

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
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

Note: Animals arranged according to days on test.

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

B6C3F1 MICE MALE	DAY ON TEST																								males (cont...)
	0 4 4 2	0 5 1 9	0 5 1 9	0 5 5 5	0 5 9 0	0 6 2 4	0 6 3 4	0 6 4 1	0 6 6 6	0 6 4 7	0 6 6 4	0 6 8 3	0 6 8 6	0 6 9 7	0 7 2 2	0 7 2 9	0 7 2 9	0 7 2 9	0 7 2 9	0 7 2 9	0 7 2 9	0 7 2 9	0 7 2 9		
Control	ANIMAL ID																								
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	2	0	2	4	1	4	1	2	2	0	4	2	0	3	4	0	0	0	0	1	1	1	3	4	
	1	2	9	5	0	3	1	5	7	7	6	4	5	9	0	3	4	8	9	4	5	8	0	2	

Sarcoma, Metastatic, Uncertain Primary Site

X

Pancreas

+ + A + + A +

Sarcoma, Metastatic, Uncertain Primary Site

X

Salivary Glands

+ +

Stomach, Forestomach

+ A A +

Sarcoma, Metastatic, Uncertain Primary Site

X

Stomach, Glandular

+ A A + + A +

Tooth

+

CARDIOVASCULAR SYSTEM

Blood Vessel

+ +

Heart

+ +

Hemangiosarcoma

X

Hepatocellular Carcinoma, Metastatic, Liver

X

Hepatocholangiocarcinoma, Metastatic, Liver

X

ENDOCRINE SYSTEM

Adrenal Cortex

+ +

Subcapsular, Adenoma

X

X

Adrenal Medulla

+ +

Islets, Pancreatic

+ + A + + A + + + + + + + + + + + + + + + + + + +

Parathyroid Gland

+ + + M + + + + + + + + + M + M + + M + M + + + + +

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------|
| B6C3F1 MICE MALE | DAY ON TEST | 0
4
4
2 | 0
5
1
9 | 0
5
1
9 | 0
5
5
0 | 0
6
2
4 | 0
6
3
4 | 0
6
4
1 | 0
6
6
6 | 0
6
7
4 | 0
6
6
3 | 0
6
8
6 | 0
6
9
7 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | males
(cont...) |
| | ANIMAL ID | 0
0
0
2
1 | 0
0
0
0
2 | 0
0
0
2
9 | 0
0
0
4
5 | 0
0
0
1
3 | 0
0
0
1
1 | 0
0
0
2
5 | 0
0
0
2
7 | 0
0
0
0
7 | 0
0
0
4
7 | 0
0
0
0
6 | 0
0
0
2
4 | 0
0
0
0
5 | 0
0
0
3
9 | 0
0
0
4
0 | 0
0
0
0
3 | 0
0
0
0
4 | 0
0
0
0
8 | 0
0
0
0
9 | 0
0
0
0
4 | 0
0
0
0
5 | 0
0
0
1
8 | 0
0
0
3
0 | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Epididymis | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Preputial Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Prostate | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Seminal Vesicle | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Testes | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow
Mast Cell Tumor Malignant | + | + | A | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node
Renal, Hepatocholangiocarcinoma, Metastatic,
Liver | | + | | | + | + | | | | + | | + | | | | | | | | | | | | | |
| Lymph Node, Bronchial
Hepatocholangiocarcinoma, Metastatic, Liver | M | + | + | + | + | M | M | M | M | I | + | I | I | + | + | + | + | + | + | + | M | + | + | + | + |
| Lymph Node, Mandibular | M | + | M | + | M | + | M | M | + | + | M | + | + | M | + | + | + | + | + | I | + | + | M | + | + |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | males
(cont...) |
|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------------------|
| | 0
4
4
2 | 0
5
1
9 | 0
5
1
9 | 0
5
5
5 | 0
5
9
2 | 0
6
2
4 | 0
6
3
4 | 0
6
4
1 | 0
6
6
6 | 0
6
4
7 | 0
6
6
4 | 0
6
8
3 | 0
6
8
6 | 0
6
9
7 | 0
7
2
2 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | |
| Control | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 2 | 0 | 2 | 4 | 1 | 4 | 1 | 2 | 2 | 0 | 4 | 2 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | |
| | 1 | 2 | 9 | 5 | 0 | 3 | 1 | 5 | 7 | 7 | 6 | 4 | 5 | 9 | 0 | 3 | 4 | 8 | 9 | 4 | 5 | 8 | |

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lymph Node, Mediastinal | + | + | + | + | + | + | + | M | + | + | + | I | + | + | + | + | I | + | + | + | + | + | I |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | X | | | | | | | | | |
| Hepatocholangiocarcinoma, Metastatic, Liver Sarcoma, Metastatic, Uncertain Primary Site | | | | X | | | | X | | | | | | | | | | | | | | | |
| Lymph Node, Mesenteric | + | + | A | + | + | A | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | X | | | | | | | | | |
| Hepatocellular Carcinoma, Metastatic, Liver Sarcoma, Metastatic, Uncertain Primary Site | | | | | | | | | | | | X | | | | | | | | | | | |
| Spleen | + | + | A | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Thymus | + | + | + | + | + | + | + | I | + | + | + | I | + | + | + | + | + | + | + | + | + | + | + |
| Hepatocholangiocarcinoma, Metastatic, Liver Sarcoma, Metastatic, Uncertain Primary Site | | | | X | | | | X | | | | | | | | | | | | | | | |

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland | M | M | M | M | M | M | M | M | + | M | M | M | M | M | M | M | M | M | M | M | M | M | M |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | X | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

Table with columns for DAY ON TEST and ANIMAL ID. Includes group labels 'B6C3F1 MICE MALE' and 'Control'. A final column is labeled 'males (cont...)'.

NERVOUS SYSTEM

Brain +

RESPIRATORY SYSTEM

Larynx + + A +

Lung + X
Alveolar/Bronchiolar Adenoma X
Alveolar/Bronchiolar Adenoma, Multiple
Alveolar/Bronchiolar Carcinoma X
Alveolar/Bronchiolar Carcinoma, Multiple X
Hepatoblastoma, Metastatic, Liver X
Hepatocellular Carcinoma, Metastatic, Liver X
Hepatocholangiocarcinoma, Metastatic, Liver X

Nose + + + + + A + + + + + + + + + + + + + + + + + +
Turbinate, Polyp X

Trachea + + A +

SPECIAL SENSES SYSTEM

Eye + + A +

Harderian Gland +
Adenoma X X

URINARY SYSTEM

Kidney + + + + + A + + + + + + + + + + + + + + + + + +

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------------------------|
| B6C3F1 MICE MALE | DAY ON TEST | 0
4
4
2 | 0
5
1
9 | 0
5
1
9 | 0
5
5
0 | 0
5
9
2 | 0
6
2
4 | 0
6
3
4 | 0
6
4
1 | 0
6
6
6 | 0
6
6
7 | 0
6
7
8 | 0
6
8
8 | 0
6
9
9 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | 0
7
2
2 | males
(cont...) |
| Control | ANIMAL ID | 0
0
2
1 | 0
0
0
2 | 0
0
2
4 | 0
0
0
1 | 0
0
4
1 | 0
0
1
4 | 0
0
1
1 | 0
0
2
2 | 0
0
2
2 | 0
0
0
4 | 0
0
0
2 | 0
0
0
0 | 0
0
0
3 | 0
0
4
0 | 0
0
0
4 | 0
0
0
8 | 0
0
0
9 | 0
0
0
4 | 0
0
0
5 | 0
0
0
8 | 0
0
0
0 | 0
0
0
3 | 0
0
0
3 | males
(cont...) |

Hepatocholangiocarcinoma, Metastatic, Liver X

Urinary Bladder + A +

SYSTEMIC LESIONS

Multiple Organ +
 Lymphoma Malignant X

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |
|------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|
| | ANIMAL ID | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| Control | | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 4 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 0 | 1 | 3 | |
| | | 8 | 6 | 2 | 3 | 7 | 9 | 0 | 2 | 3 | 6 | 8 | 2 | 4 | 5 | 6 | 7 | 8 | 1 | 4 | 7 | 0 | 1 | 6 | 9 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Gallbladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 45 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 46 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 46 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 46 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 45 |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Polyp Adenomatous | | | | | | | | | | | | | | | | | | | | | | X | | 1 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 45 |
| Sarcoma, Metastatic, Uncertain Primary Site | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 44 |
| Sarcoma, Metastatic, Uncertain Primary Site | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hepatoblastoma | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Hepatocellular Adenoma | | | | | | | X | X | | | | | | X | X | | | | | | | | | 6 |
| Hepatocellular Adenoma, Multiple | | | | | X | X | | | | | | X | | | | | X | X | | | X | X | | 11 |
| Hepatocellular Carcinoma | | | X | | | | | | | X | X | | | | | X | X | X | | | | | | 10 |
| Hepatocellular Carcinoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | 7 |
| Hepatocholangiocarcinoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Sarcoma, Metastatic, Uncertain Primary Site | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | | | 4 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Date Report Requested: 04/15/2016

Test Type: CHRONIC

2,3-Butanedione

Time Report Requested: 10:33:43

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: 431-03-8

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

Species/Strain: MICE/B6C3F1

Lab: BNW

| B6C3F1 MICE MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|--|
| | 0729 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | | | |
| Control | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
| | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | 0048 | | 0048 | |
| | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | | 0000 | |
| | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | | 0000 | |
| Sarcoma, Metastatic, Uncertain Primary Site | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 | | |
| Sarcoma, Metastatic, Uncertain Primary Site | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 | | |
| Sarcoma, Metastatic, Uncertain Primary Site | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 | | |
| Tooth | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Hemangiosarcoma | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Hepatocellular Carcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Subcapsular, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 | | |
| Parathyroid Gland | + | + | + | M | M | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | M | + | + | + | 40 | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Date Report Requested: 04/15/2016

Test Type: CHRONIC

2,3-Butanedione

Time Report Requested: 10:33:43

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: 431-03-8

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

Species/Strain: MICE/B6C3F1

Lab: BNW

| B6C3F1 MICE MALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|-----------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|
| | 0729 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | |
| ANIMAL ID | 0048 | 0006 | 0002 | 0003 | 0007 | 0009 | 0000 | 0002 | 0003 | 0006 | 0008 | 0002 | 0004 | 0005 | 0006 | 0007 | 0008 | 0001 | 0004 | 0007 | 0000 | 0001 | 0006 | |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Preputial Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Prostate | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Seminal Vesicle | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Testes | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Mast Cell Tumor Malignant | X | | | | | | | | | | | | | | | | | | | | | | 1 |
| Lymph Node | | | | | | | | | | | | | | | | | | | | | | | 5 |
| Renal, Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Lymph Node, Bronchial | + | + | M | + | + | + | M | M | + | + | + | I | + | + | + | + | + | M | + | I | + | + | 34 |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Lymph Node, Mandibular | + | + | + | + | + | + | M | M | + | + | + | + | + | + | M | M | M | + | + | + | + | + | 36 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE
Control | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |
|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|
| | ANIMAL ID | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 4 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 0 | 1 | 3 | 4 | |
| | | 8 | 6 | 2 | 3 | 7 | 9 | 0 | 2 | 3 | 6 | 8 | 2 | 4 | 5 | 6 | 7 | 8 | 1 | 4 | 7 | 0 | 1 | 6 | 1 | 9 | |
| Lymph Node, Mediastinal | | + | | + | + | | M | + | | + | + | + | | + | + | M | | + | + | | + | | + | + | + | + | 37 |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Hepatocolangiocarcinoma, Metastatic, Liver Sarcoma, Metastatic, Uncertain Primary Site | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Lymph Node, Mesenteric | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Hepatocellular Carcinoma, Metastatic, Liver Sarcoma, Metastatic, Uncertain Primary Site | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Spleen | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Thymus | | + | + | | + | + | + | + | + | + | + | | + | + | + | | | + | M | + | + | + | + | + | + | + | 43 |
| Hepatocolangiocarcinoma, Metastatic, Liver Sarcoma, Metastatic, Uncertain Primary Site | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | 1 |
| Skin | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Hepatocolangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 | .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE MALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |
|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|---|----------|
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| Control | ANIMAL ID | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | |
| | | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 4 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 0 | 1 | 3 | | |
| | | 8 | 6 | 2 | 3 | 7 | 9 | 0 | 2 | 3 | 6 | 8 | 2 | 4 | 5 | 6 | 7 | 8 | 1 | 4 | 7 | 0 | 1 | 6 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Urinary Bladder | | | | | | | | | | | | | | | | | | | | | | | | 49 | | |
| + | | | | | | | | | | | | | | | | | | | | | | | | 49 | | |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Multiple Organ | | | | | | | | | | | | | | | | | | | | | | | | 50 | | |
| Lymphoma Malignant | | | | | | | | | | | | | | | | | | | | | | | | 6 | | |
| + + + + + + X + + + + + + + + + + X X + + + + + + | | | | | | | | | | | | | | | | | | | | | | | | 6 | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------|
| B6C3F1 MICE MALE

12.5 ppm | DAY ON TEST | 0396 | 0480 | 0578 | 0650 | 0661 | 0665 | 0666 | 0666 | 0666 | 0773 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | males (cont...) |
| | ANIMAL ID | 00249 | 00022 | 00023 | 00033 | 00033 | 00034 | 00044 | 00022 | 00011 | 00020 | 00041 | 00044 | 00088 | 00011 | 00002 | 00004 | 00006 | 00003 | 00008 | 00004 | 00005 | 00009 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Gallbladder | + | A | A | + | + | + | M | + | + | + | + | + | + | + | M | + | + | + | + | + | + | M | M | + |
| Intestine Large, Cecum | + | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | A | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | A | A | A | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | A | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | + | A | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | + | A | A | A | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hepatocellular Adenoma | | | | | | X | | | | | X | X | | | | | X | X | | | X | X | X | |
| Hepatocellular Adenoma, Multiple | | | | | | | | | | | | | | | X | | | | X | | | | | |
| Hepatocellular Carcinoma | X | X | X | | | | | | | | | | | | X | | | | | | | | | |
| Hepatocellular Carcinoma, Multiple | | | | X | | | X | X | | | | | | | | | | | | | | | | |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | | | |
| Pancreas | + | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Salivary Glands | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Forestomach | + | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Squamous Cell Papilloma | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE
12.5 ppm | DAY ON TEST | | ANIMAL ID | | | | | | | | | | | | | | | | | | | | males
(cont...) | | | |
|------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------|
| | 0
3
9
6 | 0
4
8
0 | 0
5
7
4 | 0
5
8
9 | 0
6
0
4 | 0
6
1
1 | 0
6
5
3 | 0
6
5
3 | 0
6
7
6 | 0
6
8
1 | 0
7
1
3 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 |
| | 0
0
2
4
9 | 0
0
0
2
2 | 0
0
0
3
6 | 0
0
0
3
5 | 0
0
0
3
9 | 0
0
0
3
0 | 0
0
0
4
0 | 0
0
0
4
3 | 0
0
0
2
5 | 0
0
0
2
8 | 0
0
0
1
4 | 0
0
0
2
1 | 0
0
0
0
8 | 0
0
0
0
9 | 0
0
0
1
0 | 0
0
0
1
2 | 0
0
0
1
4 | 0
0
0
1
6 | 0
0
0
2
3 | 0
0
0
2
8 | 0
0
0
4
4 | 0
0
0
4
5 | 0
0
0
4
0 | 0
0
0
5
0 | 0
0
0
0
2 | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stomach, Glandular | + | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Tooth | | | | | | | | | | | | | | | | | | | | | | | | | | |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adrenal Cortex
Adenoma
Subcapsular, Adenoma | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | | | | | X | | | | | | | | | | | X | | X | | | | |
| Adrenal Medulla | + | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Islets, Pancreatic | + | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Parathyroid Gland | + | + | M | + | M | M | + | + | + | M | + | + | + | + | + | M | + | + | + | + | + | M | M | + | + |
| Pituitary Gland | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Thyroid Gland
Follicular Cell, Adenoma | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |

GENERAL BODY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| NONE | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

GENITAL SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE
12.5 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ANIMAL ID | males
(cont...) |
|------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--------------------|
| | | 3 | 4 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | |
| | | 9 | 8 | 7 | 8 | 0 | 1 | 5 | 5 | 7 | 8 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | | |
| | | 6 | 0 | 4 | 9 | 4 | 1 | 3 | 3 | 6 | 1 | 3 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | |
| | | 4 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 4 | 4 | 5 | 0 | | |
| | | 9 | 2 | 6 | 5 | 9 | 3 | 0 | 3 | 5 | 8 | 4 | 1 | 4 | 8 | 9 | 0 | 2 | 4 | 6 | 3 | 8 | 4 | 5 | 0 | 2 | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Epididymis | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Preputial Gland | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Prostate | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Seminal Vesicle | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Testes | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Bone Marrow
Hemangiosarcoma, Metastatic, Spleen | A | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| | | | | | | | X | | | | | | | | | | | | | X | | | | | | | |
| Lymph Node | | | | | | | | + | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Bronchial | + | + | A | M | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | M | + | + | + | |
| Lymph Node, Mandibular | + | + | M | M | M | M | + | M | I | + | M | + | M | M | + | + | + | + | + | + | + | + | M | M | + | + | |
| Lymph Node, Mediastinal | + | + | A | + | I | + | + | I | + | + | I | + | + | I | M | + | M | M | + | + | + | + | + | + | I | + | |
| Lymph Node, Mesenteric | + | A | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | + | |
| Spleen
Hemangiosarcoma | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| | | | | | | | X | | | | | | | | | | | | | X | | | | | | | |
| Thymus | + | + | A | + | I | + | + | + | + | + | + | + | + | + | + | + | + | I | + | + | + | + | + | + | I | + | |

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Mammary Gland | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | |
|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE MALE
12.5 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | males
(cont...) |
|------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------|
| | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| | | 9 | 8 | 7 | 8 | 0 | 1 | 5 | 5 | 7 | 8 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | |
| | | 6 | 0 | 4 | 9 | 4 | 1 | 3 | 3 | 6 | 1 | 3 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | | 4 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 4 | 4 | 5 | 0 | |
| | | 9 | 2 | 6 | 5 | 9 | 3 | 0 | 3 | 5 | 8 | 4 | 1 | 4 | 8 | 9 | 0 | 2 | 4 | 6 | 3 | 8 | 4 | 5 | 0 | 2 | |

Skin Carcinoma

+ A +

MUSCULOSKELETAL SYSTEM

Bone

+ +

Skeletal Muscle

+ + + + +

NERVOUS SYSTEM

Brain

+ +

Peripheral Nerve

+ +

Spinal Cord

+ +

RESPIRATORY SYSTEM

Larynx

+ + A +

Lung

Alveolar/Bronchiolar Adenoma

Alveolar/Bronchiolar Carcinoma

Hepatocellular Carcinoma, Metastatic, Liver

+ + A +
X
X X
X X X
X

Nose

+ A A +

Trachea

+ + A +

SPECIAL SENSES SYSTEM

Eye

+ A +

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE MALE
12.5 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ANIMAL ID | males
(cont...) |
|------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--------------------|
| | 3 | 4 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 9 | | |
| | 9 | 8 | 7 | 8 | 0 | 1 | 5 | 5 | 7 | 8 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 0 | |
| | 6 | 0 | 4 | 9 | 4 | 1 | 3 | 3 | 6 | 1 | 3 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | 0 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | |
| | 4 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 4 | 4 | 5 | 0 | 0 | | |
| | 9 | 2 | 6 | 5 | 9 | 3 | 0 | 3 | 5 | 8 | 4 | 1 | 4 | 8 | 9 | 0 | 2 | 4 | 6 | 3 | 8 | 4 | 5 | 0 | 2 | 0 | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Harderian Gland | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Adenoma | | | X | | | | | | | | | X | | | | | | | | X | | | | | | | |
| Carcinoma | | | | | | | | | | | X | | | | | | | | | | | | | | | | |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Urinary Bladder | + | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |

SYSTEMIC LESIONS

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Multiple Organ | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Histiocytic Sarcoma | | | | | | | | | | | X | | | | | | | | | | | | | | | | |
| Lymphoma Malignant | | X | | | | | X | | | | | | | | X | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE
12.5 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |
|------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|
| | ANIMAL ID | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 1 | |
| | | 7 | 1 | 3 | 5 | 9 | 0 | 1 | 6 | 7 | 9 | 0 | 1 | 2 | 4 | 7 | 8 | 1 | 2 | 6 | 7 | 3 | 5 | 6 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Gallbladder | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | 42 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 46 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 46 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hepatocellular Adenoma | | | | | | | | | | | | | | | | | | | | | | X | | | 9 |
| Hepatocellular Adenoma, Multiple | | | X | X | | | | X | X | | | | | X | | | | | | | | | | | 7 |
| Hepatocellular Carcinoma | | | | | X | | | | | | | | | | | | | | X | | | | | | 6 |
| Hepatocellular Carcinoma, Multiple | | | | | | | | | | | | | | | X | | | | | X | | | | | 5 |
| Mesentery | | | + | | | | | | | | | | | | | | | | | | | | | | 1 |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Squamous Cell Papilloma | | | | | | X | | | | | | | | | | | | | | | | | | | 1 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE
12.5 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------|
| | 0730 | 0733 | 0730 | 0733 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | | 0733 |
| ANIMAL ID | 00200 | 00011 | 00113 | 00115 | 00119 | 00200 | 00201 | 00206 | 00207 | 00209 | 00210 | 00212 | 00214 | 00217 | 00218 | 00221 | 00222 | 00226 | 00227 | 00233 | 00235 | |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Tooth | | | | + | | | | | | | | | + | | | | | | | | | 2 |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | |
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Adenoma | | | | | | | | | | | | | | | | | | | X | | | 1 |
| Subcapsular, Adenoma | X | | | | | X | | | | | | | X | X | | | | | | | | 7 |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Parathyroid Gland | + | + | + | + | + | + | M | M | + | + | + | + | + | + | + | M | + | M | + | + | + | 39 |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Follicular Cell, Adenoma | | | | | | | | | | | | | | | | | | | X | | | 1 |
| GENERAL BODY SYSTEM | | | | | | | | | | | | | | | | | | | | | | |
| NONE | | | | | | | | | | | | | | | | | | | | | | |
| GENITAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE
12.5 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|-------------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|
| | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | | 0730 |
| | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | |
| | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | 0007 | |
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Preputial Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Prostate | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Seminal Vesicle | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Testes | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Hemangiosarcoma, Metastatic, Spleen | | | | | | | | | | | | | | | | | | | | | | 2 |
| Lymph Node | | | | | | | | | | | | | | | | | | | | | | 1 |
| Lymph Node, Bronchial | + | + | + | + | + | + | + | + | + | I | + | + | M | + | + | + | + | + | + | + | + | 43 |
| Lymph Node, Mandibular | + | + | + | M | + | + | + | I | + | I | + | + | M | M | M | + | + | + | + | + | + | 33 |
| Lymph Node, Mediastinal | I | M | + | + | + | I | + | M | I | I | + | + | + | + | + | I | + | + | + | + | + | 33 |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Hemangiosarcoma | | | | | | | | | | | | | | | | | | | | | | 2 |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | I | + | I | I | + | 42 |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | 0 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE MALE
12.5 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS | |
|------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---|
| | ANIMAL ID | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | |
| | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | |
| | | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | | | |
| | | 7 | 1 | 3 | 5 | 9 | 0 | 1 | 6 | 7 | 9 | 0 | 1 | 2 | 4 | 7 | 8 | 1 | 2 | 6 | 7 | 3 | 5 | 6 | 7 | 8 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------|
| Skin
Carcinoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49
1 |
|-------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------|

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | 4 |

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Peripheral Nerve | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| Spinal Cord | | | | | | | | | | | | | | | | | | | | | | | | | 2 |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Alveolar/Bronchiolar Adenoma | | | | | X | | | | | | | | | | | | | | | | X | | | | 5 |
| Alveolar/Bronchiolar Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| Hepatocellular Carcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | X | | | | 2 |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE
12.5 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |
|------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----------|
| | ANIMAL ID | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | |
| | | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 1 | 4 | |
| | | 7 | 1 | 3 | 5 | 9 | 0 | 1 | 6 | 7 | 9 | 0 | 1 | 2 | 4 | 7 | 8 | 1 | 2 | 6 | 7 | 3 | 5 | 6 | 7 | 8 | |
| Harderian Gland | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Adenoma | | | | | X | | | | | | | X | | | | X | | | | | | | | | | 6 | |
| Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Urinary Bladder | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 | |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Multiple Organ | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Histiocytic Sarcoma | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Lymphoma Malignant | | | | | | | | | | | | | X | | | | | | | | | | | | | 4 | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B6C3F1 MICE MALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 3 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | | 2 | 2 | 5 | 8 | 9 | 0 | 3 | 8 | 8 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 25 ppm | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | 1 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 0 | 2 | 1 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | | |
| | 1 | 3 | 2 | 0 | 5 | 4 | 6 | 9 | 5 | 0 | 2 | 6 | 2 | 1 | 2 | 3 | 6 | 7 | 8 | 9 | 0 | 5 | 7 | 8 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |

males (cont...)

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Gallbladder | + | + | + | A | + | + | + | A | + | A | + | + | A | + | + | + | + | + | + | + | + | + | M | + |
| Intestine Large, Cecum | + | + | + | A | + | + | + | M | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | + | + | A | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | I | I | A | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | I | + | + | + |
| Intestine Small, Duodenum | + | + | + | A | + | + | + | A | A | A | A | + | A | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | + | + | A | A | + | + | + | A | A | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | + | + | A | A | + | + | + | A | A | A | A | + | A | + | + | + | + | + | + | + | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hepatoblastoma | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Adenoma | | | X | | | | | | | | | | | | X | | X | | X | | | X | | |
| Hepatocellular Adenoma, Multiple | | | | | | | | | | | | X | | | | X | | | | | | | | |
| Hepatocellular Carcinoma | | X | | | | X | | X | | | | | | | | | | | | | | X | | |
| Hepatocellular Carcinoma, Multiple | | | | | | | | | X | | X | | | | | X | | | | | | | X | |
| Hepatocholeangiocarcinoma | | | | | | | | | | | | | X | | | | | | | | | | | |
| Mesentery | | | | | + | | | | + | | | | | | | | | | | | | | | |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Carcinoma, Metastatic, Liver | | | | | | | | X | | | | | | | | | | | | | | | | |
| Hepatocholeangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | X | | | | | | | | | | | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE MALE
25 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | | |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------------------|
| | 0
3
2
0 | 0
5
2
7 | 0
5
5
4 | 0
5
8
8 | 0
5
9
7 | 0
6
0
0 | 0
6
3
7 | 0
6
8
3 | 0
6
8
9 | 0
7
0
6 | 0
7
1
9 | 0
7
2
2 | 0
7
2
3 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | | | |
| | 0
4
1
1 | 0
0
4
4 | 0
0
4
4 | 0
0
4
3 | 0
0
4
4 | 0
0
4
4 | 0
0
4
4 | 0
0
4
3 | 0
0
0
2 | 0
0
0
1 | 0
0
0
3 | 0
0
0
2 | 0
0
0
0 | 0
0
0
0 | 0
0
0
0 | 0
0
0
0 | 0
0
0
0 | 0
0
0
0 | 0
0
0
1 | 0
0
0
1 | 0
0
0
1 | 0
0
0
8 | 0
0
0
7 | 0
0
0
1 | males
(cont...) |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | X | |
| Salivary Glands | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Stomach, Forestomach | + | | | | | | | | | | | | | | | | | | | | | | | A | |
| Stomach, Glandular | + | | | | | | | | | | | | | | | | | | | | | | | A | |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | X | |
| Tooth | | | | | | | | | | | | | | | | | | | | | | | | + | |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blood Vessel | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Heart | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | X | |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | |
| Subcapsular, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | X | |
| Adrenal Medulla | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Islets, Pancreatic | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | X | |
| Parathyroid Gland | + | | | | | | | | | | | | | | | | | | | | | | | M | |
| Pituitary Gland | + | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE MALE
25 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ANIMAL ID | males
(cont...) |
|----------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--------------------|
| | 0 | 3 | 5 | 8 | 9 | 0 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 6 | 7 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | | 1 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 0 | 2 | 1 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | |
| | | 1 | 3 | 2 | 0 | 5 | 4 | 6 | 9 | 5 | 0 | 2 | 6 | 2 | 1 | 2 | 3 | 6 | 7 | 8 | 9 | 0 | 5 | 7 | 8 | 1 |

Thyroid Gland
 Follicular Cell, Adenoma

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocholeangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | X | | | | | | | | | | | | |
| Preputial Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Prostate | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma, Metastatic, Urinary Bladder | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocholeangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | X | | | | | | | | | | | | |
| Seminal Vesicle | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hepatocholeangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | X | | | | | | | | | | | | |
| Testes | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node | | | | | | | | | | | | | | | | | | | | | | | | |
| Pancreatic, Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | + | | | | | | | | | | | + | |
| Lymph Node, Bronchial | M | + | + | + | M | M | M | + | M | A | + | + | + | M | + | + | + | + | + | + | + | + | + | I |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|--|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 25 ppm | ANIMAL ID | 2 | 2 | 5 | 8 | 9 | 0 | 3 | 8 | 8 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | 0 | 7 | 4 | 8 | 7 | 0 | 7 | 3 | 9 | 6 | 9 | 2 | 3 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | | 1 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 0 | 2 | 1 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| | | 1 | 3 | 2 | 0 | 5 | 4 | 6 | 9 | 5 | 0 | 2 | 6 | 2 | 1 | 2 | 3 | 6 | 7 | 8 | 9 | 0 | 5 | 7 |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | X | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Mandibular | | M | M | + | + | + | + | + | M | M | M | M | + | M | M | M | I | M | + | M | + | + | + | I |
| Lymph Node, Mediastinal | | M | + | + | + | I | M | M | + | + | I | + | + | + | I | + | + | + | I | + | M | + | + | + |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | X | | | | | | | | | | | | | | | | | | | |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | X | | | | | | | | | | | |
| Lymph Node, Mesenteric | | + | + | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | X | | | | | | | | | | | |
| Spleen | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Thymus | | + | I | + | + | I | + | M | + | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | X | | | | | | | | | | | | | | | | | | | |

males
(cont...)

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Skeletal Muscle | + | | | + | | + | | | | | | | + | | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | X | | | | | | | | | | | | | | | | | | | | |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

| B6C3F1 MICE MALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ANIMAL ID | males
(cont...) |
|------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--------------------|
| | | 3 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | |
| 25 ppm | | 2 | 2 | 5 | 8 | 9 | 0 | 3 | 8 | 8 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | |
| | | 0 | 7 | 4 | 8 | 7 | 0 | 7 | 3 | 9 | 6 | 9 | 2 | 3 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | | 1 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 0 | 2 | 1 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | |
| | | 1 | 3 | 2 | 0 | 5 | 4 | 6 | 9 | 5 | 0 | 2 | 6 | 2 | 1 | 2 | 3 | 6 | 7 | 8 | 9 | 0 | 5 | 7 | 8 | 1 |

Hepatocarcinoma, Metastatic, Liver

X

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Peripheral Nerve | + | | | | | | | | | | | | | | | | | | | | | | | |
| Spinal Cord | + | | | | | | | | | | | | | | | | | | | | | | | |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Adenoma | | | | | | | | | | | | | | | | | | | | | | | | X |
| Alveolar/Bronchiolar Carcinoma | | | | | | | | | | | | | X | X | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | X |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Carcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Trachea | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Harderian Gland Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------------|
| B6C3F1 MICE MALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 25 ppm | | 3 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | | 2 | 2 | 5 | 8 | 9 | 0 | 3 | 8 | 8 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | | 0 | 7 | 4 | 8 | 7 | 0 | 7 | 3 | 9 | 6 | 9 | 2 | 3 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | | 1 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 0 | 2 | 1 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | |
| | | 1 | 3 | 2 | 0 | 5 | 4 | 6 | 9 | 5 | 0 | 2 | 6 | 2 | 1 | 2 | 3 | 6 | 7 | 8 | 9 | 0 | 5 | 7 | 8 | 1 | males
(cont...) |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hepatocellular Carcinoma, Metastatic, Liver | | | | | | | | | X | | | | | | | | | | | | | | | | | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | X | | | | | | | | | | | | | |

SYSTEMIC LESIONS

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Multiple Organ | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Histiocytic Sarcoma | | | | | | X | | | | | | | | | | | | | | | | | | | | |
| Lymphoma Malignant | | | | | | | X | | | X | X | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |
|------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|
| | ANIMAL ID | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | |
| 25 ppm | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 0 | |
| | 3 | 5 | 6 | 8 | 1 | 2 | 3 | 7 | 8 | 9 | 0 | 3 | 4 | 6 | 4 | 7 | 9 | 7 | 8 | 0 | 1 | 4 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Gallbladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | M | + | + | + | + | + | 43 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 45 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 44 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 44 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 43 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hepatoblastoma | | | | | | | | X | | | | | | | | | | | | | | | 1 |
| Hepatocellular Adenoma | | X | | X | | X | | | | | | | X | | X | | | | | | | X | 11 |
| Hepatocellular Adenoma, Multiple | | | | | | | | | X | | | | X | | | | | | | | | | 4 |
| Hepatocellular Carcinoma | | | | | | | | | | | | | | | | | X | | | | | | 5 |
| Hepatocellular Carcinoma, Multiple | | | | X | | | | | | | | | | | X | | | X | | X | | | 8 |
| Hepatocholangiocarcinoma | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Mesentery | | | | | | + | + | | | | | | | | | | | | | | | | 5 |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | X | | | | | | | | | | | | | | | 1 |
| Hepatocellular Carcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | X | | | | | | | | | | | | | | | 1 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE
25 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|--|------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|
| | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | | |
| ANIMAL ID | 0
4
2
3 | 0
0
4
2
5 | 0
0
4
2
6 | 0
0
4
2
8 | 0
0
4
2
1 | 0
0
4
2
2 | 0
0
4
3
3 | 0
0
4
4
3 | 0
0
4
4
4 | 0
0
4
4
4 | 0
0
4
4
5 | 0
0
4
4
1 | 0
0
4
4
1 | 0
0
4
4
1 | 0
0
4
2
2 | 0
0
4
2
2 | 0
0
4
3
3 | 0
0
4
3
4 | 0
0
4
4
4 | 0
0
4
4
0 | 0
0
4
4
1 | 0
0
4
4
4 | 0
0
4
0
9 | 0
0
4
1
4 | 0
0
4
3
5 | |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Tooth | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Subcapsular, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | 3 | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | 2 | |
| Parathyroid Gland | + | M | + | M | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 44 | |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE
25 ppm | DAY ON TEST | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | * TOTALS |
|----------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|
| | ANIMAL ID | 004233 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | 004422 | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---|
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Follicular Cell, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Hepatocholeangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Preputial Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Prostate | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Carcinoma, Metastatic, Urinary Bladder | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Hepatocholeangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Seminal Vesicle | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Hepatocholeangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Testes | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Lymph Node | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| Pancreatic, Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Lymph Node, Bronchial | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 38 | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE
25 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | | |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|---|----|
| | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | | 0
7
2
9 | | |
| ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 0
4
2
3 | 0
0
4
5 | 0
0
4
6 | 0
0
4
8 | 0
0
4
1 | 0
0
4
2 | 0
0
4
3 | 0
0
4
7 | 0
0
4
8 | 0
0
4
9 | 0
0
4
0 | 0
0
4
3 | 0
0
4
4 | 0
0
4
6 | 0
0
4
4 | 0
0
4
7 | 0
0
4
9 | 0
0
4
7 | 0
0
4
8 | 0
0
4
0 | 0
0
4
1 | 0
0
4
4 | 0
0
4
9 | 1 | |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | 1 | | | | |
| Lymph Node, Mandibular | | M | M | + | M | + | M | + | + | + | + | + | M | + | + | + | + | I | + | + | + | + | + | I | + | 30 |
| Lymph Node, Mediastinal | | + | I | + | M | + | + | + | + | I | + | + | + | + | + | + | + | + | + | + | + | I | + | + | + | 38 |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | 1 | | | | |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | 1 | | | | |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | 1 | | | | |
| Lymph Node, Mesenteric | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | 1 | | | | |
| Spleen | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Thymus | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 44 |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | 1 | | | | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | 0 |
| Skin | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | + | 5 | | | |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | 1 | | | | |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | X | 1 | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|
| B6C3F1 MICE MALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| 25 ppm | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | |
| | | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 0 | | |
| | | 3 | 5 | 6 | 8 | 1 | 2 | 3 | 7 | 8 | 9 | 0 | 3 | 4 | 6 | 4 | 7 | 9 | 7 | 8 | 0 | 1 | 4 | 9 | | |

Hepatocolangiocarcinoma, Metastatic, Liver

1

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Peripheral Nerve | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Spinal Cord | | | | | | | | | | | | | | | | | | | | | | | | | 1 |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Alveolar/Bronchiolar Adenoma | | | | | | | X | | | | | | | X | | | | | | X | | | | | 5 |
| Alveolar/Bronchiolar Carcinoma | | | | | X | | | X | | | | | | | | | | | | | | | | | 4 |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | | | | | | | | | | X | | | | | | | | | | | | 2 |
| Hepatoblastoma, Metastatic, Liver | | | | | | | X | | | | | | | | | | | | | | | | | | 1 |
| Hepatocellular Carcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | X | | | X | | | | | 7 |
| Hepatocolangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Adenoma | | | | | | | | | | | | | | | | | | | | X | | | X | | 2 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|---------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|---|
| B6C3F1 MICE MALE | 25 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | 7 |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 |
| | | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| | | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | |
| | | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 0 | 1 | 3 | | 3 |
| | | 3 | 5 | 6 | 8 | 1 | 2 | 3 | 7 | 8 | 9 | 0 | 3 | 4 | 6 | 4 | 7 | 9 | 7 | 8 | 0 | 1 | 4 | 9 | 4 | 5 | |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hepatocellular Carcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma | | | | | | | | | | | | | X | | | | | | | | | | | | | 1 |
| Hepatocholangiocarcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |

SYSTEMIC LESIONS

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Multiple Organ | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Histiocytic Sarcoma | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| Lymphoma Malignant | | | | | | | | | | | | | | | | | | | | | | | | | | 3 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE MALE
50 ppm | DAY ON TEST | 0141 | 0266 | 0320 | 0332 | 0333 | 0447 | 0444 | 0444 | 0441 | 0447 | 0551 | 0555 | 0556 | 0669 | 0666 | 0666 | 0668 | 0668 | 0669 | 0771 | 0771 | 0771 | 0772 | 0773 | |
|----------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------------|
| | ANIMAL ID | 00638 | 00663 | 00623 | 00627 | 00603 | 00602 | 00606 | 00606 | 00606 | 00606 | 00606 | 00606 | 00606 | 00606 | 00606 | 00606 | 00606 | 00606 | 00606 | 00606 | 00606 | 00606 | 00606 | 00606 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | males
(cont...) |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Gallbladder | + | A | + | + | + | M | + | + | + | + | + | A | + | A | A | A | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum | + | A | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | A | + | + | + | + | + | + | + | + | + | + | + | + | A | A | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | A | + | + | + | + | + | + | + | + | + | A | + | A | A | A | + | A | + | + | + | + | + | + |
| Intestine Small, Ileum | + | A | + | + | + | + | + | + | + | + | + | + | + | A | A | A | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | + | A | + | + | + | + | + | + | + | + | + | A | + | A | A | A | + | A | + | + | + | + | A | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hemangiosarcoma | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Adenoma | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Adenoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE MALE
50 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|----------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ANIMAL ID | 1 | 2 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | | 4 | 6 | 2 | 3 | 4 | 0 | 0 | 1 | 7 | 0 | 5 | 6 | 1 | 5 | 6 | 6 | 8 | 8 | 9 | 9 | 1 | 1 | 1 | 1 | 2 | 3 | |
| | | 1 | 6 | 0 | 2 | 0 | 7 | 9 | 1 | 7 | 6 | 1 | 0 | 9 | 0 | 5 | 6 | 0 | 8 | 8 | 0 | 5 | 7 | 8 | 8 | 8 | 3 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | | 3 | 3 | 2 | 2 | 0 | 0 | 1 | 2 | 0 | 4 | 3 | 2 | 1 | 4 | 3 | 4 | 2 | 2 | 1 | 4 | 1 | 0 | 1 | 5 | 1 | 1 | |
| | | 8 | 6 | 3 | 7 | 3 | 2 | 6 | 6 | 6 | 2 | 4 | 2 | 2 | 8 | 7 | 5 | 9 | 8 | 4 | 4 | 7 | 7 | 3 | 0 | 1 | 1 | |

males
(cont...)

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Heart
Hemangioma | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adrenal Cortex
Subcapsular, Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Parathyroid Gland | + | M | + | M | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

GENERAL BODY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|
| Tissue NOS | | | | | | | | | | | | | | | | | | | | | | | | | | | | + |
|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + |
| Preputial Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | + | + | + | + | + | + | + |
| Prostate | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------|
| B6C3F1 MICE MALE
50 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | males
(cont...) |
| | | 1 | 2 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | |
| | | 4 | 6 | 2 | 3 | 4 | 0 | 0 | 1 | 7 | 0 | 5 | 6 | 1 | 5 | 6 | 6 | 8 | 8 | 9 | 9 | 1 | 1 | 1 | 1 | |
| ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | |
| | 3 | 3 | 2 | 2 | 0 | 0 | 1 | 2 | 0 | 4 | 3 | 2 | 1 | 4 | 3 | 4 | 2 | 2 | 1 | 4 | 1 | 0 | 1 | 5 | | |
| | 8 | 6 | 3 | 7 | 3 | 2 | 6 | 6 | 6 | 2 | 4 | 2 | 2 | 8 | 7 | 5 | 9 | 8 | 4 | 4 | 7 | 7 | 3 | 0 | | |

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Peripheral Nerve | | | | | | | | | | | + | | | | | | | | | | | | | |
| Spinal Cord | | | | | | | | | | | + | | | | | | | | | | | | | |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Adenoma | | | | | | | | | | | | | X | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma | | | | | | | | | | | | | | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Trachea | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adenoma | | | | | | | | | | | | | | | | | | | | | X | | |
| Carcinoma | | | | | | | | | | | | | X | | | | | | | | | | |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Date Report Requested: 04/15/2016

Test Type: CHRONIC

2,3-Butanedione

Time Report Requested: 10:33:43

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: 431-03-8

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

Species/Strain: MICE/B6C3F1

Lab: BNW

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------------|
| B6C3F1 MICE MALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 1 | 2 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | | 7 |
| 50 ppm | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | males
(cont...) |
| | | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |

Urinary Bladder

+ +

SYSTEMIC LESIONS

Multiple Organ

+ +

Lymphoma Malignant

X

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---|
| B6C3F1 MICE MALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | 7 |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 |
| | | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | | 1 |
| 50 ppm | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | |
| | | 0 | 1 | 1 | 2 | 2 | 2 | 3 | 4 | 4 | 4 | 0 | 0 | 1 | 2 | 3 | 3 | 3 | 4 | 0 | 0 | 1 | 3 | 3 | | 4 |
| | | 4 | 0 | 5 | 0 | 1 | 4 | 1 | 0 | 1 | 3 | 8 | 9 | 9 | 9 | 5 | 0 | 3 | 9 | 9 | 1 | 5 | 8 | 2 | * TOTALS | |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Hemangioma | | | | | | | | | | | | | | X | | | | | | | | | | 1 |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Subcapsular, Adenoma | | | | | | | | | X | | | | | | X | | | | | | | | | 2 |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Parathyroid Gland | M | M | + | + | + | + | M | + | M | + | + | M | M | + | + | M | M | + | M | + | + | + | M | 37 |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

GENERAL BODY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|
| Tissue NOS | | | | | | | | | | | | | | | | | | | | | | | | 1 |
|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Preputial Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Prostate | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE MALE
50 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS | | |
|----------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---|--|
| | ANIMAL ID | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | |
| | | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | |
| | | 0 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 4 | 4 | 4 | 0 | 0 | 1 | 2 | 3 | 3 | 3 | 4 | 0 | 0 | 1 | 3 | 3 | 4 | 4 | |
| | | 4 | 0 | 5 | 0 | 1 | 4 | 1 | 0 | 1 | 3 | 8 | 9 | 9 | 5 | 0 | 3 | 9 | 9 | 1 | 5 | 8 | 2 | 5 | 6 | 7 | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Seminal Vesicle | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Testes | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Lymph Node | + | | + | | | | + | | | + | | | | | | + | | | | | | | | | | 8 |
| Lymph Node, Bronchial | + | M | + | + | + | M | + | M | + | + | + | I | + | + | + | + | M | + | + | I | + | + | + | + | M | 31 |
| Lymph Node, Mandibular | + | M | + | M | + | M | M | I | M | M | + | + | M | + | + | M | M | + | + | + | M | M | + | + | M | 32 |
| Lymph Node, Mediastinal | + | + | + | + | M | + | M | M | + | + | I | M | + | I | + | + | + | + | + | I | + | M | I | I | I | 32 |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Thymus | I | I | + | + | I | I | + | + | I | + | + | + | + | I | + | + | + | + | + | I | I | + | + | + | I | 30 |

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Mammary Gland | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | 1 |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Date Report Requested: 04/15/2016

Test Type: CHRONIC

2,3-Butanedione

Time Report Requested: 10:33:43

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: 431-03-8

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

Species/Strain: MICE/B6C3F1

Lab: BNW

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|---|-----------|--|
| B6C3F1 MICE MALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | 7 | | |
| 50 ppm | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS | | | |
| | | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | | |
| | | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 3 | 4 | 4 | 4 | 0 | 0 | 1 | 2 | 3 | 3 | 3 | 4 | 0 | 0 | 1 | 3 | 3 | 4 | 4 | |
| | | 4 | 0 | 5 | 0 | 1 | 4 | 1 | 0 | 1 | 3 | 8 | 9 | 9 | 5 | 0 | 3 | 9 | 9 | 1 | 5 | 8 | 2 | 5 | 6 | 7 | | |
| Urinary Bladder | | + | + | + | + | + | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Multiple Organ | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Lymphoma Malignant | | | | | | | | X | | | | | | | | | | | | | | | | | | | 2 | |

*** END OF MALE DATA ***

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------------|-----------------------|
| B6C3F1 MICE FEMALE | DAY ON TEST | 0
1
7
7 | 0
4
9
9 | 0
5
8
7 | 0
5
9
0 | 0
5
9
3 | 0
6
4
7 | 0
6
5
3 | 0
6
6
3 | 0
6
6
3 | 0
6
6
9 | 0
6
6
4 | 0
6
6
7 | 0
6
6
0 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | females
(cont...) | |
| | ANIMAL ID | 0
0
1
4
4 | 0
0
1
4
1 | 0
0
1
0
8 | 0
0
1
3
5 | 0
0
1
4
6 | 0
0
1
3
2 | 0
0
1
2
3 | 0
0
1
2
0 | 0
0
1
5
0 | 0
0
1
3
8 | 0
0
1
0
1 | 0
0
1
1
2 | 0
0
1
0
6 | 0
0
1
2
4 | 0
0
1
0
4 | 0
0
1
0
7 | 0
0
1
1
3 | 0
0
1
1
8 | 0
0
1
2
9 | 0
0
1
3
9 | 0
0
1
4
0 | 0
0
1
1
5 | | 0
0
1
1
5 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Gallbladder | + | A | A | + | M | + | + | A | + | + | + | + | + | A | + | M | + | + | + | + | + | + | M | + | + |
| Intestine Large, Cecum | + | A | A | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | A | A | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | A | + | + | + | + | A | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | + | A | A | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | + | A | A | + | + | + | + | A | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Granulosa-Theca Tumor Malignant, Metastatic, Ovary | | | | | | | | X | | | | | | | | | | | | | | | | | |
| Hepatoblastoma | | | | X | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Adenoma | | | | | | | | X | | | | | | | | | | | | | | | | | |
| Hepatocellular Adenoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Carcinoma | | | | | | | | | | | | | | | | | | | X | X | | | | | |
| Hepatocellular Carcinoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | X | | |
| Mesentery | | | | + | | | + | | | | | | + | | + | | | | | | | | | | |
| Hepatoblastoma, Metastatic, Liver | | | | X | | | | | | | | | | | | | | | | | | | | | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------------|-----------------------|
| B6C3F1 MICE FEMALE | DAY ON TEST | 0
1
7
7 | 0
4
9
9 | 0
5
8
7 | 0
5
9
0 | 0
5
9
3 | 0
6
4
7 | 0
6
5
3 | 0
6
6
3 | 0
6
6
3 | 0
6
6
9 | 0
6
6
4 | 0
6
6
7 | 0
6
6
0 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | females
(cont...) | |
| | ANIMAL ID | 0
0
1
4
4 | 0
0
1
4
1 | 0
0
1
0
8 | 0
0
1
3
5 | 0
0
1
4
6 | 0
0
1
3
2 | 0
0
1
2
3 | 0
0
1
2
2 | 0
0
1
5
0 | 0
0
1
3
8 | 0
0
1
0
1 | 0
0
1
0
2 | 0
0
1
0
4 | 0
0
1
2
4 | 0
0
1
0
7 | 0
0
1
0
3 | 0
0
1
1
8 | 0
0
1
1
9 | 0
0
1
2
9 | 0
0
1
3
9 | 0
0
1
4
0 | 0
0
1
1
5 | | 0
0
1
1
5 |

Granulosa-Theca Tumor Malignant, Metastatic, Ovary

X

Salivary Glands

+ +

Stomach, Forestomach

+ +

Granulosa-Theca Tumor Malignant, Metastatic, Ovary

X

Stomach, Glandular

+ + + + + + + + + + + + + + A + + + + + + + + + + + +

Granulosa-Theca Tumor Malignant, Metastatic, Ovary

X

Tooth

+

CARDIOVASCULAR SYSTEM

Blood Vessel

+ +

Heart

+ +

ENDOCRINE SYSTEM

Adrenal Cortex

+ +

Subcapsular, Adenoma

Adrenal Medulla

+ +

Pheochromocytoma Benign

Islets, Pancreatic

+ + + + + + + M + + + + + + + + + + + + + + + + + +

Parathyroid Gland

+ + + + M M + + + + + M + + M + + + + M + + + + +

Pituitary Gland

+ +

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|
| B6C3F1 MICE FEMALE | DAY ON TEST | 0
1
7
7 | 0
4
9
9 | 0
5
8
7 | 0
5
9
0 | 0
5
9
3 | 0
6
4
7 | 0
6
5
3 | 0
6
6
3 | 0
6
6
3 | 0
6
6
9 | 0
6
8
4 | 0
6
8
7 | 0
6
9
0 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | females
(cont...) | |
| | ANIMAL ID | 0
0
1
4
4 | 0
0
1
4
1 | 0
0
1
0
8 | 0
0
1
3
5 | 0
0
1
4
6 | 0
0
1
2
2 | 0
0
1
2
3 | 0
0
1
2
2 | 0
0
1
5
0 | 0
0
1
3
8 | 0
0
1
0
1 | 0
0
1
0
2 | 0
0
1
1
0 | 0
0
1
0
2 | 0
0
1
0
4 | 0
0
1
0
4 | 0
0
1
0
7 | 0
0
1
1
3 | 0
0
1
1
3 | 0
0
1
2
9 | 0
0
1
3
9 | 0
0
1
4
0 | | 0
0
1
1
5 |

Pars Distalis, Adenoma
Pars Intermedia, Carcinoma

X

X

Thyroid Gland
Follicular Cell, Adenoma

+
X

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | |
|--|--|
| Clitoral Gland | + + + + + + + + M + + + + + + + + + + + + + + + |
| Ovary
Granulosa-Theca Tumor Malignant
Periovarian Tissue, Hepatoblastoma,
Metastatic, Liver | + + + + + + + X + + + + + + + + + + + + + + + + + +
X |
| Uterus | + |

HEMATOPOIETIC SYSTEM

| | |
|--|--|
| Bone Marrow | + |
| Lymph Node
Iliac, Hepatoblastoma, Metastatic, Liver | + + + + + + + + + + + + + + + + + +
X |
| Lymph Node, Bronchial | + M + M + M + + + + I + + + + + + + + + + + M |
| Lymph Node, Mandibular
Carcinoma, Metastatic, Harderian Gland | M + M + + M + + M + + + + + + + M + + + + + M + +
X |
| Lymph Node, Mediastinal | I + + + + I + I + I + + + + + + + + + + + + + |

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|---|--|
| | 0
1
7
7 | 0
4
9
9 | 0
5
8
7 | 0
5
9
0 | 0
5
9
3 | 0
6
4
7 | 0
6
5
3 | 0
6
6
3 | 0
6
6
3 | 0
6
6
9 | 0
6
6
4 | 0
6
8
7 | 0
6
8
0 | 0
6
9
0 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | | | |
| ANIMAL ID | 0
0
1
4
4 | 0
0
1
4
1 | 0
0
1
0
8 | 0
0
1
3
5 | 0
0
1
4
6 | 0
0
1
3
2 | 0
0
0
2
3 | 0
0
1
2
2 | 0
0
1
5
0 | 0
0
1
3
8 | 0
0
1
0
1 | 0
0
1
0
2 | 0
0
1
1
6 | 0
0
1
0
4 | 0
0
1
0
4 | 0
0
1
0
7 | 0
0
1
1
3 | 0
0
1
1
8 | 0
0
1
2
9 | 0
0
1
3
9 | 0
0
1
4
0 | 0
0
1
0
5 | 0
0
1
1
5 | 0
0
1
1
6 | 0
0
1
1
9 | | |
| Hepatoblastoma, Metastatic, Liver | | | | X | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Mesenteric
Granulosa-Theca Tumor Malignant, Metastatic, Ovary | + | + | + | + | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Thymus
Hepatoblastoma, Metastatic, Liver | + | + | + | + | I | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland
Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Skin
Basal Cell Carcinoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Skeletal Muscle
Granulosa-Theca Tumor Malignant, Metastatic, Ovary
Sarcoma | + | | | | | | + | + | + | | | | | + | | | | | | | | | | | | | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Peripheral Nerve | + | | | | | | + | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B6C3F1 MICE FEMALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 1 | 4 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 7 | 9 | 8 | 9 | 9 | 4 | 5 | 6 | 6 | 6 | 8 | 8 | 9 | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Control | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | 4 | 4 | 0 | 3 | 4 | 3 | 2 | 2 | 5 | 3 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 2 | 3 | 4 | 0 | 1 |
| | | 4 | 1 | 8 | 5 | 6 | 2 | 3 | 2 | 0 | 8 | 1 | 2 | 6 | 4 | 4 | 7 | 3 | 8 | 9 | 9 | 0 | 5 | 5 |

females
(cont...)

Spinal Cord + +

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Adenoma | | | | | | | | | | | | | | | | | | | | | | X | |
| Alveolar/Bronchiolar Carcinoma | | | | | | | | | | | | | | | X | | | | | X | | | |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | | | | | | X | | | | | | | | | | | | | | |
| Carcinoma, Metastatic, Harderian Gland | | | | | | | | | | | | | | | X | | | | | | | | |
| Hepatoblastoma, Metastatic, Liver | | | | X | | | | | | | | | | | | | | | | | | | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma, Metastatic, Harderian Gland | | | | | | | | | | | | | | X | | | | | | | | | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma, Metastatic, Harderian Gland | | | | | | | | | | | | | | X | | | | | | | | | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | |
| Carcinoma | | | | | | | | | | | | | | X | | | | | | | | | |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
Control | DAY ON TEST | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
|-------------------------------|-------------|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------------------|
| | | 0001 | 0002 | 0003 | 0004 | 0005 | 0006 | 0007 | 0008 | 0009 | 0010 | 0011 | 0012 | 0013 | 0014 | 0015 | 0016 | 0017 | 0018 | 0019 | 0020 | 0021 | 0022 | 0023 | 0024 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 1 | 4 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | 7 | 9 | 8 | 9 | 9 | 4 | 5 | 6 | 6 | 6 | 8 | 8 | 9 | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 7 | 9 | 7 | 0 | 3 | 7 | 3 | 3 | 3 | 9 | 4 | 7 | 0 | 9 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | 4 | 4 | 0 | 3 | 4 | 3 | 2 | 2 | 5 | 3 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 2 | 3 | 4 | 0 | 1 | 1 | 1 | |
| | 4 | 1 | 8 | 5 | 6 | 2 | 3 | 2 | 0 | 8 | 1 | 2 | 6 | 4 | 4 | 7 | 3 | 8 | 9 | 9 | 0 | 5 | 5 | 6 | 9 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Urinary Bladder | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Multiple Organ | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Histiocytic Sarcoma | | | X | | | | | | | | | | | | | | | | | | | | | | | |
| Lymphoma Malignant | | | | | | | | | | | | X | X | X | | | | | | | | X | X | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----|----------|
| | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | | |
| Control | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
| 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | | |
| Granulosa-Theca Tumor Malignant, Metastatic, Ovary | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Salivary Glands | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Granulosa-Theca Tumor Malignant, Metastatic, Ovary | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Granulosa-Theca Tumor Malignant, Metastatic, Ovary | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Tooth | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Subcapsular, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Pheochromocytoma Benign | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Parathyroid Gland | + | + | + | + | + | + | M | + | M | + | + | + | M | + | M | + | + | + | + | + | M | M | + | 38 | |
| Pituitary Gland | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
|--------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|
| | ANIMAL ID | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| Control | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 3 | |
| | | 0 | 1 | 5 | 6 | 8 | 0 | 1 | 3 | 4 | 2 | 5 | 7 | 9 | 2 | 3 | 9 | 0 | 1 | 4 | 7 | 7 | 6 | |
| | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Pars Distalis, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | X | 2 |
| Pars Intermedia, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | 50 |
| Follicular Cell, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | 1 |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|-----------|
| Clitoral Gland | + | + | + | + | + | + | + | + | + | + | M | + | M | + | + | + | + | + | + | + | + | + | + | | 47 |
| Ovary | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | + | + | + | + | + | + | | 49 |
| Granulosa-Theca Tumor Malignant | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Periovarian Tissue, Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Uterus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | 50 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|-----------|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | 50 |
| Lymph Node | | | | | + | | | | | | + | + | | | | | + | | | | | | | | 11 |
| Iliac, Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Lymph Node, Bronchial | + | M | + | + | + | + | + | + | + | I | + | + | + | + | M | + | + | + | M | + | M | + | + | | 40 |
| Lymph Node, Mandibular | M | + | + | + | + | + | + | + | + | + | + | I | + | + | + | + | M | + | + | M | + | + | + | | 39 |
| Carcinoma, Metastatic, Harderian Gland | | | | | | | | | | | | | | | | | | | | | | | M | | 1 |
| Lymph Node, Mediastinal | + | + | + | I | + | M | I | + | + | + | + | + | + | + | + | I | + | + | + | + | + | M | + | | 40 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----|----------|
| | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | | |
| Control | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
| | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | 0
0
1
2
0 | | |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Granulosa-Theca Tumor Malignant, Metastatic, Ovary | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 | | |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | I | + | + | 1 | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | | |
| Adenoma | | | | | | | | | | | | | M | + | + | + | + | + | + | + | + | + | 1 | | |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Basal Cell Carcinoma | | | | | | | | | | | | | | | | | | | | | | X | 1 | | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Skeletal Muscle | + | | | | | | | | | | | | | | | | | | | | | | 6 | | |
| Granulosa-Theca Tumor Malignant, Metastatic, Ovary | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Sarcoma | X | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Peripheral Nerve | | | | | | | | | | | | | | | | | | | | | | | 2 | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|--------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|
| | 0732 | 0733 | 0732 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | |
| Control | 0010 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 2 |

Spinal Cord 2

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Alveolar/Bronchiolar Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| Alveolar/Bronchiolar Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Carcinoma, Metastatic, Harderian Gland | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Hepatoblastoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma, Metastatic, Harderian Gland | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma, Metastatic, Harderian Gland | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | 1 |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | 1 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE FEMALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |
|-------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|----------|
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| Control | ANIMAL ID | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | * TOTALS | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| | | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 3 | | |
| | | 0 | 1 | 5 | 6 | 8 | 0 | 1 | 3 | 4 | 2 | 5 | 7 | 9 | 2 | 3 | 9 | 0 | 1 | 4 | 7 | 7 | 6 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Urinary Bladder | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | | |
| Multiple Organ | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Histiocytic Sarcoma | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Lymphoma Malignant | | X | | | | X | | | | | | | X | X | | | | | | | | | | 9 | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
12.5 ppm | | DAY ON TEST | | | | | | | | | | | | | | | | | | | | females
(cont...) | | | | | | |
|--------------------------------|-------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------------------|----|----|----|----|----|----|
| | | 05 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | | 06 | 06 | 06 | 06 | 06 | 06 |
| ANIMAL ID | | 01 | 02 | 03 | 03 | 04 | 04 | 04 | 04 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 |
| 00324 | 00308 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Gallbladder | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + |
| Hemangiosarcoma, Metastatic, Liver | | | | | | | | | | X | | | | | | | | | | | | | | | | | |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | A | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hemangiosarcoma | | | | | | | | | | X | | | | | | | | | | | | | | | | | |
| Hepatoblastoma | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Adenoma | | | | | | | | | | | | | | | | | | X | X | X | | X | | | | X | |
| Hepatocellular Adenoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Carcinoma | | | | | | | | | | | | | | | | | X | | | | | X | | | | | |
| Hepatocellular Carcinoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Carcinoma, Metastatic, Liver | | | + | + | | | | | | | | | | | | | | | | | | | | | | | + |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|---|
| | 0
5
6
1 | 0
6
2
5 | 0
6
3
5 | 0
6
4
4 | 0
6
7
4 | 0
6
8
0 | 0
6
9
0 | 0
6
9
7 | 0
7
0
3 | 0
7
2
8 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | | | | |
| 12.5 ppm | 0
0
3
2
4 | 0
0
3
2
0 | 0
0
3
0
8 | 0
0
3
0
1 | 0
0
3
5
4 | 0
0
3
4
3 | 0
0
3
1
3 | 0
0
3
0
6 | 0
0
3
4
1 | 0
0
3
3
1 | 0
0
3
0
1 | 0
0
3
0
5 | 0
0
3
0
7 | 0
0
3
1
0 | 0
0
3
1
2 | 0
0
3
1
6 | 0
0
3
1
4 | 0
0
3
1
5 | 0
0
3
2
7 | 0
0
3
3
4 | 0
0
3
3
3 | 0
0
3
4
2 | 0
0
3
0
4 | 0
0
3
0
1 | 0
0
3
1
1 | females
(cont...) | |
| Salivary Glands | + | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stomach, Forestomach
Squamous Cell Papilloma | + | | | | | | | | | | | | | | | | | | | | | | | | X | | |
| Stomach, Glandular | + | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blood Vessel | + | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heart | + | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | + | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Medulla | + | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Islets, Pancreatic | + | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Parathyroid Gland | M | + | + | M | + | M | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M |
| Pituitary Gland | + | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pars Distalis, Adenoma | X | X | | | | | | | | | | | | | | | | | | | | | | X | | | |
| Pars Distalis, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pars Intermedia, Adenoma | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thyroid Gland | + | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GENERAL BODY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NONE | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| B6C3F1 MICE FEMALE | DAY ON TEST | 0
5
6
1 | 0
6
2
5 | 0
6
3
5 | 0
6
4
4 | 0
6
7
4 | 0
6
8
0 | 0
6
9
0 | 0
6
9
7 | 0
7
0
3 | 0
7
2
8 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | | |
| | 12.5 ppm | | | | | | | | | | | | | | | | | | | | | | | | |
| | ANIMAL ID | 0
0
3
2
4 | 0
0
3
2
0 | 0
0
3
0
8 | 0
0
3
0
1 | 0
0
3
5
0 | 0
0
3
4
3 | 0
0
3
1
3 | 0
0
3
0
6 | 0
0
3
4
1 | 0
0
3
3
1 | 0
0
3
0
1 | 0
0
3
0
5 | 0
0
3
0
7 | 0
0
3
0
0 | 0
0
3
1
2 | 0
0
3
1
6 | 0
0
3
2
4 | 0
0
3
3
5 | 0
0
3
3
7 | 0
0
3
4
7 | 0
0
3
0
2 | 0
0
3
0
3 | 0
0
3
0
4 | 0
0
3
0
1 |
| | Sex | 0
0
3
2
4 | 0
0
3
2
0 | 0
0
3
0
8 | 0
0
3
0
1 | 0
0
3
5
0 | 0
0
3
4
3 | 0
0
3
1
3 | 0
0
3
0
6 | 0
0
3
4
1 | 0
0
3
3
1 | 0
0
3
0
5 | 0
0
3
0
7 | 0
0
3
0
0 | 0
0
3
1
2 | 0
0
3
1
6 | 0
0
3
2
4 | 0
0
3
3
5 | 0
0
3
3
7 | 0
0
3
4
7 | 0
0
3
0
2 | 0
0
3
0
3 | 0
0
3
0
4 | 0
0
3
0
1 | 0
0
3
0
1 |

females
(cont...)

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clitoral Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Ovary | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Cystadenoma | | | | | | | | | | | | | | | X | | | | | X | | | |
| Luteoma | | | | | | | | | | | | X | | | | | | | | | | | |
| Teratoma Benign | | | | | | X | | | | | | | | | | | | | | | | | |
| Uterus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Polyp Stromal | | | | | | | | | | | | | | | | | | | | | | | |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hemangiosarcoma, Metastatic, Spleen | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node | | | | | | + | + | | | | + | | | | | | | | | + | | | |
| Pancreatic, Hepatocellular Carcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Bronchial | M | I | + | I | I | + | + | M | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + |
| Lymph Node, Mandibular | + | + | + | + | + | + | M | + | + | M | + | M | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node, Mediastinal | + | + | + | + | I | + | M | + | + | + | + | + | I | + | + | + | + | + | I | + | M | + | M |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hemangiosarcoma | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
12.5 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ANIMAL ID | females
(cont...) |
|--------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------------------------------|----------------------|
| | | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | |
| | | 6 | 2 | 3 | 4 | 7 | 8 | 9 | 9 | 0 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0
0
0
0
3
2
4 | |
| | | 1 | 5 | 5 | 4 | 4 | 0 | 0 | 7 | 3 | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0
0
0
0
3
2
4 | |

Thymus +

INTEGUMENTARY SYSTEM

Mammary Gland +

Skin +

Melanoma Malignant X

Neural Crest Tumor X

Subcutaneous Tissue, Fibrosarcoma X

MUSCULOSKELETAL SYSTEM

Bone +

Skeletal Muscle +

NERVOUS SYSTEM

Brain +

Carcinoma, Metastatic, Pituitary Gland

Peripheral Nerve +

Spinal Cord +

RESPIRATORY SYSTEM

Larynx +

Lung +

Alveolar/Bronchiolar Adenoma

Alveolar/Bronchiolar Adenoma, Multiple

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
12.5 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | females
(cont...) | | | |
|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|---|---|----------------------|
| | ANIMAL ID | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | 6 | 2 | 3 | 4 | 7 | 8 | 9 | 9 | 0 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 1 | 5 | 5 | 4 | 4 | 0 | 0 | 7 | 3 | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 2 | 2 | 0 | 0 | 5 | 4 | 1 | 0 | 4 | 3 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 4 | 0 | 0 | 0 | 1 | |
| | 4 | 0 | 8 | 1 | 0 | 3 | 3 | 6 | 1 | 1 | 5 | 7 | 0 | 2 | 6 | 7 | 6 | 4 | 5 | 7 | 7 | 2 | 3 | 4 | 1 | females
(cont...) |
| Alveolar/Bronchiolar Carcinoma | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Carcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nose | | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Trachea | | + | | | | | | | | | | | | | | | | | | | | | | | | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Harderian Gland Adenoma | | + | | | | | | | | | | | | | | | | | | | | | | | | |
| | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Urinary Bladder | | + | | | | | | | | | | | | | | | | | | | | | | | | |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Multiple Organ | | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Histiocytic Sarcoma | | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymphoma Malignant | | + | | | | | | | | | | | | | | | | | | | | | | | | |
| | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| | | X | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
12.5 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |
|--------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|
| | ANIMAL ID | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | |
| | | 4 | 9 | 2 | 3 | 5 | 8 | 9 | 0 | 6 | 0 | 2 | 5 | 6 | 8 | 9 | 5 | 8 | 1 | 7 | 2 | 3 | 8 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Gallbladder | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | M | + | M | + | + | + | + | 45 |
| Hemangiosarcoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hemangiosarcoma | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Hepatoblastoma | | | | | | | | | | | | | | | | | | | | | | X | | 1 |
| Hepatocellular Adenoma | | X | | | | X | | | X | | | | | X | | | X | | | | | | | 10 |
| Hepatocellular Adenoma, Multiple | | | | | X | | | | | | | | | | | | | | | | | | | 1 |
| Hepatocellular Carcinoma | | | | X | | | | | | | | | | | | | | | | | | X | | 4 |
| Hepatocellular Carcinoma, Multiple | | | | | | | | | | | | | | | | | | X | | | | | | 1 |
| Mesentery | + | | | | + | | | + | | | | | | | | | | | + | + | | | + | 10 |
| Hepatocellular Carcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | X | | | | | 1 |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
12.5 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|
| | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | | | | |
| | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0
0
3
1
4 | 0
0
3
1
9 | 0
0
3
2
2 | 0
0
3
2
3 | 0
0
3
2
5 | 0
0
3
2
8 | 0
0
3
2
9 | 0
0
3
3
0 | 0
0
3
3
6 | 0
0
3
4
0 | 0
0
3
4
2 | 0
0
3
4
5 | 0
0
3
4
6 | 0
0
3
4
8 | 0
0
3
0
9 | 0
0
3
1
5 | 0
0
3
1
8 | 0
0
3
2
1 | 0
0
3
2
7 | 0
0
3
3
2 | 0
0
3
3
3 | 0
0
3
3
8 | 0
0
3
3
9 | 0
0
3
4
4 | 0
0
3
4
9 | |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Stomach, Forestomach
Squamous Cell Papilloma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Parathyroid Gland | M | + | M | + | + | + | + | + | + | + | + | + | + | + | + | M | M | + | M | M | + | + | + | + | 39 | |
| Pituitary Gland | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Pars Distalis, Adenoma | | | X | | | | | | | | | | | | | | | | | | | | | 4 | | |
| Pars Distalis, Carcinoma | | | | | | | | | | | | | | | | | | X | | | | | | 1 | | |
| Pars Intermedia, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | 49 | |
| GENERAL BODY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NONE | | | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE FEMALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |
|--------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| 12.5 ppm | ANIMAL ID | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | |
| | | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | | |
| | | 4 | 9 | 2 | 3 | 5 | 8 | 9 | 0 | 6 | 0 | 2 | 5 | 6 | 8 | 9 | 5 | 8 | 1 | 7 | 2 | 3 | 8 | | |

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|
| Clitoral Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | 49 |
| Ovary | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Cystadenoma | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| Luteoma | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Teratoma Benign | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Uterus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Polyp Stromal | | | | | X | | | | | | | | | | | | X | | | | | | | | 2 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Hemangiosarcoma, Metastatic, Spleen | | | | | | | | | | | | | | | | | | | | | X | | | | 1 |
| Lymph Node | | | | | + | + | | | | | | | | | | | | | | + | | + | | | 10 |
| Pancreatic, Hepatocellular Carcinoma, Metastatic, Liver | | | | | | | | | | | | | | | | | | | | | | X | | | 1 |
| Lymph Node, Bronchial | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | + | + | + | + | 42 |
| Lymph Node, Mandibular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Lymph Node, Mediastinal | + | + | + | + | + | I | + | I | + | I | + | + | M | + | + | + | + | + | + | + | + | M | + | I | 38 |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hemangiosarcoma | | | | | | | | | | | | | | | | | | | | | X | | | | 1 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
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

| B6C3F1 MICE FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--|----------|
| | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
3 | 0
7
3
3 | 0
7
3
3 | 0
7
3
3 | 0
7
3
3 | 0
7
3
3 | 0
7
3
3 | | |
| 12.5 ppm | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | |
| | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | | |
| | 4 | 9 | 2 | 3 | 5 | 8 | 9 | 0 | 6 | 0 | 2 | 5 | 6 | 8 | 9 | 5 | 8 | 1 | 7 | 2 | 3 | 8 | 9 | | |

Thymus + 50

INTEGUMENTARY SYSTEM

Mammary Gland + 50

Skin + 50

Melanoma Malignant 1

Neural Crest Tumor 1

Subcutaneous Tissue, Fibrosarcoma 1

MUSCULOSKELETAL SYSTEM

Bone + 50

Skeletal Muscle 1

NERVOUS SYSTEM

Brain + 50

Carcinoma, Metastatic, Pituitary Gland X 1

Peripheral Nerve 1

Spinal Cord 1

RESPIRATORY SYSTEM

Larynx + 50

Lung + 50

Alveolar/Bronchiolar Adenoma X X X X 4

Alveolar/Bronchiolar Adenoma, Multiple X 1

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|--------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|--|-----------|---|--|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | |
| 12.5 ppm | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | |
| | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 4 | | | | |
| | 4 | 9 | 2 | 3 | 5 | 8 | 9 | 0 | 6 | 0 | 2 | 5 | 6 | 8 | 9 | 5 | 8 | 1 | 7 | 2 | 3 | 8 | 9 | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | Alveolar/Bronchiolar Carcinoma | 1 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | Hepatocellular Carcinoma, Metastatic, Liver | 2 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | X | X | |
| | | | | | | | | | | | | | | | | | | | | | | | | Nose | 50 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | Trachea | 49 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | SPECIAL SENSES SYSTEM | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | Eye | 49 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | Harderian Gland Adenoma | 50 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | X | X | |
| | | | | | | | | | | | | | | | | | | | | | | | | URINARY SYSTEM | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | Kidney | 50 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | Urinary Bladder | 50 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | SYSTEMIC LESIONS | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | Multiple Organ | 50 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | Histiocytic Sarcoma | 3 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | Lymphoma Malignant | 6 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | X | X | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|--|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------------------------|
| B6C3F1 MICE FEMALE | | DAY ON TEST | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 5 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| 25 ppm | | ANIMAL ID | | 8 | 9 | 0 | 2 | 2 | 3 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | females
(cont...) |
| | | | | 1 | 2 | 0 | 0 | 0 | 9 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Gallbladder | A | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | I | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum
Polyp Adenomatous | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver
Hepatocellular Adenoma
Hepatocellular Carcinoma | + | + | + | + | + | + | + | + | + | + | + | + | X | + | + | + | + | + | + | + | + | X | X |
| Mesentery | | | | | | | | | | | | + | | | | | | | | | | | + |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------------|-----------------------|
| B6C3F1 MICE FEMALE | DAY ON TEST | 0
5
8
1 | 0
5
9
2 | 0
6
0
0 | 0
6
2
0 | 0
6
2
0 | 0
6
3
9 | 0
7
1
3 | 0
7
1
4 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | females
(cont...) | |
| | ANIMAL ID | 0
0
5
1
8 | 0
0
5
1
1 | 0
0
5
4
9 | 0
0
5
2
5 | 0
0
5
4
1 | 0
0
5
3
4 | 0
0
5
3
1 | 0
0
5
2
1 | 0
0
5
0
2 | 0
0
5
0
8 | 0
0
5
0
9 | 0
0
5
1
2 | 0
0
5
1
4 | 0
0
5
2
5 | 0
0
5
3
9 | 0
0
5
3
0 | 0
0
5
4
2 | 0
0
5
4
8 | 0
0
5
4
2 | 0
0
5
5
3 | 0
0
5
5
4 | | 0
0
5
5
0 |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | X | | | | | | | | | | | | | | | | | |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Islets, Pancreatic | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Parathyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | M | + | M | + | + | + | + |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Pars Distalis, Adenoma | | | | | | | | | | | | | | | | | | | | | | | |
| Pars Distalis, Carcinoma | | | | | | | | | | | X | | | | | | | | | X | | | |
| Thyroid Gland | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma | | | | | | | | | | | | | | | | | | | | | | | |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clitoral Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hemangiosarcoma, Metastatic, Spleen | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE FEMALE
25 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ANIMAL ID | females
(cont...) |
|------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|----------------------|
| | 0 | 5 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | |
| | | 8 | 9 | 0 | 2 | 2 | 3 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 |
| | | 1 | 2 | 0 | 0 | 0 | 9 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 |
| | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 0 |
| | | 1 | 1 | 4 | 2 | 4 | 3 | 3 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 0 | 0 | 0 |
| | | 8 | 1 | 9 | 5 | 1 | 4 | 1 | 1 | 2 | 8 | 9 | 2 | 4 | 5 | 9 | 0 | 2 | 8 | 2 | 3 | 4 | 5 | 0 | 0 |

| | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ovary | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Cystadenoma | | | | | | | | | | | | | | X | | | | | | | | | |
| Hemangioma | | | | | | | | | | X | | | | | | | | | | | | | |
| Hemangiosarcoma, Metastatic, Spleen | | | | | | | X | | | | | | | | | | | | | | | | |
| Luteoma | | | | | | | | | | | | | | | X | | | | | X | | | |
| Uterus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Granular Cell Tumor Benign | | | | | | X | | | | | | | | | | | | | | | | | |
| Polyp Stromal | | | | | | | | | | | | | | | | | | | | | | | |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hemangiosarcoma, Metastatic, Spleen | | | | | | X | | | | | | | | | | | | | | | | | |
| Lymph Node | | + | | | + | | | | | | | + | + | + | | | | | | | | + | + |
| Lymph Node, Bronchial | + | + | I | + | + | + | + | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | X | | | | | | | | | | | | | | | | | |
| Lymph Node, Mandibular | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M |
| Lymph Node, Mediastinal | + | + | I | + | + | + | + | + | + | + | I | + | + | + | + | + | + | I | + | + | I | + | + |
| Hemangiosarcoma, Metastatic, Spleen | | | | | | X | | | | | | | | | | | | | | | | | |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hemangiosarcoma | | | | | | X | | | | | | | | | | | | | | | | | |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------------------------|
| B6C3F1 MICE FEMALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 5 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| 25 ppm | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | females
(cont...) |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Alveolar/Bronchiolar Carcinoma, Metastatic, Lung X

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Skin
Subcutaneous Tissue, Fibrosarcoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | X |

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Skeletal Muscle
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | + | + | | | | | | | | | | | | | | | | | | | X |

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Peripheral Nerve | | | + | + | | | | | | | | | | | | | | | | | | | |
| Spinal Cord | | | + | + | | | | | | | | | | | | | | | | | | | |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lung
Alveolar/Bronchiolar Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Carcinoma | | | | | | | X | | | | | | | | | | | | | | | | X |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
25 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------------------|
| | 0581 | 0582 | 0660 | 0662 | 0663 | 0666 | 0771 | 0773 | 0774 | 0777 | 0778 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | |
| | ANIMAL ID | 0051 | 0055 | 0059 | 0055 | 0051 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Pleura
Alveolar/Bronchiolar Carcinoma, Metastatic,
Lung | | | | | | | + | X | | | | | | | | | | | | | | | | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Harderian Gland
Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | |
| Multiple Organ
Lymphoma Malignant | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| | | X | | | X | | | | | | | | X | X | X | | | | | | X | X | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
25 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS | |
|------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|--|
| | ANIMAL ID | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | |
| | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | |
| | | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 1 | 2 | 2 | 3 | 4 | |
| | | 0 | 3 | 6 | 9 | 0 | 2 | 3 | 8 | 3 | 5 | 6 | 7 | 0 | 6 | 7 | 8 | 1 | 6 | 7 | 7 | 4 | 6 | 7 | 5 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Gallbladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | M | + | + | + | 45 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Rectum | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | + | + | + | + | I | 46 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Polyp Adenomatous | | | | | X | | | | | | | | | | | | | | | | | | | | 1 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hepatocellular Adenoma | | | | | | | | | | | | | | | X | X | | | | X | | X | | | 7 |
| Hepatocellular Carcinoma | | | | | | | | | | | | X | | | | | | | | X | | | | | 3 |
| Mesentery | | | + | | | | | | | | | | | | + | | | | | | | | | | 4 |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE | DAY ON TEST | ANIMAL ID | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|--------------------|-------------|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|---|---|--|
| | | 0732 | 0733 | 0732 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | | 0733 | | | |
| 25 ppm | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | | | |
| | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 1 | | | |
| | | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 0 | 0 | 1 | 2 | 2 | 3 | 4 | | |
| | | 0 | 3 | 6 | 9 | 0 | 2 | 3 | 8 | 3 | 5 | 6 | 7 | 0 | 6 | 7 | 8 | 1 | 6 | 7 | 7 | 4 | 6 | 7 | 9 | |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | | 1 |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Adrenal Medulla | + | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Parathyroid Gland | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | 46 | |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Pars Distalis, Adenoma | | | | | | | | | | | X | | | | | | | | | | | | | | 2 |
| Pars Distalis, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Carcinoma | | | | | | | | | | | X | | | | | | | | | | | | | | 1 |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Clitoral Gland | M | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Hemangiosarcoma, Metastatic, Spleen | | | | | | | | | | | | | | | | | | | | | | | | | 1 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE FEMALE
25 ppm | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS | | |
|--|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|----|--|
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | |
| | ANIMAL ID | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | |
| | | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 3 | 4 | |
| | | 0 | 3 | 6 | 9 | 0 | 2 | 3 | 8 | 3 | 5 | 6 | 7 | 0 | 6 | 7 | 8 | 1 | 6 | 7 | 7 | 4 | 6 | 7 | 9 | 5 | |
| Ovary | | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Cystadenoma | | | | | | | | | X | X | | | | | | | | | | | | | | | | 3 | |
| Hemangioma | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Hemangiosarcoma, Metastatic, Spleen | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Luteoma | | | | X | | | | | | | | | | | | | | | | | | | | | | 3 | |
| Uterus | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Granular Cell Tumor Benign | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Polyp Stromal | | | | | | | | | X | | | | | | | | | | X | | | | | | | 2 | |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Hemangiosarcoma, Metastatic, Spleen | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Lymph Node | | | | | | | | | | | | | + | | | | | | | | | | | + | + | 11 | |
| Lymph Node, Bronchial | | + | I | M | M | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | + | + | 43 | |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Lymph Node, Mandibular | | + | I | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | I | | 45 | |
| Lymph Node, Mediastinal | | I | + | + | + | + | + | + | + | I | + | I | I | + | + | M | + | + | + | + | + | + | + | + | + | 41 | |
| Hemangiosarcoma, Metastatic, Spleen | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Lymph Node, Mesenteric | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Spleen | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Hemangiosarcoma | | | | | | | | | | | | | | | | | | | | | | | | | X | 2 | |
| Thymus | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | + | + | + | + | + | + | 49 | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
25 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|--|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|------|--------------|----|
| | 0732 | 0733 | 0732 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | 0733 | | 0733 | | | |
| ANIMAL ID | 0001 | 0005 | 0001 | 0005 | 0002 | 0002 | 0003 | 0008 | 0003 | 0005 | 0006 | 0007 | 0000 | 0006 | 0007 | 0008 | 0001 | 0006 | 0007 | 0004 | 0006 | 0007 | 0009 | 0005 | |
| | Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| | INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| | Mammary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Skin
Subcutaneous Tissue, Fibrosarcoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Skeletal Muscle
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | 3
1 | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Peripheral Nerve | | | | | | | | | | | | | | | | | | | | | | | | 2 | |
| Spinal Cord | | | | | | | | | | | | | | | | | | | | | | | | 2 | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Lung
Alveolar/Bronchiolar Adenoma
Alveolar/Bronchiolar Carcinoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | X | + | + | + | 50
2
2 | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| B6C3F1 MICE FEMALE
25 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|----------|
| | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | 0732 | | 0732 | 0732 |
| ANIMAL ID | 0010 | 0005 | 0001 | 0001 | 0002 | 0002 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Pleura
Alveolar/Bronchiolar Carcinoma, Metastatic,
Lung | | | | | | | | | | | | | | | | | | | | | | | 1
1 |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Harderian Gland
Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | X | + | + | + | + | + | X | + | 50
3 |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | |
| Multiple Organ
Lymphoma Malignant | + | + | + | + | + | + | + | + | + | + | + | + | + | + | X | X | X | X | + | + | X | X | 50
16 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------------------------|
| B6C3F1 MICE FEMALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | |
| 50 ppm | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | females
(cont...) |
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | | 3 | 2 | 0 | 3 | 1 | 4 | 1 | 0 | 3 | 4 | 2 | 4 | 0 | 2 | 4 | 1 | 4 | 4 | 4 | 3 | 0 | 2 | 1 | 1 | |
| | | 4 | 2 | 7 | 0 | 5 | 3 | 7 | 2 | 9 | 8 | 7 | 0 | 5 | 9 | 5 | 6 | 8 | 1 | 5 | 9 | 7 | 3 | 0 | 1 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Gallbladder | A | + | + | A | + | + | + | + | A | + | A | + | + | + | A | + | A | A | + | A | + | A | + | + | A | |
| Intestine Large, Cecum | A | + | + | + | + | + | + | + | + | + | A | + | + | + | A | + | + | A | + | + | + | A | + | + | A | |
| Intestine Large, Colon | A | + | + | + | + | + | + | + | + | + | A | + | + | + | A | + | + | + | + | + | + | + | + | + | + | |
| Intestine Large, Rectum | A | + | + | + | + | + | + | + | + | + | A | + | + | + | + | I | + | A | + | + | + | + | + | + | + | |
| Intestine Small, Duodenum | A | A | + | A | + | + | + | + | + | + | A | + | + | + | + | A | A | A | + | M | + | A | + | + | A | |
| Intestine Small, Ileum | A | + | + | + | A | + | + | + | + | + | A | + | + | + | A | + | A | A | + | A | + | A | + | + | A | |
| Intestine Small, Jejunum | A | + | + | + | + | + | + | + | + | A | + | A | + | + | + | A | A | A | + | + | A | + | A | + | + | A |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Hemangiosarcoma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hemangiosarcoma, Metastatic, Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | X | |
| Hepatocellular Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | X | |
| Hepatocellular Adenoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | X | |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | | | | + | |
| Hemangiosarcoma, Metastatic, Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | X | |
| Pancreas | A | + | + | + | + | + | + | + | + | + | A | + | + | + | A | + | + | + | + | + | + | + | + | + | + | |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Stomach, Forestomach | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

Experiment Number: 20725 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

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

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B6C3F1 MICE FEMALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 |
| | | 2 | 5 | 6 | 6 | 7 | 2 | 2 | 4 | 4 | 0 | 1 | 2 | 6 | 8 | 1 | 4 | 5 | 8 | 9 | 0 | 0 | 4 | 5 | 5 |
| | | 5 | 2 | 0 | 7 | 1 | 0 | 5 | 6 | 7 | 3 | 2 | 4 | 6 | 0 | 5 | 7 | 9 | 5 | 6 | 0 | 5 | 6 | 6 | 6 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 50 ppm | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | | 3 | 2 | 0 | 3 | 1 | 4 | 1 | 0 | 3 | 4 | 2 | 4 | 0 | 0 | 2 | 4 | 1 | 4 | 4 | 4 | 3 | 0 | 2 | |
| | | 4 | 2 | 7 | 0 | 5 | 3 | 7 | 2 | 9 | 8 | 7 | 0 | 5 | 9 | 5 | 6 | 8 | 1 | 5 | 9 | 7 | 3 | 0 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |

females (cont...)

Stomach, Glandular

A + + + + + + + + + + A + + + A + + + + + + + + + +

CARDIOVASCULAR SYSTEM

Blood Vessel

+ +

Hemangiosarcoma, Metastatic, Skeletal Muscle

X

Heart

+ +

ENDOCRINE SYSTEM

Adrenal Cortex

+ +

Capsule, Hemangiosarcoma, Metastatic, Skeletal Muscle

X

Adrenal Medulla

+ +

Islets, Pancreatic

A + + + + + + + + + + A + + + + + + + + + + + + +

Parathyroid Gland

+ + + + + + + + + + + + + + + + + M + + + + +

Pituitary Gland

+ + I +

Pars Intermedia, Adenoma

Thyroid Gland

+ +

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

Clitoral Gland

+ M + M + M M + + + + + + + + + + + + + + + +

* .. Total animals with tissue examined microscopically; Total animals with tumor
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue

M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
50 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|----------------------|
| | 0205 | 0206 | 0207 | 0208 | 0209 | 0210 | 0211 | 0212 | 0213 | 0214 | 0215 | 0216 | 0217 | 0218 | 0219 | 0220 | 0221 | 0222 | 0223 | 0224 | 0225 | 0226 | 0227 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00734 | |
| | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 00735 | |
| | 2 | 5 | 6 | 6 | 7 | 2 | 2 | 4 | 4 | 0 | 1 | 2 | 6 | 8 | 1 | 4 | 5 | 8 | 9 | 0 | 0 | 4 | 5 | 00736 | |
| | 5 | 2 | 0 | 7 | 1 | 0 | 5 | 6 | 7 | 3 | 2 | 4 | 6 | 0 | 5 | 7 | 9 | 5 | 6 | 0 | 5 | 6 | 5 | 00737 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00738 | |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 00739 | |
| | 3 | 2 | 0 | 3 | 1 | 4 | 1 | 0 | 3 | 4 | 2 | 4 | 0 | 0 | 2 | 4 | 1 | 4 | 4 | 4 | 3 | 0 | 2 | 00740 | |
| | 4 | 2 | 7 | 0 | 5 | 3 | 7 | 2 | 9 | 8 | 7 | 0 | 5 | 9 | 5 | 6 | 8 | 1 | 5 | 9 | 7 | 3 | 0 | 00741 | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ovary
Periovarian Tissue, Hemangiosarcoma,
Metastatic, Skeletal Muscle | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | X | + | + | + | + | + | |
| Uterus
Hemangioma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | X | + | + | + | + | + |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node | | | | | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Bronchial | M | + | + | + | + | M | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node, Mandibular | M | + | + | + | + | + | + | + | + | M | + | + | M | + | M | + | + | + | + | + | M | + | M | + | M | + | M | + | M |
| Lymph Node, Mediastinal | + | + | + | + | + | + | + | M | M | I | I | + | + | + | + | + | + | + | + | M | + | I | + | + | M | + | + | + | |
| Lymph Node, Mesenteric | A | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + |
| Spleen | A | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Thymus | + | + | + | + | + | I | + | + | + | I | + | + | + | + | + | + | + | + | + | + | I | I | + | + | + | + | + | + | |

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Skin
Squamous Cell Carcinoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

MUSCULOSKELETAL SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
50 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | | | | |
|------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|----------------------|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | | | | |
| | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| | 5 | 5 | 6 | 6 | 7 | 7 | 2 | 2 | 4 | 4 | 0 | 1 | 2 | 6 | 8 | 1 | 4 | 5 | 8 | 9 | 0 | 0 | 4 | 5 | 5 | 6 | 6 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 3 | 2 | 0 | 3 | 1 | 4 | 1 | 0 | 3 | 4 | 2 | 4 | 0 | 0 | 2 | 4 | 1 | 4 | 4 | 4 | 3 | 0 | 2 | 1 | 1 | 1 | |
| | 4 | 2 | 7 | 0 | 5 | 3 | 7 | 2 | 9 | 8 | 7 | 0 | 5 | 9 | 5 | 6 | 8 | 1 | 5 | 9 | 7 | 3 | 0 | 0 | 1 | 1 | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hemangiosarcoma | | | | | | | | | | | | | | | | | | | | | | | | | | | |

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Peripheral Nerve | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Spinal Cord | | | | | | | | | | | | | | | | | | | | | | | | | | | |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adenocarcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ear | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
50 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|----|
| | 0670 | 0677 | 0679 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | 0699 | | |
| | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 00728 | 00772 | 00773 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | |
| Ovary
Periovarian Tissue, Hemangiosarcoma,
Metastatic, Skeletal Muscle | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| Uterus
Hemangioma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Lymph Node | | | | | | | | | | | | | | | | | | | | | | | | | 7 | |
| Lymph Node, Bronchial | + | + | + | + | I | + | + | + | + | + | + | I | + | + | + | M | + | + | + | I | + | + | + | + | 43 | |
| Lymph Node, Mandibular | M | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | M | + | + | 39 | |
| Lymph Node, Mediastinal | M | + | I | + | M | I | + | + | I | + | I | + | + | M | I | + | + | + | + | + | + | + | I | + | M | 33 |
| Lymph Node, Mesenteric | + | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | 45 | |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 | |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | + | + | + | + | + | + | + | 45 | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | + | + | + | + | + | + | + | + | + | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Skin
Squamous Cell Carcinoma | + | + | + | + | + | + | + | + | + | + | + | X | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 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

| B6C3F1 MICE FEMALE
50 ppm | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|--------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|----------|
| | 0670 | 0679 | 0690 | 0699 | 0699 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | | |
| ANIMAL ID | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | 00728 | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Skeletal Muscle
Hemangiosarcoma | | | | + | | | | | | | | | | | | | | | | | | | | | 4
1 | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Peripheral Nerve | | | | + | | | | | | | | | | | | | | | | | | | | | 2 | |
| Spinal Cord | | | | + | | | | | | | | | | | | | | | | | | | | | 2 | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Lung
Alveolar/Bronchiolar Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| Nose
Adenocarcinoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
2 | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ear | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Eye | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Harderian Gland
Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
2 | |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

