P=0.255

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Olfactory Epithelium Atrophy				
LESION RATES				
OVERALL (a)	0/49 (0%)	14/48 (29%)	48/50 (96%)	38/50 (76%)
POLY-3 RATE (b)	0/44.07	14/45.24	48/49.43	38/46.83
POLY-3 PERCENT (g)	0%	30.9%	97.1%	81.1%
TERMINAL (d)	0/35 (0%)	13/39 (33%)	37/37 (100%)	18/25 (72%)
FIRST INCIDENCE	---	611	320	141
STATISTICAL TESTS				
POLY 3	P<0.001**	P<0.001**	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P<0.001**	P<0.001**	P<0.001**
POLY 6	P<0.001**	P<0.001**	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P<0.001**	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P<0.001**	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Olfactory Epithelium Metaplasia Respiratory				
LESION RATES				
OVERALL (a)	1/49 (2%)	0/48 (0%)	39/50 (78%)	45/50 (90%)
POLY-3 RATE (b)	1/44.31	0/44.83	39/48.06	45/48.89
POLY-3 PERCENT (g)	2.3%	0%	81.2%	92%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	32/37 (87%)	22/25 (88%)
FIRST INCIDENCE	667	---	320	141
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.498N	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P=0.500N	P<0.001**	P<0.001**
POLY 6	P<0.001**	P=0.494N	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.505N	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.160N	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Olfactory Epithelium Necrosis				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/48 (0%)	0/50 (0%)	19/50 (38%)
POLY-3 RATE (b)	0/44.07	0/44.83	0/45.68	19/44.89
POLY-3 PERCENT (g)	0%	0%	0%	42.3%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	7/25 (28%)
FIRST INCIDENCE	---	---	---	320
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Respiratory Epithelium Accumulation, Hyaline Droplet				
LESION RATES				
OVERALL (a)	3/49 (6%)	1/48 (2%)	6/50 (12%)	7/50 (14%)
POLY-3 RATE (b)	3/45.32	1/44.83	6/46.12	7/39.01
POLY-3 PERCENT (g)	6.6%	2.2%	13%	17.9%
TERMINAL (d)	1/35 (3%)	1/39 (3%)	5/37 (14%)	5/25 (20%)
FIRST INCIDENCE	442	729 (T)	600	506
STATISTICAL TESTS				
POLY 3	P=0.022*	P=0.309N	P=0.251	P=0.103
POLY 1.5	P=0.027*	P=0.311N	P=0.250	P=0.118
POLY 6	P=0.019*	P=0.305N	P=0.255	P=0.092
COCH-ARM / FISHERS	P=0.046*	P=0.316N	P=0.254	P=0.167
MAX-ISO-POLY-3	P=0.034*	P=0.157N	P=0.154	P=0.068

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Respiratory Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	1/49 (2%)	0/48 (0%)	0/50 (0%)	8/50 (16%)
POLY-3 RATE (b)	1/44.07	0/44.83	0/45.68	8/38.98
POLY-3 PERCENT (g)	2.3%	0%	0%	20.5%
TERMINAL (d)	1/35 (3%)	0/39 (0%)	0/37 (0%)	7/25 (28%)
FIRST INCIDENCE	729 (T)	---	---	409
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.497N	P=0.493N	P=0.009**
POLY 1.5	P<0.001**	P=0.500N	P=0.495N	P=0.011*
POLY 6	P<0.001**	P=0.492N	P=0.490N	P=0.007**
COCH-ARM / FISHERS	P<0.001**	P=0.505N	P=0.495N	P=0.017*
MAX-ISO-POLY-3	P<0.001**	P=0.160N	P=0.157N	P=0.005**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Respiratory Epithelium Metaplasia				
LESION RATES				
OVERALL (a)	0/49 (0%)	6/48 (13%)	47/50 (94%)	50/50 (100%)
POLY-3 RATE (b)	0/44.07	6/45.52	47/49.50	50/50.00
POLY-3 PERCENT (g)	0%	13.2%	95%	100%
TERMINAL (d)	0/35 (0%)	4/39 (10%)	36/37 (97%)	25/25 (100%)
FIRST INCIDENCE	---	611	320	141
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.017*	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P=0.016*	P<0.001**	P<0.001**
POLY 6	P<0.001**	P=0.019*	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.012*	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.006**	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Respiratory Epithelium Necrosis				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/48 (0%)	34/50 (68%)	50/50 (100%)
POLY-3 RATE (b)	0/44.07	0/44.83	34/48.49	50/50.00
POLY-3 PERCENT (g)	0%	0%	70.1%	100%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	25/37 (68%)	25/25 (100%)
FIRST INCIDENCE	---	---	527	141
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
Time Report Requested: 10:33:43
First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Respiratory Epithelium Regeneration				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/48 (0%)	2/50 (4%)	0/50 (0%)
POLY-3 RATE (b)	0/44.07	0/44.83	2/45.68	0/38.16
POLY-3 PERCENT (g)	0%	0%	4.4%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	2/37 (5%)	0/25 (0%)
FIRST INCIDENCE	---	---	729 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.500	(e)	P=0.245	(e)
POLY 1.5	P=0.531	(e)	P=0.243	(e)
POLY 6	P=0.474	(e)	P=0.248	(e)
COCH-ARM / FISHERS	P=0.605	(e)	P=0.253	(e)
MAX-ISO-POLY-3	P=0.291	(e)	P=0.082	(e)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Septum Perforation				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/48 (0%)	3/50 (6%)	11/50 (22%)
POLY-3 RATE (b)	0/44.07	0/44.83	3/46.01	11/42.78
POLY-3 PERCENT (g)	0%	0%	6.5%	25.7%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	2/37 (5%)	3/25 (12%)
FIRST INCIDENCE	---	---	637	332
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P=0.126	P<0.001**
POLY 1.5	P<0.001**	(e)	P=0.124	P<0.001**
POLY 6	P<0.001**	(e)	P=0.130	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P=0.125	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P=0.044*	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Sinus, Glands Metaplasia Respiratory				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/48 (0%)	1/50 (2%)	13/50 (26%)
POLY-3 RATE (b)	0/44.07	0/44.83	1/46.13	13/39.64
POLY-3 PERCENT (g)	0%	0%	2.2%	32.8%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	9/25 (36%)
FIRST INCIDENCE	---	---	597	320
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P=0.509	P<0.001**
POLY 1.5	P<0.001**	(e)	P=0.506	P<0.001**
POLY 6	P<0.001**	(e)	P=0.513	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P=0.505	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P=0.169	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Turbinate Atrophy				
LESION RATES				
OVERALL (a)	0/49 (0%)	8/48 (17%)	49/50 (98%)	50/50 (100%)
POLY-3 RATE (b)	0/44.07	8/45.52	49/49.91	50/50.00
POLY-3 PERCENT (g)	0%	17.6%	98.2%	100%
TERMINAL (d)	0/35 (0%)	6/39 (15%)	37/37 (100%)	25/25 (100%)
FIRST INCIDENCE	---	611	320	141
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.004**	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P=0.004**	P<0.001**	P<0.001**
POLY 6	P<0.001**	P=0.005**	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.003**	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.002**	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Turbinate Necrosis				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/48 (0%)	4/50 (8%)	27/50 (54%)
POLY-3 RATE (b)	0/44.07	0/44.83	4/46.75	27/42.55
POLY-3 PERCENT (g)	0%	0%	8.6%	63.5%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	2/37 (5%)	14/25 (56%)
FIRST INCIDENCE	---	---	527	266
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P=0.068	P<0.001**
POLY 1.5	P<0.001**	(e)	P=0.066	P<0.001**
POLY 6	P<0.001**	(e)	P=0.072	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P=0.061	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P=0.025*	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Pancreas: Acinus Atrophy				
LESION RATES				
OVERALL (a)	2/48 (4%)	0/48 (0%)	1/50 (2%)	0/50 (0%)
POLY-3 RATE (b)	2/44.66	0/44.83	1/46.01	0/38.16
POLY-3 PERCENT (g)	4.5%	0%	2.2%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	442	---	637	---
STATISTICAL TESTS				
POLY 3	P=0.193N	P=0.236N	P=0.490N	P=0.274N
POLY 1.5	P=0.189N	P=0.237N	P=0.489N	P=0.260N
POLY 6	P=0.196N	P=0.234N	P=0.487N	P=0.286N
COCH-ARM / FISHERS	P=0.177N	P=0.247N	P=0.485N	P=0.237N
MAX-ISO-POLY-3	P=0.129N	P=0.076N	P=0.272N	P=0.113N

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
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Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Peripheral Nerve Degeneration				
LESION RATES				
OVERALL (a)	0/0 (0%)	1/2 (50%)	1/1 (100%)	1/1 (100%)
POLY-3 RATE (b)	0/0.00	1/1.72	1/1.00	1/1.00
POLY-3 PERCENT (g)	0%	58.2%	100%	100%
TERMINAL (d)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)
FIRST INCIDENCE	---	713	320	477
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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 CAS Number: 431-03-8

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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Pituitary Gland: Pars Distalis Angiectasis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.70	0/45.12	0/45.68	0/38.16
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Pituitary Gland: Pars Distalis Hyperplasia				
LESION RATES				
OVERALL (a)	1/50 (2%)	2/49 (4%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	1/44.70	2/45.12	0/45.68	0/38.16
POLY-3 PERCENT (g)	2.2%	4.4%	0%	0%
TERMINAL (d)	1/35 (3%)	2/39 (5%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	729 (T)	729 (T)	---	---
STATISTICAL TESTS				
POLY 3	P=0.204N	P=0.503	P=0.496N	P=0.531N
POLY 1.5	P=0.202N	P=0.498	P=0.498N	P=0.523N
POLY 6	P=0.203N	P=0.511	P=0.492N	P=0.537N
COCH-ARM / FISHERS	P=0.192N	P=0.492	P=0.500N	P=0.500N
MAX-ISO-POLY-3	P=0.237N	P=0.285	P=0.158N	P=0.197N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Preputial Gland Ectasia				
LESION RATES				
OVERALL (a)	0/50 (0%)	2/49 (4%)	2/50 (4%)	1/49 (2%)
POLY-3 RATE (b)	0/44.70	2/45.32	2/45.68	1/37.31
POLY-3 PERCENT (g)	0%	4.4%	4.4%	2.7%
TERMINAL (d)	0/35 (0%)	2/39 (5%)	2/37 (5%)	1/25 (4%)
FIRST INCIDENCE	---	729 (T)	729 (T)	729 (T)
STATISTICAL TESTS				
POLY 3	P=0.372	P=0.240	P=0.242	P=0.464
POLY 1.5	P=0.395	P=0.237	P=0.239	P=0.472
POLY 6	P=0.358	P=0.245	P=0.246	P=0.459
COCH-ARM / FISHERS	P=0.461	P=0.242	P=0.247	P=0.495
MAX-ISO-POLY-3	P=0.282	P=0.080	P=0.081	P=0.157

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Preputial Gland Inflammation				
LESION RATES				
OVERALL (a)	1/50 (2%)	3/49 (6%)	5/50 (10%)	3/49 (6%)
POLY-3 RATE (b)	1/44.70	3/45.38	5/45.77	3/37.68
POLY-3 PERCENT (g)	2.2%	6.6%	10.9%	8%
TERMINAL (d)	1/35 (3%)	2/39 (5%)	4/37 (11%)	1/25 (4%)
FIRST INCIDENCE	729 (T)	713	706	666
STATISTICAL TESTS				
POLY 3	P=0.178	P=0.311	P=0.107	P=0.247
POLY 1.5	P=0.199	P=0.305	P=0.104	P=0.259
POLY 6	P=0.169	P=0.319	P=0.111	P=0.241
COCH-ARM / FISHERS	P=0.266	P=0.301	P=0.102	P=0.301
MAX-ISO-POLY-3	P=0.191	P=0.161	P=0.049*	P=0.133

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Prostate Inflammation				
LESION RATES				
OVERALL (a)	0/49 (0%)	2/49 (4%)	0/49 (0%)	1/50 (2%)
POLY-3 RATE (b)	0/44.34	2/45.52	0/44.68	1/38.16
POLY-3 PERCENT (g)	0%	4.4%	0%	2.6%
TERMINAL (d)	0/35 (0%)	1/39 (3%)	0/36 (0%)	1/25 (4%)
FIRST INCIDENCE	---	676	---	729 (T)
STATISTICAL TESTS				
POLY 3	P=0.483	P=0.243	(e)	P=0.470
POLY 1.5	P=0.497	P=0.240	(e)	P=0.479
POLY 6	P=0.475	P=0.247	(e)	P=0.464
COCH-ARM / FISHERS	P=0.537	P=0.247	(e)	P=0.505
MAX-ISO-POLY-3	P=0.334	P=0.082	(e)	P=0.159

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Salivary Glands Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.70	0/45.32	0/45.68	0/38.16
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Seminal Vesicle Dilatation				
LESION RATES				
OVERALL (a)	2/49 (4%)	0/49 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	2/44.34	0/45.32	0/45.68	0/38.16
POLY-3 PERCENT (g)	4.5%	0%	0%	0%
TERMINAL (d)	2/35 (6%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	729 (T)	---	---	---
STATISTICAL TESTS				
POLY 3	P=0.102N	P=0.232N	P=0.230N	P=0.272N
POLY 1.5	P=0.104N	P=0.235N	P=0.232N	P=0.261N
POLY 6	P=0.100N	P=0.229N	P=0.227N	P=0.280N
COCH-ARM / FISHERS	P=0.110N	P=0.247N	P=0.242N	P=0.242N
MAX-ISO-POLY-3	P=0.064N	P=0.076N	P=0.075N	P=0.110N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Skeletal Muscle Degeneration				
LESION RATES				
OVERALL (a)	0/2 (0%)	1/4 (25%)	0/5 (0%)	1/2 (50%)
POLY-3 RATE (b)	0/1.50	1/2.45	0/3.14	1/1.01
POLY-3 PERCENT (g)	0%	40.9%	0%	99.3%
TERMINAL (d)	0/0 (0%)	0/0 (0%)	0/1 (0%)	0/0 (0%)
FIRST INCIDENCE	---	713	---	477
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Skeletal Muscle Hemorrhage Acute				
LESION RATES				
OVERALL (a)	0/2 (0%)	2/4 (50%)	0/5 (0%)	0/2 (0%)
POLY-3 RATE (b)	0/1.50	2/3.65	0/3.14	0/0.29
POLY-3 PERCENT (g)	0%	54.7%	0%	0%
TERMINAL (d)	0/0 (0%)	0/0 (0%)	0/1 (0%)	0/0 (0%)
FIRST INCIDENCE	---	396	---	---
STATISTICAL TESTS				
POLY 3	P=0.594N	P=0.440	(e)	(e)
POLY 1.5	P=0.514N	P=0.415	(e)	(e)
POLY 6	P=0.626N	P=0.477	(e)	(e)
COCH-ARM / FISHERS	P=0.416N	P=0.400	(e)	(e)
MAX-ISO-POLY-3	P=0.666N	P=0.192	(e)	(e)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Skin				
Inflammation Chronic				
LESION RATES				
OVERALL (a)	1/50 (2%)	1/49 (2%)	2/50 (4%)	1/49 (2%)
POLY-3 RATE (b)	1/44.70	1/45.50	2/46.30	1/37.34
POLY-3 PERCENT (g)	2.2%	2.2%	4.3%	2.7%
TERMINAL (d)	1/35 (3%)	0/39 (0%)	1/37 (3%)	1/25 (4%)
FIRST INCIDENCE	729 (T)	681	527	729 (T)
STATISTICAL TESTS				
POLY 3	P=0.507	P=0.757N	P=0.512	P=0.719
POLY 1.5	P=0.529	P=0.760N	P=0.506	P=0.729
POLY 6	P=0.492	P=0.751N	P=0.521	P=0.713
COCH-ARM / FISHERS	P=0.588	P=0.747	P=0.500	P=0.747
MAX-ISO-POLY-3	P=0.584	P=0.494N	P=0.294	P=0.452

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Skin: Epidermis Hyperplasia				
LESION RATES				
OVERALL (a)	0/50 (0%)	2/49 (4%)	1/50 (2%)	0/49 (0%)
POLY-3 RATE (b)	0/44.70	2/45.38	1/45.68	0/37.34
POLY-3 PERCENT (g)	0%	4.4%	2.2%	0%
TERMINAL (d)	0/35 (0%)	1/39 (3%)	1/37 (3%)	0/25 (0%)
FIRST INCIDENCE	---	713	729 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.520N	P=0.241	P=0.504	(e)
POLY 1.5	P=0.509N	P=0.237	P=0.502	(e)
POLY 6	P=0.525N	P=0.245	P=0.508	(e)
COCH-ARM / FISHERS	P=0.472N	P=0.242	P=0.500	(e)
MAX-ISO-POLY-3	P=0.380	P=0.080	P=0.164	(e)

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Skin: Subcutaneous Tissue Necrosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	1/50 (2%)	0/49 (0%)
POLY-3 RATE (b)	0/44.70	0/45.32	1/46.30	0/37.34
POLY-3 PERCENT (g)	0%	0%	2.2%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	527	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Spleen				
Hematopoietic Cell Proliferation				
LESION RATES				
OVERALL (a)	11/48 (23%)	12/49 (24%)	15/50 (30%)	25/50 (50%)
POLY-3 RATE (b)	11/45.84	12/47.53	15/47.14	25/46.10
POLY-3 PERCENT (g)	24%	25.3%	31.8%	54.2%
TERMINAL (d)	4/35 (11%)	6/39 (15%)	9/37 (24%)	11/25 (44%)
FIRST INCIDENCE	519	396	527	320
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.540	P=0.272	P=0.002**
POLY 1.5	P<0.001**	P=0.532	P=0.275	P=0.002**
POLY 6	P<0.001**	P=0.550	P=0.270	P=0.002**
COCH-ARM / FISHERS	P<0.001**	P=0.523	P=0.286	P=0.005**
MAX-ISO-POLY-3	P<0.001**	P=0.444	P=0.202	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Spleen Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	0/48 (0%)	4/49 (8%)	1/50 (2%)	3/50 (6%)
POLY-3 RATE (b)	0/43.71	4/45.12	1/45.68	3/38.39
POLY-3 PERCENT (g)	0%	8.9%	2.2%	7.8%
TERMINAL (d)	0/35 (0%)	4/39 (10%)	1/37 (3%)	2/25 (8%)
FIRST INCIDENCE	---	729 (T)	729 (T)	666
STATISTICAL TESTS				
POLY 3	P=0.179	P=0.064	P=0.509	P=0.097
POLY 1.5	P=0.193	P=0.064	P=0.508	P=0.105
POLY 6	P=0.171	P=0.065	P=0.511	P=0.092
COCH-ARM / FISHERS	P=0.238	P=0.061	P=0.510	P=0.129
MAX-ISO-POLY-3	P=0.098	P=0.022*	P=0.167	P=0.039*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Spleen Inflammation				
LESION RATES				
OVERALL (a)	1/48 (2%)	0/49 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	1/43.95	0/45.12	0/45.68	2/39.40
POLY-3 PERCENT (g)	2.3%	0%	0%	5.1%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	666	---	---	266
STATISTICAL TESTS				
POLY 3	P=0.241	P=0.495N	P=0.492N	P=0.462
POLY 1.5	P=0.245	P=0.496N	P=0.493N	P=0.477
POLY 6	P=0.238	P=0.493N	P=0.491N	P=0.451
COCH-ARM / FISHERS	P=0.257	P=0.495N	P=0.490N	P=0.515
MAX-ISO-POLY-3	P=0.128	P=0.157N	P=0.156N	P=0.262

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Spleen Necrosis				
LESION RATES				
OVERALL (a)	0/48 (0%)	0/49 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	0/43.71	0/45.12	0/45.68	2/40.10
POLY-3 PERCENT (g)	0%	0%	0%	5%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	141
STATISTICAL TESTS				
POLY 3	P=0.043*	(e)	(e)	P=0.218
POLY 1.5	P=0.044*	(e)	(e)	P=0.227
POLY 6	P=0.042*	(e)	(e)	P=0.212
COCH-ARM / FISHERS	P=0.049*	(e)	(e)	P=0.258
MAX-ISO-POLY-3	P=0.033*	(e)	(e)	P=0.078

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Spleen: Lymphoid Follicle Atrophy				
LESION RATES				
OVERALL (a)	0/48 (0%)	0/49 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	0/43.71	0/45.12	0/45.68	2/38.88
POLY-3 PERCENT (g)	0%	0%	0%	5.1%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	551
STATISTICAL TESTS				
POLY 3	P=0.042*	(e)	(e)	P=0.212
POLY 1.5	P=0.043*	(e)	(e)	P=0.221
POLY 6	P=0.041*	(e)	(e)	P=0.207
COCH-ARM / FISHERS	P=0.049*	(e)	(e)	P=0.258
MAX-ISO-POLY-3	P=0.033*	(e)	(e)	P=0.077

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Stomach, Forestomach Inflammation				
LESION RATES				
OVERALL (a)	2/48 (4%)	1/48 (2%)	1/49 (2%)	0/50 (0%)
POLY-3 RATE (b)	2/44.45	1/44.83	1/45.11	0/38.16
POLY-3 PERCENT (g)	4.5%	2.2%	2.2%	0%
TERMINAL (d)	1/35 (3%)	1/39 (3%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	590	729 (T)	637	---
STATISTICAL TESTS				
POLY 3	P=0.170N	P=0.497N	P=0.495N	P=0.273N
POLY 1.5	P=0.164N	P=0.499N	P=0.495N	P=0.259N
POLY 6	P=0.175N	P=0.494N	P=0.492N	P=0.284N
COCH-ARM / FISHERS	P=0.145N	P=0.500N	P=0.492N	P=0.237N
MAX-ISO-POLY-3	P=0.181N	P=0.279N	P=0.277N	P=0.112N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Stomach, Forestomach: Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	3/48 (6%)	2/48 (4%)	1/49 (2%)	1/50 (2%)
POLY-3 RATE (b)	3/44.99	2/45.11	1/45.11	1/38.29
POLY-3 PERCENT (g)	6.7%	4.4%	2.2%	2.6%
TERMINAL (d)	0/35 (0%)	1/39 (3%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	590	653	637	695
STATISTICAL TESTS				
POLY 3	P=0.224N	P=0.499N	P=0.304N	P=0.365N
POLY 1.5	P=0.214N	P=0.500N	P=0.303N	P=0.342N
POLY 6	P=0.231N	P=0.496N	P=0.304N	P=0.385N
COCH-ARM / FISHERS	P=0.188N	P=0.500N	P=0.301N	P=0.293N
MAX-ISO-POLY-3	P=0.307N	P=0.323N	P=0.154N	P=0.217N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Stomach, Glandular Inflammation				
LESION RATES				
OVERALL (a)	3/47 (6%)	4/48 (8%)	2/49 (4%)	0/49 (0%)
POLY-3 RATE (b)	3/43.91	4/45.26	2/45.33	0/37.41
POLY-3 PERCENT (g)	6.8%	8.8%	4.4%	0%
TERMINAL (d)	2/35 (6%)	3/39 (8%)	1/37 (3%)	0/25 (0%)
FIRST INCIDENCE	555	604	554	---
STATISTICAL TESTS				
POLY 3	P=0.086N	P=0.517	P=0.485N	P=0.150N
POLY 1.5	P=0.076N	P=0.514	P=0.485N	P=0.138N
POLY 6	P=0.093N	P=0.522	P=0.483N	P=0.160N
COCH-ARM / FISHERS	P=0.056N	P=0.512	P=0.480N	P=0.113N
MAX-ISO-POLY-3	P=0.124N	P=0.364	P=0.312N	P=0.067N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Stomach, Glandular Mineralization				
LESION RATES				
OVERALL (a)	0/47 (0%)	0/48 (0%)	1/49 (2%)	0/49 (0%)
POLY-3 RATE (b)	0/43.35	0/44.83	1/45.40	0/37.41
POLY-3 PERCENT (g)	0%	0%	2.2%	0%
TERMINAL (d)	0/35 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	527	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Testes: Seminiferous Tubule Degeneration				
LESION RATES				
OVERALL (a)	14/49 (29%)	6/49 (12%)	13/50 (26%)	6/49 (12%)
POLY-3 RATE (b)	14/46.12	6/45.71	13/47.26	6/38.46
POLY-3 PERCENT (g)	30.4%	13.1%	27.5%	15.6%
TERMINAL (d)	9/35 (26%)	4/39 (10%)	8/37 (22%)	3/25 (12%)
FIRST INCIDENCE	442	676	527	332
STATISTICAL TESTS				
POLY 3	P=0.166N	P=0.038N*	P=0.470N	P=0.091N
POLY 1.5	P=0.138N	P=0.038N*	P=0.476N	P=0.071N
POLY 6	P=0.191N	P=0.037N*	P=0.458N	P=0.109N
COCH-ARM / FISHERS	P=0.082N	P=0.039N*	P=0.475N	P=0.039N*
MAX-ISO-POLY-3	P=0.110N	P=0.022N*	P=0.380N	P=0.071N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Thymus Atrophy				
LESION RATES				
OVERALL (a)	10/43 (23%)	5/42 (12%)	2/44 (5%)	5/30 (17%)
POLY-3 RATE (b)	10/39.68	5/40.06	2/41.34	5/27.30
POLY-3 PERCENT (g)	25.2%	12.5%	4.8%	18.3%
TERMINAL (d)	5/30 (17%)	1/33 (3%)	1/35 (3%)	1/16 (6%)
FIRST INCIDENCE	590	396	689	141
STATISTICAL TESTS				
POLY 3	P=0.222N	P=0.121N	P=0.010N**	P=0.358N
POLY 1.5	P=0.221N	P=0.127N	P=0.010N**	P=0.356N
POLY 6	P=0.223N	P=0.114N	P=0.009N**	P=0.368N
COCH-ARM / FISHERS	P=0.221N	P=0.138N	P=0.012N*	P=0.352N
MAX-ISO-POLY-3	P=0.092N	P=0.074N	P=0.004N**	P=0.273N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Thymus				
Ectopic Parathyroid Gland				
LESION RATES				
OVERALL (a)	6/43 (14%)	4/42 (10%)	11/44 (25%)	4/30 (13%)
POLY-3 RATE (b)	6/38.67	4/38.55	11/41.58	4/25.52
POLY-3 PERCENT (g)	15.5%	10.4%	26.5%	15.7%
TERMINAL (d)	5/30 (17%)	4/33 (12%)	7/35 (20%)	3/16 (19%)
FIRST INCIDENCE	590	729 (T)	683	680
STATISTICAL TESTS				
POLY 3	P=0.348	P=0.370N	P=0.177	P=0.629
POLY 1.5	P=0.351	P=0.377N	P=0.164	P=0.630
POLY 6	P=0.348	P=0.360N	P=0.199	P=0.631
COCH-ARM / FISHERS	P=0.401	P=0.384N	P=0.152	P=0.658
MAX-ISO-POLY-3	P=0.313	P=0.253N	P=0.122	P=0.493

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Thymus				
Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	0/43 (0%)	0/42 (0%)	0/44 (0%)	0/30 (0%)
POLY-3 RATE (b)	0/38.20	0/38.55	0/41.18	0/25.34
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/30 (0%)	0/33 (0%)	0/35 (0%)	0/16 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Thymus Inflammation Chronic				
LESION RATES				
OVERALL (a)	1/43 (2%)	0/42 (0%)	0/44 (0%)	3/30 (10%)
POLY-3 RATE (b)	1/38.23	0/38.55	0/41.18	3/25.92
POLY-3 PERCENT (g)	2.6%	0%	0%	11.6%
TERMINAL (d)	0/30 (0%)	0/33 (0%)	0/35 (0%)	0/16 (0%)
FIRST INCIDENCE	722	---	---	650
STATISTICAL TESTS				
POLY 3	P=0.041*	P=0.498N	P=0.485N	P=0.176
POLY 1.5	P=0.041*	P=0.501N	P=0.490N	P=0.174
POLY 6	P=0.041*	P=0.494N	P=0.478N	P=0.181
COCH-ARM / FISHERS	P=0.043*	P=0.506N	P=0.494N	P=0.186
MAX-ISO-POLY-3	P=0.014*	P=0.160N	P=0.157N	P=0.092

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Thyroid Gland Inflammation Chronic				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/49 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	1/44.70	0/45.12	0/45.68	2/38.46
POLY-3 PERCENT (g)	2.2%	0%	0%	5.2%
TERMINAL (d)	1/35 (3%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	729 (T)	---	---	660
STATISTICAL TESTS				
POLY 3	P=0.233	P=0.498N	P=0.496N	P=0.448
POLY 1.5	P=0.237	P=0.501N	P=0.498N	P=0.461
POLY 6	P=0.231	P=0.494N	P=0.492N	P=0.441
COCH-ARM / FISHERS	P=0.250	P=0.505N	P=0.500N	P=0.500
MAX-ISO-POLY-3	P=0.124	P=0.160N	P=0.158N	P=0.253

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Thyroid Gland: Follicular Cell Hyperplasia				
LESION RATES				
OVERALL (a)	0/50 (0%)	1/49 (2%)	0/50 (0%)	1/50 (2%)
POLY-3 RATE (b)	0/44.70	1/45.12	0/45.68	1/38.39
POLY-3 PERCENT (g)	0%	2.2%	0%	2.6%
TERMINAL (d)	0/35 (0%)	1/39 (3%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	729 (T)	---	666
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Tooth Dysplasia				
LESION RATES				
OVERALL (a)	2/2 (100%)	2/2 (100%)	1/1 (100%)	0/0 (0%)
POLY-3 RATE (b)	2/2.00	2/2.00	1/1.00	0/0.00
POLY-3 PERCENT (g)	100%	100%	100%	0%
TERMINAL (d)	1/1 (100%)	2/2 (100%)	1/1 (100%)	0/0 (0%)
FIRST INCIDENCE	590	729 (T)	729 (T)	---
STATISTICAL TESTS				
POLY 3	(e)	(e)	(e)	(e)
POLY 1.5	(e)	(e)	(e)	(e)
POLY 6	(e)	(e)	(e)	(e)
COCH-ARM / FISHERS	(e)	(e)	(e)	(e)
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea				
Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/48 (0%)	0/49 (0%)	2/49 (4%)	45/49 (92%)
POLY-3 RATE (b)	0/43.34	0/45.12	2/44.81	45/46.91
POLY-3 PERCENT (g)	0%	0%	4.5%	95.9%
TERMINAL (d)	0/34 (0%)	0/39 (0%)	1/37 (3%)	24/25 (96%)
FIRST INCIDENCE	---	---	719	320
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P=0.245	P<0.001**
POLY 1.5	P<0.001**	(e)	P=0.243	P<0.001**
POLY 6	P<0.001**	(e)	P=0.248	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P=0.253	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P=0.082	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea Necrosis				
LESION RATES				
OVERALL (a)	0/48 (0%)	0/49 (0%)	0/49 (0%)	47/49 (96%)
POLY-3 RATE (b)	0/43.34	0/45.12	0/44.77	47/48.01
POLY-3 PERCENT (g)	0%	0%	0%	97.9%
TERMINAL (d)	0/34 (0%)	0/39 (0%)	0/37 (0%)	24/25 (96%)
FIRST INCIDENCE	---	---	---	320
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	0/48 (0%)	0/49 (0%)	0/49 (0%)	6/49 (12%)
POLY-3 RATE (b)	0/43.34	0/45.12	0/44.77	6/39.48
POLY-3 PERCENT (g)	0%	0%	0%	15.2%
TERMINAL (d)	0/34 (0%)	0/39 (0%)	0/37 (0%)	2/25 (8%)
FIRST INCIDENCE	---	---	---	477
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P=0.011*
POLY 1.5	P<0.001**	(e)	(e)	P=0.012*
POLY 6	P<0.001**	(e)	(e)	P=0.010**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.014*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.004**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Epithelium Metaplasia				
LESION RATES				
OVERALL (a)	0/48 (0%)	0/49 (0%)	0/49 (0%)	5/49 (10%)
POLY-3 RATE (b)	0/43.34	0/45.12	0/44.77	5/38.11
POLY-3 PERCENT (g)	0%	0%	0%	13.1%
TERMINAL (d)	0/34 (0%)	0/39 (0%)	0/37 (0%)	5/25 (20%)
FIRST INCIDENCE	---	---	---	729 (T)
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P=0.021*
POLY 1.5	P<0.001**	(e)	(e)	P=0.024*
POLY 6	P<0.001**	(e)	(e)	P=0.019*
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.030*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.009**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Epithelium Regeneration				
LESION RATES				
OVERALL (a)	0/48 (0%)	0/49 (0%)	0/49 (0%)	45/49 (92%)
POLY-3 RATE (b)	0/43.34	0/45.12	0/44.77	45/47.68
POLY-3 PERCENT (g)	0%	0%	0%	94.4%
TERMINAL (d)	0/34 (0%)	0/39 (0%)	0/37 (0%)	24/25 (96%)
FIRST INCIDENCE	---	---	---	141
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Lumen Exudate				
LESION RATES				
OVERALL (a)	0/48 (0%)	0/49 (0%)	0/49 (0%)	4/49 (8%)
POLY-3 RATE (b)	0/43.34	0/45.12	0/44.77	4/38.70
POLY-3 PERCENT (g)	0%	0%	0%	10.3%
TERMINAL (d)	0/34 (0%)	0/39 (0%)	0/37 (0%)	0/25 (0%)
FIRST INCIDENCE	---	---	---	660
STATISTICAL TESTS				
POLY 3	P=0.002**	(e)	(e)	P=0.047*
POLY 1.5	P=0.002**	(e)	(e)	P=0.051
POLY 6	P=0.002**	(e)	(e)	P=0.045*
COCH-ARM / FISHERS	P=0.003**	(e)	(e)	P=0.061
MAX-ISO-POLY-3	P=0.003**	(e)	(e)	P=0.019*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Submucosa Fibrosis				
LESION RATES				
OVERALL (a)	0/48 (0%)	0/49 (0%)	0/49 (0%)	46/49 (94%)
POLY-3 RATE (b)	0/43.34	0/45.12	0/44.77	46/46.28
POLY-3 PERCENT (g)	0%	0%	0%	99.4%
TERMINAL (d)	0/34 (0%)	0/39 (0%)	0/37 (0%)	25/25 (100%)
FIRST INCIDENCE	---	---	---	320
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Submucosa, Carina Fibrosis				
LESION RATES				
OVERALL (a)	0/48 (0%)	0/49 (0%)	0/49 (0%)	16/49 (33%)
POLY-3 RATE (b)	0/43.34	0/45.12	0/44.77	16/39.89
POLY-3 PERCENT (g)	0%	0%	0%	40.1%
TERMINAL (d)	0/34 (0%)	0/39 (0%)	0/37 (0%)	9/25 (36%)
FIRST INCIDENCE	---	---	---	407
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

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Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Submucosa, Carina Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/48 (0%)	0/49 (0%)	0/49 (0%)	4/49 (8%)
POLY-3 RATE (b)	0/43.34	0/45.12	0/44.77	4/38.36
POLY-3 PERCENT (g)	0%	0%	0%	10.4%
TERMINAL (d)	0/34 (0%)	0/39 (0%)	0/37 (0%)	3/25 (12%)
FIRST INCIDENCE	---	---	---	660
STATISTICAL TESTS				
POLY 3	P=0.002**	(e)	(e)	P=0.046*
POLY 1.5	P=0.002**	(e)	(e)	P=0.050*
POLY 6	P=0.002**	(e)	(e)	P=0.043*
COCH-ARM / FISHERS	P=0.003**	(e)	(e)	P=0.061
MAX-ISO-POLY-3	P=0.003**	(e)	(e)	P=0.019*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Males			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Submucosa, Carina Mineralization				
LESION RATES				
OVERALL (a)	0/48 (0%)	0/49 (0%)	0/49 (0%)	15/49 (31%)
POLY-3 RATE (b)	0/43.34	0/45.12	0/44.77	15/39.32
POLY-3 PERCENT (g)	0%	0%	0%	38.2%
TERMINAL (d)	0/34 (0%)	0/39 (0%)	0/37 (0%)	8/25 (32%)
FIRST INCIDENCE	---	---	---	560
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Adrenal Cortex				
Angiectasis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	2/32.55
POLY-3 PERCENT (g)	0%	0%	0%	6.1%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	585
STATISTICAL TESTS				
POLY 3	P=0.038*	(e)	(e)	P=0.174
POLY 1.5	P=0.039*	(e)	(e)	P=0.192
POLY 6	P=0.038*	(e)	(e)	P=0.160
COCH-ARM / FISHERS	P=0.047*	(e)	(e)	P=0.247
MAX-ISO-POLY-3	P=0.032*	(e)	(e)	P=0.075

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Adrenal Cortex Hypertrophy				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	2/32.29
POLY-3 PERCENT (g)	0%	0%	0%	6.2%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	1/17 (6%)
FIRST INCIDENCE	---	---	---	646
STATISTICAL TESTS				
POLY 3	P=0.038*	(e)	(e)	P=0.173
POLY 1.5	P=0.039*	(e)	(e)	P=0.192
POLY 6	P=0.038*	(e)	(e)	P=0.158
COCH-ARM / FISHERS	P=0.047*	(e)	(e)	P=0.247
MAX-ISO-POLY-3	P=0.032*	(e)	(e)	P=0.074

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Adrenal Cortex: Zona Fasciculata Hypertrophy Focal				
LESION RATES				
OVERALL (a)	2/50 (4%)	0/50 (0%)	2/50 (4%)	3/50 (6%)
POLY-3 RATE (b)	2/45.26	0/47.59	2/47.33	3/32.26
POLY-3 PERCENT (g)	4.4%	0%	4.2%	9.3%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	2/42 (5%)	2/17 (12%)
FIRST INCIDENCE	653	---	731 (T)	655
STATISTICAL TESTS				
POLY 3	P=0.163	P=0.226N	P=0.678N	P=0.352
POLY 1.5	P=0.182	P=0.230N	P=0.682N	P=0.399
POLY 6	P=0.151	P=0.223N	P=0.672N	P=0.312
COCH-ARM / FISHERS	P=0.242	P=0.247N	P=0.691N	P=0.500
MAX-ISO-POLY-3	P=0.164	P=0.076N	P=0.481N	P=0.234

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Adrenal Medulla Hyperplasia				
LESION RATES				
OVERALL (a)	2/50 (4%)	4/50 (8%)	1/49 (2%)	2/50 (4%)
POLY-3 RATE (b)	2/44.98	4/47.59	1/46.33	2/33.89
POLY-3 PERCENT (g)	4.5%	8.4%	2.2%	5.9%
TERMINAL (d)	2/36 (6%)	4/40 (10%)	1/41 (2%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	731 (T)	731 (T)	252
STATISTICAL TESTS				
POLY 3	P=0.516N	P=0.364	P=0.490N	P=0.587
POLY 1.5	P=0.496N	P=0.355	P=0.495N	P=0.625
POLY 6	P=0.527N	P=0.374	P=0.482N	P=0.552
COCH-ARM / FISHERS	P=0.439N	P=0.339	P=0.508N	P=0.691N
MAX-ISO-POLY-3	P=0.520N	P=0.228	P=0.276N	P=0.399

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Blood Vessel Inflammation				
LESION RATES				
OVERALL (a)	1/50 (2%)	1/50 (2%)	0/50 (0%)	3/50 (6%)
POLY-3 RATE (b)	1/44.98	1/47.59	0/47.33	3/33.18
POLY-3 PERCENT (g)	2.2%	2.1%	0%	9%
TERMINAL (d)	1/36 (3%)	1/40 (3%)	0/42 (0%)	1/17 (6%)
FIRST INCIDENCE	731 (T)	731 (T)	---	466
STATISTICAL TESTS				
POLY 3	P=0.135	P=0.748N	P=0.490N	P=0.208
POLY 1.5	P=0.139	P=0.752N	P=0.493N	P=0.236
POLY 6	P=0.136	P=0.743N	P=0.485N	P=0.186
COCH-ARM / FISHERS	P=0.160	P=0.753N	P=0.500N	P=0.309
MAX-ISO-POLY-3	P=0.080	P=0.484N	P=0.158N	P=0.123

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Bone Marrow: Myeloid Cell Hyperplasia				
LESION RATES				
OVERALL (a)	3/50 (6%)	2/50 (4%)	7/50 (14%)	33/49 (67%)
POLY-3 RATE (b)	3/45.93	2/47.72	7/47.87	33/43.75
POLY-3 PERCENT (g)	6.5%	4.2%	14.6%	75.4%
TERMINAL (d)	0/36 (0%)	1/40 (3%)	5/42 (12%)	11/17 (65%)
FIRST INCIDENCE	593	697	592	252
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.483N	P=0.175	P<0.001**
POLY 1.5	P<0.001**	P=0.487N	P=0.171	P<0.001**
POLY 6	P<0.001**	P=0.478N	P=0.181	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.500N	P=0.159	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.312N	P=0.106	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Bone				
Fibro-osseous Lesion				
LESION RATES				
OVERALL (a)	13/50 (26%)	12/50 (24%)	17/50 (34%)	3/50 (6%)
POLY-3 RATE (b)	13/45.73	12/47.59	17/47.78	3/31.98
POLY-3 PERCENT (g)	28.4%	25.2%	35.6%	9.4%
TERMINAL (d)	11/36 (31%)	12/40 (30%)	16/42 (38%)	3/17 (18%)
FIRST INCIDENCE	593	731 (T)	600	731 (T)
STATISTICAL TESTS				
POLY 3	P=0.131N	P=0.454N	P=0.302	P=0.041N*
POLY 1.5	P=0.067N	P=0.466N	P=0.289	P=0.022N*
POLY 6	P=0.211N	P=0.441N	P=0.320	P=0.068N
COCH-ARM / FISHERS	P=0.012N*	P=0.500N	P=0.257	P=0.006N**
MAX-ISO-POLY-3	P=0.081N	P=0.365N	P=0.235	P=0.040N*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Brain				
Infiltration Cellular Lymphocyte				
LESION RATES				
OVERALL (a)	2/50 (4%)	0/50 (0%)	2/50 (4%)	5/50 (10%)
POLY-3 RATE (b)	2/44.98	0/47.59	2/47.33	5/33.97
POLY-3 PERCENT (g)	4.5%	0%	4.2%	14.7%
TERMINAL (d)	2/36 (6%)	0/40 (0%)	2/42 (5%)	2/17 (12%)
FIRST INCIDENCE	731 (T)	---	731 (T)	267
STATISTICAL TESTS				
POLY 3	P=0.029*	P=0.225N	P=0.675N	P=0.120
POLY 1.5	P=0.033*	P=0.229N	P=0.681N	P=0.148
POLY 6	P=0.027*	P=0.220N	P=0.667N	P=0.098
COCH-ARM / FISHERS	P=0.049*	P=0.247N	P=0.691N	P=0.218
MAX-ISO-POLY-3	P=0.028*	P=0.076N	P=0.479N	P=0.082

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Esophagus: Periesophageal Tissue Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	9/50 (18%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	9/35.88
POLY-3 PERCENT (g)	0%	0%	0%	25.1%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	252
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Eye: Anterior Chamber Inflammation				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	4/50 (8%)	3/49 (6%)
POLY-3 RATE (b)	0/44.98	0/46.60	4/47.33	3/32.68
POLY-3 PERCENT (g)	0%	0%	8.5%	9.2%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	4/42 (10%)	1/17 (6%)
FIRST INCIDENCE	---	---	731 (T)	403
STATISTICAL TESTS				
POLY 3	P=0.012*	(e)	P=0.067	P=0.072
POLY 1.5	P=0.017*	(e)	P=0.065	P=0.084
POLY 6	P=0.009**	(e)	P=0.070	P=0.063
COCH-ARM / FISHERS	P=0.039*	(e)	P=0.059	P=0.117
MAX-ISO-POLY-3	P=0.018*	(e)	P=0.025*	P=0.036*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Eye: Cornea				
Inflammation Acute				
LESION RATES				
OVERALL (a)	1/50 (2%)	2/49 (4%)	20/50 (40%)	23/49 (47%)
POLY-3 RATE (b)	1/44.98	2/47.16	20/47.47	23/35.02
POLY-3 PERCENT (g)	2.2%	4.2%	42.1%	65.7%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	18/42 (43%)	12/17 (71%)
FIRST INCIDENCE	731 (T)	635	713	403
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.517	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P=0.508	P<0.001**	P<0.001**
POLY 6	P<0.001**	P=0.527	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.492	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.300	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Eye: Cornea Mineralization				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	13/50 (26%)	16/49 (33%)
POLY-3 RATE (b)	0/44.98	0/46.60	13/47.40	16/33.10
POLY-3 PERCENT (g)	0%	0%	27.4%	48.3%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	12/42 (29%)	10/17 (59%)
FIRST INCIDENCE	---	---	714	515
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Eye: Cornea				
Necrosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	6/49 (12%)
POLY-3 RATE (b)	0/44.98	0/46.60	0/47.33	6/32.97
POLY-3 PERCENT (g)	0%	0%	0%	18.2%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	1/17 (6%)
FIRST INCIDENCE	---	---	---	585
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P=0.005**
POLY 1.5	P<0.001**	(e)	(e)	P=0.007**
POLY 6	P<0.001**	(e)	(e)	P=0.004**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.012*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.004**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Eye: Cornea, Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	2/50 (4%)	2/49 (4%)	10/50 (20%)	9/49 (18%)
POLY-3 RATE (b)	2/44.98	2/47.16	10/47.41	9/31.33
POLY-3 PERCENT (g)	4.5%	4.2%	21.1%	28.7%
TERMINAL (d)	2/36 (6%)	0/40 (0%)	9/42 (21%)	6/17 (35%)
FIRST INCIDENCE	731 (T)	635	713	696
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.677N	P=0.017*	P=0.004**
POLY 1.5	P<0.001**	P=0.685N	P=0.016*	P=0.007**
POLY 6	P<0.001**	P=0.666N	P=0.019*	P=0.002**
COCH-ARM / FISHERS	P=0.006**	P=0.684	P=0.014*	P=0.023*
MAX-ISO-POLY-3	P<0.001**	P=0.480N	P=0.009**	P=0.004**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Eye: Cornea, Epithelium Ulcer				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	10/50 (20%)	10/49 (20%)
POLY-3 RATE (b)	0/44.98	0/46.60	10/47.47	10/32.77
POLY-3 PERCENT (g)	0%	0%	21.1%	30.5%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	8/42 (19%)	6/17 (35%)
FIRST INCIDENCE	---	---	713	403
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Eye: Lens				
Cataract				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	2/49 (4%)
POLY-3 RATE (b)	0/44.98	0/46.60	0/47.33	2/32.06
POLY-3 PERCENT (g)	0%	0%	0%	6.2%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	480
STATISTICAL TESTS				
POLY 3	P=0.037*	(e)	(e)	P=0.171
POLY 1.5	P=0.038*	(e)	(e)	P=0.189
POLY 6	P=0.037*	(e)	(e)	P=0.158
COCH-ARM / FISHERS	P=0.046*	(e)	(e)	P=0.242
MAX-ISO-POLY-3	P=0.031*	(e)	(e)	P=0.073

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Gallbladder Inflammation				
LESION RATES				
OVERALL (a)	0/42 (0%)	0/45 (0%)	0/45 (0%)	3/37 (8%)
POLY-3 RATE (b)	0/38.95	0/42.60	0/43.16	3/26.09
POLY-3 PERCENT (g)	0%	0%	0%	11.5%
TERMINAL (d)	0/33 (0%)	0/36 (0%)	0/39 (0%)	2/16 (13%)
FIRST INCIDENCE	---	---	---	547
STATISTICAL TESTS				
POLY 3	P=0.006**	(e)	(e)	P=0.061
POLY 1.5	P=0.006**	(e)	(e)	P=0.070
POLY 6	P=0.006**	(e)	(e)	P=0.054
COCH-ARM / FISHERS	P=0.007**	(e)	(e)	P=0.098
MAX-ISO-POLY-3	P=0.005**	(e)	(e)	P=0.031*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Harderian Gland Hyperplasia				
LESION RATES				
OVERALL (a)	2/50 (4%)	4/50 (8%)	1/50 (2%)	4/50 (8%)
POLY-3 RATE (b)	2/45.16	4/47.97	1/47.33	4/32.93
POLY-3 PERCENT (g)	4.4%	8.3%	2.1%	12.2%
TERMINAL (d)	1/36 (3%)	3/40 (8%)	1/42 (2%)	2/17 (12%)
FIRST INCIDENCE	684	625	731 (T)	480
STATISTICAL TESTS				
POLY 3	P=0.255	P=0.366	P=0.484N	P=0.207
POLY 1.5	P=0.279	P=0.357	P=0.489N	P=0.245
POLY 6	P=0.243	P=0.377	P=0.477N	P=0.178
COCH-ARM / FISHERS	P=0.352	P=0.339	P=0.500N	P=0.339
MAX-ISO-POLY-3	P=0.211	P=0.230	P=0.271N	P=0.139

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Heart				
Cardiomyopathy				
LESION RATES				
OVERALL (a)	4/50 (8%)	1/50 (2%)	2/50 (4%)	4/50 (8%)
POLY-3 RATE (b)	4/44.98	1/47.70	2/47.41	4/32.35
POLY-3 PERCENT (g)	8.9%	2.1%	4.2%	12.4%
TERMINAL (d)	4/36 (11%)	0/40 (0%)	1/42 (2%)	2/17 (12%)
FIRST INCIDENCE	731 (T)	703	713	655
STATISTICAL TESTS				
POLY 3	P=0.343	P=0.161N	P=0.313N	P=0.455
POLY 1.5	P=0.366	P=0.167N	P=0.321N	P=0.517
POLY 6	P=0.332	P=0.154N	P=0.302N	P=0.404
COCH-ARM / FISHERS	P=0.443	P=0.181N	P=0.339N	P=0.643N
MAX-ISO-POLY-3	P=0.235	P=0.079N	P=0.188N	P=0.337

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Heart Inflammation Acute				
LESION RATES				
OVERALL (a)	2/50 (4%)	0/50 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	2/45.64	0/47.59	0/47.33	2/32.95
POLY-3 PERCENT (g)	4.4%	0%	0%	6.1%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	1/17 (6%)
FIRST INCIDENCE	587	---	---	225
STATISTICAL TESTS				
POLY 3	P=0.480	P=0.228N	P=0.229N	P=0.571
POLY 1.5	P=0.482	P=0.231N	P=0.231N	P=0.615
POLY 6	P=0.485	P=0.225N	P=0.226N	P=0.529
COCH-ARM / FISHERS	P=0.505	P=0.247N	P=0.247N	P=0.691N
MAX-ISO-POLY-3	P=0.218	P=0.076N	P=0.076N	P=0.387

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Heart Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/50 (0%)	2/50 (4%)	1/50 (2%)	7/50 (14%)
POLY-3 RATE (b)	0/44.98	2/47.59	1/47.40	7/36.66
POLY-3 PERCENT (g)	0%	4.2%	2.1%	19.1%
TERMINAL (d)	0/36 (0%)	2/40 (5%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	731 (T)	714	252
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.250	P=0.510	P=0.003**
POLY 1.5	P<0.001**	P=0.246	P=0.507	P=0.004**
POLY 6	P<0.001**	P=0.255	P=0.515	P=0.002**
COCH-ARM / FISHERS	P=0.002**	P=0.247	P=0.500	P=0.006**
MAX-ISO-POLY-3	P<0.001**	P=0.088	P=0.172	P=0.002**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Heart Necrosis				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/50 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	1/44.98	0/47.59	0/47.33	2/33.16
POLY-3 PERCENT (g)	2.2%	0%	0%	6%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	---	---	267
STATISTICAL TESTS				
POLY 3	P=0.226	P=0.489N	P=0.490N	P=0.396
POLY 1.5	P=0.229	P=0.492N	P=0.493N	P=0.430
POLY 6	P=0.227	P=0.484N	P=0.485N	P=0.368
COCH-ARM / FISHERS	P=0.249	P=0.500N	P=0.500N	P=0.500
MAX-ISO-POLY-3	P=0.114	P=0.158N	P=0.158N	P=0.230

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Heart				
Polyarteritis				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/50 (0%)	0/50 (0%)	3/50 (6%)
POLY-3 RATE (b)	1/44.98	0/47.59	0/47.33	3/32.72
POLY-3 PERCENT (g)	2.2%	0%	0%	9.2%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	0/42 (0%)	2/17 (12%)
FIRST INCIDENCE	731 (T)	---	---	466
STATISTICAL TESTS				
POLY 3	P=0.077	P=0.489N	P=0.490N	P=0.204
POLY 1.5	P=0.077	P=0.492N	P=0.493N	P=0.234
POLY 6	P=0.080	P=0.484N	P=0.485N	P=0.180
COCH-ARM / FISHERS	P=0.087	P=0.500N	P=0.500N	P=0.309
MAX-ISO-POLY-3	P=0.034*	P=0.158N	P=0.158N	P=0.122

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Intestine Large, Cecum Inflammation				
LESION RATES				
OVERALL (a)	2/47 (4%)	0/49 (0%)	2/50 (4%)	0/41 (0%)
POLY-3 RATE (b)	2/43.86	0/46.60	2/47.33	0/26.90
POLY-3 PERCENT (g)	4.6%	0%	4.2%	0%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	2/42 (5%)	0/17 (0%)
FIRST INCIDENCE	593	---	731 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.339N	P=0.224N	P=0.666N	P=0.357N
POLY 1.5	P=0.319N	P=0.224N	P=0.666N	P=0.327N
POLY 6	P=0.353N	P=0.223N	P=0.666N	P=0.381N
COCH-ARM / FISHERS	P=0.269N	P=0.237N	P=0.668N	P=0.282N
MAX-ISO-POLY-3	P=0.281N	P=0.074N	P=0.469N	P=0.182N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Intestine Small, Duodenum Inflammation				
LESION RATES				
OVERALL (a)	1/47 (2%)	2/48 (4%)	0/49 (0%)	0/38 (0%)
POLY-3 RATE (b)	1/43.09	2/45.93	0/46.83	0/26.51
POLY-3 PERCENT (g)	2.3%	4.4%	0%	0%
TERMINAL (d)	0/36 (0%)	1/40 (3%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	653	674	---	---
STATISTICAL TESTS				
POLY 3	P=0.228N	P=0.522	P=0.483N	P=0.594N
POLY 1.5	P=0.228N	P=0.518	P=0.486N	P=0.577N
POLY 6	P=0.226N	P=0.526	P=0.481N	P=0.607N
COCH-ARM / FISHERS	P=0.221N	P=0.508	P=0.490N	P=0.553N
MAX-ISO-POLY-3	P=0.341N	P=0.304	P=0.156N	P=0.258N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Intestine Small, Ileum Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	0/47 (0%)	1/48 (2%)	1/49 (2%)	0/39 (0%)
POLY-3 RATE (b)	0/43.40	1/45.71	1/46.83	0/26.61
POLY-3 PERCENT (g)	0%	2.2%	2.1%	0%
TERMINAL (d)	0/36 (0%)	1/40 (3%)	1/42 (2%)	0/17 (0%)
FIRST INCIDENCE	---	731 (T)	731 (T)	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Intestine Small, Ileum Inflammation				
LESION RATES				
OVERALL (a)	1/47 (2%)	0/48 (0%)	0/49 (0%)	0/39 (0%)
POLY-3 RATE (b)	1/43.86	0/45.71	0/46.83	0/26.61
POLY-3 PERCENT (g)	2.3%	0%	0%	0%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	593	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Islets, Pancreatic Hyperplasia				
LESION RATES				
OVERALL (a)	0/49 (0%)	1/50 (2%)	0/49 (0%)	0/48 (0%)
POLY-3 RATE (b)	0/44.23	1/47.60	0/46.80	0/31.77
POLY-3 PERCENT (g)	0%	2.1%	0%	0%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	728	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Kidney Cyst				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/50 (0%)	0/50 (0%)	0/49 (0%)
POLY-3 RATE (b)	1/44.98	0/47.59	0/47.33	0/31.95
POLY-3 PERCENT (g)	2.2%	0%	0%	0%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Kidney				
Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	1/50 (2%)	3/50 (6%)	3/50 (6%)	0/49 (0%)
POLY-3 RATE (b)	1/44.98	3/47.59	3/47.33	0/31.95
POLY-3 PERCENT (g)	2.2%	6.3%	6.3%	0%
TERMINAL (d)	1/36 (3%)	3/40 (8%)	3/42 (7%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	731 (T)	731 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.449N	P=0.326	P=0.324	P=0.566N
POLY 1.5	P=0.395N	P=0.319	P=0.318	P=0.546N
POLY 6	P=0.496N	P=0.334	P=0.332	P=0.585N
COCH-ARM / FISHERS	P=0.289N	P=0.309	P=0.309	P=0.505N
MAX-ISO-POLY-3	P=0.306N	P=0.175	P=0.173	P=0.238N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Kidney Infarct				
LESION RATES				
OVERALL (a)	0/50 (0%)	3/50 (6%)	3/50 (6%)	2/49 (4%)
POLY-3 RATE (b)	0/44.98	3/47.59	3/47.33	2/31.95
POLY-3 PERCENT (g)	0%	6.3%	6.3%	6.3%
TERMINAL (d)	0/36 (0%)	3/40 (8%)	3/42 (7%)	2/17 (12%)
FIRST INCIDENCE	---	731 (T)	731 (T)	731 (T)
STATISTICAL TESTS				
POLY 3	P=0.153	P=0.129	P=0.128	P=0.170
POLY 1.5	P=0.194	P=0.126	P=0.125	P=0.190
POLY 6	P=0.123	P=0.133	P=0.132	P=0.155
COCH-ARM / FISHERS	P=0.300	P=0.121	P=0.121	P=0.242
MAX-ISO-POLY-3	P=0.240	P=0.047*	P=0.046*	P=0.073

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Kidney Inflammation				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	1/49 (2%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	1/31.95
POLY-3 PERCENT (g)	0%	0%	0%	3.1%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	1/17 (6%)
FIRST INCIDENCE	---	---	---	731 (T)
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Kidney				
Metaplasia Osseous				
LESION RATES				
OVERALL (a)	1/50 (2%)	1/50 (2%)	1/50 (2%)	0/49 (0%)
POLY-3 RATE (b)	1/44.98	1/47.97	1/47.33	0/31.95
POLY-3 PERCENT (g)	2.2%	2.1%	2.1%	0%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	1/42 (2%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	625	731 (T)	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Kidney Nephropathy				
LESION RATES				
OVERALL (a)	14/50 (28%)	15/50 (30%)	6/50 (12%)	6/49 (12%)
POLY-3 RATE (b)	14/46.01	15/49.39	6/47.73	6/33.81
POLY-3 PERCENT (g)	30.4%	30.4%	12.6%	17.8%
TERMINAL (d)	10/36 (28%)	10/40 (25%)	4/42 (10%)	0/17 (0%)
FIRST INCIDENCE	590	561	639	480
STATISTICAL TESTS				
POLY 3	P=0.040N*	P=0.585N	P=0.029N*	P=0.154N
POLY 1.5	P=0.028N*	P=0.560	P=0.032N*	P=0.105N
POLY 6	P=0.049N*	P=0.549N	P=0.027N*	P=0.205N
COCH-ARM / FISHERS	P=0.011N*	P=0.500	P=0.039N*	P=0.044N*
MAX-ISO-POLY-3	P=0.061N	P=0.497N	P=0.018N*	P=0.130N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx Inflammation				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/50 (0%)	0/50 (0%)	0/49 (0%)
POLY-3 RATE (b)	0/44.46	0/47.59	0/47.33	0/31.80
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx				
Inflammation Chronic				
LESION RATES				
OVERALL (a)	4/49 (8%)	5/50 (10%)	22/50 (44%)	36/49 (73%)
POLY-3 RATE (b)	4/45.18	5/47.82	22/49.16	36/39.11
POLY-3 PERCENT (g)	8.9%	10.5%	44.8%	92%
TERMINAL (d)	1/36 (3%)	3/40 (8%)	16/42 (38%)	16/17 (94%)
FIRST INCIDENCE	653	674	581	424
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.535	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P=0.530	P<0.001**	P<0.001**
POLY 6	P<0.001**	P=0.540	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.513	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.398	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx: Lumen Exudate				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/50 (0%)	0/50 (0%)	4/49 (8%)
POLY-3 RATE (b)	0/44.46	0/47.59	0/47.33	4/33.43
POLY-3 PERCENT (g)	0%	0%	0%	12%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	559
STATISTICAL TESTS				
POLY 3	P=0.002**	(e)	(e)	P=0.032*
POLY 1.5	P=0.002**	(e)	(e)	P=0.039*
POLY 6	P=0.002**	(e)	(e)	P=0.028*
COCH-ARM / FISHERS	P=0.003**	(e)	(e)	P=0.059
MAX-ISO-POLY-3	P=0.002**	(e)	(e)	P=0.018*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx: Respiratory Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/50 (0%)	4/50 (8%)	1/49 (2%)
POLY-3 RATE (b)	0/44.46	0/47.59	4/47.33	1/31.80
POLY-3 PERCENT (g)	0%	0%	8.5%	3.1%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	4/42 (10%)	1/17 (6%)
FIRST INCIDENCE	---	---	731 (T)	731 (T)
STATISTICAL TESTS				
POLY 3	P=0.093	(e)	P=0.069	P=0.435
POLY 1.5	P=0.133	(e)	P=0.067	P=0.456
POLY 6	P=0.065	(e)	P=0.071	P=0.416
COCH-ARM / FISHERS	P=0.247	(e)	P=0.061	P=0.500
MAX-ISO-POLY-3	P=0.147	(e)	P=0.025*	P=0.158

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx: Respiratory Epithelium Metaplasia				
LESION RATES				
OVERALL (a)	2/49 (4%)	0/50 (0%)	6/50 (12%)	48/49 (98%)
POLY-3 RATE (b)	2/44.64	0/47.59	6/47.67	48/48.77
POLY-3 PERCENT (g)	4.5%	0%	12.6%	98.4%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	5/42 (12%)	17/17 (100%)
FIRST INCIDENCE	684	---	639	225
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.223N	P=0.155	P<0.001**
POLY 1.5	P<0.001**	P=0.226N	P=0.151	P<0.001**
POLY 6	P<0.001**	P=0.220N	P=0.162	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.242N	P=0.141	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.075N	P=0.089	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx: Respiratory Epithelium Necrosis				
LESION RATES				
OVERALL (a)	1/49 (2%)	1/50 (2%)	14/50 (28%)	32/49 (65%)
POLY-3 RATE (b)	1/44.75	1/47.81	14/48.59	32/41.11
POLY-3 PERCENT (g)	2.2%	2.1%	28.8%	77.8%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	10/42 (24%)	11/17 (65%)
FIRST INCIDENCE	653	674	592	225
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.746N	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P=0.749N	P<0.001**	P<0.001**
POLY 6	P<0.001**	P=0.742N	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.747N	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.481N	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx: Respiratory Epithelium Regeneration				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/50 (0%)	3/50 (6%)	30/49 (61%)
POLY-3 RATE (b)	0/44.46	0/47.59	3/47.33	30/43.77
POLY-3 PERCENT (g)	0%	0%	6.3%	68.5%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	3/42 (7%)	14/17 (82%)
FIRST INCIDENCE	---	---	731 (T)	225
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P=0.130	P<0.001**
POLY 1.5	P<0.001**	(e)	P=0.128	P<0.001**
POLY 6	P<0.001**	(e)	P=0.133	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P=0.125	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P=0.047*	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Larynx: Squamous Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	4/49 (8%)	13/50 (26%)	34/50 (68%)	40/49 (82%)
POLY-3 RATE (b)	4/45.68	13/48.72	34/50.00	40/43.58
POLY-3 PERCENT (g)	8.8%	26.7%	68%	91.8%
TERMINAL (d)	1/36 (3%)	7/40 (18%)	26/42 (62%)	16/17 (94%)
FIRST INCIDENCE	499	635	581	225
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.021*	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P=0.020*	P<0.001**	P<0.001**
POLY 6	P<0.001**	P=0.023*	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.017*	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.012*	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Liver				
Basophilic Focus				
LESION RATES				
OVERALL (a)	1/50 (2%)	3/50 (6%)	3/50 (6%)	1/50 (2%)
POLY-3 RATE (b)	1/44.98	3/47.59	3/47.83	1/31.98
POLY-3 PERCENT (g)	2.2%	6.3%	6.3%	3.1%
TERMINAL (d)	1/36 (3%)	3/40 (8%)	2/42 (5%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	731 (T)	581	730
STATISTICAL TESTS				
POLY 3	P=0.477	P=0.326	P=0.328	P=0.679
POLY 1.5	P=0.545	P=0.319	P=0.320	P=0.707
POLY 6	P=0.423	P=0.334	P=0.338	P=0.652
COCH-ARM / FISHERS	P=0.504N	P=0.309	P=0.309	P=0.753N
MAX-ISO-POLY-3	P=0.475	P=0.175	P=0.177	P=0.417

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Liver				
Clear Cell Focus				
LESION RATES				
OVERALL (a)	1/50 (2%)	7/50 (14%)	3/50 (6%)	0/50 (0%)
POLY-3 RATE (b)	1/44.98	7/47.59	3/47.78	0/31.98
POLY-3 PERCENT (g)	2.2%	14.7%	6.3%	0%
TERMINAL (d)	1/36 (3%)	7/40 (18%)	2/42 (5%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	731 (T)	600	---
STATISTICAL TESTS				
POLY 3	P=0.291N	P=0.037*	P=0.327	P=0.566N
POLY 1.5	P=0.236N	P=0.035*	P=0.320	P=0.545N
POLY 6	P=0.338N	P=0.039*	P=0.338	P=0.585N
COCH-ARM / FISHERS	P=0.143N	P=0.030*	P=0.309	P=0.500N
MAX-ISO-POLY-3	P=0.171N	P=0.018*	P=0.177	P=0.239N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Liver Cyst				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/50 (0%)	1/50 (2%)	2/50 (4%)
POLY-3 RATE (b)	1/44.98	0/47.59	1/47.33	2/32.26
POLY-3 PERCENT (g)	2.2%	0%	2.1%	6.2%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	1/42 (2%)	1/17 (6%)
FIRST INCIDENCE	731 (T)	---	731 (T)	656
STATISTICAL TESTS				
POLY 3	P=0.187	P=0.489N	P=0.749N	P=0.387
POLY 1.5	P=0.203	P=0.492N	P=0.753N	P=0.423
POLY 6	P=0.177	P=0.484N	P=0.744N	P=0.358
COCH-ARM / FISHERS	P=0.251	P=0.500N	P=0.753N	P=0.500
MAX-ISO-POLY-3	P=0.190	P=0.158N	P=0.485N	P=0.226

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Liver				
Eosinophilic Focus				
LESION RATES				
OVERALL (a)	4/50 (8%)	4/50 (8%)	0/50 (0%)	1/50 (2%)
POLY-3 RATE (b)	4/45.46	4/47.59	0/47.33	1/32.63
POLY-3 PERCENT (g)	8.8%	8.4%	0%	3.1%
TERMINAL (d)	3/36 (8%)	4/40 (10%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	587	731 (T)	---	515
STATISTICAL TESTS				
POLY 3	P=0.076N	P=0.618N	P=0.055N	P=0.296N
POLY 1.5	P=0.073N	P=0.625N	P=0.057N	P=0.254N
POLY 6	P=0.075N	P=0.609N	P=0.053N	P=0.335N
COCH-ARM / FISHERS	P=0.061N	P=0.643N	P=0.059N	P=0.181N
MAX-ISO-POLY-3	P=0.119N	P=0.473N	P=0.019N*	P=0.194N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Liver Fatty Change				
LESION RATES				
OVERALL (a)	0/50 (0%)	1/50 (2%)	2/50 (4%)	0/50 (0%)
POLY-3 RATE (b)	0/44.98	1/47.81	2/48.17	0/31.98
POLY-3 PERCENT (g)	0%	2.1%	4.2%	0%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	674	600	---
STATISTICAL TESTS				
POLY 3	P=0.476	P=0.512	P=0.253	(e)
POLY 1.5	P=0.551	P=0.508	P=0.247	(e)
POLY 6	P=0.414	P=0.517	P=0.261	(e)
COCH-ARM / FISHERS	P=0.618N	P=0.500	P=0.247	(e)
MAX-ISO-POLY-3	P=0.412	P=0.174	P=0.091	(e)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Liver				
Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	0/50 (0%)	2/50 (4%)	4/50 (8%)	0/50 (0%)
POLY-3 RATE (b)	0/44.98	2/47.59	4/47.33	0/31.98
POLY-3 PERCENT (g)	0%	4.2%	8.5%	0%
TERMINAL (d)	0/36 (0%)	2/40 (5%)	4/42 (10%)	0/17 (0%)
FIRST INCIDENCE	---	731 (T)	731 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.385	P=0.250	P=0.067	(e)
POLY 1.5	P=0.479	P=0.246	P=0.065	(e)
POLY 6	P=0.307	P=0.255	P=0.070	(e)
COCH-ARM / FISHERS	P=0.558N	P=0.247	P=0.059	(e)
MAX-ISO-POLY-3	P=0.274	P=0.088	P=0.025*	(e)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Liver				
Mixed Cell Focus				
LESION RATES				
OVERALL (a)	2/50 (4%)	0/50 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	2/44.98	0/47.59	0/47.33	0/31.98
POLY-3 PERCENT (g)	4.5%	0%	0%	0%
TERMINAL (d)	2/36 (6%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	---	---	---
STATISTICAL TESTS				
POLY 3	P=0.090N	P=0.225N	P=0.226N	P=0.320N
POLY 1.5	P=0.100N	P=0.229N	P=0.230N	P=0.291N
POLY 6	P=0.081N	P=0.220N	P=0.221N	P=0.347N
COCH-ARM / FISHERS	P=0.112N	P=0.247N	P=0.247N	P=0.247N
MAX-ISO-POLY-3	P=0.118N	P=0.076N	P=0.076N	P=0.154N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Liver				
Tension Lipidosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	1/50 (2%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	1/32.12
POLY-3 PERCENT (g)	0%	0%	0%	3.1%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	696
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
Time Report Requested: 10:33:43
First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Liver: Hepatocyte Degeneration				
LESION RATES				
OVERALL (a)	0/50 (0%)	1/50 (2%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.98	1/47.94	0/47.33	0/31.98
POLY-3 PERCENT (g)	0%	2.1%	0%	0%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	635	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Liver: Hepatocyte Necrosis				
LESION RATES				
OVERALL (a)	3/50 (6%)	4/50 (8%)	1/50 (2%)	1/50 (2%)
POLY-3 RATE (b)	3/45.89	4/48.05	1/47.40	1/32.70
POLY-3 PERCENT (g)	6.5%	8.3%	2.1%	3.1%
TERMINAL (d)	0/36 (0%)	2/40 (5%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	590	635	714	480
STATISTICAL TESTS				
POLY 3	P=0.199N	P=0.525	P=0.294N	P=0.434N
POLY 1.5	P=0.182N	P=0.518	P=0.297N	P=0.390N
POLY 6	P=0.210N	P=0.533	P=0.290N	P=0.476N
COCH-ARM / FISHERS	P=0.139N	P=0.500	P=0.309N	P=0.309N
MAX-ISO-POLY-3	P=0.321N	P=0.373	P=0.150N	P=0.281N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung Inflammation				
LESION RATES				
OVERALL (a)	0/50 (0%)	1/50 (2%)	0/50 (0%)	5/50 (10%)
POLY-3 RATE (b)	0/44.98	1/47.94	0/47.33	5/33.61
POLY-3 PERCENT (g)	0%	2.1%	0%	14.9%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	635	---	585
STATISTICAL TESTS				
POLY 3	P=0.002**	P=0.513	(e)	P=0.013*
POLY 1.5	P=0.002**	P=0.508	(e)	P=0.017*
POLY 6	P=0.002**	P=0.518	(e)	P=0.011*
COCH-ARM / FISHERS	P=0.004**	P=0.500	(e)	P=0.028*
MAX-ISO-POLY-3	P=0.002**	P=0.174	(e)	P=0.009**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung Inflammation Chronic				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/50 (0%)	1/50 (2%)	2/50 (4%)
POLY-3 RATE (b)	1/45.23	0/47.59	1/47.40	2/32.96
POLY-3 PERCENT (g)	2.2%	0%	2.1%	6.1%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	663	---	714	346
STATISTICAL TESTS				
POLY 3	P=0.189	P=0.490N	P=0.750N	P=0.393
POLY 1.5	P=0.205	P=0.493N	P=0.753N	P=0.427
POLY 6	P=0.179	P=0.486N	P=0.746N	P=0.362
COCH-ARM / FISHERS	P=0.251	P=0.500N	P=0.753N	P=0.500
MAX-ISO-POLY-3	P=0.192	P=0.158N	P=0.486N	P=0.229

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung Thrombosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	0/31.98
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Alveolar Epithelium Hyperplasia Focal				
LESION RATES				
OVERALL (a)	3/50 (6%)	0/50 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	3/45.21	0/47.59	0/47.33	0/31.98
POLY-3 PERCENT (g)	6.6%	0%	0%	0%
TERMINAL (d)	2/36 (6%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	669	---	---	---
STATISTICAL TESTS				
POLY 3	P=0.035N*	P=0.110N	P=0.111N	P=0.194N
POLY 1.5	P=0.039N*	P=0.113N	P=0.113N	P=0.166N
POLY 6	P=0.031N*	P=0.107N	P=0.108N	P=0.222N
COCH-ARM / FISHERS	P=0.046N*	P=0.121N	P=0.121N	P=0.121N
MAX-ISO-POLY-3	P=0.054N	P=0.038N*	P=0.038N*	P=0.105N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Alveolus Infiltration Cellular Histiocyte				
LESION RATES				
OVERALL (a)	2/50 (4%)	3/50 (6%)	3/50 (6%)	4/50 (8%)
POLY-3 RATE (b)	2/45.54	3/47.97	3/47.33	4/33.62
POLY-3 PERCENT (g)	4.4%	6.3%	6.3%	11.9%
TERMINAL (d)	0/36 (0%)	2/40 (5%)	3/42 (7%)	1/17 (6%)
FIRST INCIDENCE	647	625	731 (T)	403
STATISTICAL TESTS				
POLY 3	P=0.159	P=0.524	P=0.518	P=0.212
POLY 1.5	P=0.188	P=0.517	P=0.513	P=0.249
POLY 6	P=0.139	P=0.531	P=0.523	P=0.182
COCH-ARM / FISHERS	P=0.272	P=0.500	P=0.500	P=0.339
MAX-ISO-POLY-3	P=0.231	P=0.348	P=0.342	P=0.142

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS

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

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Bronchiole, Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/50 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	1/44.98	0/47.59	0/47.33	2/31.98
POLY-3 PERCENT (g)	2.2%	0%	0%	6.3%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	0/42 (0%)	2/17 (12%)
FIRST INCIDENCE	731 (T)	---	---	731 (T)
STATISTICAL TESTS				
POLY 3	P=0.226	P=0.489N	P=0.490N	P=0.385
POLY 1.5	P=0.228	P=0.492N	P=0.493N	P=0.422
POLY 6	P=0.231	P=0.484N	P=0.485N	P=0.353
COCH-ARM / FISHERS	P=0.249	P=0.500N	P=0.500N	P=0.500
MAX-ISO-POLY-3	P=0.112	P=0.158N	P=0.158N	P=0.225

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Bronchus Inflammation				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	2/32.57
POLY-3 PERCENT (g)	0%	0%	0%	6.1%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	646
STATISTICAL TESTS				
POLY 3	P=0.038*	(e)	(e)	P=0.174
POLY 1.5	P=0.039*	(e)	(e)	P=0.192
POLY 6	P=0.038*	(e)	(e)	P=0.160
COCH-ARM / FISHERS	P=0.047*	(e)	(e)	P=0.247
MAX-ISO-POLY-3	P=0.032*	(e)	(e)	P=0.075

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Bronchus, Epithelium Degeneration				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	4/50 (8%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	4/33.70
POLY-3 PERCENT (g)	0%	0%	0%	11.9%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	1/17 (6%)
FIRST INCIDENCE	---	---	---	480
STATISTICAL TESTS				
POLY 3	P=0.002**	(e)	(e)	P=0.032*
POLY 1.5	P=0.002**	(e)	(e)	P=0.039*
POLY 6	P=0.002**	(e)	(e)	P=0.027*
COCH-ARM / FISHERS	P=0.003**	(e)	(e)	P=0.059
MAX-ISO-POLY-3	P=0.002**	(e)	(e)	P=0.018*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Bronchus, Epithelium Necrosis				
LESION RATES				
OVERALL (a)	2/50 (4%)	0/50 (0%)	0/50 (0%)	5/50 (10%)
POLY-3 RATE (b)	2/45.23	0/47.59	0/47.33	5/32.80
POLY-3 PERCENT (g)	4.4%	0%	0%	15.2%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	0/42 (0%)	2/17 (12%)
FIRST INCIDENCE	663	---	---	646
STATISTICAL TESTS				
POLY 3	P=0.035*	P=0.226N	P=0.227N	P=0.110
POLY 1.5	P=0.034*	P=0.229N	P=0.230N	P=0.138
POLY 6	P=0.037*	P=0.222N	P=0.223N	P=0.090
COCH-ARM / FISHERS	P=0.041*	P=0.247N	P=0.247N	P=0.218
MAX-ISO-POLY-3	P=0.008**	P=0.076N	P=0.076N	P=0.078

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Bronchus, Epithelium Regeneration				
LESION RATES				
OVERALL (a)	2/50 (4%)	0/50 (0%)	0/50 (0%)	38/50 (76%)
POLY-3 RATE (b)	2/45.23	0/47.59	0/47.33	38/44.56
POLY-3 PERCENT (g)	4.4%	0%	0%	85.3%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	0/42 (0%)	13/17 (77%)
FIRST INCIDENCE	663	---	---	252
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.226N	P=0.227N	P<0.001**
POLY 1.5	P<0.001**	P=0.229N	P=0.230N	P<0.001**
POLY 6	P<0.001**	P=0.222N	P=0.223N	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.247N	P=0.247N	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.076N	P=0.076N	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Bronchus, Smooth Muscle Mineralization				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	3/50 (6%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	3/32.23
POLY-3 PERCENT (g)	0%	0%	0%	9.3%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	1/17 (6%)
FIRST INCIDENCE	---	---	---	690
STATISTICAL TESTS				
POLY 3	P=0.009**	(e)	(e)	P=0.071
POLY 1.5	P=0.009**	(e)	(e)	P=0.084
POLY 6	P=0.010**	(e)	(e)	P=0.061
COCH-ARM / FISHERS	P=0.012*	(e)	(e)	P=0.121
MAX-ISO-POLY-3	P=0.009**	(e)	(e)	P=0.037*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Mediastinum Inflammation				
LESION RATES				
OVERALL (a)	0/50 (0%)	1/50 (2%)	1/50 (2%)	8/50 (16%)
POLY-3 RATE (b)	0/44.98	1/47.94	1/47.41	8/36.17
POLY-3 PERCENT (g)	0%	2.1%	2.1%	22.1%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	635	713	225
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.513	P=0.510	P<0.001**
POLY 1.5	P<0.001**	P=0.508	P=0.507	P=0.002**
POLY 6	P<0.001**	P=0.518	P=0.515	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.500	P=0.500	P=0.003**
MAX-ISO-POLY-3	P<0.001**	P=0.174	P=0.172	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Mediastinum Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	1/50 (2%)	7/50 (14%)
POLY-3 RATE (b)	0/44.98	0/47.59	1/47.40	7/35.96
POLY-3 PERCENT (g)	0%	0%	2.1%	19.5%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	1/17 (6%)
FIRST INCIDENCE	---	---	714	252
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P=0.510	P=0.003**
POLY 1.5	P<0.001**	(e)	P=0.507	P=0.004**
POLY 6	P<0.001**	(e)	P=0.515	P=0.002**
COCH-ARM / FISHERS	P<0.001**	(e)	P=0.500	P=0.006**
MAX-ISO-POLY-3	P<0.001**	(e)	P=0.172	P=0.002**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Pleura Inflammation				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	5/50 (10%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	5/36.63
POLY-3 PERCENT (g)	0%	0%	0%	13.7%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	252
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P=0.017*
POLY 1.5	P<0.001**	(e)	(e)	P=0.021*
POLY 6	P<0.001**	(e)	(e)	P=0.013*
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.028*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.009**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lung: Submucosa, Bronchus Fibrosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	5/50 (10%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	5/33.48
POLY-3 PERCENT (g)	0%	0%	0%	14.9%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	2/17 (12%)
FIRST INCIDENCE	---	---	---	252
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P=0.013*
POLY 1.5	P<0.001**	(e)	(e)	P=0.017*
POLY 6	P<0.001**	(e)	(e)	P=0.010**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.028*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.009**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Bronchial Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	5/40 (13%)	7/42 (17%)	4/43 (9%)	1/43 (2%)
POLY-3 RATE (b)	5/36.62	7/41.34	4/40.78	1/27.83
POLY-3 PERCENT (g)	13.7%	16.9%	9.8%	3.6%
TERMINAL (d)	5/30 (17%)	6/37 (16%)	4/36 (11%)	1/14 (7%)
FIRST INCIDENCE	731 (T)	690	731 (T)	731 (T)
STATISTICAL TESTS				
POLY 3	P=0.105N	P=0.466	P=0.432N	P=0.177N
POLY 1.5	P=0.077N	P=0.448	P=0.438N	P=0.138N
POLY 6	P=0.135N	P=0.491	P=0.424N	P=0.222N
COCH-ARM / FISHERS	P=0.037N*	P=0.414	P=0.453N	P=0.085N
MAX-ISO-POLY-3	P=0.166N	P=0.351	P=0.307N	P=0.118N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Bronchial Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/40 (0%)	0/42 (0%)	0/43 (0%)	5/43 (12%)
POLY-3 RATE (b)	0/36.62	0/41.18	0/40.78	5/30.96
POLY-3 PERCENT (g)	0%	0%	0%	16.2%
TERMINAL (d)	0/30 (0%)	0/37 (0%)	0/36 (0%)	0/14 (0%)
FIRST INCIDENCE	---	---	---	252
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P=0.018*
POLY 1.5	P<0.001**	(e)	(e)	P=0.023*
POLY 6	P<0.001**	(e)	(e)	P=0.014*
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.033*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.009**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Bronchial Pigmentation				
LESION RATES				
OVERALL (a)	0/40 (0%)	0/42 (0%)	0/43 (0%)	0/43 (0%)
POLY-3 RATE (b)	0/36.62	0/41.18	0/40.78	0/27.83
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/30 (0%)	0/37 (0%)	0/36 (0%)	0/14 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mandibular Ectasia				
LESION RATES				
OVERALL (a)	0/39 (0%)	1/47 (2%)	0/45 (0%)	3/39 (8%)
POLY-3 RATE (b)	0/36.01	1/44.76	0/42.67	3/25.62
POLY-3 PERCENT (g)	0%	2.2%	0%	11.7%
TERMINAL (d)	0/29 (0%)	1/39 (3%)	0/38 (0%)	2/15 (13%)
FIRST INCIDENCE	---	731 (T)	---	698
STATISTICAL TESTS				
POLY 3	P=0.027*	P=0.543	(e)	P=0.068
POLY 1.5	P=0.027*	P=0.541	(e)	P=0.081
POLY 6	P=0.027*	P=0.547	(e)	P=0.060
COCH-ARM / FISHERS	P=0.035*	P=0.547	(e)	P=0.120
MAX-ISO-POLY-3	P=0.017*	P=0.200	(e)	P=0.035*

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
Time Report Requested: 10:33:43
First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mandibular Hematopoietic Cell Proliferation				
LESION RATES				
OVERALL (a)	0/39 (0%)	0/47 (0%)	2/45 (4%)	1/39 (3%)
POLY-3 RATE (b)	0/36.01	0/44.76	2/42.73	1/25.65
POLY-3 PERCENT (g)	0%	0%	4.7%	3.9%
TERMINAL (d)	0/29 (0%)	0/39 (0%)	1/38 (3%)	0/15 (0%)
FIRST INCIDENCE	---	---	714	690
STATISTICAL TESTS				
POLY 3	P=0.123	(e)	P=0.276	P=0.434
POLY 1.5	P=0.151	(e)	P=0.273	P=0.453
POLY 6	P=0.105	(e)	P=0.281	P=0.420
COCH-ARM / FISHERS	P=0.231	(e)	P=0.284	P=0.500
MAX-ISO-POLY-3	P=0.197	(e)	P=0.105	P=0.158

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mandibular Hyperplasia				
LESION RATES				
OVERALL (a)	0/39 (0%)	0/47 (0%)	0/45 (0%)	2/39 (5%)
POLY-3 RATE (b)	0/36.01	0/44.76	0/42.67	2/26.60
POLY-3 PERCENT (g)	0%	0%	0%	7.5%
TERMINAL (d)	0/29 (0%)	0/39 (0%)	0/38 (0%)	0/15 (0%)
FIRST INCIDENCE	---	---	---	271
STATISTICAL TESTS				
POLY 3	P=0.032*	(e)	(e)	P=0.176
POLY 1.5	P=0.033*	(e)	(e)	P=0.193
POLY 6	P=0.032*	(e)	(e)	P=0.164
COCH-ARM / FISHERS	P=0.039*	(e)	(e)	P=0.247
MAX-ISO-POLY-3	P=0.025*	(e)	(e)	P=0.074

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mandibular Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	4/39 (10%)	5/47 (11%)	12/45 (27%)	12/39 (31%)
POLY-3 RATE (b)	4/36.01	5/44.87	12/42.81	12/27.96
POLY-3 PERCENT (g)	11.1%	11.1%	28%	42.9%
TERMINAL (d)	4/29 (14%)	4/39 (10%)	10/38 (26%)	8/15 (53%)
FIRST INCIDENCE	731 (T)	703	713	346
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.636	P=0.055	P=0.003**
POLY 1.5	P<0.001**	P=0.627	P=0.052	P=0.006**
POLY 6	P<0.001**	P=0.628N	P=0.060	P=0.002**
COCH-ARM / FISHERS	P=0.005**	P=0.619	P=0.050*	P=0.024*
MAX-ISO-POLY-3	P<0.001**	P=0.497	P=0.036*	P=0.003**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mandibular Infiltration Cellular Plasma Cell				
LESION RATES				
OVERALL (a)	1/39 (3%)	0/47 (0%)	0/45 (0%)	5/39 (13%)
POLY-3 RATE (b)	1/36.01	0/44.76	0/42.67	5/28.33
POLY-3 PERCENT (g)	2.8%	0%	0%	17.7%
TERMINAL (d)	1/29 (3%)	0/39 (0%)	0/38 (0%)	1/15 (7%)
FIRST INCIDENCE	731 (T)	---	---	252
STATISTICAL TESTS				
POLY 3	P=0.004**	P=0.457N	P=0.466N	P=0.054
POLY 1.5	P=0.004**	P=0.459N	P=0.468N	P=0.065
POLY 6	P=0.005**	P=0.453N	P=0.462N	P=0.046*
COCH-ARM / FISHERS	P=0.006**	P=0.453N	P=0.464N	P=0.100
MAX-ISO-POLY-3	P=0.002**	P=0.146N	P=0.149N	P=0.033*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mediastinal Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	1/40 (3%)	2/38 (5%)	2/41 (5%)	1/33 (3%)
POLY-3 RATE (b)	1/36.76	2/35.97	2/38.78	1/20.20
POLY-3 PERCENT (g)	2.7%	5.6%	5.2%	5%
TERMINAL (d)	1/30 (3%)	2/30 (7%)	2/34 (6%)	1/11 (9%)
FIRST INCIDENCE	731 (T)	731 (T)	731 (T)	731 (T)
STATISTICAL TESTS				
POLY 3	P=0.422	P=0.492	P=0.519	P=0.616
POLY 1.5	P=0.475	P=0.488	P=0.514	P=0.648
POLY 6	P=0.394	P=0.498	P=0.525	P=0.587
COCH-ARM / FISHERS	P=0.607	P=0.481	P=0.509	P=0.703
MAX-ISO-POLY-3	P=0.586	P=0.274	P=0.300	P=0.367

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mediastinal Infiltration Cellular Plasma Cell				
LESION RATES				
OVERALL (a)	0/40 (0%)	0/38 (0%)	0/41 (0%)	0/33 (0%)
POLY-3 RATE (b)	0/36.76	0/35.97	0/38.78	0/20.20
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/30 (0%)	0/30 (0%)	0/34 (0%)	0/11 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mediastinal Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/40 (0%)	0/38 (0%)	0/41 (0%)	2/33 (6%)
POLY-3 RATE (b)	0/36.76	0/35.97	0/38.78	2/21.80
POLY-3 PERCENT (g)	0%	0%	0%	9.2%
TERMINAL (d)	0/30 (0%)	0/30 (0%)	0/34 (0%)	0/11 (0%)
FIRST INCIDENCE	---	---	---	271
STATISTICAL TESTS				
POLY 3	P=0.029*	(e)	(e)	P=0.138
POLY 1.5	P=0.029*	(e)	(e)	P=0.153
POLY 6	P=0.030*	(e)	(e)	P=0.127
COCH-ARM / FISHERS	P=0.034*	(e)	(e)	P=0.201
MAX-ISO-POLY-3	P=0.021*	(e)	(e)	P=0.063

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
Time Report Requested: 10:33:43
First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mesenteric Hematopoietic Cell Proliferation				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/50 (0%)	0/50 (0%)	2/45 (4%)
POLY-3 RATE (b)	0/44.28	0/47.59	0/47.33	2/30.29
POLY-3 PERCENT (g)	0%	0%	0%	6.6%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/16 (0%)
FIRST INCIDENCE	---	---	---	480
STATISTICAL TESTS				
POLY 3	P=0.033*	(e)	(e)	P=0.163
POLY 1.5	P=0.034*	(e)	(e)	P=0.179
POLY 6	P=0.033*	(e)	(e)	P=0.150
COCH-ARM / FISHERS	P=0.039*	(e)	(e)	P=0.226
MAX-ISO-POLY-3	P=0.026*	(e)	(e)	P=0.070

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node, Mesenteric Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	2/49 (4%)	1/50 (2%)	2/50 (4%)	1/45 (2%)
POLY-3 RATE (b)	2/44.52	1/47.59	2/47.40	1/29.97
POLY-3 PERCENT (g)	4.5%	2.1%	4.2%	3.3%
TERMINAL (d)	1/36 (3%)	1/40 (3%)	1/42 (2%)	0/16 (0%)
FIRST INCIDENCE	669	731 (T)	714	559
STATISTICAL TESTS				
POLY 3	P=0.554N	P=0.477N	P=0.671N	P=0.633N
POLY 1.5	P=0.533N	P=0.481N	P=0.675N	P=0.600N
POLY 6	P=0.567N	P=0.472N	P=0.666N	P=0.660N
COCH-ARM / FISHERS	P=0.474N	P=0.492N	P=0.684N	P=0.532N
MAX-ISO-POLY-3	P=0.633N	P=0.267N	P=0.474N	P=0.416N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node: Deep Cervical Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	0/11 (0%)	0/10 (0%)	1/11 (9%)	4/7 (57%)
POLY-3 RATE (b)	0/9.64	0/9.65	1/10.14	4/5.99
POLY-3 PERCENT (g)	0%	0%	9.9%	66.8%
TERMINAL (d)	0/5 (0%)	0/8 (0%)	1/9 (11%)	4/5 (80%)
FIRST INCIDENCE	---	---	731 (T)	731 (T)
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P=0.510	P<0.001**
POLY 1.5	P<0.001**	(e)	P=0.505	P<0.001**
POLY 6	P<0.001**	(e)	P=0.521	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P=0.500	P=0.011*
MAX-ISO-POLY-3	P<0.001**	(e)	P=0.170	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Lymph Node: Renal Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	2/11 (18%)	1/10 (10%)	0/11 (0%)	0/7 (0%)
POLY-3 RATE (b)	2/9.82	1/9.81	0/10.14	0/5.99
POLY-3 PERCENT (g)	20.4%	10.2%	0%	0%
TERMINAL (d)	1/5 (20%)	0/8 (0%)	0/9 (0%)	0/5 (0%)
FIRST INCIDENCE	684	690	---	---
STATISTICAL TESTS				
POLY 3	P=0.127N	P=0.501N	P=0.218N	P=0.347N
POLY 1.5	P=0.128N	P=0.516N	P=0.223N	P=0.351N
POLY 6	P=0.127N	P=0.475N	P=0.209N	P=0.329N
COCH-ARM / FISHERS	P=0.127N	P=0.538N	P=0.238N	P=0.359N
MAX-ISO-POLY-3	P=0.177N	P=0.278N	P=0.066N	P=0.150N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Mesentery: Fat Necrosis				
LESION RATES				
OVERALL (a)	4/6 (67%)	9/10 (90%)	4/4 (100%)	0/1 (0%)
POLY-3 RATE (b)	4/5.53	9/10.00	4/4.00	0/0.57
POLY-3 PERCENT (g)	72.4%	90%	100%	0%
TERMINAL (d)	2/3 (67%)	7/8 (88%)	4/4 (100%)	0/0 (0%)
FIRST INCIDENCE	653	625	731 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.514	P=0.428	P=0.395	P=0.620N
POLY 1.5	P=0.685	P=0.374	P=0.356	P=0.532N
POLY 6	P=0.380	P=0.506	P=0.460	P=0.752N
COCH-ARM / FISHERS	P=0.553N	P=0.304	P=0.333	P=0.429N
MAX-ISO-POLY-3	P=0.231N	P=0.219	P=0.127	P=0.258N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose				
Foreign Body				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	3/50 (6%)	3/50 (6%)
POLY-3 RATE (b)	0/44.98	0/47.59	3/47.33	3/32.88
POLY-3 PERCENT (g)	0%	0%	6.3%	9.1%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	3/42 (7%)	1/17 (6%)
FIRST INCIDENCE	---	---	731 (T)	466
STATISTICAL TESTS				
POLY 3	P=0.013*	(e)	P=0.128	P=0.073
POLY 1.5	P=0.017*	(e)	P=0.125	P=0.086
POLY 6	P=0.010**	(e)	P=0.132	P=0.064
COCH-ARM / FISHERS	P=0.035*	(e)	P=0.121	P=0.121
MAX-ISO-POLY-3	P=0.019*	(e)	P=0.046*	P=0.037*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose Inflammation				
LESION RATES				
OVERALL (a)	3/50 (6%)	20/50 (40%)	50/50 (100%)	50/50 (100%)
POLY-3 RATE (b)	3/45.50	20/48.37	50/50.00	50/50.00
POLY-3 PERCENT (g)	6.6%	41.4%	100%	100%
TERMINAL (d)	1/36 (3%)	16/40 (40%)	42/42 (100%)	17/17 (100%)
FIRST INCIDENCE	653	625	581	225
STATISTICAL TESTS				
POLY 3	P<0.001**	P<0.001**	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P<0.001**	P<0.001**	P<0.001**
POLY 6	P<0.001**	P<0.001**	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P<0.001**	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P<0.001**	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Glands, Respiratory Epithelium Cyst				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	2/32.07
POLY-3 PERCENT (g)	0%	0%	0%	6.2%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	1/17 (6%)
FIRST INCIDENCE	---	---	---	708
STATISTICAL TESTS				
POLY 3	P=0.038*	(e)	(e)	P=0.171
POLY 1.5	P=0.039*	(e)	(e)	P=0.191
POLY 6	P=0.038*	(e)	(e)	P=0.156
COCH-ARM / FISHERS	P=0.047*	(e)	(e)	P=0.247
MAX-ISO-POLY-3	P=0.032*	(e)	(e)	P=0.074

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Lamina Propria Fibrosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	47/50 (94%)	49/50 (98%)
POLY-3 RATE (b)	0/44.98	0/47.59	47/49.06	49/50.00
POLY-3 PERCENT (g)	0%	0%	95.8%	98%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	41/42 (98%)	16/17 (94%)
FIRST INCIDENCE	---	---	592	225
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Lateral Wall Inflammation Chronic				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/50 (0%)	1/50 (2%)	0/50 (0%)
POLY-3 RATE (b)	1/44.98	0/47.59	1/47.33	0/31.98
POLY-3 PERCENT (g)	2.2%	0%	2.1%	0%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	1/42 (2%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	---	731 (T)	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Mucosa Regeneration				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	39/50 (78%)	48/50 (96%)
POLY-3 RATE (b)	0/44.98	0/47.59	39/49.50	48/48.29
POLY-3 PERCENT (g)	0%	0%	78.8%	99.4%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	32/42 (76%)	17/17 (100%)
FIRST INCIDENCE	---	---	592	225
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Olfactory Epithelium Accumulation, Hyaline Droplet				
LESION RATES				
OVERALL (a)	11/50 (22%)	11/50 (22%)	17/50 (34%)	2/50 (4%)
POLY-3 RATE (b)	11/44.98	11/48.51	17/47.83	2/32.29
POLY-3 PERCENT (g)	24.5%	22.7%	35.5%	6.2%
TERMINAL (d)	11/36 (31%)	9/40 (23%)	16/42 (38%)	1/17 (6%)
FIRST INCIDENCE	731 (T)	561	581	646
STATISTICAL TESTS				
POLY 3	P=0.160N	P=0.516N	P=0.173	P=0.036N*
POLY 1.5	P=0.087N	P=0.544N	P=0.159	P=0.022N*
POLY 6	P=0.239N	P=0.481N	P=0.195	P=0.053N
COCH-ARM / FISHERS	P=0.018N*	P=0.595N	P=0.133	P=0.007N**
MAX-ISO-POLY-3	P=0.058N	P=0.421N	P=0.129	P=0.033N*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Olfactory Epithelium Atrophy				
LESION RATES				
OVERALL (a)	0/50 (0%)	41/50 (82%)	49/50 (98%)	45/50 (90%)
POLY-3 RATE (b)	0/44.98	41/50.00	49/49.93	45/47.99
POLY-3 PERCENT (g)	0%	82%	98.1%	93.8%
TERMINAL (d)	0/36 (0%)	31/40 (78%)	42/42 (100%)	15/17 (88%)
FIRST INCIDENCE	---	561	581	225
STATISTICAL TESTS				
POLY 3	P<0.001**	P<0.001**	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P<0.001**	P<0.001**	P<0.001**
POLY 6	P<0.001**	P<0.001**	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P<0.001**	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P<0.001**	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Olfactory Epithelium Metaplasia Respiratory				
LESION RATES				
OVERALL (a)	0/50 (0%)	22/50 (44%)	46/50 (92%)	49/50 (98%)
POLY-3 RATE (b)	0/44.98	22/48.22	46/49.06	49/49.05
POLY-3 PERCENT (g)	0%	45.6%	93.8%	99.9%
TERMINAL (d)	0/36 (0%)	18/40 (45%)	40/42 (95%)	17/17 (100%)
FIRST INCIDENCE	---	625	592	225
STATISTICAL TESTS				
POLY 3	P<0.001**	P<0.001**	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P<0.001**	P<0.001**	P<0.001**
POLY 6	P<0.001**	P<0.001**	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P<0.001**	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P<0.001**	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Olfactory Epithelium Necrosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	1/50 (2%)	20/50 (40%)
POLY-3 RATE (b)	0/44.98	0/47.59	1/47.41	20/41.24
POLY-3 PERCENT (g)	0%	0%	2.1%	48.5%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	6/17 (35%)
FIRST INCIDENCE	---	---	713	267
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P=0.510	P<0.001**
POLY 1.5	P<0.001**	(e)	P=0.507	P<0.001**
POLY 6	P<0.001**	(e)	P=0.515	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P=0.500	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P=0.172	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Respiratory Epithelium Accumulation, Hyaline Droplet				
LESION RATES				
OVERALL (a)	18/50 (36%)	28/50 (56%)	28/50 (56%)	3/50 (6%)
POLY-3 RATE (b)	18/45.83	28/48.91	28/48.67	3/33.81
POLY-3 PERCENT (g)	39.3%	57.3%	57.5%	8.9%
TERMINAL (d)	16/36 (44%)	22/40 (55%)	25/42 (60%)	0/17 (0%)
FIRST INCIDENCE	499	561	581	325
STATISTICAL TESTS				
POLY 3	P=0.011N*	P=0.058	P=0.055	P=0.002N**
POLY 1.5	P=0.002N**	P=0.048*	P=0.047*	P<0.001N**
POLY 6	P=0.030N*	P=0.074	P=0.069	P=0.004N**
COCH-ARM / FISHERS	P<0.001N**	P=0.035*	P=0.035*	P<0.001N**
MAX-ISO-POLY-3	P<0.001N**	P=0.042*	P=0.039*	P=0.003N**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Respiratory Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	0/50 (0%)	1/50 (2%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	0/44.98	1/47.72	0/47.33	2/32.90
POLY-3 PERCENT (g)	0%	2.1%	0%	6.1%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	1/17 (6%)
FIRST INCIDENCE	---	697	---	320
STATISTICAL TESTS				
POLY 3	P=0.109	P=0.512	(e)	P=0.176
POLY 1.5	P=0.116	P=0.508	(e)	P=0.194
POLY 6	P=0.106	P=0.517	(e)	P=0.160
COCH-ARM / FISHERS	P=0.138	P=0.500	(e)	P=0.247
MAX-ISO-POLY-3	P=0.077	P=0.173	(e)	P=0.075

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Respiratory Epithelium Metaplasia				
LESION RATES				
OVERALL (a)	1/50 (2%)	9/50 (18%)	48/50 (96%)	50/50 (100%)
POLY-3 RATE (b)	1/45.26	9/48.26	48/49.50	50/50.00
POLY-3 PERCENT (g)	2.2%	18.7%	97%	100%
TERMINAL (d)	0/36 (0%)	6/40 (15%)	41/42 (98%)	17/17 (100%)
FIRST INCIDENCE	653	625	592	225
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.011*	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P=0.010**	P<0.001**	P<0.001**
POLY 6	P<0.001**	P=0.012*	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.008**	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.005**	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Respiratory Epithelium Necrosis				
LESION RATES				
OVERALL (a)	1/50 (2%)	5/50 (10%)	33/50 (66%)	50/50 (100%)
POLY-3 RATE (b)	1/45.26	5/47.88	33/49.43	50/50.00
POLY-3 PERCENT (g)	2.2%	10.4%	66.8%	100%
TERMINAL (d)	0/36 (0%)	3/40 (8%)	27/42 (64%)	17/17 (100%)
FIRST INCIDENCE	653	690	592	225
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.115	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P=0.111	P<0.001**	P<0.001**
POLY 6	P<0.001**	P=0.120	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.102	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.057	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Respiratory Epithelium Regeneration				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	0/31.98
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Septum Perforation				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	6/50 (12%)	5/50 (10%)
POLY-3 RATE (b)	0/44.98	0/47.59	6/48.92	5/34.48
POLY-3 PERCENT (g)	0%	0%	12.3%	14.5%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	2/42 (5%)	0/17 (0%)
FIRST INCIDENCE	---	---	592	320
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P=0.020*	P=0.014*
POLY 1.5	P=0.002**	(e)	P=0.019*	P=0.018*
POLY 6	P<0.001**	(e)	P=0.023*	P=0.011*
COCH-ARM / FISHERS	P=0.007**	(e)	P=0.013*	P=0.028*
MAX-ISO-POLY-3	P=0.002**	(e)	P=0.009**	P=0.009**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Sinus, Glands Metaplasia Respiratory				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	12/50 (24%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	12/36.14
POLY-3 PERCENT (g)	0%	0%	0%	33.2%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	4/17 (24%)
FIRST INCIDENCE	---	---	---	320
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Turbinate Atrophy				
LESION RATES				
OVERALL (a)	0/50 (0%)	32/50 (64%)	50/50 (100%)	50/50 (100%)
POLY-3 RATE (b)	0/44.98	32/49.04	50/50.00	50/50.00
POLY-3 PERCENT (g)	0%	65.3%	100%	100%
TERMINAL (d)	0/36 (0%)	27/40 (68%)	42/42 (100%)	17/17 (100%)
FIRST INCIDENCE	---	625	581	225
STATISTICAL TESTS				
POLY 3	P<0.001**	P<0.001**	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P<0.001**	P<0.001**	P<0.001**
POLY 6	P<0.001**	P<0.001**	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P<0.001**	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P<0.001**	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Nose: Turbinate Necrosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	1/50 (2%)	11/50 (22%)
POLY-3 RATE (b)	0/44.98	0/47.59	1/47.33	11/39.38
POLY-3 PERCENT (g)	0%	0%	2.1%	27.9%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	1/42 (2%)	2/17 (12%)
FIRST INCIDENCE	---	---	731 (T)	260
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P=0.510	P<0.001**
POLY 1.5	P<0.001**	(e)	P=0.507	P<0.001**
POLY 6	P<0.001**	(e)	P=0.515	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P=0.500	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P=0.172	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Ovary Cyst				
LESION RATES				
OVERALL (a)	15/49 (31%)	17/50 (34%)	12/49 (24%)	12/50 (24%)
POLY-3 RATE (b)	15/45.18	17/48.58	12/46.33	12/34.38
POLY-3 PERCENT (g)	33.2%	35%	25.9%	34.9%
TERMINAL (d)	12/35 (34%)	13/40 (33%)	12/41 (29%)	6/17 (35%)
FIRST INCIDENCE	587	635	731 (T)	403
STATISTICAL TESTS				
POLY 3	P=0.477N	P=0.514	P=0.296N	P=0.531
POLY 1.5	P=0.386N	P=0.491	P=0.302N	P=0.541N
POLY 6	P=0.522	P=0.544	P=0.288N	P=0.440
COCH-ARM / FISHERS	P=0.187N	P=0.442	P=0.326N	P=0.304N
MAX-ISO-POLY-3	P=0.574N	P=0.428	P=0.225N	P=0.443

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Ovary Inflammation				
LESION RATES				
OVERALL (a)	2/49 (4%)	1/50 (2%)	3/49 (6%)	6/50 (12%)
POLY-3 RATE (b)	2/44.63	1/47.94	3/46.90	6/36.46
POLY-3 PERCENT (g)	4.5%	2.1%	6.4%	16.5%
TERMINAL (d)	0/35 (0%)	0/40 (0%)	1/41 (2%)	0/17 (0%)
FIRST INCIDENCE	587	635	581	225
STATISTICAL TESTS				
POLY 3	P=0.020*	P=0.475N	P=0.523	P=0.077
POLY 1.5	P=0.024*	P=0.481N	P=0.516	P=0.096
POLY 6	P=0.017*	P=0.469N	P=0.532	P=0.063
COCH-ARM / FISHERS	P=0.037*	P=0.492N	P=0.500	P=0.141
MAX-ISO-POLY-3	P=0.030*	P=0.266N	P=0.347	P=0.051

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Pancreas: Acinus Atrophy				
LESION RATES				
OVERALL (a)	1/50 (2%)	2/50 (4%)	1/50 (2%)	0/47 (0%)
POLY-3 RATE (b)	1/44.98	2/47.59	1/47.78	0/31.42
POLY-3 PERCENT (g)	2.2%	4.2%	2.1%	0%
TERMINAL (d)	1/36 (3%)	2/40 (5%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	731 (T)	600	---
STATISTICAL TESTS				
POLY 3	P=0.325N	P=0.520	P=0.747N	P=0.570N
POLY 1.5	P=0.307N	P=0.513	P=0.751N	P=0.551N
POLY 6	P=0.336N	P=0.527	P=0.741N	P=0.586N
COCH-ARM / FISHERS	P=0.264N	P=0.500	P=0.753N	P=0.515N
MAX-ISO-POLY-3	P=0.370N	P=0.302	P=0.482N	P=0.240N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Peripheral Nerve Degeneration				
LESION RATES				
OVERALL (a)	1/2 (50%)	0/1 (0%)	2/2 (100%)	1/2 (50%)
POLY-3 RATE (b)	1/1.71	0/0.45	2/2.00	1/1.26
POLY-3 PERCENT (g)	58.4%	0%	100%	79.4%
TERMINAL (d)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)
FIRST INCIDENCE	177	---	600	690
STATISTICAL TESTS				
POLY 3	P=0.434	P=0.713N	P=0.618	P=0.765
POLY 1.5	P=0.492	P=0.665N	P=0.555	P=0.756
POLY 6	P=0.487	P=0.800N	P=0.764	P=0.831
COCH-ARM / FISHERS	P=0.588	P=0.667N	P=0.500	P=0.833N
MAX-ISO-POLY-3	P=0.353	P=0.379N	P=0.177	P=0.388

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Pituitary Gland: Pars Distalis Angiectasis				
LESION RATES				
OVERALL (a)	3/49 (6%)	1/49 (2%)	1/50 (2%)	0/48 (0%)
POLY-3 RATE (b)	3/44.23	1/46.59	1/47.33	0/31.07
POLY-3 PERCENT (g)	6.8%	2.2%	2.1%	0%
TERMINAL (d)	2/35 (6%)	1/39 (3%)	1/42 (2%)	0/17 (0%)
FIRST INCIDENCE	663	731 (T)	731 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.091N	P=0.287N	P=0.281N	P=0.195N
POLY 1.5	P=0.087N	P=0.293N	P=0.287N	P=0.167N
POLY 6	P=0.093N	P=0.281N	P=0.275N	P=0.222N
COCH-ARM / FISHERS	P=0.073N	P=0.309N	P=0.301N	P=0.125N
MAX-ISO-POLY-3	P=0.136N	P=0.147N	P=0.145N	P=0.105N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Pituitary Gland: Pars Distalis Hyperplasia				
LESION RATES				
OVERALL (a)	15/49 (31%)	7/49 (14%)	6/50 (12%)	1/48 (2%)
POLY-3 RATE (b)	15/44.23	7/46.91	6/47.33	1/31.30
POLY-3 PERCENT (g)	33.9%	14.9%	12.7%	3.2%
TERMINAL (d)	14/35 (40%)	6/39 (15%)	6/42 (14%)	0/17 (0%)
FIRST INCIDENCE	663	644	731 (T)	670
STATISTICAL TESTS				
POLY 3	P<0.001N**	P=0.028N*	P=0.013N*	P<0.001N**
POLY 1.5	P<0.001N**	P=0.033N*	P=0.015N*	P<0.001N**
POLY 6	P<0.001N**	P=0.023N*	P=0.011N*	P=0.003N**
COCH-ARM / FISHERS	P<0.001N**	P=0.044N*	P=0.021N*	P<0.001N**
MAX-ISO-POLY-3	P<0.001N**	P=0.018N*	P=0.008N**	P=0.002N**

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Salivary Glands Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/49 (0%)	0/50 (0%)	0/50 (0%)	3/50 (6%)
POLY-3 RATE (b)	0/43.98	0/47.59	0/47.33	3/33.92
POLY-3 PERCENT (g)	0%	0%	0%	8.9%
TERMINAL (d)	0/35 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	267
STATISTICAL TESTS				
POLY 3	P=0.009**	(e)	(e)	P=0.079
POLY 1.5	P=0.010**	(e)	(e)	P=0.092
POLY 6	P=0.010**	(e)	(e)	P=0.070
COCH-ARM / FISHERS	P=0.012*	(e)	(e)	P=0.125
MAX-ISO-POLY-3	P=0.009**	(e)	(e)	P=0.037*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Skeletal Muscle Degeneration				
LESION RATES				
OVERALL (a)	2/6 (33%)	0/1 (0%)	1/3 (33%)	1/4 (25%)
POLY-3 RATE (b)	2/5.32	0/0.45	1/2.22	1/2.67
POLY-3 PERCENT (g)	37.6%	0%	45%	37.5%
TERMINAL (d)	0/1 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)
FIRST INCIDENCE	177	---	620	596
STATISTICAL TESTS				
POLY 3	P=0.597	P=0.773N	P=0.711	P=0.754N
POLY 1.5	P=0.594N	P=0.730N	P=0.728	P=0.711N
POLY 6	P=0.538	P=0.828N	P=0.684	P=0.729
COCH-ARM / FISHERS	P=0.559N	P=0.714N	P=0.762	P=0.667N
MAX-ISO-POLY-3	P=0.688	P=0.400N	P=0.443	P=0.499N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Skeletal Muscle Hemorrhage Acute				
LESION RATES				
OVERALL (a)	0/6 (0%)	0/1 (0%)	0/3 (0%)	0/4 (0%)
POLY-3 RATE (b)	0/4.05	0/0.45	0/1.83	0/2.21
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/1 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Skin				
Inflammation Chronic				
LESION RATES				
OVERALL (a)	1/50 (2%)	2/50 (4%)	0/50 (0%)	3/50 (6%)
POLY-3 RATE (b)	1/45.21	2/47.75	0/47.33	3/33.70
POLY-3 PERCENT (g)	2.2%	4.2%	0%	8.9%
TERMINAL (d)	0/36 (0%)	1/40 (3%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	669	690	---	325
STATISTICAL TESTS				
POLY 3	P=0.197	P=0.519	P=0.491N	P=0.210
POLY 1.5	P=0.206	P=0.513	P=0.494N	P=0.239
POLY 6	P=0.193	P=0.526	P=0.487N	P=0.187
COCH-ARM / FISHERS	P=0.239	P=0.500	P=0.500N	P=0.309
MAX-ISO-POLY-3	P=0.142	P=0.302	P=0.158N	P=0.124

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Skin: Epidermis Hyperplasia				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/50 (0%)	0/50 (0%)	1/50 (2%)
POLY-3 RATE (b)	1/45.21	0/47.59	0/47.33	1/32.14
POLY-3 PERCENT (g)	2.2%	0%	0%	3.1%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	669	---	---	690
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Skin: Subcutaneous Tissue				
Necrosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	2/33.61
POLY-3 PERCENT (g)	0%	0%	0%	6%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	325
STATISTICAL TESTS				
POLY 3	P=0.038*	(e)	(e)	P=0.179
POLY 1.5	P=0.039*	(e)	(e)	P=0.197
POLY 6	P=0.038*	(e)	(e)	P=0.165
COCH-ARM / FISHERS	P=0.047*	(e)	(e)	P=0.247
MAX-ISO-POLY-3	P=0.032*	(e)	(e)	P=0.075

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Spleen				
Hematopoietic Cell Proliferation				
LESION RATES				
OVERALL (a)	8/50 (16%)	14/50 (28%)	5/50 (10%)	11/48 (23%)
POLY-3 RATE (b)	8/46.92	14/48.18	5/47.40	11/37.88
POLY-3 PERCENT (g)	17.1%	29.1%	10.6%	29%
TERMINAL (d)	3/36 (8%)	11/40 (28%)	4/42 (10%)	1/17 (6%)
FIRST INCIDENCE	499	644	714	252
STATISTICAL TESTS				
POLY 3	P=0.285	P=0.125	P=0.269N	P=0.146
POLY 1.5	P=0.327	P=0.123	P=0.269N	P=0.184
POLY 6	P=0.251	P=0.128	P=0.269N	P=0.116
COCH-ARM / FISHERS	P=0.425	P=0.114	P=0.277N	P=0.271
MAX-ISO-POLY-3	P=0.180	P=0.084	P=0.182N	P=0.114

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Spleen Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	10/50 (20%)	15/50 (30%)	10/50 (20%)	4/48 (8%)
POLY-3 RATE (b)	10/45.73	15/47.59	10/47.33	4/33.47
POLY-3 PERCENT (g)	21.9%	31.5%	21.1%	12%
TERMINAL (d)	7/36 (19%)	15/40 (38%)	10/42 (24%)	2/17 (12%)
FIRST INCIDENCE	647	731 (T)	731 (T)	260
STATISTICAL TESTS				
POLY 3	P=0.122N	P=0.206	P=0.565N	P=0.203N
POLY 1.5	P=0.082N	P=0.199	P=0.573N	P=0.154N
POLY 6	P=0.168N	P=0.211	P=0.557N	P=0.261N
COCH-ARM / FISHERS	P=0.032N*	P=0.178	P=0.598N	P=0.086N
MAX-ISO-POLY-3	P=0.151N	P=0.150	P=0.465N	P=0.161N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Spleen Inflammation				
LESION RATES				
OVERALL (a)	1/50 (2%)	1/50 (2%)	1/50 (2%)	2/48 (4%)
POLY-3 RATE (b)	1/44.98	1/47.94	1/47.40	2/33.67
POLY-3 PERCENT (g)	2.2%	2.1%	2.1%	5.9%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	635	714	267
STATISTICAL TESTS				
POLY 3	P=0.270	P=0.746N	P=0.749N	P=0.401
POLY 1.5	P=0.290	P=0.751N	P=0.753N	P=0.430
POLY 6	P=0.253	P=0.740N	P=0.743N	P=0.373
COCH-ARM / FISHERS	P=0.338	P=0.753N	P=0.753N	P=0.485
MAX-ISO-POLY-3	P=0.329	P=0.482N	P=0.485N	P=0.230

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Spleen Necrosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	1/50 (2%)	1/50 (2%)	3/48 (6%)
POLY-3 RATE (b)	0/44.98	1/47.94	1/47.33	3/33.86
POLY-3 PERCENT (g)	0%	2.1%	2.1%	8.9%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	1/42 (2%)	0/17 (0%)
FIRST INCIDENCE	---	635	731 (T)	271
STATISTICAL TESTS				
POLY 3	P=0.032*	P=0.513	P=0.510	P=0.076
POLY 1.5	P=0.036*	P=0.508	P=0.507	P=0.087
POLY 6	P=0.029*	P=0.518	P=0.515	P=0.067
COCH-ARM / FISHERS	P=0.049*	P=0.500	P=0.500	P=0.114
MAX-ISO-POLY-3	P=0.038*	P=0.174	P=0.172	P=0.035*

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/15/2016
Time Report Requested: 10:33:43
First Dose M/F: 08/31/09 / 08/31/09
Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Spleen: Lymphoid Follicle Atrophy				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/50 (0%)	0/50 (0%)	1/48 (2%)
POLY-3 RATE (b)	0/44.98	0/47.59	0/47.33	1/32.05
POLY-3 PERCENT (g)	0%	0%	0%	3.1%
TERMINAL (d)	0/36 (0%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	656
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Stomach, Forestomach Inflammation				
LESION RATES				
OVERALL (a)	3/50 (6%)	1/50 (2%)	3/50 (6%)	0/49 (0%)
POLY-3 RATE (b)	3/45.35	1/47.94	3/47.85	0/31.95
POLY-3 PERCENT (g)	6.6%	2.1%	6.3%	0%
TERMINAL (d)	1/36 (3%)	0/40 (0%)	1/42 (2%)	0/17 (0%)
FIRST INCIDENCE	653	635	600	---
STATISTICAL TESTS				
POLY 3	P=0.223N	P=0.286N	P=0.637N	P=0.194N
POLY 1.5	P=0.193N	P=0.292N	P=0.645N	P=0.167N
POLY 6	P=0.251N	P=0.279N	P=0.627N	P=0.223N
COCH-ARM / FISHERS	P=0.136N	P=0.309N	P=0.661N	P=0.125N
MAX-ISO-POLY-3	P=0.197N	P=0.147N	P=0.473N	P=0.104N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Stomach, Forestomach: Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	3/50 (6%)	2/50 (4%)	2/50 (4%)	1/49 (2%)
POLY-3 RATE (b)	3/45.77	2/47.94	2/47.78	1/31.95
POLY-3 PERCENT (g)	6.6%	4.2%	4.2%	3.1%
TERMINAL (d)	0/36 (0%)	1/40 (3%)	1/42 (2%)	1/17 (6%)
FIRST INCIDENCE	653	635	600	731 (T)
STATISTICAL TESTS				
POLY 3	P=0.322N	P=0.479N	P=0.480N	P=0.442N
POLY 1.5	P=0.298N	P=0.485N	P=0.486N	P=0.396N
POLY 6	P=0.341N	P=0.473N	P=0.474N	P=0.487N
COCH-ARM / FISHERS	P=0.237N	P=0.500N	P=0.500N	P=0.316N
MAX-ISO-POLY-3	P=0.462N	P=0.309N	P=0.310N	P=0.288N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Stomach, Glandular Inflammation				
LESION RATES				
OVERALL (a)	5/49 (10%)	0/50 (0%)	1/50 (2%)	2/46 (4%)
POLY-3 RATE (b)	5/44.53	0/47.59	1/47.40	2/30.55
POLY-3 PERCENT (g)	11.2%	0%	2.1%	6.6%
TERMINAL (d)	3/36 (8%)	0/40 (0%)	0/42 (0%)	2/17 (12%)
FIRST INCIDENCE	653	---	714	731 (T)
STATISTICAL TESTS				
POLY 3	P=0.247N	P=0.025N*	P=0.088N	P=0.393N
POLY 1.5	P=0.253N	P=0.026N*	P=0.090N	P=0.339N
POLY 6	P=0.235N	P=0.024N*	P=0.084N	P=0.445N
COCH-ARM / FISHERS	P=0.244N	P=0.027N*	P=0.098N	P=0.245N
MAX-ISO-POLY-3	P=0.117N	P=0.009N**	P=0.041N*	P=0.283N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Stomach, Glandular Mineralization				
LESION RATES				
OVERALL (a)	3/49 (6%)	0/50 (0%)	0/50 (0%)	1/46 (2%)
POLY-3 RATE (b)	3/44.07	0/47.59	0/47.33	1/31.51
POLY-3 PERCENT (g)	6.8%	0%	0%	3.2%
TERMINAL (d)	3/36 (8%)	0/40 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	---	---	260
STATISTICAL TESTS				
POLY 3	P=0.229N	P=0.105N	P=0.106N	P=0.433N
POLY 1.5	P=0.243N	P=0.109N	P=0.109N	P=0.396N
POLY 6	P=0.212N	P=0.102N	P=0.103N	P=0.466N
COCH-ARM / FISHERS	P=0.255N	P=0.117N	P=0.117N	P=0.333N
MAX-ISO-POLY-3	P=0.125N	P=0.037N*	P=0.037N*	P=0.277N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Thymus Atrophy				
LESION RATES				
OVERALL (a)	4/47 (9%)	5/50 (10%)	2/49 (4%)	12/45 (27%)
POLY-3 RATE (b)	4/43.95	5/48.53	2/46.79	12/35.14
POLY-3 PERCENT (g)	9.1%	10.3%	4.3%	34.2%
TERMINAL (d)	0/35 (0%)	2/40 (5%)	0/41 (0%)	0/16 (0%)
FIRST INCIDENCE	587	625	620	252
STATISTICAL TESTS				
POLY 3	P=0.002**	P=0.561	P=0.309N	P=0.006**
POLY 1.5	P=0.003**	P=0.556	P=0.310N	P=0.008**
POLY 6	P=0.002**	P=0.566	P=0.309N	P=0.004**
COCH-ARM / FISHERS	P=0.006**	P=0.540	P=0.319N	P=0.021*
MAX-ISO-POLY-3	P<0.001**	P=0.424	P=0.184N	P=0.005**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Thymus				
Ectopic Parathyroid Gland				
LESION RATES				
OVERALL (a)	4/47 (9%)	8/50 (16%)	4/49 (8%)	3/45 (7%)
POLY-3 RATE (b)	4/42.93	8/47.59	4/46.33	3/31.00
POLY-3 PERCENT (g)	9.3%	16.8%	8.6%	9.7%
TERMINAL (d)	3/35 (9%)	8/40 (20%)	4/41 (10%)	0/16 (0%)
FIRST INCIDENCE	684	731 (T)	731 (T)	252
STATISTICAL TESTS				
POLY 3	P=0.431N	P=0.230	P=0.601N	P=0.633
POLY 1.5	P=0.385N	P=0.225	P=0.605N	P=0.624N
POLY 6	P=0.466N	P=0.235	P=0.596N	P=0.592
COCH-ARM / FISHERS	P=0.279N	P=0.210	P=0.619N	P=0.525N
MAX-ISO-POLY-3	P=0.513N	P=0.156	P=0.455N	P=0.481

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Thymus Hyperplasia Lymphoid				
LESION RATES				
OVERALL (a)	3/47 (6%)	4/50 (8%)	2/49 (4%)	1/45 (2%)
POLY-3 RATE (b)	3/43.16	4/47.59	2/46.33	1/29.61
POLY-3 PERCENT (g)	7%	8.4%	4.3%	3.4%
TERMINAL (d)	1/35 (3%)	4/40 (10%)	2/41 (5%)	1/16 (6%)
FIRST INCIDENCE	663	731 (T)	731 (T)	731 (T)
STATISTICAL TESTS				
POLY 3	P=0.266N	P=0.553	P=0.468N	P=0.449N
POLY 1.5	P=0.239N	P=0.549	P=0.470N	P=0.405N
POLY 6	P=0.287N	P=0.556	P=0.465N	P=0.490N
COCH-ARM / FISHERS	P=0.178N	P=0.535	P=0.480N	P=0.325N
MAX-ISO-POLY-3	P=0.427N	P=0.400	P=0.300N	P=0.293N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Thymus Inflammation Chronic				
LESION RATES				
OVERALL (a)	2/47 (4%)	0/50 (0%)	0/49 (0%)	8/45 (18%)
POLY-3 RATE (b)	2/43.00	0/47.59	0/46.33	8/33.15
POLY-3 PERCENT (g)	4.7%	0%	0%	24.1%
TERMINAL (d)	1/35 (3%)	0/40 (0%)	0/41 (0%)	1/16 (6%)
FIRST INCIDENCE	663	---	---	225
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.215N	P=0.221N	P=0.014*
POLY 1.5	P<0.001**	P=0.217N	P=0.222N	P=0.020*
POLY 6	P<0.001**	P=0.213N	P=0.219N	P=0.011*
COCH-ARM / FISHERS	P<0.001**	P=0.232N	P=0.237N	P=0.039*
MAX-ISO-POLY-3	P<0.001**	P=0.072N	P=0.073N	P=0.011*

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Thyroid Gland Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/48 (0%)	9/50 (18%)
POLY-3 RATE (b)	0/44.98	0/46.59	0/45.72	9/35.28
POLY-3 PERCENT (g)	0%	0%	0%	25.5%
TERMINAL (d)	0/36 (0%)	0/39 (0%)	0/41 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	480
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Thyroid Gland: Follicular Cell Hyperplasia				
LESION RATES				
OVERALL (a)	0/50 (0%)	2/49 (4%)	1/48 (2%)	0/50 (0%)
POLY-3 RATE (b)	0/44.98	2/46.81	1/45.72	0/31.98
POLY-3 PERCENT (g)	0%	4.3%	2.2%	0%
TERMINAL (d)	0/36 (0%)	1/39 (3%)	1/41 (2%)	0/17 (0%)
FIRST INCIDENCE	---	674	731 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.565N	P=0.246	P=0.503	(e)
POLY 1.5	P=0.536N	P=0.242	P=0.499	(e)
POLY 6	P=0.590N	P=0.252	P=0.509	(e)
COCH-ARM / FISHERS	P=0.468N	P=0.242	P=0.490	(e)
MAX-ISO-POLY-3	P=0.426	P=0.086	P=0.165	(e)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Tooth Dysplasia				
LESION RATES				
OVERALL (a)	0/1 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)
POLY-3 RATE (b)	0/1.00	0/0.00	0/0.00	0/0.00
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/1 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea				
Inflammation Chronic				
LESION RATES				
OVERALL (a)	1/50 (2%)	0/49 (0%)	4/50 (8%)	42/50 (84%)
POLY-3 RATE (b)	1/44.98	0/46.59	4/47.67	42/43.25
POLY-3 PERCENT (g)	2.2%	0%	8.4%	97.1%
TERMINAL (d)	1/36 (3%)	0/39 (0%)	3/42 (7%)	17/17 (100%)
FIRST INCIDENCE	731 (T)	---	639	225
STATISTICAL TESTS				
POLY 3	P<0.001**	P=0.493N	P=0.197	P<0.001**
POLY 1.5	P<0.001**	P=0.496N	P=0.191	P<0.001**
POLY 6	P<0.001**	P=0.489N	P=0.206	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.505N	P=0.181	P<0.001**
MAX-ISO-POLY-3	P<0.001**	P=0.160N	P=0.101	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea Necrosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	3/50 (6%)	48/50 (96%)
POLY-3 RATE (b)	0/44.98	0/46.59	3/48.11	48/48.82
POLY-3 PERCENT (g)	0%	0%	6.2%	98.3%
TERMINAL (d)	0/36 (0%)	0/39 (0%)	1/42 (2%)	17/17 (100%)
FIRST INCIDENCE	---	---	600	225
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P=0.131	P<0.001**
POLY 1.5	P<0.001**	(e)	P=0.127	P<0.001**
POLY 6	P<0.001**	(e)	P=0.138	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P=0.121	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P=0.049*	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Epithelium Hyperplasia				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	1/50 (2%)	1/50 (2%)
POLY-3 RATE (b)	0/44.98	0/46.59	1/47.33	1/31.98
POLY-3 PERCENT (g)	0%	0%	2.1%	3.1%
TERMINAL (d)	0/36 (0%)	0/39 (0%)	1/42 (2%)	1/17 (6%)
FIRST INCIDENCE	---	---	731 (T)	731 (T)
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Epithelium Metaplasia				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	2/50 (4%)
POLY-3 RATE (b)	0/44.98	0/46.59	0/47.33	2/31.98
POLY-3 PERCENT (g)	0%	0%	0%	6.3%
TERMINAL (d)	0/36 (0%)	0/39 (0%)	0/42 (0%)	2/17 (12%)
FIRST INCIDENCE	---	---	---	731 (T)
STATISTICAL TESTS				
POLY 3	P=0.038*	(e)	(e)	P=0.171
POLY 1.5	P=0.039*	(e)	(e)	P=0.191
POLY 6	P=0.039*	(e)	(e)	P=0.155
COCH-ARM / FISHERS	P=0.047*	(e)	(e)	P=0.247
MAX-ISO-POLY-3	P=0.032*	(e)	(e)	P=0.074

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
 Time Report Requested: 10:33:43
 First Dose M/F: 08/31/09 / 08/31/09
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Epithelium Regeneration				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	9/50 (18%)	45/50 (90%)
POLY-3 RATE (b)	0/44.98	0/46.59	9/49.00	45/47.71
POLY-3 PERCENT (g)	0%	0%	18.4%	94.3%
TERMINAL (d)	0/36 (0%)	0/39 (0%)	5/42 (12%)	17/17 (100%)
FIRST INCIDENCE	---	---	581	225
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	P=0.003**	P<0.001**
POLY 1.5	P<0.001**	(e)	P=0.002**	P<0.001**
POLY 6	P<0.001**	(e)	P=0.003**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	P<0.001**	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Lumen Exudate				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	12/50 (24%)
POLY-3 RATE (b)	0/44.98	0/46.59	0/47.33	12/36.77
POLY-3 PERCENT (g)	0%	0%	0%	32.6%
TERMINAL (d)	0/36 (0%)	0/39 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	225
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Submucosa Fibrosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	44/50 (88%)
POLY-3 RATE (b)	0/44.98	0/46.59	0/47.33	44/44.36
POLY-3 PERCENT (g)	0%	0%	0%	99.2%
TERMINAL (d)	0/36 (0%)	0/39 (0%)	0/42 (0%)	17/17 (100%)
FIRST INCIDENCE	---	---	---	267
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Submucosa, Carina Fibrosis				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	6/50 (12%)
POLY-3 RATE (b)	0/44.98	0/46.59	0/47.33	6/32.52
POLY-3 PERCENT (g)	0%	0%	0%	18.5%
TERMINAL (d)	0/36 (0%)	0/39 (0%)	0/42 (0%)	4/17 (24%)
FIRST INCIDENCE	---	---	---	600
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P=0.005**
POLY 1.5	P<0.001**	(e)	(e)	P=0.007**
POLY 6	P<0.001**	(e)	(e)	P=0.003**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.013*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.004**

Experiment Number: 20725 - 04
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Submucosa, Carina Inflammation Chronic				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	0/44.98	0/46.59	0/47.33	0/31.98
POLY-3 PERCENT (g)	0%	0%	0%	0%
TERMINAL (d)	0/36 (0%)	0/39 (0%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	---	---	---	---
STATISTICAL TESTS				
POLY 3	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Trachea: Submucosa, Carina Mineralization				
LESION RATES				
OVERALL (a)	0/50 (0%)	0/49 (0%)	0/50 (0%)	5/50 (10%)
POLY-3 RATE (b)	0/44.98	0/46.59	0/47.33	5/32.56
POLY-3 PERCENT (g)	0%	0%	0%	15.4%
TERMINAL (d)	0/36 (0%)	0/39 (0%)	0/42 (0%)	4/17 (24%)
FIRST INCIDENCE	---	---	---	547
STATISTICAL TESTS				
POLY 3	P<0.001**	(e)	(e)	P=0.012*
POLY 1.5	P<0.001**	(e)	(e)	P=0.016*
POLY 6	P<0.001**	(e)	(e)	P=0.009**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.028*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.009**

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/15/2016
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Uterus				
Angiectasis				
LESION RATES				
OVERALL (a)	1/50 (2%)	4/50 (8%)	2/50 (4%)	0/50 (0%)
POLY-3 RATE (b)	1/44.98	4/47.59	2/47.33	0/31.98
POLY-3 PERCENT (g)	2.2%	8.4%	4.2%	0%
TERMINAL (d)	1/36 (3%)	4/40 (10%)	2/42 (5%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	731 (T)	731 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.329N	P=0.196	P=0.518	P=0.566N
POLY 1.5	P=0.288N	P=0.191	P=0.512	P=0.545N
POLY 6	P=0.365N	P=0.203	P=0.526	P=0.585N
COCH-ARM / FISHERS	P=0.205N	P=0.181	P=0.500	P=0.500N
MAX-ISO-POLY-3	P=0.278N	P=0.100	P=0.300	P=0.239N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

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 2,3-Butanedione
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Uterus Inflammation				
LESION RATES				
OVERALL (a)	4/50 (8%)	2/50 (4%)	0/50 (0%)	0/50 (0%)
POLY-3 RATE (b)	4/45.64	2/47.94	0/47.33	0/31.98
POLY-3 PERCENT (g)	8.8%	4.2%	0%	0%
TERMINAL (d)	2/36 (6%)	1/40 (3%)	0/42 (0%)	0/17 (0%)
FIRST INCIDENCE	587	635	---	---
STATISTICAL TESTS				
POLY 3	P=0.019N*	P=0.315N	P=0.056N	P=0.121N
POLY 1.5	P=0.019N*	P=0.322N	P=0.057N	P=0.097N
POLY 6	P=0.019N*	P=0.307N	P=0.054N	P=0.147N
COCH-ARM / FISHERS	P=0.018N*	P=0.339N	P=0.059N	P=0.059N
MAX-ISO-POLY-3	P=0.029N*	P=0.189N	P=0.019N*	P=0.073N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Uterus Thrombosis				
LESION RATES				
OVERALL (a)	1/50 (2%)	3/50 (6%)	1/50 (2%)	0/50 (0%)
POLY-3 RATE (b)	1/44.98	3/47.59	1/47.33	0/31.98
POLY-3 PERCENT (g)	2.2%	6.3%	2.1%	0%
TERMINAL (d)	1/36 (3%)	3/40 (8%)	1/42 (2%)	0/17 (0%)
FIRST INCIDENCE	731 (T)	731 (T)	731 (T)	---
STATISTICAL TESTS				
POLY 3	P=0.283N	P=0.326	P=0.749N	P=0.566N
POLY 1.5	P=0.259N	P=0.319	P=0.753N	P=0.545N
POLY 6	P=0.301N	P=0.334	P=0.744N	P=0.585N
COCH-ARM / FISHERS	P=0.205N	P=0.309	P=0.753N	P=0.500N
MAX-ISO-POLY-3	P=0.303N	P=0.175	P=0.485N	P=0.239N

Experiment Number: 20725 - 04
 Test Type: CHRONIC
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN MICE(B6C3F1)
 TERMINAL SACRIFICE AT 105 WEEKS**

DOSE	Females			
	Control	12.5 ppm	25 ppm	50 ppm
Uterus: Endometrium Hyperplasia Cystic				
LESION RATES				
OVERALL (a)	42/50 (84%)	43/50 (86%)	47/50 (94%)	30/50 (60%)
POLY-3 RATE (b)	42/48.85	43/49.63	47/50.00	30/42.47
POLY-3 PERCENT (g)	86%	86.7%	94%	70.6%
TERMINAL (d)	33/36 (92%)	34/40 (85%)	39/42 (93%)	11/17 (65%)
FIRST INCIDENCE	177	561	581	225
STATISTICAL TESTS				
POLY 3	P=0.037N*	P=0.580	P=0.151	P=0.051N
POLY 1.5	P=0.012N*	P=0.542	P=0.124	P=0.026N*
POLY 6	P=0.076N	P=0.603N	P=0.206	P=0.081N
COCH-ARM / FISHERS	P<0.001N**	P=0.500	P=0.100	P=0.007N**
MAX-ISO-POLY-3	P=0.014N*	P=0.460	P=0.086	P=0.037N*

Experiment Number: 20725 - 04
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Species/Strain: MICE/B6C3F1

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LEGEND

- (a) Number of tumor-bearing animals/number of animals examined at site.
 - (b) Number of tumor-bearing animals/Poly-3 number
 - (d) Observed incidence at terminal kill.
 - (e) Value of statistic cannot be computed.
 - (f) Beneath the control incidence are the P-values associated with the trend test. Beneath the dosed group incidence are the P-values corresponding to pairwise comparisons between the controls and that dosed group.
 - (g) Poly-3 adjusted lifetime tumor incidence.
 - (n) No statistics are calculated if all dose groups have fewer than two tumors.
 - (I) Interim sacrifice
 - (T) Terminal sacrifice
 - # Tumor rates based on numbers of animals necropsied.
 - * To the right of any statistical result, indicates significance at ($P \leq 0.05$).
 - ** To the right of any statistical result, indicates significance at ($P \leq 0.01$).
 - N Indicates a negative trend for all tests
- The Cochran-Armitage and Fishers exact tests compare directly the overall incidence rates.

*** END OF REPORT ***