

**Experiment Number:** 20523 - 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: Trim VX

**CAS Number:** TRIMVX

**Date Report Requested:** 02/02/2015

**Time Report Requested:** 13:50:12

**First Dose M/F:** 08/03/09 / 08/03/09

**Lab:** BNW

F1\_M3

**NTP Study Number:** C20523  
**Lock Date:** 06/04/2012  
**Cage Range:** ALL  
**Date Range:** ALL  
**Reasons For Removal:** ALL  
**Removal Date Range:** ALL  
**Treatment Groups:** Include ALL  
**Study Gender:** Both  
**TDMSE Version:** 3.0.2.2\_002  
**PWG Approval Date:** NONE

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B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
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**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>Accidentally Killed</b>			<b>1</b>	
<b>Moribund Sacrifice</b>	<b>4</b>	<b>9</b>	<b>6</b>	<b>5</b>
<b>Natural Death</b>	<b>8</b>	<b>2</b>	<b>6</b>	<b>8</b>
<b>Survivors</b>				
<b>Natural Death</b>			<b>1</b>	
<b>Terminal Sacrifice</b>	<b>38</b>	<b>39</b>	<b>36</b>	<b>37</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	(43)	(46)	(39)	(42)
Infiltration Cellular, Lymphoid			1 (3%)	
Inflammation, Chronic Active	1 (2%)	1 (2%)	1 (3%)	1 (2%)
Vacuolization Cytoplasmic		1 (2%)		2 (5%)
Epithelium, Hyperplasia				1 (2%)
Intestine Large, Cecum	(45)	(49)	(47)	(46)
Hemorrhage	1 (2%)			
Hyperplasia	1 (2%)			
Hyperplasia, Lymphoid	2 (4%)			3 (7%)
Infiltration Cellular, Lymphoid			1 (2%)	
Inflammation	2 (4%)	2 (4%)	3 (6%)	1 (2%)
Necrosis	1 (2%)		1 (2%)	
Intestine Large, Colon	(48)	(50)	(48)	(48)
Hyperplasia, Lymphoid			1 (2%)	
Intestine Large, Rectum	(46)	(48)	(46)	(45)
Inflammation		1 (2%)		
Intestine Small, Duodenum	(44)	(48)	(45)	(44)
Inflammation				1 (2%)
Intestine Small, Ileum	(45)	(49)	(46)	(43)
Cyst		1 (2%)		
Hyperplasia, Lymphoid	8 (18%)	9 (18%)	11 (24%)	11 (26%)

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

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B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Inflammation		1 (2%)	1 (2%)	
Intestine Small, Jejunum	(45)	(48)	(45)	(44)
Hyperplasia, Lymphoid	1 (2%)	1 (2%)	3 (7%)	2 (5%)
Inflammation			1 (2%)	
Necrosis			1 (2%)	
Perforation			1 (2%)	
Liver	(50)	(50)	(50)	(50)
Angiectasis	1 (2%)			
Basophilic Focus	11 (22%)	9 (18%)	3 (6%)	4 (8%)
Clear Cell Focus	14 (28%)	11 (22%)	9 (18%)	13 (26%)
Congestion	1 (2%)			
Eosinophilic Focus	8 (16%)	12 (24%)	17 (34%)	7 (14%)
Fatty Change				1 (2%)
Fibrosis			1 (2%)	
Hemorrhage	1 (2%)			
Inflammation, Chronic Active			2 (4%)	1 (2%)
Mixed Cell Focus	3 (6%)	3 (6%)	6 (12%)	5 (10%)
Necrosis				1 (2%)
Tension Lipidosis	1 (2%)	3 (6%)	3 (6%)	
Thrombosis				1 (2%)
Bile Duct, Vacuolization Cytoplasmic				1 (2%)
Centrilobular, Hepatocyte, Fatty Change		2 (4%)		
Centrilobular, Hepatocyte, Necrosis	2 (4%)			
Hepatocyte, Hypertrophy	1 (2%)	1 (2%)		1 (2%)
Hepatocyte, Necrosis	3 (6%)	7 (14%)	5 (10%)	5 (10%)
Hepatocyte, Vacuolization Cytoplasmic	1 (2%)			
Periportal, Fatty Change			1 (2%)	
Serosa, Fibrosis			1 (2%)	
Mesentery	(5)	(7)	(4)	(2)
Fat, Necrosis	4 (80%)	4 (57%)	1 (25%)	2 (100%)
Pancreas	(50)	(50)	(49)	(50)
Atrophy			1 (2%)	
Cyst				1 (2%)
Hemorrhage, Acute		1 (2%)		
Hypertrophy	2 (4%)			
Inflammation, Chronic Active		3 (6%)		

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B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Acinus, Atrophy				1 (2%)
Duct, Hyperplasia		1 (2%)		
Salivary Glands	(50)	(50)	(49)	(50)
Stomach, Forestomach	(50)	(50)	(49)	(50)
Abscess				1 (2%)
Cyst, Squamous				1 (2%)
Hyperplasia		1 (2%)	5 (10%)	1 (2%)
Infiltration Cellular, Lymphoid		1 (2%)		
Inflammation, Chronic Active	1 (2%)	3 (6%)	3 (6%)	5 (10%)
Necrosis		1 (2%)	1 (2%)	
Stomach, Glandular	(48)	(50)	(49)	(50)
Cyst, Squamous	1 (2%)			
Infiltration Cellular, Lymphoid			1 (2%)	
Inflammation, Chronic Active	1 (2%)	4 (8%)	2 (4%)	4 (8%)
Mineralization	1 (2%)	1 (2%)	2 (4%)	
Tooth	(5)	(10)	(8)	(5)
Dysplasia	4 (80%)	9 (90%)	7 (88%)	3 (60%)
Inflammation, Suppurative, Chronic Active		2 (20%)		
Inflammation, Suppurative			1 (13%)	2 (40%)
Malformation	1 (20%)			
<b>CARDIOVASCULAR SYSTEM</b>				
Blood Vessel	(50)	(50)	(50)	(50)
Heart	(50)	(50)	(50)	(50)
Cardiomyopathy	19 (38%)	17 (34%)	18 (36%)	19 (38%)
Inflammation, Chronic Active	1 (2%)	3 (6%)		1 (2%)
Mineralization	1 (2%)			
Atrium, Thrombosis	2 (4%)			
<b>ENDOCRINE SYSTEM</b>				
Adrenal Cortex	(50)	(50)	(49)	(49)
Accessory Adrenal Cortical Nodule		1 (2%)	1 (2%)	1 (2%)
Angiectasis			1 (2%)	2 (4%)

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B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Hyperplasia	3 (6%)	2 (4%)	1 (2%)	1 (2%)
Hypertrophy	21 (42%)	30 (60%)	26 (53%)	18 (37%)
Subcapsular, Hyperplasia		1 (2%)		
Subcapsular, Hypertrophy		1 (2%)		
Adrenal Medulla	(50)	(50)	(48)	(49)
Angiectasis	1 (2%)	2 (4%)		1 (2%)
Hyperplasia	6 (12%)	5 (10%)	5 (10%)	5 (10%)
Hypertrophy	1 (2%)			1 (2%)
Islets, Pancreatic	(50)	(50)	(48)	(50)
Hyperplasia		2 (4%)		
Hypertrophy			1 (2%)	
Parathyroid Gland	(28)	(28)	(36)	(34)
Cyst		1 (4%)		1 (3%)
Pituitary Gland	(50)	(49)	(48)	(48)
Pars Distalis, Angiectasis			1 (2%)	1 (2%)
Pars Distalis, Cyst	4 (8%)	1 (2%)	3 (6%)	6 (13%)
Pars Distalis, Hyperplasia	3 (6%)	3 (6%)	2 (4%)	3 (6%)
Pars Intermedia, Cyst	1 (2%)			
Thyroid Gland	(50)	(49)	(47)	(49)

GENERAL BODY SYSTEM

None

GENITAL SYSTEM

Epididymis	(50)	(50)	(49)	(50)
Exfoliated Germ Cell	39 (78%)	40 (80%)	44 (90%)	40 (80%)
Infiltration Cellular, Lymphoid				1 (2%)
Inflammation, Chronic Active	1 (2%)	3 (6%)	1 (2%)	1 (2%)
Preputial Gland	(49)	(50)	(48)	(49)
Ectasia	4 (8%)	3 (6%)	3 (6%)	4 (8%)
Inflammation, Chronic Active	9 (18%)	14 (28%)	12 (25%)	12 (24%)
Necrosis			1 (2%)	
Duct, Ectasia		2 (4%)		

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B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Prostate	(50)	(49)	(50)	(50)
Hyperplasia			3 (6%)	
Infiltration Cellular, Lymphoid	1 (2%)	1 (2%)	1 (2%)	2 (4%)
Inflammation	2 (4%)	1 (2%)	1 (2%)	
Arteriole, Inflammation, Chronic Active	1 (2%)			
Seminal Vesicle	(50)	(50)	(50)	(50)
Dilatation				1 (2%)
Infiltration Cellular, Lymphoid	1 (2%)	1 (2%)	1 (2%)	
Inflammation	1 (2%)	2 (4%)	1 (2%)	
Testes	(50)	(50)	(49)	(50)
Degeneration	9 (18%)	17 (34%)	15 (31%)	9 (18%)
Necrosis		1 (2%)		

## HEMATOPOIETIC SYSTEM

Bone Marrow	(50)	(50)	(49)	(50)
Necrosis		2 (4%)		
Myeloid Cell, Hyperplasia	16 (32%)	29 (58%)	18 (37%)	29 (58%)
Lymph Node	(3)	(0)	(3)	(1)
Lumbar, Hyperplasia, Lymphoid			1 (33%)	
Pancreatic, Hyperplasia, Lymphoid	1 (33%)			
Lymph Node, Bronchial	(38)	(37)	(39)	(39)
Hematopoietic Cell Proliferation		1 (3%)		
Hyperplasia, Lymphoid	3 (8%)	3 (8%)	2 (5%)	14 (36%)
Infiltration Cellular, Histiocyte		1 (3%)		7 (18%)
Infiltration Cellular, Plasma Cell				1 (3%)
Plasma Cell, Hyperplasia			1 (3%)	
Lymph Node, Mandibular	(20)	(27)	(25)	(27)
Hematopoietic Cell Proliferation	1 (5%)			
Hyperplasia, Lymphoid	3 (15%)	3 (11%)	2 (8%)	1 (4%)
Infiltration Cellular, Histiocyte	1 (5%)	1 (4%)	1 (4%)	1 (4%)
Lymph Node, Mediastinal	(35)	(35)	(41)	(40)
Hematopoietic Cell Proliferation			1 (2%)	
Hyperplasia, Lymphoid	3 (9%)	2 (6%)	1 (2%)	5 (13%)
Lymph Node, Mesenteric	(48)	(49)	(47)	(48)

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Angiectasis	1 (2%)		3 (6%)	
Congestion	1 (2%)			
Hematopoietic Cell Proliferation		3 (6%)	4 (9%)	1 (2%)
Hyperplasia, Lymphoid	15 (31%)	11 (22%)	9 (19%)	6 (13%)
Hyperplasia, Plasma Cell	1 (2%)		1 (2%)	
Infiltration Cellular		1 (2%)		
Inflammation, Chronic Active		1 (2%)	1 (2%)	1 (2%)
Spleen	(49)	(50)	(49)	(50)
Angiectasis		1 (2%)		
Hematopoietic Cell Proliferation	11 (22%)	8 (16%)	11 (22%)	10 (20%)
Hyperplasia, Lymphoid	13 (27%)	15 (30%)	9 (18%)	8 (16%)
Necrosis, Lymphoid		1 (2%)		
Thymus	(44)	(44)	(47)	(46)
Atrophy	5 (11%)	5 (11%)	8 (17%)	9 (20%)
Cyst	1 (2%)	3 (7%)	5 (11%)	5 (11%)
Ectopic Parathyroid Gland	1 (2%)	2 (5%)	3 (6%)	
Ectopic Thyroid				1 (2%)
Hyperplasia, Lymphoid	1 (2%)	5 (11%)		4 (9%)
Epithelial Cell, Hyperplasia	1 (2%)			

## INTEGUMENTARY SYSTEM

Mammary Gland	(3)	(3)	(0)	(0)
Skin	(50)	(50)	(50)	(50)
Cyst Epithelial Inclusion		1 (2%)		4 (8%)
Fibrosis			1 (2%)	
Hyperkeratosis				1 (2%)
Hyperplasia	3 (6%)	2 (4%)		3 (6%)
Inflammation, Chronic Active	10 (20%)	6 (12%)	8 (16%)	11 (22%)
Metaplasia, Osseous			1 (2%)	
Necrosis	1 (2%)	3 (6%)	1 (2%)	
Ulcer	3 (6%)	2 (4%)	3 (6%)	3 (6%)
Hair Follicle, Atrophy			1 (2%)	
Subcutaneous Tissue, Inflammation, Chronic Active		1 (2%)		

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B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
<b>MUSCULOSKELETAL SYSTEM</b>				
Bone	(50)	(50)	(50)	(50)
Fibro-Osseous Lesion	1 (2%)	3 (6%)	1 (2%)	
Hyperostosis	1 (2%)	1 (2%)		
Skeletal Muscle	(0)	(1)	(2)	(1)
Degeneration		1 (100%)		1 (100%)
<b>NERVOUS SYSTEM</b>				
Brain	(50)	(50)	(49)	(50)
Compression			1 (2%)	
Gliosis				1 (2%)
Infiltration Cellular	1 (2%)	2 (4%)	1 (2%)	
Inflammation, Chronic Active	2 (4%)	1 (2%)	1 (2%)	1 (2%)
Peripheral Nerve	(0)	(1)	(1)	(2)
Degeneration		1 (100%)		1 (50%)
Spinal Cord	(0)	(1)	(1)	(2)
<b>RESPIRATORY SYSTEM</b>				
Larynx	(48)	(49)	(49)	(49)
Foreign Body		1 (2%)		
Inflammation, Chronic Active	45 (94%)	47 (96%)	46 (94%)	48 (98%)
Mineralization			1 (2%)	
Necrosis		1 (2%)	1 (2%)	
Epiglottis, Hyperplasia, Squamous	1 (2%)	2 (4%)	14 (29%)	30 (61%)
Epiglottis, Metaplasia, Squamous		49 (100%)	49 (100%)	49 (100%)
Squamous Epithelium, Hyperplasia	1 (2%)			
Lung	(50)	(50)	(49)	(50)
Fibrosis		2 (4%)	5 (10%)	45 (90%)
Hemorrhage		1 (2%)	1 (2%)	
Infiltration Cellular, Histiocyte	5 (10%)	9 (18%)	15 (31%)	49 (98%)

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Inflammation, Chronic	5 (10%)	12 (24%)	16 (33%)	50 (100%)
Metaplasia, Osseous				1 (2%)
Pigmentation	2 (4%)	2 (4%)	2 (4%)	8 (16%)
Proteinosis			1 (2%)	
Thrombosis		1 (2%)	2 (4%)	
Alveolar/bronchiolar Epithelium, Hyperplasia	3 (6%)	7 (14%)	15 (31%)	50 (100%)
Alveolar Epithelium, Hyperplasia	3 (6%)	3 (6%)	7 (14%)	47 (94%)
Bronchiole, Metaplasia, Squamous				1 (2%)
Nose	(49)	(50)	(49)	(50)
Exudate	2 (4%)	11 (22%)	35 (71%)	49 (98%)
Inflammation, Suppurative	1 (2%)			
Inflammation, Chronic			1 (2%)	
Inflammation, Chronic Active	3 (6%)	33 (66%)	39 (80%)	50 (100%)
Polyp, Inflammatory			1 (2%)	
Glands, Olfactory Epithelium, Hyperplasia				1 (2%)
Lateral Wall, Inflammation, Chronic Active	2 (4%)	7 (14%)	4 (8%)	5 (10%)
Lateral Wall, Necrosis		1 (2%)		
Nasolacrimal Duct, Abscess	1 (2%)			
Nasolacrimal Duct, Inflammation, Chronic Active	3 (6%)	2 (4%)	2 (4%)	2 (4%)
Nasopharyngeal Duct, Hyperplasia		1 (2%)		
Nasopharyngeal Duct, Inflammation, Chronic Active		1 (2%)		
Nasopharyngeal Duct, Perforation		1 (2%)	11 (22%)	19 (38%)
Olfactory Epithelium, Accumulation, Hyaline Droplet	2 (4%)	46 (92%)	48 (98%)	50 (100%)
Olfactory Epithelium, Atrophy		1 (2%)		4 (8%)
Olfactory Epithelium, Metaplasia, Respiratory	3 (6%)	2 (4%)	3 (6%)	5 (10%)
Respiratory Epithelium, Accumulation, Hyaline Droplet	7 (14%)	49 (98%)	49 (100%)	50 (100%)
Respiratory Epithelium, Atrophy		1 (2%)	20 (41%)	40 (80%)
Respiratory Epithelium, Hyperplasia	41 (84%)	49 (98%)	47 (96%)	48 (96%)
Respiratory Epithelium, Metaplasia, Squamous	1 (2%)	2 (4%)	1 (2%)	1 (2%)
Respiratory Epithelium, Necrosis	2 (4%)	1 (2%)	2 (4%)	23 (46%)
Turbinate, Atrophy		2 (4%)	5 (10%)	14 (28%)
Turbinate, Perforation			1 (2%)	13 (26%)
Pleura	(0)	(1)	(0)	(1)

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B6C3F1 MICE MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Trachea	(46)	(50)	(47)	(48)
Cartilage, Metaplasia, Osseous	1 (2%)		1 (2%)	1 (2%)
Epithelium, Hyperplasia				3 (6%)
<b>SPECIAL SENSES SYSTEM</b>				
Eye	(50)	(50)	(49)	(49)
Cataract				1 (2%)
Inflammation, Chronic Active	1 (2%)	4 (8%)	3 (6%)	3 (6%)
Necrosis			1 (2%)	
Harderian Gland	(50)	(50)	(49)	(50)
Hyperplasia	1 (2%)	1 (2%)	3 (6%)	1 (2%)
Inflammation		1 (2%)		
<b>URINARY SYSTEM</b>				
Kidney	(50)	(50)	(49)	(50)
Angiectasis			1 (2%)	
Cyst			1 (2%)	1 (2%)
Hydronephrosis				1 (2%)
Hyperplasia, Lymphoid	1 (2%)	2 (4%)		
Infarct, Chronic	1 (2%)	2 (4%)	1 (2%)	2 (4%)
Inflammation, Chronic Active	1 (2%)	1 (2%)	2 (4%)	2 (4%)
Metaplasia, Osseous		2 (4%)	1 (2%)	1 (2%)
Mineralization	1 (2%)	1 (2%)		
Nephropathy	47 (94%)	46 (92%)	45 (92%)	49 (98%)
Artery, Inflammation, Chronic Active			1 (2%)	
Urethra	(0)	(0)	(1)	(0)
Urinary Bladder	(50)	(50)	(49)	(50)
Angiectasis		1 (2%)		
Calculus Micro Observation Only	1 (2%)			
Inflammation, Suppurative		1 (2%)		
Inflammation, Chronic Active			1 (2%)	
Ulcer		1 (2%)		

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**B6C3F1 MICE MALE**

**Control**

**10 mg/m3**

**30 mg/m3**

**100 mg/m3**

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

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Species/Strain: MICE/B6C3F1

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

Metal Working Fluids: Trim VX

CAS Number: TRIMVX

Date Report Requested: 02/02/2015

Time Report Requested: 13:50:12

First Dose M/F: 08/03/09 / 08/03/09

Lab: BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
<b>Disposition Summary</b>				
Animals Initially In Study	50	50	50	50
Early Deaths				
Accidentally Killed	1			
Moribund Sacrifice	10	9	4	13
Natural Death	4	5	10	7
Survivors				
Moribund Sacrifice	1			
Natural Death				1
Terminal Sacrifice	34	36	36	29
Animals Examined Microscopically	50	50	50	50

ALIMENTARY SYSTEM

Esophagus	(50)	(50)	(50)	(49)
Periesophageal Tissue, Inflammation, Chronic Active	1 (2%)			1 (2%)
Gallbladder	(46)	(46)	(44)	(44)
Inflammation, Chronic Active	1 (2%)			
Vacuolization Cytoplasmic			1 (2%)	
Intestine Large, Cecum	(50)	(49)	(46)	(45)
Hyperplasia, Lymphoid		1 (2%)		
Inflammation	2 (4%)		1 (2%)	1 (2%)
Intestine Large, Colon	(50)	(50)	(47)	(50)
Hyperplasia, Lymphoid				1 (2%)
Inflammation	1 (2%)			
Intestine Large, Rectum	(48)	(48)	(46)	(45)
Edema	1 (2%)			
Inflammation		1 (2%)		
Intestine Small, Duodenum	(48)	(46)	(43)	(45)
Hyperplasia, Lymphoid		1 (2%)		
Infiltration Cellular, Lymphoid		1 (2%)		
Inflammation	1 (2%)	3 (7%)	1 (2%)	
Necrosis			1 (2%)	
Intestine Small, Ileum	(48)	(47)	(44)	(46)

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

Experiment Number: 20523 - 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: Trim VX

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First Dose M/F: 08/03/09 / 08/03/09

Lab: BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Hyperplasia, Lymphoid	4 (8%)	8 (17%)	4 (9%)	2 (4%)
Hyperplasia, Plasma Cell				1 (2%)
Inflammation	1 (2%)	4 (9%)		
Perforation		1 (2%)		
Serosa, Fibrosis		1 (2%)		
Intestine Small, Jejunum	(48)	(45)	(45)	(46)
Hyperplasia, Lymphoid	2 (4%)	2 (4%)	1 (2%)	1 (2%)
Inflammation	1 (2%)	1 (2%)	1 (2%)	
Perforation	1 (2%)			
Ulcer			1 (2%)	
Liver	(50)	(50)	(50)	(50)
Angiectasis	1 (2%)	2 (4%)	1 (2%)	
Basophilic Focus	6 (12%)	2 (4%)	2 (4%)	4 (8%)
Clear Cell Focus		5 (10%)	3 (6%)	3 (6%)
Cyst		1 (2%)		
Eosinophilic Focus	3 (6%)	8 (16%)	7 (14%)	8 (16%)
Fatty Change	1 (2%)	2 (4%)	1 (2%)	
Hematopoietic Cell Proliferation		1 (2%)	1 (2%)	
Hepatodiaphragmatic Nodule		1 (2%)		
Hyperplasia, Granulocytic	1 (2%)			
Infarct		1 (2%)		
Inflammation, Chronic Active	5 (10%)	1 (2%)	1 (2%)	2 (4%)
Mixed Cell Focus	1 (2%)	1 (2%)		1 (2%)
Necrosis	1 (2%)	1 (2%)		
Tension Lipidosis	1 (2%)	4 (8%)		
Hepatocyte, Degeneration				2 (4%)
Hepatocyte, Hypertrophy		2 (4%)	1 (2%)	1 (2%)
Hepatocyte, Necrosis	3 (6%)	1 (2%)	2 (4%)	5 (10%)
Mesentery	(10)	(10)	(5)	(11)
Inflammation, Chronic Active	2 (20%)	1 (10%)		
Pigmentation	1 (10%)			
Fat, Necrosis	6 (60%)	9 (90%)	5 (100%)	6 (55%)
Pancreas	(50)	(50)	(49)	(50)
Atrophy	2 (4%)	1 (2%)	1 (2%)	1 (2%)
Hypertrophy				3 (6%)
Infiltration Cellular, Lymphoid	1 (2%)	1 (2%)		1 (2%)

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

Experiment Number: 20523 - 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: Trim VX

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Date Report Requested: 02/02/2015

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First Dose M/F: 08/03/09 / 08/03/09

Lab: BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Inflammation, Chronic Active	3 (6%)		3 (6%)	
Necrosis	1 (2%)			
Duct, Cyst	1 (2%)		1 (2%)	
Salivary Glands	(50)	(50)	(50)	(50)
Inflammation, Suppurative		1 (2%)		
Necrosis, Acute		1 (2%)		
Stomach, Forestomach	(50)	(50)	(50)	(50)
Cyst, Squamous		1 (2%)		
Hyperkeratosis	2 (4%)	4 (8%)	1 (2%)	2 (4%)
Hyperplasia	3 (6%)	6 (12%)	1 (2%)	2 (4%)
Inflammation			1 (2%)	1 (2%)
Inflammation, Chronic Active	5 (10%)	1 (2%)	1 (2%)	1 (2%)
Ulcer		1 (2%)	1 (2%)	1 (2%)
Stomach, Glandular	(49)	(50)	(49)	(50)
Cyst		1 (2%)	1 (2%)	
Hyperplasia, Lymphoid		1 (2%)		
Inflammation, Chronic Active	4 (8%)	3 (6%)	2 (4%)	1 (2%)
Mineralization	1 (2%)	2 (4%)		
Tooth	(0)	(1)	(0)	(0)
Dysplasia		1 (100%)		

## CARDIOVASCULAR SYSTEM

Blood Vessel	(50)	(50)	(50)	(50)
Heart	(50)	(50)	(49)	(50)
Cardiomyopathy	12 (24%)	18 (36%)	12 (24%)	15 (30%)
Infiltration Cellular, Lymphoid	1 (2%)			
Inflammation, Suppurative			1 (2%)	
Inflammation, Chronic Active	1 (2%)	5 (10%)	3 (6%)	6 (12%)
Mineralization	1 (2%)		1 (2%)	
Necrosis			2 (4%)	1 (2%)
Thrombosis				1 (2%)
Coronary Artery, Fibrosis	1 (2%)			
Coronary Artery, Thrombosis				1 (2%)

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

Experiment Number: 20523 - 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: Trim VX  
 CAS Number: TRIMVX

Date Report Requested: 02/02/2015  
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 First Dose M/F: 08/03/09 / 08/03/09  
 Lab: BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
<b>ENDOCRINE SYSTEM</b>				
Adrenal Cortex	(50)	(50)	(50)	(50)
Accessory Adrenal Cortical Nodule	2 (4%)	2 (4%)	3 (6%)	1 (2%)
Angiectasis		3 (6%)	2 (4%)	2 (4%)
Degeneration, Cystic				1 (2%)
Hematopoietic Cell Proliferation	1 (2%)		1 (2%)	
Hyperplasia	6 (12%)	6 (12%)	2 (4%)	7 (14%)
Hypertrophy	14 (28%)	8 (16%)	13 (26%)	10 (20%)
Inflammation, Chronic Active	1 (2%)			
Adrenal Medulla	(50)	(50)	(50)	(50)
Hyperplasia	11 (22%)	7 (14%)	5 (10%)	5 (10%)
Hypertrophy	1 (2%)		1 (2%)	
Pigmentation				1 (2%)
Islets, Pancreatic	(50)	(49)	(49)	(50)
Parathyroid Gland	(35)	(30)	(36)	(28)
Ectopic Tissue	1 (3%)			
Pituitary Gland	(48)	(49)	(49)	(49)
Pars Distalis, Angiectasis	5 (10%)	2 (4%)	2 (4%)	5 (10%)
Pars Distalis, Cyst				1 (2%)
Pars Distalis, Hyperplasia	11 (23%)	17 (35%)	15 (31%)	10 (20%)
Pars Distalis, Hypertrophy	1 (2%)			1 (2%)
Pars Intermedia, Hyperplasia	1 (2%)			
Thyroid Gland	(50)	(50)	(50)	(49)
Cyst	1 (2%)	1 (2%)	1 (2%)	
Inflammation, Suppurative			1 (2%)	
Inflammation, Chronic Active		2 (4%)		1 (2%)
Follicular Cell, Hyperplasia	3 (6%)		2 (4%)	2 (4%)
Follicular Cell, Hypertrophy				1 (2%)
<b>GENERAL BODY SYSTEM</b>				
Tissue NOS	(1)	(0)	(0)	(0)
Hemorrhage	1 (100%)			

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Species/Strain: MICE/B6C3F1

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Lab: BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
<b>GENITAL SYSTEM</b>				
Clitoral Gland	(46)	(48)	(45)	(46)
Ovary	(50)	(49)	(49)	(50)
Angiectasis	1 (2%)	1 (2%)		3 (6%)
Congestion			1 (2%)	
Cyst	13 (26%)	8 (16%)	9 (18%)	7 (14%)
Cyst, Multiple	1 (2%)			1 (2%)
Hemorrhage	1 (2%)			
Inflammation, Chronic Active	2 (4%)	1 (2%)	2 (4%)	
Periovarian Tissue, Inflammation, Chronic Active	1 (2%)			
Uterus	(50)	(50)	(50)	(50)
Adenomyosis	1 (2%)			
Angiectasis	1 (2%)	4 (8%)	3 (6%)	2 (4%)
Hemorrhage			1 (2%)	
Inflammation, Chronic Active	3 (6%)	4 (8%)	3 (6%)	5 (10%)
Necrosis				1 (2%)
Endometrium, Hyperplasia, Cystic	45 (90%)	35 (70%)	43 (86%)	43 (86%)
<b>HEMATOPOIETIC SYSTEM</b>				
Bone Marrow	(49)	(50)	(50)	(50)
Atrophy		1 (2%)		
Hyperplasia, Granulocytic	1 (2%)			
Myelofibrosis	1 (2%)			
Necrosis				2 (4%)
Myeloid Cell, Hyperplasia	1 (2%)		4 (8%)	1 (2%)
Lymph Node	(11)	(11)	(11)	(10)
Pigmentation			1 (9%)	1 (10%)
Artery, Lumbar, Inflammation, Chronic Active				1 (10%)
Artery, Renal, Inflammation, Chronic Active				1 (10%)
Iliac, Angiectasis			1 (9%)	1 (10%)
Iliac, Infiltration Cellular, Mixed Cell	1 (9%)			
Lumbar, Angiectasis	1 (9%)	3 (27%)	1 (9%)	1 (10%)

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Species/Strain: MICE/B6C3F1

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B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Lumbar, Hematopoietic Cell Proliferation			1 (9%)	
Lumbar, Infiltration Cellular, Plasma Cell				1 (10%)
Lumbar, Inflammation, Suppurative	1 (9%)			
Lumbar, Necrosis	1 (9%)			
Pancreatic, Hyperplasia, Lymphoid		1 (9%)	1 (9%)	
Renal, Angiectasis			1 (9%)	1 (10%)
Renal, Hyperplasia, Lymphoid			1 (9%)	
Renal, Infiltration Cellular, Plasma Cell				1 (10%)
Renal, Necrosis				1 (10%)
Lymph Node, Bronchial	(44)	(44)	(44)	(43)
Hematopoietic Cell Proliferation			1 (2%)	
Hyperplasia, Lymphoid	6 (14%)	4 (9%)	9 (20%)	9 (21%)
Infiltration Cellular, Histiocyte	1 (2%)		2 (5%)	4 (9%)
Inflammation, Suppurative			1 (2%)	
Plasma Cell, Hyperplasia				1 (2%)
Lymph Node, Mandibular	(35)	(42)	(37)	(39)
Hematopoietic Cell Proliferation			1 (3%)	
Hyperplasia, Lymphoid	4 (11%)	1 (2%)	3 (8%)	1 (3%)
Infiltration Cellular, Histiocyte			1 (3%)	1 (3%)
Infiltration Cellular, Plasma Cell	1 (3%)			
Lymph Node, Mediastinal	(40)	(44)	(45)	(45)
Hyperplasia, Lymphoid	2 (5%)	4 (9%)	7 (16%)	5 (11%)
Hyperplasia, Plasma Cell	1 (3%)	1 (2%)		
Infiltration Cellular, Histiocyte	1 (3%)		1 (2%)	1 (2%)
Pigmentation				1 (2%)
Lymph Node, Mesenteric	(49)	(49)	(47)	(48)
Angiectasis		3 (6%)	2 (4%)	1 (2%)
Hematopoietic Cell Proliferation			1 (2%)	1 (2%)
Hyperplasia, Lymphoid	11 (22%)	7 (14%)	12 (26%)	4 (8%)
Inflammation, Chronic Active	1 (2%)			
Necrosis	1 (2%)	1 (2%)		
Artery, Inflammation		1 (2%)		
Spleen	(50)	(49)	(48)	(49)
Angiectasis	2 (4%)	1 (2%)	2 (4%)	1 (2%)
Hematopoietic Cell Proliferation	11 (22%)	7 (14%)	11 (23%)	11 (22%)
Hyperplasia, Granulocytic	1 (2%)		1 (2%)	

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

Experiment Number: 20523 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

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

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CAS Number: TRIMVX

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First Dose M/F: 08/03/09 / 08/03/09

Lab: BNW

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B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Hyperplasia, Lymphoid	20 (40%)	26 (53%)	17 (35%)	13 (27%)
Inflammation, Suppurative	1 (2%)	1 (2%)	1 (2%)	1 (2%)
Necrosis, Lymphoid		1 (2%)		1 (2%)
Thymus	(48)	(48)	(47)	(49)
Angiectasis		2 (4%)		3 (6%)
Atrophy	6 (13%)	1 (2%)	7 (15%)	4 (8%)
Cyst	1 (2%)	1 (2%)	1 (2%)	5 (10%)
Ectopic Parathyroid Gland	2 (4%)	3 (6%)	5 (11%)	5 (10%)
Hyperplasia, Lymphoid	11 (23%)	15 (31%)	13 (28%)	11 (22%)
Necrosis, Lymphoid				1 (2%)

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**INTEGUMENTARY SYSTEM**

Mammary Gland	(50)	(50)	(50)	(50)
Dilatation		1 (2%)		
Hyperplasia	1 (2%)		1 (2%)	1 (2%)
Inflammation	1 (2%)			
Skin	(50)	(50)	(50)	(50)
Edema	1 (2%)		1 (2%)	
Hemorrhage, Acute	1 (2%)			
Hyperplasia				1 (2%)
Inflammation, Chronic Active	2 (4%)	3 (6%)	2 (4%)	5 (10%)
Necrosis				1 (2%)
Ulcer		2 (4%)		

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**MUSCULOSKELETAL SYSTEM**

Bone	(50)	(50)	(50)	(50)
Fibro-Osseous Lesion	6 (12%)	10 (20%)	12 (24%)	9 (18%)
Skeletal Muscle	(3)	(4)	(2)	(4)
Degeneration	1 (33%)			
Infiltration Cellular, Lymphoid	1 (33%)			

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Species/Strain: MICE/B6C3F1

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Lab: BNW

B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
<b>NERVOUS SYSTEM</b>				
Brain	(50)	(50)	(50)	(50)
Compression	5 (10%)	1 (2%)	1 (2%)	3 (6%)
Demyelination			1 (2%)	
Hemorrhage	2 (4%)			
Hydrocephalus	1 (2%)			
Infiltration Cellular		1 (2%)	3 (6%)	
Infiltration Cellular, Lymphocyte		1 (2%)		
Inflammation, Chronic Active	3 (6%)			
Necrosis, Focal		1 (2%)		
Meninges, Infiltration Cellular			1 (2%)	
Peripheral Nerve	(3)	(3)	(1)	(2)
Degeneration	1 (33%)			1 (50%)
Spinal Cord	(2)	(3)	(1)	(2)
<b>RESPIRATORY SYSTEM</b>				
Larynx	(50)	(50)	(50)	(50)
Inflammation, Chronic Active	44 (88%)	50 (100%)	48 (96%)	47 (94%)
Necrosis	2 (4%)			3 (6%)
Epiglottis, Hyperplasia, Squamous	4 (8%)	3 (6%)	16 (32%)	42 (84%)
Epiglottis, Metaplasia, Squamous		50 (100%)	50 (100%)	50 (100%)
Lung	(50)	(50)	(50)	(50)
Fibrosis			2 (4%)	42 (84%)
Hemorrhage		1 (2%)	2 (4%)	
Hyperplasia, Lymphoid				1 (2%)
Infiltration Cellular, Histiocyte	1 (2%)	4 (8%)	15 (30%)	48 (96%)
Inflammation, Chronic	1 (2%)	6 (12%)	26 (52%)	47 (94%)
Metaplasia, Osseous				1 (2%)
Metaplasia, Squamous				1 (2%)
Mineralization			1 (2%)	
Pigmentation				1 (2%)
Proteinosis			1 (2%)	
Thrombosis	1 (2%)			

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B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Alveolar/bronchiolar Epithelium, Hyperplasia		3 (6%)	8 (16%)	45 (90%)
Alveolar Epithelium, Hyperplasia			2 (4%)	43 (86%)
Alveolar Epithelium, Metaplasia, Squamous				1 (2%)
Interstitial, Inflammation, Suppurative	1 (2%)			
Mediastinum, Necrosis			1 (2%)	
Nose	(50)	(50)	(50)	(50)
Cyst, Squamous		1 (2%)		
Exudate	8 (16%)	17 (34%)	48 (96%)	49 (98%)
Foreign Body		1 (2%)		
Inflammation, Chronic Active	4 (8%)	25 (50%)	49 (98%)	49 (98%)
Glands, Hyperplasia		1 (2%)		
Goblet Cell, Hyperplasia				2 (4%)
Lateral Wall, Inflammation, Chronic Active		2 (4%)		
Nasolacrimal Duct, Inflammation, Chronic Active	2 (4%)		2 (4%)	
Nasopharyngeal Duct, Perforation			14 (28%)	17 (34%)
Olfactory Epithelium, Accumulation, Hyaline Droplet	14 (28%)	48 (96%)	50 (100%)	50 (100%)
Olfactory Epithelium, Atrophy	1 (2%)	2 (4%)	1 (2%)	5 (10%)
Olfactory Epithelium, Metaplasia, Respiratory	2 (4%)	2 (4%)	1 (2%)	4 (8%)
Respiratory Epithelium, Accumulation, Hyaline Droplet	23 (46%)	50 (100%)	50 (100%)	50 (100%)
Respiratory Epithelium, Atrophy	1 (2%)	2 (4%)	28 (56%)	39 (78%)
Respiratory Epithelium, Hyperplasia	49 (98%)	44 (88%)	48 (96%)	49 (98%)
Respiratory Epithelium, Metaplasia, Squamous	1 (2%)	2 (4%)	2 (4%)	2 (4%)
Respiratory Epithelium, Necrosis		2 (4%)	13 (26%)	23 (46%)
Turbinate, Atrophy			10 (20%)	19 (38%)
Turbinate, Perforation			6 (12%)	6 (12%)
Trachea	(49)	(50)	(50)	(49)
Pigmentation				1 (2%)
Cartilage, Metaplasia, Osseous			2 (4%)	4 (8%)
Epithelium, Degeneration				2 (4%)
Epithelium, Hyperplasia			1 (2%)	5 (10%)
Epithelium, Necrosis				1 (2%)

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Species/Strain: MICE/B6C3F1

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Lab: BNW

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B6C3F1 MICE FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
<hr/>				
SPECIAL SENSES SYSTEM				
Ear	(0)	(0)	(0)	(1)
Eye	(49)	(50)	(50)	(50)
Inflammation, Chronic Active			1 (2%)	1 (2%)
Cornea, Hyperplasia			1 (2%)	1 (2%)
Harderian Gland	(50)	(49)	(49)	(49)
Cyst			1 (2%)	
Hyperplasia	3 (6%)	2 (4%)	2 (4%)	1 (2%)
Hypertrophy		1 (2%)		
<hr/>				
URINARY SYSTEM				
Kidney	(49)	(50)	(49)	(50)
Amyloid Deposition			1 (2%)	
Angiectasis				1 (2%)
Cyst	1 (2%)			2 (4%)
Hyperplasia, Lymphoid	2 (4%)	4 (8%)		
Infarct, Chronic	4 (8%)	5 (10%)	5 (10%)	
Infiltration Cellular, Lymphoid	1 (2%)			
Inflammation, Chronic Active	1 (2%)	2 (4%)	1 (2%)	
Metaplasia, Osseous		2 (4%)	2 (4%)	
Mineralization	1 (2%)			
Necrosis	1 (2%)			
Nephropathy	38 (78%)	28 (56%)	26 (53%)	29 (58%)
Pigmentation				1 (2%)
Glomerulus, Inflammation, Acute		1 (2%)		
Renal Tubule, Hyperplasia	1 (2%)			
Urethra	(0)	(1)	(0)	(0)
Inflammation, Chronic Active		1 (100%)		
Urinary Bladder	(50)	(50)	(50)	(50)
Angiectasis			1 (2%)	
Hyperplasia, Lymphoid	2 (4%)	3 (6%)		3 (6%)
Inflammation, Chronic Active	2 (4%)			

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Metal Working Fluids: Trim VX

**CAS Number:** TRIMVX

**Date Report Requested:** 02/02/2015

**Time Report Requested:** 13:50:12

**First Dose M/F:** 08/03/09 / 08/03/09

**Lab:** BNW

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**B6C3F1 MICE FEMALE**

**Control**

**10 mg/m3**

**30 mg/m3**

**100 mg/m3**

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

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