

**Experiment Number:** 20515 - 04  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** MICE/B6C3F1

**P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)**  
Metal working fluids (CIMSTAR 3800)  
**CAS Number:** CIMSTAR3800

**Date Report Requested:** 03/08/2013  
**Time Report Requested:** 14:13:47  
**First Dose M/F:** 05/05/08 / 05/05/08  
**Lab:** BNW

F1\_M3

**NTP Study Number:** C20515  
**Lock Date:** 01/12/2011  
**Cage Range:** ALL  
**Date Range:** ALL  
**Reasons For Removal:** ALL  
**Removal Date Range:** ALL  
**Treatment Groups:** Include ALL  
**Study Gender:** Both  
**TDMSE Version:** 3.0.1.1\_001  
**PWG Approval Date:** NONE

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

**P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)**

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

---

<b>B6C3F1 MICE MALE</b>	<b>Control</b>	<b>10 mg/m3</b>	<b>30 mg/m3</b>	<b>100 mg/m3</b>
-------------------------	----------------	-----------------	-----------------	------------------

---

**Disposition Summary**

<b>Animals Initially In Study</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>
<b>Early Deaths</b>				
<b>Moribund Sacrifice</b>	<b>5</b>	<b>12</b>	<b>7</b>	<b>4</b>
<b>Natural Death</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>6</b>
<b>Survivors</b>				
<b>Terminal Sacrifice</b>	<b>39</b>	<b>31</b>	<b>36</b>	<b>40</b>
<b>Animals Examined Microscopically</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>

---

**ALIMENTARY SYSTEM**

Esophagus	(50)	(50)	(50)	(50)
Gallbladder	(44)	(44)	(44)	(44)
Cytoplasmic Alteration				1 (2%)
Inflammation, Suppurative	1 (2%)			1 (2%)
Intestine Large, Cecum	(50)	(50)	(49)	(49)
Hemorrhage			1 (2%)	
Intestine Large, Colon	(50)	(50)	(50)	(50)
Ulcer		1 (2%)		
Intestine Large, Rectum	(50)	(50)	(50)	(49)
Cyst		1 (2%)		
Fibrosis		1 (2%)		
Intestine Small, Duodenum	(49)	(48)	(48)	(47)
Artery, Infiltration Cellular, Lymphocyte	1 (2%)			
Intestine Small, Ileum	(50)	(50)	(49)	(48)
Hyperplasia, Lymphoid				1 (2%)
Inflammation, Chronic Active			2 (4%)	2 (4%)
Epithelium, Hyperplasia	1 (2%)			
Lymphoid Follicle, Hyperplasia	1 (2%)			
Peyer's Patch, Hyperplasia, Lymphoid	1 (2%)			
Intestine Small, Jejunum	(50)	(48)	(49)	(48)
Inflammation, Chronic Active			1 (2%)	
Serosa, Inflammation, Granulomatous				1 (2%)
Liver	(50)	(50)	(50)	(49)
Angiectasis		1 (2%)		

a - Number of animals examined microscopically at site and number of animals with lesion

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

## P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Basophilic Focus	1 (2%)	3 (6%)		4 (8%)
Clear Cell Focus	10 (20%)	9 (18%)	3 (6%)	6 (12%)
Congestion		1 (2%)	1 (2%)	
Cyst		1 (2%)	1 (2%)	
Eosinophilic Focus	14 (28%)	3 (6%)	20 (40%)	17 (35%)
Fatty Change	24 (48%)	22 (44%)	24 (48%)	25 (51%)
Hepatodiaphragmatic Nodule	1 (2%)		1 (2%)	
Hyperplasia	1 (2%)	1 (2%)	1 (2%)	
Infiltration Cellular, Lymphocyte			1 (2%)	
Inflammation, Chronic	1 (2%)			
Inflammation, Chronic Active				1 (2%)
Mixed Cell Focus	6 (12%)	4 (8%)	11 (22%)	5 (10%)
Necrosis	5 (10%)	7 (14%)	6 (12%)	7 (14%)
Tension Lipidosis	3 (6%)	2 (4%)	5 (10%)	7 (14%)
Mesentery	(4)	(5)	(3)	(4)
Inflammation, Chronic Active		1 (20%)	1 (33%)	
Arteriole, Inflammation, Chronic Active		1 (20%)		
Artery, Inflammation, Chronic Active				1 (25%)
Fat, Necrosis	1 (25%)	2 (40%)	2 (67%)	3 (75%)
Pancreas	(50)	(50)	(50)	(50)
Fibrosis	1 (2%)			
Lipomatosis		1 (2%)		
Necrosis				1 (2%)
Acinus, Hypertrophy	1 (2%)	1 (2%)		
Artery, Inflammation, Chronic Active		1 (2%)		
Salivary Glands	(50)	(50)	(50)	(50)
Infiltration Cellular, Lymphocyte		1 (2%)		
Stomach, Forestomach	(50)	(50)	(50)	(50)
Cyst, Squamous		1 (2%)		
Hyperplasia, Squamous	2 (4%)	2 (4%)	1 (2%)	3 (6%)
Inflammation, Chronic Active	1 (2%)	2 (4%)	1 (2%)	
Ulcer			1 (2%)	
Stomach, Glandular	(50)	(50)	(50)	(50)
Erosion	1 (2%)			
Inflammation, Chronic Active	1 (2%)			2 (4%)
Ulcer				1 (2%)

a - Number of animals examined microscopically at site and number of animals with lesion

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Arteriole, Serosa, Inflammation, Chronic Active Glands, Mineralization		1 (2%)		1 (2%)
Tooth	(50)	(47)	(49)	(50)
Dysplasia	43 (86%)	35 (74%)	41 (84%)	40 (80%)
Inflammation, Chronic Active	3 (6%)	1 (2%)	6 (12%)	5 (10%)
<b>CARDIOVASCULAR SYSTEM</b>				
Blood Vessel	(45)	(49)	(48)	(48)
Inflammation, Chronic Active	1 (2%)			
Aorta, Inflammation, Chronic Active		1 (2%)		
Heart	(50)	(50)	(50)	(50)
Cardiomyopathy	2 (4%)	3 (6%)	1 (2%)	2 (4%)
Inflammation, Suppurative			1 (2%)	
Inflammation, Chronic Active				1 (2%)
Thrombosis	1 (2%)			2 (4%)
Artery, Inflammation, Chronic Active		1 (2%)		1 (2%)
Valve, Fibrosis			1 (2%)	
<b>ENDOCRINE SYSTEM</b>				
Adrenal Cortex	(49)	(50)	(50)	(50)
Hyperplasia	24 (49%)	23 (46%)	26 (52%)	24 (48%)
Capsule, Inflammation, Chronic Active	1 (2%)			
Adrenal Medulla	(48)	(50)	(50)	(50)
Hyperplasia		1 (2%)		2 (4%)
Islets, Pancreatic	(50)	(50)	(50)	(50)
Parathyroid Gland	(34)	(28)	(27)	(21)
Cyst	1 (3%)			
Pituitary Gland	(50)	(50)	(50)	(48)
Angiectasis				1 (2%)
Pars Distalis, Cyst	1 (2%)			1 (2%)
Pars Distalis, Hyperplasia	5 (10%)	8 (16%)	7 (14%)	2 (4%)
Pars Intermedia, Hypertrophy		1 (2%)		
Thyroid Gland	(50)	(50)	(49)	(50)

a - Number of animals examined microscopically at site and number of animals with lesion

**Experiment Number:** 20515 - 04  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** MICE/B6C3F1

**P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)**  
 Metal working fluids (CIMSTAR 3800)  
**CAS Number:** CIMSTAR3800

**Date Report Requested:** 03/08/2013  
**Time Report Requested:** 14:13:47  
**First Dose M/F:** 05/05/08 / 05/05/08  
**Lab:** BNW

B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Inflammation, Chronic Active Follicular Cell, Hyperplasia			1 (2%) 1 (2%)	1 (2%)
<b>GENERAL BODY SYSTEM</b>				
Tissue NOS	(0)	(2)	(0)	(1)
<b>GENITAL SYSTEM</b>				
Epididymis	(50)	(50)	(50)	(50)
Inflammation, Chronic Active	1 (2%)	1 (2%)		2 (4%)
Spermatocele		1 (2%)		
Penis	(0)	(0)	(0)	(1)
Congestion				1 (100%)
Preputial Gland	(50)	(49)	(48)	(49)
Ectasia	8 (16%)	4 (8%)	7 (15%)	7 (14%)
Inflammation, Chronic Active	9 (18%)	4 (8%)	11 (23%)	4 (8%)
Prostate	(50)	(49)	(50)	(50)
Seminal Vesicle	(50)	(50)	(50)	(50)
Dilatation			1 (2%)	1 (2%)
Testes	(50)	(50)	(50)	(50)
Angiectasis				1 (2%)
Nuclear Alteration, Focal		1 (2%)		
Germinal Epithelium, Atrophy	1 (2%)	4 (8%)		3 (6%)
<b>HEMATOPOIETIC SYSTEM</b>				
Bone Marrow	(50)	(50)	(50)	(50)
Hyperplasia			1 (2%)	
Hyperplasia, Granulocytes				1 (2%)
Lymph Node	(4)	(3)	(1)	(1)
Lumbar, Infiltration Cellular, Mixed Cell	1 (25%)			
Lumbar, Inflammation, Pyogranulomatous				1 (100%)
Lumbar, Lymphoid Follicle, Hyperplasia	1 (25%)			

a - Number of animals examined microscopically at site and number of animals with lesion

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

**P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)**

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Lymphoid Follicle, Renal, Hyperplasia	1 (25%)			
Pancreatic, Inflammation, Pyogranulomatous				1 (100%)
Renal, Inflammation, Pyogranulomatous				1 (100%)
Lymph Node, Bronchial	(26)	(31)	(26)	(18)
Infiltration Cellular, Polymorphonuclear	1 (4%)			
Lymph Node, Mandibular	(31)	(36)	(34)	(33)
Hyperplasia, Lymphoid		2 (6%)	1 (3%)	
Infiltration Cellular, Plasma Cell		1 (3%)		
Inflammation, Pyogranulomatous				1 (3%)
Lymph Node, Mediastinal	(39)	(39)	(32)	(35)
Hematopoietic Cell Proliferation			1 (3%)	
Hyperplasia, Plasma Cell			1 (3%)	
Infiltration Cellular, Mixed Cell			1 (3%)	
Inflammation, Pyogranulomatous				1 (3%)
Lymphoid Follicle, Hyperplasia	1 (3%)			
Lymph Node, Mesenteric	(49)	(50)	(48)	(49)
Fibrosis	1 (2%)			
Hemorrhage		1 (2%)	1 (2%)	
Hyperplasia, Plasma Cell			1 (2%)	
Infiltration Cellular, Histiocyte			1 (2%)	
Inflammation, Pyogranulomatous				1 (2%)
Lymphoid Follicle, Hyperplasia	1 (2%)			
Spleen	(50)	(50)	(49)	(49)
Congestion			1 (2%)	
Fibrosis		1 (2%)		
Hematopoietic Cell Proliferation	1 (2%)	1 (2%)	3 (6%)	1 (2%)
Lymphoid Follicle, Hyperplasia	3 (6%)	2 (4%)	1 (2%)	1 (2%)
Thymus	(41)	(38)	(39)	(41)
Atrophy			1 (3%)	1 (2%)

**INTEGUMENTARY SYSTEM**

Mammary Gland	(1)	(0)	(1)	(0)
Skin	(50)	(49)	(50)	(50)
Abscess				1 (2%)

a - Number of animals examined microscopically at site and number of animals with lesion

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

**P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)**

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Angiectasis			1 (2%)	
Inflammation, Chronic Active	2 (4%)	4 (8%)	1 (2%)	3 (6%)
Ulcer	1 (2%)	4 (8%)	2 (4%)	
Epidermis, Hyperplasia				1 (2%)
Sebaceous Gland, Hyperplasia		1 (2%)		
<b>MUSCULOSKELETAL SYSTEM</b>				
Bone	(50)	(50)	(50)	(50)
Fibro-Osseous Lesion	7 (14%)	7 (14%)	10 (20%)	7 (14%)
Cranium, Fracture		1 (2%)		
Cranium, Inflammation, Chronic Active	3 (6%)	2 (4%)	3 (6%)	5 (10%)
Joint, Vertebra, Fracture		1 (2%)		
Maxilla, Necrosis		1 (2%)		
Skeletal Muscle	(1)	(3)	(2)	(3)
Infiltration Cellular, Lymphocyte		1 (33%)		
Infiltration Cellular, Mixed Cell				1 (33%)
Inflammation, Chronic Active				1 (33%)
<b>NERVOUS SYSTEM</b>				
Brain	(50)	(50)	(50)	(50)
Inflammation, Suppurative			1 (2%)	
Thrombosis			1 (2%)	
Arteriole, Inflammation, Chronic Active		1 (2%)		
Ventricle, Dilatation			1 (2%)	
Venule, Infiltration Cellular, Lymphoid		1 (2%)		
Peripheral Nerve	(1)	(2)	(1)	(2)
Spinal Cord	(1)	(3)	(1)	(2)
<b>RESPIRATORY SYSTEM</b>				
Larynx	(50)	(50)	(49)	(50)
Hyperplasia			1 (2%)	

a - Number of animals examined microscopically at site and number of animals with lesion

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

## P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Inflammation, Suppurative		1 (2%)		1 (2%)
Inflammation, Chronic Active		2 (4%)	3 (6%)	8 (16%)
Metaplasia, Squamous		50 (100%)	49 (100%)	50 (100%)
Necrosis		1 (2%)	1 (2%)	1 (2%)
Lung	(50)	(50)	(50)	(50)
Congestion			1 (2%)	
Erythrophagocytosis		1 (2%)		
Hemorrhage			2 (4%)	1 (2%)
Infiltration Cellular, Histiocyte	5 (10%)	5 (10%)	1 (2%)	9 (18%)
Inflammation, Acute			1 (2%)	
Thrombosis	1 (2%)			
Alveolar Epithelium, Hyperplasia	4 (8%)	4 (8%)	6 (12%)	7 (14%)
Bronchiole, Hyperplasia	11 (22%)	11 (22%)	32 (64%)	44 (88%)
Interstitial, Inflammation, Chronic Active	1 (2%)		1 (2%)	1 (2%)
Perivascular, Inflammation, Chronic Active	1 (2%)	1 (2%)	1 (2%)	1 (2%)
Nose	(50)	(50)	(50)	(50)
Inflammation, Chronic Active	6 (12%)	8 (16%)	4 (8%)	12 (24%)
Necrosis	2 (4%)	2 (4%)		1 (2%)
Nasopharyngeal Duct, Necrosis				1 (2%)
Olfactory Epithelium, Accumulation, Hyaline Droplet	4 (8%)	31 (62%)	43 (86%)	49 (98%)
Olfactory Epithelium, Atrophy	1 (2%)			4 (8%)
Olfactory Epithelium, Metaplasia, Respiratory	7 (14%)	15 (30%)	25 (50%)	37 (74%)
Olfactory Epithelium, Necrosis		1 (2%)		
Respiratory Epithelium, Accumulation, Hyaline Droplet	7 (14%)	36 (72%)	50 (100%)	50 (100%)
Respiratory Epithelium, Hyperplasia	38 (76%)	44 (88%)	36 (72%)	41 (82%)
Respiratory Epithelium, Metaplasia, Squamous		3 (6%)		1 (2%)
Turbinate, Atrophy				1 (2%)
Turbinate, Degeneration	1 (2%)	1 (2%)		
Pleura	(1)	(0)	(0)	(0)
Trachea	(50)	(50)	(47)	(50)
Ulcer				1 (2%)

## SPECIAL SENSES SYSTEM

a - Number of animals examined microscopically at site and number of animals with lesion



Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

**P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)**

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

---

B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Eye	(50)	(50)	(50)	(50)
Atrophy	1 (2%)			
Cornea, Hyperplasia, Squamous				1 (2%)
Cornea, Inflammation, Chronic Active		4 (8%)	2 (4%)	2 (4%)
Cornea, Vacuolization Cytoplasmic	2 (4%)			
Lens, Degeneration	1 (2%)	1 (2%)		1 (2%)
Harderian Gland	(50)	(50)	(49)	(50)
Cyst		1 (2%)		
Hyperplasia	2 (4%)	1 (2%)	3 (6%)	2 (4%)

---

URINARY SYSTEM

Kidney	(50)	(50)	(50)	(50)
Congestion	1 (2%)			
Cyst	4 (8%)	2 (4%)	3 (6%)	5 (10%)
Dilatation	1 (2%)			
Infarct	3 (6%)	1 (2%)	4 (8%)	2 (4%)
Inflammation, Suppurative			1 (2%)	
Inflammation, Chronic Active	1 (2%)			
Metaplasia, Osseous	1 (2%)	1 (2%)		
Nephropathy	48 (96%)	48 (96%)	45 (90%)	48 (96%)
Artery, Hemorrhage	1 (2%)			
Artery, Inflammation, Chronic Active	1 (2%)	3 (6%)		
Capsule, Fibrosis		1 (2%)		
Capsule, Hemorrhage		1 (2%)		
Papilla, Necrosis		1 (2%)		
Pelvis, Inflammation, Suppurative		1 (2%)		
Ureter	(0)	(0)	(0)	(1)
Inflammation, Chronic Active				1 (100%)
Urinary Bladder	(50)	(50)	(50)	(49)

---

\*\*\* END OF MALE \*\*\*

a - Number of animals examined microscopically at site and number of animals with lesion

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

---

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
--------------------	---------	----------	----------	-----------

---

## Disposition Summary

Animals Initially In Study	50	50	50	50
Early Deaths				
Accidentally Killed				1
Moribund Sacrifice	7	8	10	11
Natural Death	4	5	3	5
Survivors				
Terminal Sacrifice	39	37	37	33
Animals Examined Microscopically	50	50	50	50

---

## ALIMENTARY SYSTEM

Esophagus	(50)	(50)	(50)	(50)
Gallbladder	(46)	(49)	(41)	(41)
Epithelium, Hyperplasia		1 (2%)		
Intestine Large, Cecum	(50)	(50)	(49)	(50)
Hyperplasia		1 (2%)		
Inflammation, Chronic Active			1 (2%)	
Intestine Large, Colon	(49)	(50)	(49)	(50)
Intestine Large, Rectum	(50)	(50)	(50)	(50)
Inflammation, Chronic Active			1 (2%)	1 (2%)
Intestine Small, Duodenum	(47)	(50)	(50)	(49)
Intestine Small, Ileum	(49)	(50)	(49)	(49)
Inflammation, Chronic Active			1 (2%)	
Intestine Small, Jejunum	(48)	(50)	(48)	(48)
Liver	(50)	(50)	(50)	(50)
Amyloid Deposition				1 (2%)
Angiectasis		2 (4%)	1 (2%)	2 (4%)
Basophilic Focus	6 (12%)	5 (10%)	3 (6%)	4 (8%)
Clear Cell Focus	1 (2%)			
Cyst		1 (2%)		1 (2%)
Degeneration		1 (2%)		
Eosinophilic Focus	6 (12%)	1 (2%)	5 (10%)	13 (26%)
Fatty Change	3 (6%)	2 (4%)	1 (2%)	5 (10%)
Hyperplasia		1 (2%)		

a - Number of animals examined microscopically at site and number of animals with lesion

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

**P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)**

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Infiltration Cellular, Lymphocyte		1 (2%)		1 (2%)
Infiltration Cellular, Mixed Cell		1 (2%)		
Inflammation, Chronic Active			1 (2%)	
Mixed Cell Focus	2 (4%)	4 (8%)	1 (2%)	
Necrosis	2 (4%)		2 (4%)	4 (8%)
Tension Lipidosis	6 (12%)	5 (10%)	5 (10%)	6 (12%)
Vacuolization Cytoplasmic	1 (2%)			
Centrilobular, Degeneration, Acute		1 (2%)		
Centrilobular, Hypertrophy			1 (2%)	
Centrilobular, Necrosis		1 (2%)		
Mesentery	(16)	(23)	(21)	(15)
Angiectasis	1 (6%)			
Cyst	1 (6%)			
Fibrosis			1 (5%)	
Inflammation, Suppurative			1 (5%)	
Inflammation, Chronic Active	1 (6%)	1 (4%)	1 (5%)	
Necrosis		1 (4%)	1 (5%)	
Arteriole, Inflammation, Chronic Active			1 (5%)	
Fat, Cyst			1 (5%)	
Fat, Necrosis	11 (69%)	17 (74%)	7 (33%)	8 (53%)
Vein, Inflammation, Chronic Active				1 (7%)
Pancreas	(50)	(50)	(50)	(50)
Cyst		1 (2%)		
Fibrosis	1 (2%)			
Inflammation, Chronic Active	1 (2%)			1 (2%)
Lipomatosis		1 (2%)		1 (2%)
Acinus, Atrophy	1 (2%)		1 (2%)	2 (4%)
Acinus, Hyperplasia				1 (2%)
Acinus, Hypertrophy			1 (2%)	1 (2%)
Salivary Glands	(50)	(50)	(50)	(49)
Stomach, Forestomach	(50)	(50)	(50)	(50)
Fibrosis	1 (2%)			
Hyperplasia, Squamous	1 (2%)	1 (2%)	2 (4%)	2 (4%)
Inflammation, Chronic Active				1 (2%)
Ulcer		1 (2%)	1 (2%)	1 (2%)
Arteriole, Inflammation, Chronic Active			1 (2%)	

a - Number of animals examined microscopically at site and number of animals with lesion

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

## P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Stomach, Glandular	(50)	(50)	(50)	(50)
Degeneration, Hyaline	1 (2%)			
Fibrosis			1 (2%)	
Inflammation, Chronic Active	1 (2%)			
Ulcer				1 (2%)
Arteriole, Inflammation, Chronic Active			1 (2%)	
Glands, Mineralization			2 (4%)	1 (2%)
Tooth	(1)	(0)	(2)	(4)
Dysplasia	1 (100%)		2 (100%)	3 (75%)
Inflammation, Chronic Active				2 (50%)
<b>CARDIOVASCULAR SYSTEM</b>				
Blood Vessel	(46)	(44)	(49)	(44)
Inflammation, Chronic Active			1 (2%)	
Aorta, Embolus Bacterial	1 (2%)			1 (2%)
Aorta, Inflammation, Suppurative				1 (2%)
Heart	(50)	(50)	(50)	(50)
Cardiomyopathy	1 (2%)	3 (6%)	8 (16%)	5 (10%)
Congestion		1 (2%)		1 (2%)
Mineralization			1 (2%)	
Necrosis	1 (2%)	1 (2%)		1 (2%)
Thrombosis		1 (2%)		
Artery, Inflammation, Chronic Active	1 (2%)			
Capillary, Hyperplasia	1 (2%)			
<b>ENDOCRINE SYSTEM</b>				
Adrenal Cortex	(49)	(50)	(50)	(50)
Angiectasis	1 (2%)			
Atrophy			1 (2%)	1 (2%)
Degeneration, Cystic		1 (2%)		
Hyperplasia	10 (20%)	5 (10%)	10 (20%)	6 (12%)
Vacuolization Cytoplasmic	2 (4%)	2 (4%)		2 (4%)
Adrenal Medulla	(49)	(50)	(49)	(50)

a - Number of animals examined microscopically at site and number of animals with lesion

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

## P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Hyperplasia	2 (4%)	1 (2%)	2 (4%)	4 (8%)
Islets, Pancreatic	(50)	(50)	(50)	(49)
Parathyroid Gland	(26)	(29)	(22)	(25)
Cyst		1 (3%)		
Hyperplasia	1 (4%)			
Pituitary Gland	(50)	(50)	(49)	(50)
Angiectasis	2 (4%)	1 (2%)		4 (8%)
Pars Distalis, Cyst		1 (2%)		1 (2%)
Pars Distalis, Hyperplasia	17 (34%)	21 (42%)	19 (39%)	24 (48%)
Pars Intermedia, Pars Nervosa, Cyst				1 (2%)
Thyroid Gland	(50)	(48)	(50)	(50)
Inflammation, Chronic Active		1 (2%)	2 (4%)	2 (4%)
C-cell, Hyperplasia	1 (2%)	1 (2%)		
Follicle, Cyst		1 (2%)		
Follicular Cell, Hyperplasia	1 (2%)	1 (2%)	2 (4%)	3 (6%)

## GENERAL BODY SYSTEM

Tissue NOS	(3)	(2)	(0)	(0)
Mediastinum, Infiltration Cellular, Lymphocyte	1 (33%)			
Mediastinum, Thrombosis	1 (33%)			

## GENITAL SYSTEM

Clitoral Gland	(44)	(45)	(43)	(44)
Hyperplasia, Basal Cell				1 (2%)
Inflammation, Chronic Active	1 (2%)	1 (2%)	1 (2%)	
Ovary	(50)	(50)	(48)	(50)
Angiectasis	3 (6%)	2 (4%)		3 (6%)
Cyst	14 (28%)	12 (24%)	12 (25%)	16 (32%)
Hemorrhage	12 (24%)	16 (32%)	7 (15%)	15 (30%)
Infiltration Cellular, Lymphocyte		1 (2%)	1 (2%)	
Inflammation, Chronic Active	1 (2%)	2 (4%)	3 (6%)	2 (4%)
Mineralization	1 (2%)			1 (2%)
Necrosis	1 (2%)			

a - Number of animals examined microscopically at site and number of animals with lesion

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Thrombosis				1 (2%)
Corpus Luteum, Hyperplasia	3 (6%)	1 (2%)		
Uterus	(50)	(50)	(50)	(50)
Angiectasis	5 (10%)	3 (6%)	1 (2%)	1 (2%)
Atrophy	1 (2%)			
Decidual Reaction	1 (2%)			
Dilatation	6 (12%)	5 (10%)	8 (16%)	6 (12%)
Hemorrhage				1 (2%)
Inflammation, Suppurative	1 (2%)			
Inflammation, Chronic Active	2 (4%)	2 (4%)	3 (6%)	4 (8%)
Thrombosis	1 (2%)			
Endometrium, Hyperplasia, Cystic	28 (56%)	29 (58%)	33 (66%)	34 (68%)

**HEMATOPOIETIC SYSTEM**

Bone Marrow	(50)	(50)	(50)	(50)
Lymph Node	(11)	(12)	(16)	(10)
Ectasia				1 (10%)
Hemorrhage	1 (9%)			
Iliac, Angiectasis		1 (8%)		
Iliac, Ectasia	1 (9%)			
Iliac, Hyperplasia, Lymphoid	1 (9%)	1 (8%)	1 (6%)	
Iliac, Hyperplasia, Plasma Cell				1 (10%)
Lumbar, Ectasia	1 (9%)	1 (8%)	2 (13%)	
Lumbar, Hyperplasia, Lymphoid		1 (8%)		1 (10%)
Lumbar, Infiltration Cellular, Histiocyte		1 (8%)		
Lumbar, Infiltration Cellular, Mixed Cell			1 (6%)	
Pancreatic, Inflammation, Chronic Active	1 (9%)			
Renal, Angiectasis		1 (8%)		
Renal, Ectasia	1 (9%)		1 (6%)	
Renal, Hyperplasia, Lymphoid		2 (17%)		
Renal, Necrosis			1 (6%)	
Lymph Node, Bronchial	(26)	(27)	(28)	(27)
Infiltration Cellular, Histiocyte				1 (4%)
Necrosis			1 (4%)	

a - Number of animals examined microscopically at site and number of animals with lesion

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMICAL SITE(a)**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Lymph Node, Mandibular Necrosis	(41)	(42)	(43) 1 (2%)	(35)
Lymph Node, Mediastinal Hematopoietic Cell Proliferation Hyperplasia, Lymphoid Infiltration Cellular, Mixed Cell	(43)	(46) 1 (2%) 1 (2%)	(40)	(47)  2 (4%) 1 (2%)
Lymph Node, Mesenteric Angiectasis Ectasia Hematopoietic Cell Proliferation Hemorrhage Hyperplasia, Lymphoid Infiltration Cellular, Histiocyte	(48)	(50) 1 (2%) 2 (4%) 1 (2%) 2 (4%)	(49) 2 (4%) 2 (4%) 1 (2%)	(49) 1 (2%)
Spleen Hematopoietic Cell Proliferation Hyperplasia, Lymphoid Infiltration Cellular, Mast Cell Lymphoid Follicle, Hyperplasia	(50) 4 (8%)	(50) 3 (6%) 1 (2%)	(50) 3 (6%) 1 (2%) 1 (2%)	(49) 2 (4%) 1 (2%) 1 (2%)
Thymus Angiectasis Atrophy Hyperplasia, Lymphoid Necrosis	(44) 2 (5%) 1 (2%)	(46)	(45) 1 (2%)	(45) 1 (2%) 1 (2%)

**INTEGUMENTARY SYSTEM**

Mammary Gland Hyperplasia	(50) 2 (4%)	(50)	(50)	(50) 1 (2%)
Skin Infiltration Cellular, Mast Cell Inflammation, Chronic Active Ulcer Epidermis, Hyperplasia Subcutaneous Tissue, Fibrosis	(50)  1 (2%) 1 (2%)	(50)	(50) 1 (2%) 1 (2%) 1 (2%)	(50) 1 (2%) 2 (4%) 3 (6%)

a - Number of animals examined microscopically at site and number of animals with lesion

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMICAL SITE(a)  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
<b>MUSCULOSKELETAL SYSTEM</b>				
Bone	(50)	(50)	(50)	(50)
Fibro-Osseous Lesion	23 (46%)	25 (50%)	27 (54%)	23 (46%)
Cartilage, Femur, Metaphysis, Hyperplasia	1 (2%)			
Cranium, Inflammation, Chronic Active	1 (2%)		2 (4%)	1 (2%)
Femur, Fracture	1 (2%)			
Femur, Tibia, Arthrosis				1 (2%)
Maxilla, Hyperostosis			1 (2%)	
Pelvis, Degeneration				1 (2%)
Vertebra, Fracture				1 (2%)
Skeletal Muscle	(3)	(3)	(1)	(4)
Degeneration				1 (25%)
Infiltration Cellular, Lymphocyte	3 (100%)	1 (33%)		
Infiltration Cellular, Polymorphonuclear				1 (25%)
Arteriole, Inflammation, Chronic Active			1 (100%)	
<b>NERVOUS SYSTEM</b>				
Brain	(50)	(50)	(50)	(50)
Compression	3 (6%)	1 (2%)	2 (4%)	3 (6%)
Meninges, Inflammation, Chronic Active				1 (2%)
Peripheral Nerve	(2)	(3)	(1)	(3)
Degeneration		1 (33%)		1 (33%)
Infiltration Cellular, Mixed Cell	1 (50%)			
Infiltration Cellular, Polymorphonuclear		1 (33%)		
Spinal Cord	(3)	(3)	(1)	(3)
Infiltration Cellular, Lymphocyte		1 (33%)		
<b>RESPIRATORY SYSTEM</b>				
Larynx	(49)	(49)	(50)	(50)
Inflammation, Chronic Active				10 (20%)
Metaplasia, Squamous	1 (2%)	49 (100%)	50 (100%)	50 (100%)

a - Number of animals examined microscopically at site and number of animals with lesion



Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

## P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Necrosis				4 (8%)
Lung	(50)	(50)	(50)	(50)
Congestion				1 (2%)
Hemorrhage	1 (2%)	1 (2%)	1 (2%)	2 (4%)
Infiltration Cellular, Histiocyte	4 (8%)	1 (2%)	1 (2%)	6 (12%)
Infiltration Cellular, Lymphocyte		1 (2%)		
Infiltration Cellular, Mixed Cell				1 (2%)
Metaplasia, Osseous		1 (2%)		
Thrombosis				1 (2%)
Alveolar Epithelium, Hyperplasia	4 (8%)	2 (4%)	5 (10%)	4 (8%)
Alveolus, Infiltration Cellular, Histiocyte	1 (2%)			
Bronchiole, Hyperplasia	7 (14%)	4 (8%)	22 (44%)	41 (82%)
Interstitial, Inflammation, Chronic Active	1 (2%)			1 (2%)
Perivascular, Inflammation, Chronic Active	4 (8%)	3 (6%)		11 (22%)
Nose	(50)	(49)	(50)	(50)
Inflammation, Chronic Active	9 (18%)		3 (6%)	5 (10%)
Necrosis	1 (2%)	1 (2%)	2 (4%)	1 (2%)
Olfactory Epithelium, Accumulation, Hyaline Droplet	25 (50%)	40 (82%)	50 (100%)	49 (98%)
Olfactory Epithelium, Atrophy	1 (2%)	1 (2%)		1 (2%)
Olfactory Epithelium, Metaplasia, Respiratory	3 (6%)	4 (8%)	12 (24%)	23 (46%)
Respiratory Epithelium, Accumulation, Hyaline Droplet	34 (68%)	48 (98%)	50 (100%)	50 (100%)
Respiratory Epithelium, Hyperplasia	39 (78%)	48 (98%)	39 (78%)	39 (78%)
Respiratory Epithelium, Metaplasia, Squamous		1 (2%)		1 (2%)
Respiratory Epithelium, Necrosis		1 (2%)		
Trachea	(49)	(49)	(50)	(50)

## SPECIAL SENSES SYSTEM

Eye	(50)	(50)	(50)	(50)
Atrophy			2 (4%)	
Cornea, Inflammation, Chronic Active		1 (2%)		1 (2%)
Lens, Degeneration	2 (4%)		2 (4%)	1 (2%)
Harderian Gland	(50)	(50)	(50)	(50)
Atrophy	1 (2%)		1 (2%)	

a - Number of animals examined microscopically at site and number of animals with lesion

**Experiment Number:** 20515 - 04  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** MICE/B6C3F1

**P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMICAL SITE(a)**  
 Metal working fluids (CIMSTAR 3800)  
**CAS Number:** CIMSTAR3800

**Date Report Requested:** 03/08/2013  
**Time Report Requested:** 14:13:47  
**First Dose M/F:** 05/05/08 / 05/05/08  
**Lab:** BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Hyperplasia	2 (4%)	1 (2%)	6 (12%)	
Inflammation, Suppurative			1 (2%)	
Inflammation, Chronic Active		1 (2%)	1 (2%)	
<b>URINARY SYSTEM</b>				
Kidney	(50)	(50)	(50)	(50)
Accumulation, Hyaline Droplet	1 (2%)	1 (2%)		
Infarct	1 (2%)	4 (8%)	4 (8%)	1 (2%)
Inflammation, Suppurative				1 (2%)
Metaplasia, Osseous		1 (2%)	2 (4%)	1 (2%)
Necrosis	1 (2%)			
Nephropathy	47 (94%)	46 (92%)	49 (98%)	47 (94%)
Glomerulus, Amyloid Deposition	1 (2%)			1 (2%)
Ureter	(0)	(0)	(1)	(0)
Urethra	(0)	(1)	(0)	(0)
Urinary Bladder	(50)	(50)	(50)	(50)
Angiectasis	1 (2%)		1 (2%)	
Arteriole, Inflammation, Chronic Active			1 (2%)	
Artery, Serosa, Inflammation, Chronic Active		1 (2%)		

\*\*\* END OF REPORT \*\*\*

a - Number of animals examined microscopically at site and number of animals with lesion