

Experiment Number: 20515 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
Metal working fluids (CIMSTAR 3800)
CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
Time Report Requested: 08:51:01
First Dose M/F: 04/14/08 / 04/14/08
Lab: BNW

F1_Rev.1_RE

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: 02/21/2013

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WISTAR HAN RATS MALE	DAY ON TEST																									males (cont...)
	0718	0715	0704	0703	0705	0707	0707	0705	0707	0707	0703	0706	0707	0707	0707	0707	0707	0707	0707	0707	0707	0707	0707	0707		
Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	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	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	

ALIMENTARY SYSTEM

Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Rectum	+	+	+	+	I	+	+	+	+	I	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Angiectasis			3																		2			
Basophilic Focus		X		X					X					X			X							X
Clear Cell Focus	X	X	X	X		X	X		X	X				X	X	X	X	X	X					X
Mixed Cell Focus																								
Necrosis											2		3											
Bile Duct, Cyst																								
Bile Duct, Dilatation									4												3			
Bile Duct, Hyperplasia																								
Bile Duct, Inflammation, Chronic Active																								
Mesentery	+								+						+					+				+
Fat, Necrosis	2								2						2					2				2

Oral Mucosa

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
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Control	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000		
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	

Developmental Malformation

Pancreas Atrophy	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Basophilic Focus				X																					

Salivary Glands	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
-----------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Stomach, Forestomach Hyperplasia, Squamous Inflammation, Chronic Active	+	+	+	+	+	+	+	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Stomach, Glandular	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
--------------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

CARDIOVASCULAR SYSTEM

Blood Vessel	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
--------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Heart Cardiomyopathy	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
		1	2		1	2		1		2			1			1		1	1			1	1	2	1

ENDOCRINE SYSTEM

Adrenal Cortex Accessory Adrenal Cortical Nodule Degeneration, Cystic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Hyperplasia										2		3	2		2	2		2			1		2	2	2

Hyper trophy	2			2						2					1	2	2	2				2	2	2	2
--------------	---	--	--	---	--	--	--	--	--	---	--	--	--	--	---	---	---	---	--	--	--	---	---	---	---

Adrenal Medulla Hyperplasia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
-----------------------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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	0 7 1 8	0 7 1 5	0 7 0 4	0 7 3 0	0 5 9 7	0 7 3 0	0 7 2 9	0 5 3 5	0 7 1 0	0 7 3 0	0 3 4 5	0 7 3 0	0 6 1 2	0 7 2 9	0 7 3 0	0 7 3 0	0 2 2 9	0 7 0 4	0 7 2 9	0 7 3 0	0 7 2 9	0 7 2 9	0 7 2 9	0 7 2 9			
ANIMAL ID	0 0 0 0 1	0 0 0 0 2	0 0 0 0 3	0 0 0 0 4	0 0 0 0 5	0 0 0 0 6	0 0 0 0 7	0 0 0 0 8	0 0 0 0 9	0 0 0 0 0	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 2	0 0 0 0 2	0 0 0 0 2	0 0 0 0 2		
Islets, Pancreatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Parathyroid Gland Hyperplasia	+	M	+	+	+	+	M	+	+	+	+	+	+	+	+	+	+	M	+	+	M	+	+	M	M	+	
Pituitary Gland Cyst	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Pars Distalis, Hyperplasia														2		2	2							1		2	3
Pars Intermedia, Hyperplasia							2																				
Thyroid Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
C-cell, Hyperplasia	2	1			1					2	1		4	2	2		1		1		1	1	1	1	1	1	
Follicular Cell, Hyperplasia						3			1								1										
GENERAL BODY SYSTEM																											
Peritoneum																											
GENITAL SYSTEM																											
Epididymis Granuloma Sperm	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
						3																					
Preputial Gland Inflammation, Chronic Active	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
																							2				
Prostate Hyperplasia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Inflammation, Chronic Active			1									1					1	1						1			
Seminal Vesicle	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	

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	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	0718	
Control	0	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	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000		
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	

Hyperplasia

Testes	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Atrophy			1	4	1		1	3				2			4				1					
Edema	2		3	3		2			2									2		3				
Necrosis											3													

HEMATOPOIETIC SYSTEM

Bone Marrow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Lymph Node	+	+	+	+		+					+								+		+			+
Axillary, Infiltration Cellular, Plasma Cell Iliac, Ectasia				2	3																		1	
Lumbar, Ectasia																							2	
Lumbar, Hemorrhage																			2					
Lumbar, Infiltration Cellular, Plasma Cell	3	2										4												3
Pancreatic, Ectasia																								
Pancreatic, Inflammation, Chronic Active																								
Lymph Node, Bronchial	+	+	M	+	+	M	+	+	+	M	+	M	+	+	+	+	+	+	M	+	+	+	+	M
Lymph Node, Mandibular Ectasia	+	+	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+
				3																				
Lymph Node, Mediastinal Ectasia	+	+	+	+	+	+	M	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
				3																				
Lymph Node, Mesenteric Ectasia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
				2																				1

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Control	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	
	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	
	1234	5678	9012	3456	7890	1234	5678	9012	3456	7890	1234	5678	9012	3456	7890	1234	5678	9012	3456	7890	1234	5678	9012	3456		
Infiltration Cellular, Plasma Cell																										3
Spleen Hematopoietic Cell Proliferation	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Thymus Atrophy	+	+	+	+	+	+	+	I	I	M	+	+	+	+	+	+	+	+	+	+	+	+	M	I	I	
																										4
INTEGUMENTARY SYSTEM																										
Mammary Gland Galactocele	M	M	+	M	M	M	M	+	M	M	M	M	M	M	M	+	M	M	M	M	M	M	M	M	M	
Skin Cyst Epithelial Inclusion Inflammation, Chronic Active	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
																										X
	4	4	4	3				4					4			4	4		4	4	4	4	4		4	4
MUSCULOSKELETAL SYSTEM																										
Bone Hyperostosis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Skeletal Muscle																										
NERVOUS SYSTEM																										
Brain	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Peripheral Nerve			+	+																					+	
Spinal Cord			+	+																					+	

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	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	
	12	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5		

RESPIRATORY SYSTEM

Larynx Metaplasia, Squamous	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Lung Foreign Body Hemorrhage Inflammation, Lymphohistiocytic Alveolar Epithelium, Hyperplasia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
														2										1
Nose Inflammation, Chronic Active Glands, Olfactory Epithelium, Hyperplasia Olfactory Epithelium, Accumulation, Hyaline Droplet	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
		1												1		1								
				2	1					2					1	1	2			1			1	2
Trachea	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

SPECIAL SENSES SYSTEM

Eye Cataract Retina, Atrophy	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
																								2
Harderian Gland Atrophy Hyperplasia Hypertrophy	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
															1	2	2	2	1	2		2		2

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		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WISTAR HAN RATS MALE	DAY ON TEST	7	7	7	7	5	7	7	5	7	7	3	7	6	7	7	7	7	7	7	7	7	7	7	7
		1	1	0	3	9	3	2	3	1	3	4	3	1	2	3	3	2	2	0	2	3	2	2	2
		8	5	4	0	7	0	9	5	0	0	5	0	2	9	0	0	9	9	4	0	0	9	9	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	0	0	0
		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	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4

males
(cont...)

Zymbal's Gland

+ +

URINARY SYSTEM

Kidney	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cyst						2																		
Nephropathy	3	2	2	1		2		2	1	2		2	1	2	2	4	1		1	2	2	2	2	1
Transitional Epithelium, Hyperplasia																								
Urinary Bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

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 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

WISTAR HAN RATS MALE Control	DAY ON TEST																				* TOTALS						
	0627	0599	0597	0730	0779	0770	0671	0731	0729	0449	0774	0771	0773	0773	0773	0773	0773	0572	0773	0772		0772	0773	0670	0673	0752	0779
ANIMAL ID	00026	00007	00008	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	0	

ALIMENTARY SYSTEM

Esophagus	+																								50		
Intestine Large, Cecum	+																								50		
Intestine Large, Colon	+																								50		
Intestine Large, Rectum	+																								48		
Intestine Small, Duodenum	+																								50		
Intestine Small, Ileum	+																								50		
Intestine Small, Jejunum	+																								50		
Liver	+																								50		
Angiectasis																									1	3	2.0
Basophilic Focus	X																								11		
Clear Cell Focus	X X																								29		
Mixed Cell Focus	X X																								3		
Necrosis																									2	2.5	
Bile Duct, Cyst																									1		
Bile Duct, Dilatation																									3	3.3	
Bile Duct, Hyperplasia																									1	2.0	
Bile Duct, Inflammation, Chronic Active																									1	2.0	
Mesentery	+																								7		
Fat, Necrosis	2																								6	2.0	
Oral Mucosa	+																								1		

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

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WISTAR HAN RATS MALE Control	DAY ON TEST																				* TOTALS					
	0627	0599	0597	0730	0779	0770	0631	0732	0729	0441	0771	0773	0773	0773	0773	0773	0773	0522	0732	0772		0667	0663	0729		
ANIMAL ID	00026	00007	00008	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000			
Developmental Malformation										X														1		
Pancreas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Atrophy				1																				1	1.0	
Basophilic Focus																								2		
Salivary Glands	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Hyperplasia, Squamous																								1	3.0	
Inflammation, Chronic Active						4																		1	4.0	
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
CARDIOVASCULAR SYSTEM																										
Blood Vessel	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Cardiomyopathy			1		1	1		1	1		1		1		1		2		1	2	2	1	1	28	1.3	
ENDOCRINE SYSTEM																										
Adrenal Cortex	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Accessory Adrenal Cortical Nodule				3																				1	3.0	
Degeneration, Cystic																								2	1.0	
Hyperplasia		2		2				2	2	2	2	2	2			2		2		2	2		2	26	2.0	
Hypertrophy	2							2	2			2				2			2	2	2		2	20	2.0	
Adrenal Medulla	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Hyperplasia								2										2						2	2	2.0

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WISTAR HAN RATS MALE Control	DAY ON TEST																								* TOTALS		
	0627	0659	0657	0673	0677	0677	0676	0677	0677	0674	0677	0677	0677	0677	0677	0677	0675	0677	0677	0672	0672	0673	0670	0676		0676	0677
ANIMAL ID	00026	00007	00008	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	
Islets, Pancreatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Parathyroid Gland Hyperplasia	+	+	+	+	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	43 1 1.0	
Pituitary Gland Cyst	+	+	+	+	+	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	49 1 2.0	
Pars Distalis, Hyperplasia		2	2		2				2			2				2	1	2								14 1.9	
Pars Intermedia, Hyperplasia																			2			3				3 2.3	
Thyroid Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
C-cell, Hyperplasia		2		1	1	2	1		1	1		1	3	1	1	1		2	2	1	1	2	2			34 1.4	
Follicular Cell, Hyperplasia									2													3				5 2.0	
GENERAL BODY SYSTEM																											
Peritoneum																											1
GENITAL SYSTEM																											
Epididymis Granuloma Sperm	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50 2 3.0	
Preputial Gland Inflammation, Chronic Active	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50 3 1.7	
Prostate Hyperplasia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Inflammation, Chronic Active				3	1								1			1			1		1		2			12 1.3 1 3.0	
Seminal Vesicle	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	

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	0627	0599	0597	0730	0779	0770	0671	0733	0729	0494	0771	0773	0773	0773	0773	0773	0572	0773	0772	0772	0773	0676	0676	0772	
Control	ANIMAL ID																								
	00026	00007	00008	00009	00000	00001	00002	00003	00004	00005	00006	00007	00008	00009	00010	00011	00012	00013	00014	00015	00016	00017	00018	00019	00020
Hyperplasia																									2
Testes	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Atrophy				4	3	3	4										3						3		15
Edema				3		2										3	2	2	2				2	1	2
Necrosis																								2	1
																									1
																									2.0

HEMATOPOIETIC SYSTEM

Bone Marrow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Lymph Node		+				+	+																		12
Axillary, Infiltration Cellular, Plasma Cell																									1
Iliac, Ectasia																									2
Lumbar, Ectasia								4																	2
Lumbar, Hemorrhage																									1
Lumbar, Infiltration Cellular, Plasma Cell			3																						5
Pancreatic, Ectasia																									1
Pancreatic, Inflammation, Chronic Active																									1
																									1
																									4.0
Lymph Node, Bronchial	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	M	+	+	+	+	+	+	+	+	42
Lymph Node, Mandibular Ectasia	+	M	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	46
																									1
																									3.0
Lymph Node, Mediastinal Ectasia	+	+	M	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	46
																									1
																									3.0
Lymph Node, Mesenteric Ectasia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
																									2
																									1.5

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	0627	0599	0597	0732	0773	0776	0771	0773	0773	0773	0773	0773	0773	0773	0773	0773	0773	0773	0773	0773	0773	0773	0773	0773	
ANIMAL ID	00026	00007	00008	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	
Infiltration Cellular, Plasma Cell																									1 3.0
Spleen Hematopoietic Cell Proliferation	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50 2 2.5
Thymus Atrophy	+	+	+	I	+	+	+	+	+	M	+	+	+	+	M	+	+	M	+	+	+	+	+	+	40 1 4.0
INTEGUMENTARY SYSTEM																									
Mammary Gland Galactocele	+	M	+	M	+	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	6 1 1.0
Skin Cyst Epithelial Inclusion Inflammation, Chronic Active	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50 1 31 3.7
MUSCULOSKELETAL SYSTEM																									
Bone Hyperostosis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50 2 1 2.0
Skeletal Muscle																									1
NERVOUS SYSTEM																									
Brain	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Peripheral Nerve		+	+																						5
Spinal Cord		+	+																						5

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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
WISTAR HAN RATS MALE		6	5	5	7	7	7	6	7	7	4	7	7	7	7	7	5	7	7	7	6	6	7			
		2	9	9	3	2	3	1	3	2	9	3	3	3	3	3	2	2	3	2	3	0	5	2		
	Control	7	9	7	0	9	0	9	1	9	4	1	0	0	0	0	9	0	9	9	0	7	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
	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

* TOTALS

RESPIRATORY SYSTEM

Larynx	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Metaplasia, Squamous																		2								1	2.0
Lung	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Foreign Body	X																									1	
Hemorrhage																										1	2.0
Inflammation, Lymphohistiocytic	1	1				1	1																			6	1.2
Alveolar Epithelium, Hyperplasia		2								1									1							4	1.3
Nose	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50			
Inflammation, Chronic Active																						1				4	1.0
Glands, Olfactory Epithelium, Hyperplasia				1																						1	1.0
Olfactory Epithelium, Accumulation, Hyaline Droplet	2		2				3			2		1		1	1	1			2			2			19	1.6	
Trachea	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50			

SPECIAL SENSES SYSTEM

Eye	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50			
Cataract																						2				2	2.0
Retina, Atrophy				2																		3				2	2.5
Harderian Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50			
Atrophy																							2			1	2.0
Hyperplasia				2	2	1				1		1				1		1	1				2		17	1.5	
Hypertrophy										2												2				2	2.0

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically M .. Missing tissue 1-4 .. Lesion qualified as:
 X .. Lesion present A .. Autolysis precludes evaluation 1) Minimal 3) Moderate
 I .. Insufficient tissue BLANK .. Not examined microscopically 2) Mild 4) Marked

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WISTAR HAN RATS MALE 10 mg/m3	DAY ON TEST																				ANIMAL ID	males (cont...)	
	0730	0733	0734	0737	0739	0742	0747	0748	0752	0757	0759	0763	0768	0772	0777	0781	0786	0790	0795	0799			0804
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0020	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0021	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0022	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0023	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0024	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0025	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0026	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0027	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0028	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0029	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0030	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0031	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0032	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0033	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0034	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0035	

ALIMENTARY SYSTEM

Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Cecum Inflammation, Acute Necrosis	+	+	A	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+
Intestine Large, Colon Inflammation, Acute Necrosis	+	+	A	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+	+	+	I	+	+	+	+	A	+	+	+	+
Intestine Small, Duodenum	+	+	A	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+
Intestine Small, Ileum	+	+	A	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+
Intestine Small, Jejunum Diverticulum	+	+	A	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+
Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Angiectasis					1							1	1									
Basophilic Focus	X			X	X	X		X			X		X					X		X		
Clear Cell Focus	X	X		X	X	X		X	X		X	X	X					X	X		X	X
Congestion																						
Inflammation, Granulomatous																						
Necrosis			4								2											
Bile Duct, Cyst											X											
Bile Duct, Dilatation																				2		

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WISTAR HAN RATS MALE 10 mg/m3	DAY ON TEST																								ANIMAL ID				
	0 7 3 0	0 7 3 0	0 5 4 7	0 7 3 0	0 7 2 9	0 7 2 9	0 7 2 8	0 7 2 8	0 7 3 6	0 7 2 9	0 7 2 9	0 7 2 9	0 7 2 9	0 7 2 9	0 7 3 0	0 7 3 3	0 6 6 2	0 5 6 4	0 4 2 9	0 7 3 0	0 7 3 0	0 6 7 7	0 7 2 9	0 6 6 3			0 7 2 0	0 6 7 3	0 7 2 0
Bile Duct, Hyperplasia																											1		
Mesentery Fat, Necrosis																												+ 2	
Pancreas Atrophy Basophilic Focus Inflammation, Acute	+ + + +	+ + + +	+ 2 + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ 2 + +	
Salivary Glands																												+ +	
Stomach, Forestomach Ulcer																												+ +	
Stomach, Glandular																												+ +	
Tooth Inflammation, Chronic Active																												+ 4	

CARDIOVASCULAR SYSTEM

Blood Vessel																												+ +		
Heart Cardiomyopathy	+ 2	+ 1	+ 2	+ 1	+ 1	+ 1	+ 1	+ 2	+ 2	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1

ENDOCRINE SYSTEM

Adrenal Cortex Degeneration, Cystic																												+ +
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--------

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

WISTAR HAN RATS MALE 10 mg/m3	DAY ON TEST																									ANIMAL ID	males (cont...)
	0730	0733	0734	0737	0738	0739	0740	0741	0742	0743	0744	0745	0746	0747	0748	0749	0750	0751	0752	0753	0754	0755	0756	0757			
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	000000000000000000000000		
	7	7	5	7	7	7	7	2	7	7	7	7	7	7	7	6	5	5	4	7	7	6	7	6	7		000000000000000000000000
	3	3	4	3	2	2	2	8	3	2	3	2	2	2	3	3	6	6	2	3	3	7	2	0	1		222222222222222222222222
	0	0	7	0	9	9	9	6	0	9	0	9	9	9	0	3	2	4	9	0	0	7	9	3	7		000000000000000000000000
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	000000000000000000000000	
	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	222222222222222222222222	
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	000000000011111111111111	
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	1234567890123456789012345	
Hyperplasia					2				2	2	2	2					2		2		2	2		2			
Hypertrophy	2	2			1	2				2	2			2	2												
Adrenal Medulla	+	+	+	+	+	+	+	+	+	+	+	+	I	+	+	+	+	+	+	+	+	+	+	+	+		
Hyperplasia					2																						
Islets, Pancreatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Parathyroid Gland	+	+	+	+	+	+	+	+	+	M	+	+	M	+	+	+	+	+	+	+	+	+	M	+	+		
Pituitary Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Pars Distalis, Hyperplasia	2	2				2	3				2					2			2								
Pars Intermedia, Hyperplasia																											
Thyroid Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
C-cell, Hyperplasia	2	1			3	2	1		2	1			1	1	1	1	1	2				1	1	1	1		
Follicular Cell, Hyperplasia												2															

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

Epididymis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Preputial Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Inflammation, Chronic Active			3	2		2																			3
Prostate	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Hyperplasia			2		2	1	1		2	2			3									2			

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

WISTAR HAN RATS MALE 10 mg/m3	DAY ON TEST																									ANIMAL ID	males (cont...)
	0 7 3 0	0 7 3 0	0 5 4 7	0 7 3 0	0 7 2 9	0 7 2 9	0 7 2 9	0 2 8 6	0 7 3 0	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 6 3 3	0 5 6 2	0 5 6 4	0 4 3 0	0 7 3 0	0 6 7 9	0 7 2 9	0 6 0 3	0 7 0 7			
Inflammation, Chronic Active																								3			
Seminal Vesicle	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Testes	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Atrophy	4			2		1							1				2										
Edema	3						2						2								2						
Artery, Inflammation, Chronic Active																								2			
HEMATOPOIETIC SYSTEM																											
Bone Marrow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Lymph Node																											
Lumbar, Ectasia																									2		
Lumbar, Infiltration Cellular, Plasma Cell																									2		
Renal, Ectasia																									3		
Lymph Node, Bronchial	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Lymph Node, Mandibular	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	M	+	M	+	+	+	+			
Ectasia																								3			
Hyperplasia, Lymphoid																									3		
Infiltration Cellular, Plasma Cell																											
Lymph Node, Mediastinal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Lymph Node, Mesenteric	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Spleen	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Inflammation, Granulomatous																											

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

	DAY ON TEST																								males (cont...)
WISTAR HAN RATS MALE 10 mg/m3	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	5	7	7	7	7	2	7	7	7	7	7	7	6	5	5	4	7	7	6	7	6	7	
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	
	3	3	4	3	2	2	2	8	3	2	3	2	2	3	3	6	6	2	3	3	7	2	0		
	0	0	7	0	9	9	9	6	0	9	0	9	9	0	3	2	4	9	0	0	7	9	3	7	
	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	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	

Thymus + + + + + + + + I + + + + + M + + + + + + + + + + +

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

Skin +

Cyst Epithelial Inclusion Inflammation, Chronic Active 4 4 4 3 4 4 4 3 3 4 4

MUSCULOSKELETAL SYSTEM

Bone +

Skeletal Muscle Necrosis

NERVOUS SYSTEM

Brain +

Peripheral Nerve + +

Spinal Cord + +

RESPIRATORY SYSTEM

Larynx +

Inflammation, Acute Inflammation, Chronic Active Metaplasia, Squamous 1 3 1 1 2 1 2 2 1 2 1 2 1 2 2 1 2 2 1 1 1 1

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically M .. Missing tissue 1-4 .. Lesion qualified as:
 X .. Lesion present A .. Autolysis precludes evaluation 1) Minimal 3) Moderate
 I .. Insufficient tissue BLANK .. Not examined microscopically 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

Wistar Han Rats Male 10 mg/m3	DAY ON TEST																				ANIMAL ID	males (cont...)				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0			
	7	7	5	7	7	7	7	2	7	7	7	7	7	7	6	5	5	4	7	7	6	7	6	7	0	
	3	3	4	3	2	2	2	8	3	2	3	2	2	3	3	6	6	2	3	3	7	2	0	1	0	
	0	0	7	0	9	9	9	6	0	9	0	9	9	9	0	2	4	9	0	0	7	9	3	7	0	
	0	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	
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2	0		
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	males (cont...)
Lung	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Inflammation, Lymphohistiocytic																										
Inflammation, Acute		1				1				1		1														
Metaplasia, Squamous																										
Alveolar Epithelium, Hyperplasia																	1				1					
Bronchus-associated Lymphoid Tissue, Hyperplasia, Lymphohistiocytic																										
Nose	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Inflammation, Acute																										
Inflammation, Chronic Active																										
Glands, Olfactory Epithelium, Hyperplasia	2	1	2	1		1	2		1	2	1	1		1	1	2	2	1	2	1	2		3			
Goblet Cell, Hyperplasia	1	1				1			1		1			1				1				1				
Olfactory Epithelium, Accumulation, Hyaline Droplet	3	3	4	2	2	3	3	2	4	3	2	4	2	3	2	3	3	3	3	2	3	3	2	3	2	
Respiratory Epithelium, Accumulation, Hyaline Droplet						1			1			1				1					1					
Trachea	+	+	A	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Inflammation, Acute																										
SPECIAL SENSES SYSTEM																										
Eye	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Cataract	3																		2							
Cornea, Inflammation, Chronic Active																										
Retina, Atrophy																										
Harderian Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Hyperplasia		1			2	1	1					2														

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Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

WISTAR HAN RATS MALE	DAY ON TEST																								ANIMAL ID	
	07	07	05	07	07	07	07	02	07	07	07	07	07	07	07	06	05	05	04	07	07	06	07	06		
10 mg/m3	30	30	47	30	29	22	22	22	86	30	29	30	22	22	39	33	62	66	29	33	77	29	03	07	00	
	20	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
	11	22	33	44	55	66	77	88	99	00	11	11	11	11	11	11	11	11	11	22	22	22	22	22	males (cont...)	

Hypertrophy

Zymbal's Gland

URINARY SYSTEM

Kidney	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cyst																								2
Hydronephrosis																								2
Inflammation, Suppurative															2									2
Nephropathy	3	2		1	3	1	2		2		3		2	3	1					2	3	1	1	2
Transitional Epithelium, Hyperplasia																								3
Urinary Bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Calculus Gross Observation																								2
Inflammation, Chronic Active																								1
Transitional Epithelium, Hyperplasia																								2

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 Lab: BNW

WISTAR HAN RATS MALE	DAY ON TEST																						* TOTALS
	0729	0439	0730	0731	0732	0733	0734	0735	0736	0737	0738	0739	0740	0741	0742	0743	0744	0745	0746	0747	0748	0749	
10 mg/m3	002226	000222	000222	000222	000333	000333	000333	000333	000333	000333	000333	000333	000333	000333	000333	000333	000333	000333	000333	000333	000333	000333	50

ALIMENTARY SYSTEM

Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48		
Inflammation, Acute																							2	1 2.0	
Necrosis																							3	1 3.0	
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	49		
Inflammation, Acute																							3	1 3.0	
Necrosis																							3	1 3.0	
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	47		
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48		
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48		
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48		
Diverticulum																							1	1 4.0	
Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Angiectasis																							1	1 1	
Basophilic Focus	X																						X	20	
Clear Cell Focus	X																						X	26	
Congestion																							1	1 1.0	
Inflammation, Granulomatous																								1 1.0	
Necrosis																								2	3 2.7
Bile Duct, Cyst																								1	1
Bile Duct, Dilatation																								2	2 2.0

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

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Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
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 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

WISTAR HAN RATS MALE 10 mg/m3	DAY ON TEST																								* TOTALS	
	0729	0439	0730	0771	0777	0777	0777	0777	0777	0777	0777	0777	0777	0679	0767	0679	0767	0777	0777	0777	0575	0777	0777	0676		
ANIMAL ID	0022	0022	0022	0022	0033	0033	0033	0033	0033	0033	0033	0033	0033	0044	0044	0044	0044	0044	0044	0044	0055	0077	0077	0066		
Bile Duct, Hyperplasia																									2	2 1.5
Mesentery Fat, Necrosis	+				+									+											7	7 2.0
Pancreas Atrophy	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	4 1.5	
Basophilic Focus																								2	4 2.0	
Inflammation, Acute																								2	1 2.0	
Salivary Glands	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Stomach, Forestomach Ulcer	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	1 2.0	
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Tooth Inflammation, Chronic Active																								1	1 4.0	
CARDIOVASCULAR SYSTEM																										
Blood Vessel	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Heart Cardiomyopathy	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	40 1.2	
ENDOCRINE SYSTEM																										
Adrenal Cortex Degeneration, Cystic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	1 1.0	

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
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 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

Wistar Han Rats Male 10 mg/m3	DAY ON TEST																								* TOTALS						
	0729	0439	0730	0733	0733	0733	0733	0733	0733	0733	0733	0733	0733	0733	0733	0733	0733	0733	0733	0733	0733	0733	0733	0733							
	ANIMAL ID																														
Hyperplasia	2			2		2			2	2	2	2		2	2	2		2	2		2						25	2.0			
Hypertrophy	2		2	2		2	2			2				2	2			2	2		2				2	2		21	2.0		
Adrenal Medulla Hyperplasia	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48	1	2.0		
Islets, Pancreatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50				
Parathyroid Gland	+	+	+	M	+	+	+	+	+	+	+	M	+	M	+	+	+	+	+	+	+	+	M	+	+	+	43				
Pituitary Gland Pars Distalis, Hyperplasia Pars Intermedia, Hyperplasia	+	+		2		2	1	2	2	2	2	2				3		2		2	2	2				50	21	2.0	1	2.0	
Thyroid Gland C-cell, Hyperplasia Follicular Cell, Hyperplasia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	30	1.4	1	2.0
GENERAL BODY SYSTEM																															
NONE																															
GENITAL SYSTEM																															
Epididymis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50				
Preputial Gland Inflammation, Chronic Active	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	3											50	5	2.6		
Prostate Hyperplasia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	17	1.9		

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
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 I .. Insufficient tissue
 M .. Missing tissue
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 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

WISTAR HAN RATS MALE 10 mg/m3	DAY ON TEST																								* TOTALS	
	0729	0439	0730	0731	0732	0733	0734	0735	0736	0737	0738	0739	0740	0741	0742	0743	0744	0745	0746	0747	0748	0749	0750	0751		
ANIMAL ID	002226	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022	000022		
Inflammation, Chronic Active																								2	2 2.5	
Seminal Vesicle	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Testes	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Atrophy				3																		3		1	8 2.1	
Edema								2								2		2	2	2	2			2	11 2.1	
Artery, Inflammation, Chronic Active															2										2 2.0	
HEMATOPOIETIC SYSTEM																										
Bone Marrow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Lymph Node				+																					5	
Lumbar, Ectasia																						3			2 2.5	
Lumbar, Infiltration Cellular, Plasma Cell																									1 2.0	
Renal, Ectasia				1																					2 2.0	
Lymph Node, Bronchial	+	+	M	M	+	+	+	M	+	+	M	M	+	+	+	M	M	+	+	M	M	+	+	+	40	
Lymph Node, Mandibular	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+	+	+	46	
Ectasia															2										2 2.5	
Hyperplasia, Lymphoid																									1 3.0	
Infiltration Cellular, Plasma Cell													2												1 2.0	
Lymph Node, Mediastinal	+	M	M	+	+	+	+	+	+	+	+	+	+	+	+	M	+	M	+	+	+	M	+	+	45	
Lymph Node, Mesenteric	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Spleen	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Inflammation, Granulomatous																							3		1 3.0	

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
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 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013

Time Report Requested: 08:51:01

First Dose M/F: 04/14/08 / 04/14/08

Lab: BNW

	DAY ON TEST																										* TOTALS
	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			
WISTAR HAN RATS MALE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10 mg/m3	7	4	7	7	7	7	7	7	7	7	7	6	7	6	7	7	7	7	7	7	5	7	7	6			
	2	3	3	3	3	3	3	0	3	3	3	2	5	3	3	2	3	3	3	0	3	2	2	2			
	9	9	0	0	1	0	0	4	0	4	0	7	9	3	0	0	9	1	0	5	0	3	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			
	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	2	2	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4			
	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9			
Thymus	M	+	M	I	+	+	I	+	+	+	M	+	+	+	+	+	+	+	+	+	+	+	+	43			
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	+	6	
Skin	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Cyst Epithelial Inclusion																						X			1		
Inflammation, Chronic Active				3		4	4	4	4		4	4		4		4		4	4			2			23 3.7		
MUSCULOSKELETAL SYSTEM																											
Bone	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Skeletal Muscle																										2	
Necrosis										+															3	1 3.0	
NERVOUS SYSTEM																											
Brain	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Peripheral Nerve													+		+											4	
Spinal Cord																										4	
RESPIRATORY SYSTEM																											
Larynx	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Inflammation, Acute																										1	1 1.0
Inflammation, Chronic Active																										2	1.0
Metaplasia, Squamous	1	3	2	1	2	1	1	2	1	1	1	3	2	1	2	2	1	1	1	2	2	2	1	1	2	47	1.5

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
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 M .. Missing tissue
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 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

WISTAR HAN RATS MALE 10 mg/m3	DAY ON TEST																				* TOTALS																		
	0729	0439	0730	0731	0732	0733	0734	0735	0736	0737	0738	0739	0740	0741	0742	0743	0744	0745	0746	0747		0748	0749	0750	0751	0752	0753	0754	0755	0756	0757	0758	0759	0760					
ANIMAL ID	002226	000027	000028	000029	000030	000031	000032	000033	000034	000035	000036	000037	000038	000039	000040	000041	000042	000043	000044	000045	000046	000047	000048	000049	000050	000051	000052	000053	000054	000055	000056	000057	000058	000059	000060				
Lung	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50				
Inflammation, Lymphohistiocytic			1					1	1		1						1		1			1					1								14	1.0			
Inflammation, Acute						2																1													2	1.5			
Metaplasia, Squamous																				1															1	1.0			
Alveolar Epithelium, Hyperplasia				2									2	2									3												6	1.8			
Bronchus-associated Lymphoid Tissue, Hyperplasia, Lymphohistiocytic								1																											1	1.0			
Nose	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50				
Inflammation, Acute																							2													1	2.0		
Inflammation, Chronic Active																																				1	3.0		
Glands, Olfactory Epithelium, Hyperplasia	2	1	1	1	2		2	3	2	1	3	1	1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	39	1.5		
Goblet Cell, Hyperplasia					1	1	1		1	2					1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20	1.1		
Olfactory Epithelium, Accumulation, Hyaline Droplet	2	3	3	2	3	3	2	3	4	3	3	2	2	3	2	3	3	3	3	4	4	3	3	2	2	4									50	2.8			
Respiratory Epithelium, Accumulation, Hyaline Droplet			1			1	1		1	2	1			1					1	1	1	1													1	17	1.1		
Trachea	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	49				
Inflammation, Acute																																				1	1	1.0	
SPECIAL SENSES SYSTEM																																							
Eye	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50				
Cataract																																					3	3.0	
Cornea, Inflammation, Chronic Active																																					1	3.0	
Retina, Atrophy																2																					3	2.7	
Harderian Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50				
Hyperplasia														1																							1	7	1.3

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 + .. Tissue examined microscopically
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 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

WISTAR HAN RATS MALE	DAY ON TEST																								* TOTALS
	07	04	07	07	07	07	07	07	07	07	07	07	06	07	06	07	06	07	07	07	05	07	07	06	
10 mg/m3	29	39	30	30	31	30	30	40	30	40	00	33	33	22	53	33	22	33	33	30	30	32	22		
	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22		
	22	22	22	22	33	33	33	33	33	33	33	33	33	33	44	44	44	44	44	44	44	44	44		
	67	78	89	00	01	02	03	04	05	06	07	08	09	00	01	02	03	04	05	06	07	08	09		

Hypertrophy

2 1 1 3 1.3

Zymbal's Gland

+ + 2

URINARY SYSTEM

Kidney

+ 50

Cyst

1 2.0

Hydronephrosis

1 2.0

Inflammation, Suppurative

1 3 1.7

Nephropathy

1 2 3 2 3 1 1 2 2 2 2 2 1 1 2 1 1 2 2 2 1 38 1.8

Transitional Epithelium, Hyperplasia

1 3.0

Urinary Bladder

+ 50

Calculus Gross Observation

1 2.0

Inflammation, Chronic Active

1 1.0

Transitional Epithelium, Hyperplasia

1 2.0

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013

Time Report Requested: 08:51:01

First Dose M/F: 04/14/08 / 04/14/08

Lab: BNW

| | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------------------|
| | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | |
| WISTAR HAN RATS MALE | 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 | 5 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | |
| | 3 | 2 | 2 | 3 | 1 | 6 | 0 | 5 | 0 | 0 | 2 | 2 | 2 | 3 | 6 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 |
| 30 mg/m3 | 1 | 9 | 9 | 1 | 1 | 4 | 4 | 3 | 4 | 4 | 9 | 6 | 9 | 0 | 4 | 0 | 0 | 0 | 0 | 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 | |
| | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | males (cont...) |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | |
|----------------------------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Esophagus | + | | | | | | | | | | | | | | | | | | | |
| Intestine Large, Cecum | + | | | | | | | | | | | | | | | | | | | |
| Intestine Large, Colon | + | | | | | | | | | | | | | | | | | | | |
| Intestine Large, Rectum | + | | | | | | | | | | | | | | | | | | | |
| Intestine Small, Duodenum | + | | | | | | | | | | | | | | | | | | | |
| Intestine Small, Ileum | + | | | | | | | | | | | | | | | | | | | |
| Intestine Small, Jejunum | + | | | | | | | | | | | | | | | | | | | |
| Liver | + | | | | | | | | | | | | | | | | | | | |
| Angiectasis | 1 + | | | | | | | | | | | | | | | | | | | |
| Basophilic Focus | X | | | | | | | | | | | | | | | | | | | |
| Clear Cell Focus | X | | | | | | | | | | | | | | | | | | | |
| Eosinophilic Focus | X | | | | | | | | | | | | | | | | | | | |
| Necrosis | X | | | | | | | | | | | | | | | | | | | |
| Bile Duct, Dilatation | X | | | | | | | | | | | | | | | | | | | |
| Mesentery | + | | | | | | | | | | | | | | | | | | | |
| Fat, Necrosis | + | | | | | | | | | | | | | | | | | | | |
| Oral Mucosa | + | | | | | | | | | | | | | | | | | | | |
| Developmental Malformation | + | | | | | | | | | | | | | | | | | | | |
| Pancreas | + | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
+ .. Tissue examined microscopically M .. Missing tissue 1-4 .. Lesion qualified as:
X .. Lesion present A .. Autolysis precludes evaluation 1) Minimal 3) Moderate
I .. Insufficient tissue BLANK .. Not examined microscopically 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| Wistar Han Rats Male
30 mg/m3 | 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 | 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 | 5 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 0 | |
| | 3 | 2 | 2 | 3 | 1 | 6 | 0 | 5 | 0 | 0 | 2 | 2 | 2 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 0 | |
| | 1 | 9 | 9 | 1 | 1 | 4 | 4 | 3 | 4 | 4 | 9 | 6 | 9 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 2 | 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 | |
| | 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 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | |

Atrophy
 Basophilic Focus
 X
 1
 X

Salivary Glands
 Atrophy
 +

Stomach, Forestomach
 +

Stomach, Glandular
 Necrosis
 +

CARDIOVASCULAR SYSTEM

Blood Vessel
 +

Heart
 Cardiomyopathy
 Necrosis
 +
 1 1 2 1 2
 1 1 1 1 1 2 1 1 1 1

ENDOCRINE SYSTEM

Adrenal Cortex
 Degeneration, Cystic
 Hyperplasia
 Hypertrophy
 +
 1
 1
 2 2 2 2
 2 2 2 2 3 2 2 2 2
 2 2 2
 2 2 2 2

Adrenal Medulla
 Hyperplasia
 +
 3 2

Islets, Pancreatic
 +

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE
30 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) | | |
|--|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|--------------------|---|---|
| | 0731 | 0732 | 0733 | 0734 | 0735 | 0736 | 0737 | 0738 | 0739 | 0740 | 0741 | 0742 | 0743 | 0744 | 0745 | 0746 | 0747 | 0748 | 0749 | 0750 | | | | |
| Parathyroid Gland Hyperplasia | M | + | + | M | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | M | + | + | + |
| Pituitary Gland Pars Distalis, Hyperplasia
Pars Intermedia, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Thyroid Gland C-cell, Hyperplasia
Follicular Cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Preputial Gland Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Prostate Hyperplasia
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Seminal Vesicle Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Testes Atrophy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE

30 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | males
(cont...) | | |
|--------------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------|------|---|
| | 0731 | 0732 | 0739 | 0771 | 0773 | 0775 | 0776 | 0777 | 0778 | 0779 | 0780 | 0781 | 0782 | 0783 | 0784 | 0785 | 0786 | 0787 | 0788 | 0789 | | 0790 | |
| ANIMAL ID | 0040 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | | |
| Edema | | 3 | | | 2 | | | | | 2 | | | | 2 | | 2 | 2 | 2 | | | 3 | | 3 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Lymph Node Iliac, Ectasia | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node Iliac, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node Lumbar, Ectasia | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node Lumbar, Infiltration Cellular, Plasma Cell | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Bronchial Hyperplasia, Lymphohistiocytic | I | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Lymph Node, Mandibular Infiltration Cellular, Plasma Cell | M | M | M | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | |
| Lymph Node, Mediastinal Hyperplasia, Lymphohistiocytic | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Spleen Angiectasis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Spleen Hematopoietic Cell Proliferation | | | | | | | | | | | | | | | | | | | | | | | | |
| Spleen Necrosis | | | | | | | | | | | | | | | | | | | | | | | | |
| Thymus Cyst | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | males
(cont...) | |
|----------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------|------|
| | 0731 | 0732 | 0739 | 0731 | 0731 | 0754 | 0774 | 0764 | 0774 | 0774 | 0774 | 0774 | 0774 | 0774 | 0774 | 0774 | 0774 | 0774 | 0774 | 0774 | 0774 | 0774 | 0774 | 0774 | | 0774 |
| 30 mg/m3 | 0 | 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 | 0040 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | |

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 Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | 4 | 4 | | 4 | 4 | | 4 | 2 | 4 | 4 | | 4 | 4 | 4 | 4 | | | | | 4 | 4 | 4 | 4 | 4 |

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Skeletal Muscle | | | | | | | + | | | | | | | | | | | | | | | | | |

NERVOUS SYSTEM

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

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx Foreign Body Inflammation, Chronic Active Metaplasia, Squamous | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| | 2 | 2 | 1 | 3 | 3 | 3 | 2 | 2 | 1 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 1 |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE

30 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) | | | |
|--|------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|------------------|---------------------|------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | 0
7
3
1 | 0
7
2
9 | 0
7
2
9 | 0
7
3
1 | 0
7
1
1 | 0
5
6
4 | 0
7
0
4 | 0
6
5
3 | 0
7
0
4 | 0
7
0
4 | 0
7
0
4 | 0
7
2
9 | 0
7
2
6 | 0
7
2
9 | 0
7
3
0 | 0
5
6
4 | 0
7
3
0 | 0
7
3
0 | 0
7
2
2 | 0
6
2
0 | | | 0
7
2
9 | 0
7
3
1 | 0
7
2
2 |
| Inflammation, Lymphohistiocytic
Alveolar Epithelium, Hyperplasia
Bronchus-associated Lymphoid Tissue,
Hyperplasia, Lymphohistiocytic | 1 | 1 | 1 | 1 | 2 | 1 | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | 2 | 1 | 1 | 1 | 2 | 2 | | 1 | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Foreign Body
Inflammation, Acute
Inflammation, Chronic Active
Glands, Olfactory Epithelium, Hyperplasia
Goblet Cell, Hyperplasia
Olfactory Epithelium, Accumulation, Hyaline
Droplet
Respiratory Epithelium, Accumulation, Hyaline
Droplet | 3
1
4
1 | 2

3

3 | 2

3

3 | 2

3

3 | 2

3

3 | 2

3

3 | 2

3

3 | 2

3

3 | 1

3

3 | 2

3

3 | 3

4

3 | 2

3

2 | | 3

3

3 | | 2

3

3 | 1

3

3 | 2

3

3 | 1

3

3 | 1

3

3 | 1

3

3 | 1

3

3 | 1

3

3 | 3

3

3 | 1

3

3 |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ear | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Cataract
Retina, Atrophy | | | | | | | | | | | | | | | | | | | | | | | | | |
| Harderian Gland
Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Zymbal's Gland | | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| Wistar Han Rats Male
30 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) |
|----------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|--------------------|
| | 0731 | 0732 | 0733 | 0734 | 0735 | 0736 | 0737 | 0738 | 0739 | 0740 | 0741 | 0742 | 0743 | 0744 | 0745 | 0746 | 0747 | 0748 | 0749 | 0750 | 0751 | 0752 | 0753 | 0754 | 0755 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0040 | |
| | 7 | 7 | 7 | 7 | 7 | 5 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 0041 | |
| | 3 | 2 | 2 | 3 | 1 | 6 | 0 | 5 | 0 | 0 | 2 | 2 | 2 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 0042 | |
| | 1 | 9 | 9 | 1 | 1 | 4 | 4 | 3 | 4 | 4 | 9 | 6 | 9 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 9 | 2 | 2 | 0 | 2 | 0043 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0044 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0045 | |
| | 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 | 0046 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 0047 | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 0048 | |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Cyst | | | | | | | | | | | | | | | | | | | | | | 2 | 2 | | | | |
| Hydronephrosis | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | |
| Inflammation, Suppurative | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| Nephropathy | | | | 2 | 3 | | 1 | 3 | 1 | 3 | 1 | 2 | 2 | 3 | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 1 | | 2 | 1 | | |
| Transitional Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |

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 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
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Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE
30 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|----------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------|
| | 0729 | 0730 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | | 0779 |
| ANIMAL ID | 00426 | 00442 | 00442 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | 4 |
| Basophilic Focus | | | | | | | | | | | | | | | | | | | | | | 1.5 |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | 1 |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Glandular Necrosis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| | | | | | | | | | | | | | | | | | | | | | | 1 |
| | | | | | | | | | | | | | | | | | | | | | | 1 |
| | | | | | | | | | | | | | | | | | | | | | | 1.0 |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | |
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Cardiomyopathy | 2 | 1 | 1 | | 1 | 2 | 1 | 1 | | | 1 | 2 | 1 | | 1 | 2 | 1 | | | 1 | 2 | 1 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | 1 |
| | | | | | | | | | | | | | | | | | | | | | | 32 |
| | | | | | | | | | | | | | | | | | | | | | | 1.3 |
| | | | | | | | | | | | | | | | | | | | | | | 1 |
| | | | | | | | | | | | | | | | | | | | | | | 1.0 |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | 49 |
| Degeneration, Cystic | | | | | | | | | | | | | | | | | | | | | | 3 |
| Hyperplasia | 2 | | | | 2 | 2 | | | | 2 | 2 | 2 | | 2 | 2 | | | | 2 | 2 | | 28 |
| Hypertrophy | 2 | | | | | 2 | | | | | | | | | 2 | 2 | 1 | 2 | | | | 14 |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | 49 |
| Hyperplasia | | 2 | | | | | | | | | | | | | | | | | | 2 | | 4 |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | 49 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
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 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
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 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
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Experiment Number: 20515 - 03

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013

Time Report Requested: 08:51:01

First Dose M/F: 04/14/08 / 04/14/08

Lab: BNW

| WISTAR HAN RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|----------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|
| | 0729 | 0730 | 0739 | 0779 | 0770 | 0771 | 0772 | 0773 | 0774 | 0775 | 0776 | 0777 | 0778 | 0779 | 0780 | 0781 | 0782 | 0783 | 0784 | 0785 | | 0786 | 0787 | 0788 | 0789 |
| 30 mg/m3 | 00426 | 00442 | 00442 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 |
| | 00226 | 00227 | 00228 | 00229 | 00230 | 00231 | 00232 | 00233 | 00234 | 00235 | 00236 | 00237 | 00238 | 00239 | 00240 | 00241 | 00242 | 00243 | 00244 | 00245 | 00246 | 00247 | 00248 | 00249 | 00250 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|-----|
| Parathyroid Gland Hyperplasia | + | + | M | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 44 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2.0 |
| Pituitary Gland Pars Distalis, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 13 | 2.1 |
| Pars Intermedia, Hyperplasia | 2 | | 2 | | 2 | | | | | | | | 1 | | | | 3 | | | | | | | | 2 | | 1 | 2.0 |
| Thyroid Gland C-cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | 30 | 1.4 |
| Follicular Cell, Hyperplasia | 2 | 1 | 3 | | 1 | 1 | 1 | 2 | 2 | 2 | | | | 1 | 3 | 1 | 1 | | | | | | | | 2 | | 5 | 1.8 |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|-----|
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Preputial Gland Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 3 | | | | | | | | | 3 | | | 3 | 2.7 |
| Prostate Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 12 | 1.8 |
| Inflammation, Chronic Active | | | | | | 2 | | | | | | | | 2 | | 3 | | | | | | | | | | | 4 | 2.5 |
| Seminal Vesicle Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | A | + | + | + | + | 48 | 2 | 2.5 |
| Testes Atrophy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 5 | 2.8 |
| | | | | | | 3 | | | | | | | | | | | | | | | | | | | 4 | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|----------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|--------|
| | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 06 | 07 | 03 | 07 | 07 | | 07 | 06 | 06 | 07 |
| 30 mg/m3 | 29 | 30 | 29 | 29 | 30 | 29 | 30 | 30 | 29 | 30 | 30 | 29 | 30 | 30 | 29 | 30 | 30 | 09 | 30 | 29 | 29 | 29 | 29 | 29 | 29 | |
| ANIMAL ID | 00426 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | 00442 | |
| Edema | | | | 3 | 3 | | | | 1 | 3 | | | | | 2 | | | | | 2 | | 2 | | | 2 | 18 2.3 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-------|--------|-------|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | | |
| Lymph Node Iliac, Ectasia | | | + | | | | + | | | | | | | | | | | | | | | | | | + | 7 | 1 2.0 | |
| Lymph Node Iliac, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 | 1 4.0 |
| Lymph Node Lumbar, Ectasia | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | 2 | 2 2.0 |
| Lymph Node Lumbar, Infiltration Cellular, Plasma Cell | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | 2 3.0 | |
| Lymph Node, Bronchial Hyperplasia, Lymphohistiocytic | + | + | + | + | + | + | + | M | + | M | + | + | + | M | + | + | + | M | M | + | + | + | + | + | M | 37 | 10 1.1 | |
| Lymph Node, Mandibular Infiltration Cellular, Plasma Cell | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 44 | 1 4.0 | |
| Lymph Node, Mediastinal Hyperplasia, Lymphohistiocytic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 4 1.5 | |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | 49 | | |
| Spleen Angiectasis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 3.0 | |
| Spleen Hematopoietic Cell Proliferation | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | 4 2.8 | |
| Spleen Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Thymus Cyst | M | + | + | + | + | + | + | + | M | + | + | + | + | M | + | + | + | I | + | + | M | + | + | + | 44 | 1 3.0 | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE
30 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|----------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| | 0729 | 0730 | 0731 | 0732 | 0733 | 0734 | 0735 | 0736 | 0737 | 0738 | 0739 | 0740 | 0741 | 0742 | 0743 | 0744 | 0745 | 0746 | 0747 | 0748 | 0749 | 0750 | 0751 | 0752 | |
| ANIMAL ID | 00426 | 00427 | 00428 | 00429 | 00430 | 00431 | 00432 | 00433 | 00434 | 00435 | 00436 | 00437 | 00438 | 00439 | 00440 | 00441 | 00442 | 00443 | 00444 | 00445 | 00446 | 00447 | 00448 | 00449 | |

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 | 3 | | |
| Skin Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| | 4 | 3 | 4 | | | 4 | | 4 | | 4 | 3 | | | | | | | 4 | | | 3 | 4 | | 3 | 4 | 30 | 3.8 |

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---|-----|
| Bone Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| | | | | | | | | | | | | | | | | | 4 | | | | | | | | | 1 | 4.0 |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---|-----|
| Brain Hemorrhage | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1.0 |
| Peripheral Nerve | | | | | | | | | | | | | | | | | | | | | | | | | | 6 | |
| Spinal Cord | | | | | | | | | | | | | | | | | | | | | | | | | | 7 | |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|-----|
| Larynx Foreign Body Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Metaplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | 1.5 |
| | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 1 | 3 | 2 | 3 | 3 | 2 | 1 | 2 | 3 | 3 | 2 | 50 | 2.2 |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| DAY ON TEST | WISTAR HAN RATS MALE | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | | |
|---|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-----|-----|--|
| | 0729 | 0730 | 0731 | 0732 | 0733 | 0734 | 0735 | 0736 | 0737 | 0738 | 0739 | 0740 | 0741 | 0742 | 0743 | 0744 | 0745 | 0746 | 0747 | 0748 | 0749 | 0750 | 0751 | 0752 | | | | |
| ANIMAL ID | 00426 | 00427 | 00428 | 00429 | 00430 | 00431 | 00432 | 00433 | 00434 | 00435 | 00436 | 00437 | 00438 | 00439 | 00440 | 00441 | 00442 | 00443 | 00444 | 00445 | 00446 | 00447 | 00448 | 00449 | | | | |
| Inflammation, Lymphohistiocytic Alveolar Epithelium, Hyperplasia | 1 | 1 | 2 | | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | | 1 | 1 | 1 | 41 | 1.1 | |
| Bronchus-associated Lymphoid Tissue, Hyperplasia, Lymphohistiocytic | | 3 | 2 | | | 1 | | | | | | | | | | | | | 1 | | 1 | | | | | 11 | 1.9 | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Foreign Body | | | | | | | | | | | | | | | | | | | | | | | | | X | 1 | | |
| Inflammation, Acute | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2.0 | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 4.0 | |
| Glands, Olfactory Epithelium, Hyperplasia | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 3 | 1 | 1 | 1 | | 3 | 3 | 2 | 3 | 3 | 2 | 47 | 2.0 | |
| Goblet Cell, Hyperplasia | | | 1 | | | 1 | | | 1 | | 1 | 2 | 1 | 1 | | 1 | 1 | 1 | | 1 | 2 | 1 | | 1 | 25 | 1.1 | | |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | 4 | 3 | 4 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 4 | 3 | 3 | 2 | 3 | 4 | 3 | 3 | 4 | 50 | 3.0 | | |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | | | 1 | | | 2 | 1 | | 1 | | 1 | | | 1 | | 1 | | 1 | | 1 | 2 | 1 | | 2 | 1 | 25 | 1.1 | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ear | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | A | + | + | + | + | + | + | 48 | | |
| Cataract | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 4.0 | |
| Retina, Atrophy | | | | | | | | 2 | | | | | | | | | | | | 2 | | | | | | 2 | 2.0 | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Hyperplasia | 2 | | 1 | | 1 | | | | | | 2 | 2 | | | | | 2 | | | | 1 | | | | | 12 | 1.6 | |
| Zymbal's Gland | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|----------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| | 0729 | 0730 | 0732 | 0733 | 0735 | 0737 | 0739 | 0741 | 0743 | 0745 | 0747 | 0749 | 0751 | 0753 | 0755 | 0757 | 0759 | 0801 | 0803 | 0805 | 0807 | 0809 | 0811 | 0813 | | |
| 30 mg/m3 | 00426 | 00447 | 00448 | 00449 | 00450 | 00451 | 00452 | 00453 | 00454 | 00455 | 00456 | 00457 | 00458 | 00459 | 00460 | 00461 | 00462 | 00463 | 00464 | 00465 | 00466 | 00467 | 00468 | 00469 | 49 | |
| | 00442 | 00443 | 00444 | 00445 | 00446 | 00447 | 00448 | 00449 | 00450 | 00451 | 00452 | 00453 | 00454 | 00455 | 00456 | 00457 | 00458 | 00459 | 00460 | 00461 | 00462 | 00463 | 00464 | 00465 | 00466 | 48 |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-----|-----|
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | 49 | 3 | 2.0 |
| Cyst | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | 2 | 2.5 |
| Hydronephrosis | | | | | | | | | | | | | | | | | | | | | | | | 4 | | | | | 2 | 1.5 |
| Inflammation, Suppurative | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | | 2 | 1.5 |
| Nephropathy | 1 | | | | 1 | 1 | 3 | 3 | 1 | | 2 | 1 | 3 | 2 | 3 | 1 | | 3 | | 2 | 1 | | 1 | 4 | 2 | | | 38 | 1.9 | |
| Transitional Epithelium, Hyperplasia | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | | 1 | 2.0 |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | 48 | | |

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013

Time Report Requested: 08:51:01

First Dose M/F: 04/14/08 / 04/14/08

Lab: BNW

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------------------------------|------------------|------------------|
| WISTAR HAN RATS MALE

100 mg/m3 | DAY ON TEST | 0
7
0
4 | 0
7
0
4 | 0
5
9
5 | 0
5
0
4 | 0
7
3
1 | 0
7
3
1 | 0
7
3
0 | 0
7
3
1 | 0
7
3
0 | 0
7
3
2 | 0
7
3
2 | 0
7
2
0 | 0
6
4
7 | 0
7
3
3 | 0
7
3
3 | 0
6
7
5 | 0
7
2
3 | 0
7
2
9 | 0
6
2
2 | 0
7
9
5 | 0
6
0
4 | 0
7
3
0 | 0
7
3
1 | males
(cont...) | | |
| | ANIMAL ID | 0
6
0
1 | 0
6
0
2 | 0
6
0
3 | 0
6
0
4 | 0
6
0
5 | 0
6
0
6 | 0
6
0
7 | 0
6
0
8 | 0
6
0
9 | 0
6
0
0 | 0
6
0
1 | 0
6
0
2 | 0
6
0
3 | 0
6
0
4 | 0
6
0
5 | 0
6
0
6 | 0
6
0
7 | 0
6
0
8 | 0
6
0
9 | 0
6
0
0 | 0
6
0
1 | 0
6
0
2 | 0
6
0
3 | | 0
6
0
4 | 0
6
0
5 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | I | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Inflammation, Chronic | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymphatic, Angiectasis | | | | | | | | | | | | | | | | | | | | | | | | |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Angiectasis | | | | | 2 | 1 | | | | | | | | | | | | 1 | | | | | | |
| Basophilic Focus | X | | | | | | | | X | X | | X | | X | | | | | | | X | | X | |
| Clear Cell Focus | X | | | | X | X | X | | X | X | | X | | X | | X | X | | | | | X | | X |
| Fatty Change | | | | | | | | | | | | | | | | | | | | | | | | |
| Mixed Cell Focus | | | | | | | | | | | | | | | | | | | | | | | | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | |
| Bile Duct, Dilatation | | | | | | | | | | | | | | 4 | 3 | | | | | 4 | | | | |
| Mesentery | | | + | | | | | | | | | | | | | | | | | | | | | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Atrophy | 1 | | | | | | | | | | | | 1 | | | | | | | | | | | 1 |

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | males
(cont...) | |
|----------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------|------|
| | 0704 | 0704 | 0705 | 0705 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | | 0707 |
| 100 mg/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| ANIMAL ID | 0060 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | |

Basophilic Focus

Salivary Glands

Stomach, Forestomach
 Hyperplasia, Squamous
 Ulcer

Stomach, Glandular

Tooth
 Dysplasia

CARDIOVASCULAR SYSTEM

Blood Vessel

Heart
 Cardiomyopathy

ENDOCRINE SYSTEM

Adrenal Cortex
 Degeneration, Cystic
 Hyperplasia
 Hypertrophy

Adrenal Medulla
 Angiectasis
 Hyperplasia

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

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Experiment Number: 20515 - 03
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
Time Report Requested: 08:51:01
First Dose M/F: 04/14/08 / 04/14/08
Lab: BNW

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| WISTAR HAN RATS MALE | DAY ON TEST | 07 | 07 | 05 | 05 | 07 | 07 | 07 | 07 | 07 | 07 | 02 | 06 | 04 | 07 | 07 | 06 | 07 | 07 | 06 | 07 | 07 | 07 | 03 | 03 | 03 | 03 |
| | ANIMAL ID | 00601 | 00602 | 00603 | 00604 | 00605 | 00606 | 00607 | 00608 | 00609 | 00610 | 00611 | 00612 | 00613 | 00614 | 00615 | 00616 | 00617 | 00618 | 00619 | 00620 | 00621 | 00622 | 00623 | 00624 | 00625 | |

**males
(cont...)**

Spleen
 Angiectasis
 Hematopoietic Cell Proliferation
 3

Thymus
 + + + M + + + + I + + + + I + + M + + + + + + + +

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
 Angiectasis
 3
 Cyst Epithelial Inclusion
 X
 Inflammation, Chronic Active
 4 3 4 4 4 4 4 4 2 4 4 4
 Thrombosis
 3

MUSCULOSKELETAL SYSTEM

Bone
 +

NERVOUS SYSTEM

Brain
 Compression
 2

Peripheral Nerve
 + + + +

Spinal Cord
 + + + +

RESPIRATORY SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
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Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE

100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|--------------------|
| | 0704 | 0704 | 0705 | 0705 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | 0707 | | |
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Inflammation, Chronic | | | | | | | | | | | | | | | | | | | | | | |
| Metaplasia, Squamous | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| Epiglottis, Fibrosis | | | | | | | | | | | | | | | | | | | | | 1 | |
| Epiglottis, Ulcer | | | | | | | | | | | | | | | | | | | | | 3 | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Inflammation, Lymphohistiocytic | 1 | 1 | 2 | | 2 | 2 | 2 | 2 | 2 | 2 | | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 |
| Alveolar Epithelium, Hyperplasia | | | | | | 3 | | | | | 3 | | 3 | | 1 | | 1 | | 2 | | | |
| Bronchus-associated Lymphoid Tissue, Hyperplasia, Lymphohistiocytic | | | | | 3 | 2 | | 1 | 2 | 2 | | | 2 | | | 2 | | 3 | 3 | | 1 | 2 |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Foreign Body | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Acute | | | | | | | | | | | | | | | | | | | | | | |
| Glands, Olfactory Epithelium, Hyperplasia | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 2 | 3 | 3 | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| Goblet Cell, Hyperplasia | | 1 | | | | 1 | | | 1 | 2 | 1 | 2 | 2 | | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 3 |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | | | | | 1 | 1 | | | | 2 | 1 | 3 | 1 | | | | 1 | 1 | 1 | 1 | 1 | 1 |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Cornea, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | |
| Retina, Atrophy | | | | | | | | | | | | | | | | | | | | | | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

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2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE

100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------|----|---------------------------|
| | 0729 | 0611 | 0730 | 0729 | 0770 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | | 0777 | | |
| ANIMAL ID | 00626 | 00662 | 00662 | 00662 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | | | |
| Basophilic Focus | | | | | | | | | | | | | | | | | | | | | | X | 1 | |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Stomach, Forestomach
Hyperplasia, Squamous
Ulcer | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 3.0
2 3.0 |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Tooth
Dysplasia | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 2.0 |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Heart
Cardiomyopathy | + | + | | | | | | | | | | | | | | | | | | | | | 50 | 33 1.2 |
| | | | | 1 | 1 | 1 | 1 | 1 | | 2 | | 1 | | 1 | | | 1 | 1 | | 1 | 1 | | | |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex
Degeneration, Cystic
Hyperplasia
Hypertrophy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 2 1.5
26 2.2
16 2.1 |
| Adrenal Medulla
Angiectasis
Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 3.0
1 3.0 |
| | 3 | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
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 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE
100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|--------------|
| | 0729 | 0611 | 0730 | 0722 | 0779 | 0770 | 0772 | 0773 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | | 0779 |
| ANIMAL ID | 00626 | 00662 | 00662 | 00662 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Parathyroid Gland
Hyperplasia | + | + | + | + | + | M | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | 47
1 2.0 |
| Pituitary Gland
Pars Distalis, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
16 1.9 |
| Pars Intermedia, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | 4 2.3 |
| Thyroid Gland
C-cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
28 1.5 |
| GENERAL BODY SYSTEM | | | | | | | | | | | | | | | | | | | | | | |
| NONE | | | | | | | | | | | | | | | | | | | | | | |
| GENITAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | |
| Coagulating Gland
Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | 1
1 3.0 |
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Preputial Gland
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
3 2.7 |
| Duct, Ectasia | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Prostate
Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
11 2.1 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | 2 2.5 |

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

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 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE

100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|---------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|
| | 079 | 061 | 073 | 072 | 079 | 070 | 077 | 072 | 072 | 079 | 079 | 075 | 073 | 074 | 077 | 066 | 077 | 067 | 073 | 073 | | 071 | 077 | 072 | 079 |
| ANIMAL ID | 00626 | 00622 | 00622 | 00622 | 00633 | 00633 | 00612 | 00603 | 00604 | 00605 | 00606 | 00607 | 00608 | 00609 | 00610 | 00611 | 00612 | 00613 | 00614 | 00615 | 00616 | 00617 | 00618 | 00619 | 00620 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-------|--------|-------|
| Seminal Vesicle
Hyperplasia
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 2.0 | 1 3.0 | |
| Testes
Atrophy
Edema
Interstitial Cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 5 2.6 | 11 2.3 | 1 3.0 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-------|--------|-------|-------|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Lymph Node
Axillary, Ectasia
Iliac, Ectasia
Renal, Ectasia | | | | | | | | | | | | | | | | | | | | | | | | | | 5 | 1 1.0 | 1 3.0 | 2 2.5 |
| Lymph Node, Bronchial
Ectasia
Hyperplasia, Lymphohistiocytic | + | + | + | + | M | + | + | + | + | + | + | + | + | + | M | M | + | + | + | M | + | M | + | + | 35 | 1 4.0 | 28 2.1 | | |
| Lymph Node, Mandibular
Hyperplasia, Lymphoid | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | 45 | 1 3.0 | | |
| Lymph Node, Mediastinal
Hyperplasia, Lymphohistiocytic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | 29 2.2 | | |
| Lymph Node, Mesenteric
Hemorrhage | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 4.0 | | |

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

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 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
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 Lab: BNW

| WISTAR HAN RATS MALE

100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|---------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|--------|
| | 0729 | 0611 | 0730 | 0722 | 0779 | 0770 | 0772 | 0773 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | 0779 | | 0779 | |
| ANIMAL ID | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | | |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Angiectasis | | 2 | | | | | | | | | | | | | | | | | | | | 1 2.0 | |
| Hematopoietic Cell Proliferation | | 4 | | | | | | | | | | | | | | | | | | | | 2 3.5 | |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 46 | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | M | M | M | M | M | M | M | M | M | M | M | M | + | M | M | M | M | M | M | M | M | 4 | |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Angiectasis | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| Cyst Epithelial Inclusion | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Inflammation, Chronic Active | | | | 3 | 4 | 4 | | | | | | 2 | | | 4 | | 1 | | | | 3 | 4 | 22 3.5 |
| Thrombosis | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Compression | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | |
| Peripheral Nerve | | | | | | | | | | | | + | | | | | + | | | | | 6 | |
| Spinal Cord | | | | | | | | | | | | + | | | | | + | | | | | 6 | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | |

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 + .. Tissue examined microscopically
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 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE
100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|----|--------|--------|
| | 0729 | 0611 | 0730 | 0722 | 0779 | 0770 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | | 0777 | | | |
| ANIMAL ID | 00626 | 00662 | 00662 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | | | | |
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Inflammation, Chronic | | | | | | | | | | | | 2 | | | | | | | | | | 1 2.0 | | | |
| Metaplasia, Squamous | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 50 2.7 | |
| Epiglottis, Fibrosis | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 | |
| Epiglottis, Ulcer | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Inflammation, Lymphohistiocytic | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 47 1.8 | |
| Alveolar Epithelium, Hyperplasia | | 4 | | | | | | | | | | | | 3 | 3 | | | | 2 | 4 | 1 | | 1 | 13 2.4 | |
| Bronchus-associated Lymphoid Tissue, Hyperplasia, Lymphohistiocytic | | 1 | | | 2 | 2 | | 2 | 3 | | | | | | 1 | | | 2 | | 2 | | | | 19 2.0 | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Foreign Body | | | | | | | | | | | | | | | | | | | | | | X | | 1 | |
| Inflammation, Acute | | | | | | | | | | | | | | | | | | | | | | 1 | | 1 1.0 | |
| Glands, Olfactory Epithelium, Hyperplasia | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 50 2.6 |
| Goblet Cell, Hyperplasia | 1 | 1 | | 2 | 1 | | 1 | 2 | 1 | 1 | 2 | | 1 | 1 | 1 | 1 | 1 | | | 1 | | | 1 | 34 1.3 | |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | 4 | 3 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 50 3.5 | |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | | 1 | 1 | 1 | | 1 | 1 | | | | 2 | | 1 | 2 | | | 1 | 1 | 1 | 1 | | 1 | | 29 1.2 | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Cornea, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | 2 | | 1 2.0 | |
| Retina, Atrophy | | | | 3 | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
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Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS MALE
100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|--------------------------------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------|----|--------|
| | 07 | 06 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | 07 | | 07 | 07 |
| | 2 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 9 | 3 | 5 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | |
| | 9 | 1 | 0 | 9 | 9 | 0 | 9 | 9 | 9 | 9 | 5 | 1 | 7 | 0 | 5 | 0 | 0 | 9 | 7 | 0 | 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 | |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| Hyperplasia | | | | | | | | | | 2 | 1 | | | | | | 1 | | | | | 1 | 6 1.2 |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Infarct | | | | | | | | | | | | | | | | | | | 4 | | | | 1 4.0 |
| Inflammation, Suppurative | | | | | | | | | | | | 2 | | | | | | | | | | | 4 2.3 |
| Nephropathy | 1 | 2 | | | 1 | | 2 | 2 | 3 | 3 | | 1 | | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 1 | 1 | 38 1.9 |
| Renal Tubule, Hyperplasia | 1 | | | | | | | | | | | | | 2 | | | | | | | | 3 | 3 1.3 |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | 1 | 1 3.0 |
| Transitional Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | 1 | 1 3.0 |

*** END OF MALE DATA ***

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

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Experiment Number: 20515 - 03

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013

Time Report Requested: 08:51:01

First Dose M/F: 04/14/08 / 04/14/08

Lab: BNW

| | | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
|------------------------|--|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|
| WISTAR HAN RATS FEMALE | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Control | | 5 | 7 | 6 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 5 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | |
| ANIMAL ID | | 9 | 3 | 1 | 3 | 3 | 9 | 3 | 3 | 3 | 1 | 3 | 8 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 1 | 8 | 3 | |
| | | 9 | 2 | 0 | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 1 | 6 | 3 | 1 | 5 | 2 | 2 | 1 | 2 | 3 | 3 | 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 | |
| | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Inflammation, Acute | | | | | | | | | | | | | | | | | | | | | | | | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Large, Cecum | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Intestine Large, Colon | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Intestine Large, Rectum | + | + | + | + | I | A | + | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Intestine Small, Duodenum | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Intestine Small, Ileum | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Intestine Small, Jejunum | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Diverticulum | | | | | | | | | | | | | | | | | | | | | 2 | | | |
| Inflammation, Acute | | | | | | | | | | | | | | | | | | | | | | | | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Angiectasis | | | | | | | | | | | | | | | | | | | | | 1 | 2 | | |
| Basophilic Focus | X | X | X | X | X | | X | X | X | X | | X | X | X | X | | X | | X | X | X | X | X | |
| Clear Cell Focus | X | X | | X | | | | X | | | | X | | X | | X | | X | | X | | | | |
| Eosinophilic Focus | | | | X | | | | | | | | | | | | | | | | | | | | |
| Fatty Change | | | | 2 | | | | | | | | | | | | | | | 3 | | | | | |
| Hematopoietic Cell Proliferation | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatodiaphragmatic Nodule | | | | | | | | | | | | | | | | | | | | | | | | |
| Mixed Cell Focus | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

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 Lab: BNW

| WISTAR HAN RATS FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|----------------------|
| | 0599 | 0732 | 0610 | 0732 | 0771 | 0670 | 0771 | 0771 | 0771 | 0771 | 0771 | 0575 | 0771 | 0676 | 0771 | 0771 | 0771 | 0771 | 0771 | 0771 | 0676 | 0771 | 0771 | 0771 | 0771 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0001 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0001 | |
| | 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 | 0001 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0001 | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 2 | 2 | 2 | 0001 | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bile Duct, Cyst | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| Bile Duct, Dilatation | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bile Duct, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| Bile Duct, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fat, Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| Pancreas | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | | | | | | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| Salivary Glands | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Basophilic Focus | | | | | | | | | | | | | | | | | | | | | | | | | | | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | X |
| Stomach, Forestomach | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hyperplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | | | | | + |
| Inflammation, Acute | | | | | | | | | | | | | | | | | | | | | | | | | | | + |
| Ulcer | | | | | | | | | | | | | | | | | | | | | | | | | | | + |
| Stomach, Glandular | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Acute | | | | | | | | | | | | | | | | | | | | | | | | | | | + |
| Mineralization | | | | | | | | | | | | | | | | | | | | | | | | | | | + |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Tongue | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Granulomatous | | | | | | | | | | | | | | | | | | | | | | | | | | | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |

CARDIOVASCULAR SYSTEM

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

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P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
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 Lab: BNW

| WISTAR HAN RATS FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | | |
|-----------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|------------------|------------------|------------------|
| | 0
5
9
9 | 0
7
3
2 | 0
6
1
0 | 0
7
3
2 | 0
7
3
1 | 0
6
9
0 | 0
7
3
1 | 0
7
3
1 | 0
7
3
2 | 0
7
3
2 | 0
7
3
1 | 0
7
3
1 | 0
5
8
6 | 0
7
3
3 | 0
7
3
1 | 0
6
4
5 | 0
7
3
2 | 0
7
3
2 | 0
7
3
1 | 0
7
3
3 | | | 0
6
9
8 | 0
7
0
3 | 0
7
0
3 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0011001 | |

| | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Cardiomyopathy | | | | | 1 | 1 | | | | 1 | 1 | | | 1 | | | 1 | 1 | | 1 | | | |
| Endocardium, Hyperplasia | | | | | | | | | | | | | | | | | | 3 | | | | | |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Accessory Adrenal Cortical Nodule | | | | | | | | | | | | | | | | | | | | | | | | | |
| Angiectasis | | | | | | | | | 2 | | | | | | | | | | | | | | | | |
| Degeneration, Cystic | | | 2 | | | | | | | 2 | 3 | | | 3 | | 3 | | | 4 | 2 | 1 | | 1 | 1 | |
| Hyperplasia | | 2 | | 2 | 2 | | | | | 2 | | 2 | | | | | | | 2 | | 2 | | 2 | | |
| Hypertrophy | | | | | | | | | | 2 | 2 | | 2 | | | | | 2 | | 2 | | | | | |
| Necrosis | | | | | | | | 2 | | | | | | | | | | | | | | | | | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | | |
| Hyperplasia | | | | | | | | | | | 3 | | | | | | | | | | | | | | |
| Islets, Pancreatic | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Parathyroid Gland | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Pars Distalis, Hyperplasia | | 2 | | | | | | | | | | | | | 2 | | 2 | | | | | | | | |
| Pars Intermedia, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| C-cell, Hyperplasia | | 2 | 3 | 2 | 1 | | 2 | 2 | | 2 | 1 | 3 | | | | 2 | | 1 | 2 | 3 | 1 | | 3 | 4 | 3 |
| Follicular Cell, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | |

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 + .. Tissue examined microscopically
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 Lab: BNW

| WISTAR HAN RATS FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|-----------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---------|-----------|----------------------|
| | 0599 | 0732 | 0610 | 0733 | 0771 | 0670 | 0771 | 0771 | 0771 | 0771 | 0771 | 0573 | 0771 | 0676 | 0771 | 0771 | 0771 | 0771 | 0771 | 0771 | 0676 | 0771 | 0771 | 0771 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0011001 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0011002 | | |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0011003 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 0011004 | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 0011005 | | |

Spinal Cord +

RESPIRATORY SYSTEM

Larynx +
 Metaplasia, Squamous 2

Lung +
 Inflammation, Lymphohistiocytic 4
 Alveolar Epithelium, Hyperplasia 1

Nose +
 Inflammation, Chronic Active 1
 Thrombosis
 Glands, Olfactory Epithelium, Hyperplasia 1
 Olfactory Epithelium, Accumulation, Hyaline Droplet 1 2 2 2
 Respiratory Epithelium, Accumulation, Hyaline Droplet

Trachea + + + + + A +

SPECIAL SENSES SYSTEM

Eye + + + + + A +
 Retina, Atrophy 1

Harderian Gland + + + + + A +
 Hyperplasia 1

URINARY SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically M .. Missing tissue
 X .. Lesion present A .. Autolysis precludes evaluation
 I .. Insufficient tissue BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|
| | 0733 | 0732 | 0499 | 0733 | 0670 | 0772 | 0773 | 0679 | 0772 | 0772 | 0472 | 0773 | 0773 | 0679 | 0772 | 0773 | 0773 | 0679 | 0772 | 0773 | | 0773 | | | |
| Control | 00126 | 00127 | 00128 | 00129 | 00130 | 00131 | 00132 | 00133 | 00134 | 00135 | 00136 | 00137 | 00138 | 00139 | 00140 | 00141 | 00142 | 00143 | 00144 | 00145 | 00146 | 00147 | 00148 | 00149 | 00150 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------|-------|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Inflammation, Acute | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | + | + | + | + | + | + | + | + | 46 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Diverticulum | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Inflammation, Acute | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Angiectasis | | | | | | | | | | | | | | | | | | | | | | | | | 4 2.0 |
| Basophilic Focus | X | | | X | | X | X | | X | X | X | | X | | X | X | | X | X | X | | X | | 34 | |
| Clear Cell Focus | X | X | | | | | | | | X | | X | | | X | | | | | | X | | | 14 | |
| Eosinophilic Focus | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Fatty Change | | | | 2 | | | | | | | | | | | | | | | | | | | | 3 2.3 | |
| Hematopoietic Cell Proliferation | | | | | | | | | | | | | | | | | | | | | | | 2 | 1 2.0 | |
| Hepatodiaphragmatic Nodule | | | | | | X | | | | | | | | | | | | | | | | | | 1 | |
| Mixed Cell Focus | | | | | | | | | | X | | | | | | | X | | | | | | | 2 | |

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS 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 | 0 | | |
| Control | 7 | 7 | 4 | 7 | 6 | 7 | 7 | 6 | 7 | 7 | 4 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | |
| | 3 | 3 | 9 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 0 | 3 | 3 | 1 | 3 | 3 | 0 | 3 | 3 | 3 | 3 | 3 | 3 | | |
| | 3 | 2 | 9 | 3 | 0 | 1 | 2 | 9 | 2 | 2 | 2 | 2 | 1 | 3 | 9 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 2 | 9 | 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 | |
| | 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 | |
| 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | | |
| 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 | |
| Bile Duct, Cyst | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Bile Duct, Dilatation | | | | | | | | | | | | | | | | | | | | | | | | | 4 1 4.0 | |
| Bile Duct, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | 5 1.8 | |
| Bile Duct, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | | | | 7 | |
| Fat, Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 7 2.0 | |
| Pancreas | | | | | | | | | | | | | | | | | | | | | | | | | 49 | |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | | | | 6 1.3 | |
| Salivary Glands | | | | | | | | | | | | | | | | | | | | | | | | | 50 | |
| Basophilic Focus | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Stomach, Forestomach | | | | | | | | | | | | | | | | | | | | | | | | | 50 | |
| Hyperplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | |
| Inflammation, Acute | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| Ulcer | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 | |
| Stomach, Glandular | | | | | | | | | | | | | | | | | | | | | | | | | 50 | |
| Inflammation, Acute | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | |
| Mineralization | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 2 1.5 | |
| Tongue | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Inflammation, Granulomatous | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | |

CARDIOVASCULAR SYSTEM

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|-----------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|--------|
| | 0733 | 0732 | 0499 | 0733 | 0670 | 0772 | 0772 | 0679 | 0772 | 0772 | 0472 | 0773 | 0773 | 0679 | 0772 | 0773 | 0773 | 0773 | 0773 | 0773 | | 0773 |
| ANIMAL ID | 00126 | 00127 | 00128 | 00129 | 00130 | 00131 | 00132 | 00133 | 00134 | 00135 | 00136 | 00137 | 00138 | 00139 | 00140 | 00141 | 00142 | 00143 | 00144 | 00145 | 00146 | |
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Cardiomyopathy | 1 | | | 1 | 1 | | | | | 1 | 1 | 1 | | | | | | 1 | | 1 | | 16 1.0 |
| Endocardium, Hyperplasia | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 1 3.0 |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Accessory Adrenal Cortical Nodule | | | | | | | | | | | 3 | | | | | | | | | | | 1 3.0 |
| Angiectasis | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Degeneration, Cystic | 2 | | | 2 | 3 | | | 2 | 2 | 3 | 2 | 3 | 4 | | 1 | 1 | | 3 | | 3 | 2 | 26 2.3 |
| Hyperplasia | | 2 | | | | | | 2 | 2 | 2 | | 2 | | | 2 | | | 2 | 3 | | | 17 2.1 |
| Hypertrophy | | | | 2 | 2 | | | 2 | 2 | 3 | | 2 | | | | | | | | 2 | 2 | 14 2.1 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Hyperplasia | | | | | | | | 1 | | | | | | | | | | | | | | 2 2.0 |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Parathyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | M | 47 |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Pars Distalis, Hyperplasia | | | | | | | | 3 | | | 2 | | | | 1 | | | 4 | | | 3 | 8 2.4 |
| Pars Intermedia, Hyperplasia | | | | | | | | | | 2 | | | | | | | | | | | | 1 2.0 |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| C-cell, Hyperplasia | | 3 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 3 | | 4 | | 1 | 1 | | 2 | 2 | 1 | 1 | 37 1.9 |
| Follicular Cell, Hyperplasia | | | | | | | 1 | | | | | | | | | | | 2 | | | | 2 1.5 |

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|----------------|--|
| | 0733 | 0732 | 0499 | 0733 | 0671 | 0773 | 0763 | 0771 | 0773 | 0773 | 0470 | 0773 | 0773 | 0676 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | | | |
| Control | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 00126 | 00127 | 00128 | 00129 | 00130 | 00131 | 00132 | 00133 | 00134 | 00135 | 00136 | 00137 | 00138 | 00139 | 00140 | 00141 | 00142 | 00143 | 00144 | 00145 | 00146 | 00147 | 00148 | 00149 | | | |
| Lymph Node, Mesenteric
Ectasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | 1 3.0 | |
| Spleen
Hematopoietic Cell Proliferation | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 4.0 | |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | M | + | + | 48 | | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland
Galactocele
Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 3 2.3
1 2.0 | |
| Skin
Angiectasis
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 4.0
2 3.5 | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone
Callus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 3.0 | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain
Meninges, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 1.0 | |
| Peripheral Nerve | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
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Experiment Number: 20515 - 03
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 Species/Strain: RATS/Wistar Han

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 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
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 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| | 0733 | 0732 | 0499 | 0733 | 0670 | 0772 | 0772 | 0679 | 0772 | 0772 | 0472 | 0773 | 0773 | 0679 | 0772 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | |
| Control | 00126 | 00127 | 00128 | 00129 | 00130 | 00131 | 00132 | 00133 | 00134 | 00135 | 00136 | 00137 | 00138 | 00139 | 00140 | 00141 | 00142 | 00143 | 00144 | 00145 | 00146 | 00147 | 00148 | 00149 | 50 |

Spinal Cord + 2

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|-----|
| Larynx
Metaplasia, Squamous | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 | 2.0 |
| Lung
Inflammation, Lymphohistiocytic
Alveolar Epithelium, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 3 | 1.0 |
| | | | | | 1 | | | | | | 1 | | | 2 | | | | | | 2 | | | | | | 4 | 2.3 |
| Nose
Inflammation, Chronic Active
Thrombosis
Glands, Olfactory Epithelium, Hyperplasia
Olfactory Epithelium, Accumulation, Hyaline Droplet
Respiratory Epithelium, Accumulation, Hyaline Droplet | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 2 | 1.0 |
| | | | 2 | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | 2.0 |
| | | | | 2 | | 3 | 2 | 1 | 1 | | 1 | | 2 | | 1 | | | 1 | 1 | | 2 | 2 | | | | 16 | 1.6 |
| | | | | | | | | | | | | 1 | | | | | | | | | | | | | | 1 | 1.0 |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | | |

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---|-----|
| Eye
Retina, Atrophy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | 3 | 1.3 |
| Harderian Gland
Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | 3 | 1.7 |

URINARY SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
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P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|--------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|----------|
| | 0733 | 0732 | 0499 | 0733 | 0671 | 0773 | 0672 | 0771 | 0772 | 0772 | 0472 | 0773 | 0773 | 0671 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | |
| ANIMAL ID | 00126 | 00127 | 00128 | 00129 | 00130 | 00131 | 00132 | 00133 | 00134 | 00135 | 00136 | 00137 | 00138 | 00139 | 00140 | 00141 | 00142 | 00143 | 00144 | 00145 | 00146 | 00147 | 00148 | 00149 | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Inflammation, Suppurative | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 | |
| Nephropathy | | | | 1 | 1 | | | | 2 | | | 1 | 1 | 1 | | | | | 1 | 1 | | | | 17 1.4 | |
| Transitional Epithelium, Hyperplasia | | | | 4 | | | | | | | | | | | | | | | | | | | | 1 4.0 | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
|------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|----------------------|
| | 0733 | 0733 | 0663 | 0668 | 0668 | 0478 | 0773 | 0773 | 0556 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0668 | 0661 | 0733 | 0733 | 0733 | | |
| 10 mg/m3 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | | |
| ANIMAL ID | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | 0030 | | |
| | 12 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | I | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Angiectasis | | | | 1 | | | | | 1 | | | | | | | | 2 | 1 | | | | | |
| Basophilic Focus | X | X | X | X | X | X | X | | | | X | | | X | X | X | X | X | X | X | | | X |
| Clear Cell Focus | | | | | | X | | | | X | | | X | X | | | X | X | | | | | |
| Fatty Change | | | 2 | | | | | | | | | | | | | | | | | | | | |
| Necrosis | | | | | | 3 | | | | | | | | | | | | | | | | | |
| Bile Duct, Cyst | | | | | | | | | | | | | | | | | | | | | | | |
| Bile Duct, Cyst, Multiple | | | | | | | | | | | | | | X | | | | | | | | | |
| Bile Duct, Hyperplasia | | | 1 | | | | | 1 | | | | | | | | | | | | | | | |
| Mesentery | | | + | | | + | | | + | | | | | | | | + | | | | | | |
| Fat, Necrosis | | | 2 | | | 3 | | | 2 | | | | | | | | 3 | | | | | | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE
10 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | | |
|------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|------------------|------------------|------------------|
| | 0
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| | 0 | 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
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0
3
1 |

Basophilic Focus

Salivary Glands
Basophilic Focus

Stomach, Forestomach
Inflammation, Chronic Active
Ulcer

Stomach, Glandular

CARDIOVASCULAR SYSTEM

Blood Vessel

Heart
Cardiomyopathy

ENDOCRINE SYSTEM

Adrenal Cortex
Angiectasis
Degeneration, Cystic
Hyperplasia
Hypertrophy
Metaplasia, Osseous
Necrosis

Adrenal Medulla
Hyperplasia

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE

10 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | | |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|------------------|------------------|------------------|
| | 0
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7 | 0
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9 | | | 0
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2 | 0
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3 | 0
7
3
3 |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Parathyroid Gland | + | + | + | + | + | M | + | + | + | M | M | + | + | + | + | M | + | + | + | + | + | + | + | M | |
| Pituitary Gland
Pars Distalis, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Thyroid Gland
C-cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| | 1 | 3 | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 3 | 1 | 1 | 2 | 2 | 4 | 2 | 2 | 2 | 3 | 1 | | 2 | 1 | 1 | |
| GENERAL BODY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| NONE | | | | | | | | | | | | | | | | | | | | | | | | | |
| GENITAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Clitoral Gland
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | + | M | + | + | M | + |
| | | | 4 | | 3 | | | | 3 | | | | | | | | | | | | | | | | |
| Ovary
Cyst | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | 4 | | | 3 | | | 2 | | | | | | | | | | | | | 2 | | | | | |
| Uterus
Endometrium, Hyperplasia, Cystic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | | | | | | | | | | | 1 | | | | | 4 | | | | 4 | | |
| Vagina | | | | | | | | | | | | | | | | | | | | | | | | | + |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------------------|
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| 10 mg/m3 | 0
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3
2 |
| ANIMAL ID | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |

MUSCULOSKELETAL SYSTEM

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

NERVOUS SYSTEM

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

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Metaplasia, Squamous | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Inflammation, Lymphohistiocytic | | 1 | | | | | | | | 1 | 1 | | | | | 1 | 1 | | | | 1 | 1 | | | |
| Alveolar Epithelium, Hyperplasia | | 1 | | | | | | | | | | | | | | 4 | | | | | 1 | | | | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Glands, Olfactory Epithelium, Hyperplasia | | 1 | 2 | | 1 | | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | | | 2 | 3 | | | 2 | |
| Goblet Cell, Hyperplasia | 1 | | | | 1 | | | | | 1 | 1 | 1 | 1 | | 1 | 1 | | | 1 | 1 | | | | | |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 4 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 1 | 3 |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | 1 | 1 | | | | | | 1 | | 1 | 1 | 1 | | 1 | 1 | 1 | | 1 | | 1 | | | | 1 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE
10 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | | |
|------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|------------------|-----------------------|------------------|
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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
3
0 | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 1
2
3
4
5 | |

Trachea +

SPECIAL SENSES SYSTEM

Eye +
 Retina, Atrophy 2
 Harderian Gland +
 Hyperplasia 1 1

URINARY SYSTEM

Kidney +
 Cyst 4
 Hydronephrosis 3
 Inflammation, Suppurative 2
 Mineralization 2
 Nephropathy 1 3 1 1 1 1 2 1
 Transitional Epithelium, Hyperplasia 1
 Urinary Bladder +

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically M .. Missing tissue 1-4 .. Lesion qualified as:
 X .. Lesion present A .. Autolysis precludes evaluation 1) Minimal 3) Moderate
 I .. Insufficient tissue BLANK .. Not examined microscopically 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|------|
| | 0732 | 0732 | 0672 | 0763 | 0763 | 0773 | 0773 | 0773 | 0653 | 0573 | 0773 | 0773 | 0663 | 0553 | 0663 | 0773 | 0553 | 0773 | 0773 | 0773 | | 0773 | 0773 |
| 10 mg/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 |
| ANIMAL ID | 00326 | 00327 | 00328 | 00329 | 00330 | 00331 | 00332 | 00333 | 00334 | 00335 | 00336 | 00337 | 00338 | 00339 | 00340 | 00341 | 00342 | 00343 | 00344 | 00345 | 00346 | 00347 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Angiectasis | | 1 | | | | | | | | | | | | | | | | | | | | | | 5 1.2 |
| Basophilic Focus | X | | X | X | | | X | X | X | | X | X | | X | X | | X | X | X | X | | | | 33 |
| Clear Cell Focus | | | | | | | | | | | | | | | | | | | | | | | | 6 |
| Fatty Change | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Bile Duct, Cyst | | | | | | | | | | | | | | | X | | | | | | | | | 1 |
| Bile Duct, Cyst, Multiple | X | | | | | | X | | X | | | | | | | | | | | | | | | 4 |
| Bile Duct, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | 2 1.0 |
| Mesentery | | | | | + | | | | | + | | + | | | | | | | | | | | | 8 |
| Fat, Necrosis | | | | | 2 | | | | | 2 | | 2 | | | | | | | | | | | | 8 2.3 |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Atrophy | | | | | | | | | | | | | | | 1 | | | | | | 1 | 1 | | 4 1.0 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE
10 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|--------------------------|
| | 0732 | 0732 | 0672 | 0763 | 0673 | 0773 | 0773 | 0676 | 0575 | 0777 | 0777 | 0777 | 0666 | 0565 | 0666 | 0777 | 0575 | 0777 | 0777 | 0777 | | 0777 | 0777 |
| ANIMAL ID | 0032 | 0033 | 0002 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | |
| Basophilic Focus | | | X | | | | | | | | | | | | | | | | | | | | 1 |
| Salivary Glands
Basophilic Focus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 |
| Stomach, Forestomach
Inflammation, Chronic Active
Ulcer | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 4.0
1 4.0 |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | |
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Heart
Cardiomyopathy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
17 1.1 |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex
Angiectasis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 2.0 |
| Degeneration, Cystic
Hyperplasia | | 1 | 2 | 3 | | 2 | 2 | | 2 | | | | 1 | | 2 | 1 | 3 | 4 | 2 | | 2 | 1 3 | 23 2.1
20 2.0 |
| Hypertrophy
Metaplasia, Osseous
Necrosis | | | 2 | 2 | | 2 | 2 | | 2 | 2 | | | | | 2 | | 2 | | | | 2 | 2 2 | 20 2.1
1 3.0
1 2.0 |
| Adrenal Medulla
Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
2 2.0 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE

10 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|--------------|------|
| | 0732 | 0732 | 0672 | 0732 | 0673 | 0771 | 0771 | 0771 | 0663 | 0573 | 0773 | 0773 | 0773 | 0665 | 0563 | 0668 | 0668 | 0734 | 0754 | 0773 | | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 |
| ANIMAL ID | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | 00326 | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Parathyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | 44 | |
| Pituitary Gland
Pars Distalis, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
11 2.0 | |
| Thyroid Gland
C-cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
44 1.8 | |
| GENERAL BODY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NONE | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GENITAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Clitoral Gland
Inflammation, Chronic Active | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 46
4 3.0 | |
| Ovary
Cyst | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
9 2.9 | |
| Uterus
Endometrium, Hyperplasia, Cystic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
4 3.0 | |
| Vagina | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE

10 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|--|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|---------------------|-------------------------------|
| | 0732 | 0732 | 0672 | 0732 | 0673 | 0773 | 0773 | 0736 | 0776 | 0553 | 0773 | 0773 | 0666 | 0556 | 0666 | 0777 | 0557 | 0777 | 0777 | 0777 | | 0777 | |
| ANIMAL ID | 0032 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | | |
| Lymph Node
Lumbar, Ectasia
Lumbar, Hemorrhage | | | | | | | | | | | | | | | | | | | | | | 2
1 2.0
1 3.0 | |
| Lymph Node, Bronchial | + | M | + | M | + | + | M | + | M | + | + | M | + | + | + | + | + | M | + | M | + | M | 35 |
| Lymph Node, Mandibular
Ectasia | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47
1 3.0 |
| Lymph Node, Mediastinal | + | + | + | + | + | + | + | + | + | + | M | M | + | + | + | + | + | + | + | + | M | + | 46 |
| Lymph Node, Mesenteric
Ectasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 2.0 |
| Spleen
Hematopoietic Cell Proliferation | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
2 3.5 |
| Thymus
Hyperplasia, Tubular | + | + | + | + | + | + | + | + | + | + | + | M | M | + | + | + | + | + | + | + | + | + | 48
1 2.0 |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland
Galactocele | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 2.0 |
| Skin
Inflammation, Chronic Active
Subcutaneous Tissue, Hemorrhage
Subcutaneous Tissue, Necrosis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
4 3.3
1 1.0
1 3.0 |

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|---|---|---|---|---|---|---|---|--|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| DAY ON TEST | 7 | 7 | 6 | 7 | 6 | 7 | 7 | 7 | 6 | 5 | 7 | 7 | 7 | 6 | 5 | 6 | 6 | 7 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | |
| WISTAR HAN RATS FEMALE | 3 | 3 | 2 | 3 | 0 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 8 | 8 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | |
| 10 mg/m3 | 2 | 2 | 7 | 2 | 3 | 1 | 9 | 1 | 3 | 0 | 2 | 1 | 1 | 3 | 0 | 1 | 4 | 2 | 4 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | |
| 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 | 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 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | |
| | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | | | | |
| | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | | | | | |

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | |

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Peripheral Nerve | | | | + | | | | | | + | | | | | | + | + | + | | | | | | | | | | | 9 | | | | | | | |
| Spinal Cord | | | | + | | | | | | + | | | | | | + | + | + | | | | | | | | | | | 9 | | | | | | | |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------|---|---|--------|---|--------|---|---|---|--------|----|--------|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Metaplasia, Squamous | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 50 1.7 |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Inflammation, Lymphohistiocytic | | | 1 | 1 | | | | | | 1 | 1 | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | 20 1.0 | | |
| Alveolar Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | 3 2.0 | | | | | | | | | | | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Glands, Olfactory Epithelium, Hyperplasia | | | | | 2 | | | 2 | 1 | 2 | | | 1 | | | 2 | | | 1 | 1 | 1 | 1 | 2 | | | | | | 32 1.6 | | | | | | | | |
| Goblet Cell, Hyperplasia | 1 | | | | 1 | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | 1 | 1 | 1 | | | | | | 25 1.0 | | | | | | | | |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 4 | 3 | 4 | 2 | 3 | 3 | 3 | 4 | 2 | 2 | 2 | 4 | 2 | 2 | 3 | 3 | 2 | 2 | | | | | | 50 2.6 | | | | | | |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | 1 | | | | | | 1 | | | 2 | 1 | 2 | | | | | | 1 | 1 | 1 | | | | | | 1 | 1 | 1 | 1 | | | | | | 24 1.1 | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|------|
| | 0732 | 0732 | 0672 | 0773 | 0673 | 0773 | 0773 | 0673 | 0573 | 0773 | 0773 | 0673 | 0573 | 0673 | 0673 | 0773 | 0573 | 0773 | 0773 | 0773 | | 0773 | 0773 |
| 10 mg/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 |
| ANIMAL ID | 0032 | 0032 | 0032 | 0032 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0034 | 0034 | 0034 | 0034 | 0034 | 0034 | 0034 | 0034 | 50 |

Trachea + 50

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-------|
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Retina, Atrophy | | | | | | | | | | | 2 | | | | | 2 | | | | 2 | | | | 4 2.0 |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Hyperplasia | | | | | | | | | | 1 | | | | | | | | | | | | | | 3 1.0 |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|--------|
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Cyst | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| Hydronephrosis | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Inflammation, Suppurative | | | 1 | | | | | | | | | | | | | | | | | | | | | 2 1.5 |
| Mineralization | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Nephropathy | 1 | | 1 | 1 | | | | 1 | | | | | | | | 1 | | 1 | | | | | | 16 1.2 |
| Transitional Epithelium, Hyperplasia | | | | 1 | | | | | | | | | | | | | | | | | 1 | | | 3 1.0 |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |

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 + .. Tissue examined microscopically
 X .. Lesion present
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Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
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P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
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Date Report Requested: 05/08/2013
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 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | |
|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | 0
7
3
2 | 0
6
7
3 | 0
7
0
8 | 0
6
9
0 | 0
7
3
2 | 0
7
3
1 | 0
6
6
0 | 0
7
3
2 | 0
7
3
1 | 0
7
3
2 | 0
7
3
2 | 0
6
8
3 | 0
7
3
1 | 0
7
3
1 | 0
5
9
8 | 0
7
3
3 | 0
7
3
1 | 0
6
4
2 | 0
7
3
3 | 0
7
3
1 | | | 0
7
1
9 |
| 30 mg/m3 | 0
0
5
0
1 | 0
0
5
0
2 | 0
0
5
0
3 | 0
0
5
0
4 | 0
0
5
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2
0 | 0
0
5
2
1 | 0
0
5
2
2 | 0
0
5
2
3 | 0
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2
4 | 0
0
5
2
5 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | I | + | + | + | + | + | + | + | + | + | + | + | I | + | + |
| Intestine Small, Duodenum
Muscularis, Hypertrophy, Focal | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Angiectasis | | | | | | | | | | | 2 | 2 | | | | 2 | | | | | | | | 1 |
| Basophilic Focus | | X | X | X | X | | X | X | X | | | | | X | X | X | X | X | | | | X | | X |
| Clear Cell Focus | | | | X | X | | | | | X | X | | X | X | | | | X | | | | | | X |
| Eosinophilic Focus | | | | | | | | | | | | | | | | | | | | | X | | | |
| Fatty Change | | | | | | | 1 | | | | | | | | | | 2 | | | | | | | |
| Hepatodiaphragmatic Nodule | | | | | | | | | | | | X | | | | | | | | | | | | |
| Necrosis | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| Bile Duct, Cyst, Multiple | | | | | | | | | | X | | | | | | | | | | | | | | |
| Bile Duct, Dilatation | 4 | | | | | | | | | | | 4 | | | | | | | | | | | | |
| Bile Duct, Hyperplasia | | | | | | | | | | | | | | 2 | | | | | | | | 2 | | |
| Mesentery | | | | | + | | | | | | + | | | | + | | | | | | + | | | + |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|----------------------|
| | 0732 | 0733 | 0738 | 0709 | 0733 | 0731 | 0700 | 0700 | 0700 | 0700 | 0700 | 0700 | 0700 | 0700 | 0700 | 0700 | 0700 | 0700 | 0700 | 0700 | 0700 | 0700 | 0700 | 0700 | | |
| 30 mg/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 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 | 5 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fat, Necrosis | 2 | | | | 2 | | | | 2 | | | | 2 | | | | 2 | | | | | | | |
| Pancreas Atrophy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Forestomach Inflammation, Acute | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Forestomach Inflammation, Chronic Active | | | | | | | | | | | | 3 | | | | | | | | 2 | | | | |
| Stomach, Forestomach Ulcer | | | | | | | | | | | | | | | | | | | | 3 | | | | |
| Stomach, Glandular Mineralization | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Heart Cardiomyopathy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | | 1 | | | | 1 | | | | 1 | | | | 1 | | | | | | | |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Adrenal Cortex Angiectasis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Adrenal Cortex Degeneration, Cystic | | | | | 1 | | | | 3 | | | | 1 | | | | 2 | | | | | | | |
| Adrenal Cortex Hyperplasia | 3 | | | | 2 | | 2 | | 2 | | 2 | | 2 | | 2 | | 2 | | 2 | | 2 | | 2 | |
| Adrenal Cortex Hypertrophy | 2 | | 2 | | 2 | | 2 | | | | 2 | | 1 | | 2 | | 2 | | | | 2 | | 2 | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE
30 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
|------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------|
| | 0732 | 0673 | 0708 | 0693 | 0733 | 0771 | 0660 | 0772 | 0777 | 0777 | 0777 | 0777 | 0666 | 0777 | 0777 | 0558 | 0773 | 0773 | 0664 | 0773 | 0773 | 0773 | 0771 | 0773 | | |
| ANIMAL ID | 00501 | 00502 | 00503 | 00504 | 00505 | 00506 | 00507 | 00508 | 00509 | 00510 | 00511 | 00512 | 00513 | 00514 | 00515 | 00516 | 00517 | 00518 | 00519 | 00520 | 00521 | 00522 | 00523 | 00524 | 00525 | |
| Endometrium, Hyperplasia, Cystic | | | | | | | 2 | 2 | | | | | | | | | | | | | | | | | 3 | |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node
Lumbar, Hyperplasia, Lymphoid | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Bronchial
Hyperplasia, Lymphohistiocytic | + | + | + | M | + | M | M | M | M | M | + | + | + | + | + | + | + | + | + | + | M | + | M | + | |
| Lymph Node, Mandibular | + | + | + | + | + | + | + | M | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node, Mediastinal
Hemorrhage
Hyperplasia, Lymphohistiocytic | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Spleen
Hematopoietic Cell Proliferation | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Thymus
Cyst | + | + | + | + | I | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland
Galactoceles | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|-------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE
30 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | | | | | | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|------------------|---|---|---|---|---|--|
| | 0
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1 | 0
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3
3 | 0
7
3
1 | 0
7
3
1 | 0
7
1
9 | | | 0
7
3
2 | | | | | | |
| Skin Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 4 | 3 | 3 | 4 | | | | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | | | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | | | |
| Peripheral Nerve | | | | + | | | | | | | | | | | | | | | + | | | | + | | | | | | | | | |
| Spinal Cord | | | | + | | | | | | | | | | | | | | | + | | | | + | | | | | | | | | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Larynx Metaplasia, Squamous | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 3 | 3 | 3 | 3 | |
| Lung Inflammation, Lymphohistiocytic Alveolar Epithelium, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 1 | 1 | 1 | 3 | |
| Nose Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 1 | | | | |
| Glands, Olfactory Epithelium, Hyperplasia | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 1 | | | | | 2 | 3 | 2 | | | | |
| Goblet Cell, Hyperplasia | 1 | 1 | 2 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | | 1 | | 1 | | | | | | | | | 1 | 1 | | | | |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | 3 | 2 | 1 | 3 | 3 | 2 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 1 | 3 | 4 | 3 | 2 | 3 | 4 | 4 | 4 | 4 | 4 | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------|
| | 0732 | 0733 | 0738 | 0739 | 0733 | 0736 | 0732 | 0731 | 0733 | 0732 | 0732 | 0733 | 0733 | 0738 | 0733 | 0733 | 0739 | 0733 | 0731 | 0732 | 0733 | 0733 | 0731 | 0739 | |
| 30 mg/m3 | 00501 | 00502 | 00503 | 00504 | 00505 | 00506 | 00507 | 00508 | 00509 | 00510 | 00511 | 00512 | 00513 | 00514 | 00515 | 00516 | 00517 | 00518 | 00519 | 00520 | 00521 | 00522 | 00523 | 00524 | 00525 |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | | | | | 1 | 1 | 1 | | 1 | 1 | 1 | | | | 1 | | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Cataract | | | | | | | | | | | | | | | | | | | | | | | 4 | | |
| Retina, Atrophy | | | | | | | | | | | | | | | | | | | | | | | | | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Hyperplasia | | | | 1 | | | | | | | | | | | 2 | | | | | | | | | | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Cyst | | | | | | | | | | | | 2 | | | | | | | | | | | | | |
| Nephropathy | | | 1 | 1 | | | | 1 | 1 | | 2 | | | 1 | | 1 | | | | | 2 | 2 | | | |
| Transitional Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |

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

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Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| DAY ON TEST | WISTAR HAN RATS FEMALE | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|-------------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|
| | 0732 | 0732 | 0733 | 0731 | 0735 | 0733 | 0731 | 0733 | 0732 | 0733 | 0731 | 0733 | 0732 | 0733 | 0731 | 0733 | 0732 | 0733 | 0731 | 0733 | | 0732 | 0733 | | |
| ANIMAL ID | 00526 | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546 | 00547 | 00548 | 00549 | 00550 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-----|-----|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Intestine Large, Rectum | + | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 | | |
| Intestine Small, Duodenum
Muscularis, Hypertrophy, Focal | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 | 2.0 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Intestine Small, Jejunum
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 | 2.0 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Angiectasis | | | | | | | | | | | | | | | | | | | | | | | | | | 5 | 1.8 | |
| Basophilic Focus | X | X | X | X | X | | X | | X | X | X | X | | | X | X | | X | X | | X | X | X | X | | 35 | | |
| Clear Cell Focus | | | X | X | | | | | | X | X | | | | X | X | | X | | | | X | | | | 17 | | |
| Eosinophilic Focus | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Fatty Change | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | 1.5 | |
| Hepatodiaphragmatic Nodule | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1.0 | |
| Bile Duct, Cyst, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Bile Duct, Dilatation | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | 4.0 | |
| Bile Duct, Hyperplasia | | | | | | | | | | | | | | | | 2 | | | | | | | | | | 3 | 2.0 | |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | | | | | | 8 | |

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|----------------|----|--------|
| | 0732 | 0732 | 0733 | 0733 | 0735 | 0738 | 0738 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | 0739 | | 0739 | 0739 | | |
| 30 mg/m3 | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | |
| | 00526 | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546 | 00547 | | | |
| Fat, Necrosis | | | | | | | | | | | | | | | | | | | | | | | 8 2.0 | | |
| Pancreas Atrophy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
2 1.5 | | |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Stomach, Forestomach Inflammation, Acute | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Stomach, Forestomach Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | 3 | | |
| Stomach, Forestomach Ulcer | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | | |
| Stomach, Glandular Mineralization | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
2 | | |
| | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | | |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Heart Cardiomyopathy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1
1 1 | | |
| | | | | | | | | | | | | | | | | | | | | | | | 16 1.1 | | |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex Angiectasis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Adrenal Cortex Degeneration, Cystic | 2 | 1 | 4 | 3 | 4 | | 3 | | | | 2 | 1 | 3 | 2 | 3 | 2 | 1 | | 2 | 2 | | 2 | 3 | 3 | 29 2.3 |
| Adrenal Cortex Hyperplasia | 2 | 2 | 2 | | | 2 | 2 | | 2 | 2 | | | | 2 | | | | 3 | 2 | 2 | | 2 | 2 | 2 | 27 2.1 |
| Adrenal Cortex Hypertrophy | | 1 | 2 | 3 | | | 2 | | | | 2 | | | | | 2 | 2 | 2 | 2 | 2 | | 2 | 2 | 2 | 24 2.0 |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE
30 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-----------------|--------------|
| | 0732 | 0732 | 0733 | 0733 | 0735 | 0736 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | | 0738 | 0738 | | | |
| ANIMAL ID | 00526 | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546 | 00547 | 00548 | 00549 | 00550 | |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Islets, Pancreatic Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 2.0 |
| Parathyroid Gland | + | + | + | + | + | + | + | + | + | M | + | M | + | + | M | + | + | + | + | + | M | + | M | + | + | 40 |
| Pituitary Gland Pars Distalis, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
10 2.4 |
| Thyroid Gland C-cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Follicular Cell, Hyperplasia | 2 | 1 | 4 | 2 | | 4 | 3 | | 2 | 2 | 2 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | | 2 | 2 | 4 | 4 | | 43 2.3
1 1.0 | |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------------|
| Clitoral Gland Inflammation, Chronic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 3.0 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | 3
1 3.0 |
| Ovary Cyst | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
5 2.2 |
| Uterus Adenomyosis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 3.0 |
| Cervix, Cyst, Squamous | | | | | | | | | | | | | | | | | | | | | | | | | | 3
1 3.0 |
| Cervix, Hypertrophy | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------|----|-----|-----|
| | 0732 | 0732 | 0733 | 0733 | 0735 | 0736 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | 0738 | | 0738 | | | |
| 30 mg/m3 | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 00526 | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546 | 00547 | 00548 | 00549 | 00550 | | | | |
| Skin Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 5 | 3.6 | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Peripheral Nerve | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 | | |
| Spinal Cord | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 | | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Larynx Metaplasia, Squamous | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 50 | 2.5 |
| Lung Inflammation, Lymphohistiocytic Alveolar Epithelium, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 42 | 1.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 3.0 |
| Nose Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 | 1.0 |
| Glands, Olfactory Epithelium, Hyperplasia | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 2 | | | 48 | 2.0 | |
| Goblet Cell, Hyperplasia | | 1 | | | 2 | 1 | 2 | | 1 | 1 | | 1 | 1 | 2 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | | 34 | 1.1 | |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | 3 | 4 | 4 | 3 | 2 | 2 | 3 | 4 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 4 | 3 | 3 | 2 | 4 | 3 | 4 | 3 | 3 | 3 | | | 50 | 2.9 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------|---|---------------|---------------|
| | 0732 | 0733 | 0734 | 0735 | 0736 | 0737 | 0738 | 0739 | 0740 | 0741 | 0742 | 0743 | 0744 | 0745 | 0746 | 0747 | 0748 | 0749 | 0750 | 0751 | | 0752 | | | |
| 30 mg/m3 | 00526 | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546 | | | | |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | 1 | | | 3 | 1 | 1 | 1 | 1 | | | | 1 | 1 | | | 1 | 1 | | 1 | 1 | 2 | 1 | 1 | 1 | 31 1.1 |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Cataract | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| Retina, Atrophy | | | | | | 2 | | | | | | 2 | | | | 3 | | | | | 2 | | | | 4 2.3 |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hyperplasia | | 2 | | 1 | | | | | | | | | | | | | | | | | 1 | | | | 5 1.4 |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Cyst | | | | | | | | | | | | | | | | | | | | | | | | 2 | 2 2.0 |
| Nephropathy | 1 | | 1 | 1 | 1 | | | | 1 | | | | | | 1 | | 1 | | | 1 | | | 1 | 19 1.2 | |
| Transitional Epithelium, Hyperplasia | | | | | | | | | | | | 1 | | | | | | | | | | | | 1 | 1 1.0 |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) | |
|------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------------------|--|
| | 0715 | 0713 | 0703 | 0633 | 0673 | 0672 | 0663 | 0573 | 0577 | 0577 | 0577 | 0567 | 0577 | 0567 | 0577 | 0567 | 0577 | 0572 | 0573 | 0563 | 0577 | 0556 | 0566 | 0566 | | |
| 100 mg/m3 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | | |
| ANIMAL ID | 7701 | 7702 | 7703 | 7704 | 7705 | 7706 | 7707 | 7708 | 7709 | 7710 | 7711 | 7712 | 7713 | 7714 | 7715 | 7716 | 7717 | 7718 | 7719 | 7720 | 7721 | 7722 | 7723 | 7724 | 7725 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | |
| Intestine Large, Rectum | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | A | + | + | + | + | |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Angiectasis | | | | | | | | | | | | | | | | | | | | 2 | | | | | |
| Basophilic Focus | | X | | X | X | X | | X | X | | X | X | | | | | | | X | X | X | X | X | X | |
| Clear Cell Focus | X | X | | | | | | X | X | | X | | | | | | | | X | | X | | | | |
| Degeneration, Cystic | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eosinophilic Focus | | | | | | | | | | | X | | | | | | | | | | | | | | |
| Fatty Change | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bile Duct, Cyst | | | | | | | | X | | | | | | | | | | | | | | | | | |
| Bile Duct, Cyst, Multiple | | | | | | | | | | | | | X | | | | | | | | | X | | | |
| Bile Duct, Dilatation | | | | | | | | | | | | | 4 | | | | | | | | | | | | |
| Bile Duct, Hyperplasia | | | | | | | | | 1 | | | | | | 2 | | 1 | | | | | | | | |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Chronic Active | | | | | + | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE
100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | | |
|-------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|------------------|-----------------------|------------------|
| | 0
7
1
5 | 0
7
3
1 | 0
7
0
3 | 0
6
3
3 | 0
7
3
2 | 0
7
3
2 | 0
6
6
3 | 0
5
2
3 | 0
7
7
3 | 0
7
1
7 | 0
7
0
3 | 0
7
3
3 | 0
6
3
5 | 0
7
6
1 | 0
7
3
2 | 0
7
7
3 | 0
6
3
5 | 0
7
2
3 | 0
7
3
3 | 0
6
3
0 | | | 0
7
5
6 | 0
6
7
0 | 0
6
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
7
0
1 | |

Fat, Necrosis

2

Oral Mucosa

Developmental Malformation
 Inflammation, Chronic Active

+
X
4

Pancreas

Atrophy

+
 1 1 1 3

Salivary Glands

+ +

Stomach, Forestomach

Ulcer

+
 3

Stomach, Glandular

Inflammation, Chronic Active

+
 2

CARDIOVASCULAR SYSTEM

Blood Vessel

+ +

Heart

Cardiomyopathy
 Mineralization

+
 1 2 2 1 1

ENDOCRINE SYSTEM

Adrenal Cortex

Angiectasis
 Degeneration, Cystic
 Hyperplasia

+
 2
 1 3 2 2 1 2 3 1 2 2 2 2 2 2 2 3 1 2
 2 2 2 2 2

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
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Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE

100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|---|-----------|----------------------|
| | 0
7
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1 | 0
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3 | 0
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2 | 0
6
6
3 | 0
5
2
3 | 0
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7 | 0
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3 | 0
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3 | 0
6
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7
3
5 | 0
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3 | 0
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5 | 0
7
3
3 | 0
6
3
0 | 0
7
3
1 | 0
5
8
6 | 0
6
7
0 | 0
6
3
3 | | | |
| Hypertrophy | 2 | | | 2 | | | | | 2 | 2 | 2 | | | 2 | | | | | | 3 | 2 | 2 | | | | | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Islets, Pancreatic
Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Parathyroid Gland | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | M | + | + | + | + | + | + | | |
| Pituitary Gland
Pars Distalis, Hyperplasia
Pars Intermedia, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Thyroid Gland
C-cell, Hyperplasia
Follicular Cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | | |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clitoral Gland
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Ovary
Cyst
Interstitial Cell, Hyperplasia | + | + | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Uterus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
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| WISTAR HAN RATS FEMALE
100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | |
|-------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|-----------------------|----------------------|
| | 0
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3
3 | 0
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0 | 0
6
3
1 | 0
5
8
6 | | | 0
6
7
0 | 0
6
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
7
0
1 | females
(cont...) |

Cervix, Hypertrophy
 Endometrium, Hyperplasia, Cystic

4 1 3

Vagina

HEMATOPOIETIC SYSTEM

Bone Marrow

+ +

Lymph Node, Bronchial
 Hyperplasia, Lymphohistiocytic

M + M M + M M + + + + + + M M M + + + + + M + + +
 1 2 1 2 1 3 1 1 1 1 4 1 3 1 1

Lymph Node, Mandibular
 Ectasia

+
 2 3

Lymph Node, Mediastinal
 Hyperplasia, Lymphohistiocytic
 Hyperplasia, Lymphoid

+ + + + + + + + + + M + + + + + + + + + + + M +
 1 1 2 1 2 2 2 3

Lymph Node, Mesenteric
 Ectasia

+ +

Spleen
 Hematopoietic Cell Proliferation

+
 4

Thymus

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

INTEGUMENTARY SYSTEM

Mammary Gland
 Galactocele

+
 4

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 Lab: BNW

| WISTAR HAN RATS FEMALE
100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|---|-----------------------|----------------------|
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5
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3 | 0
6
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1 | 0
7
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3 | 0
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5 | 0
7
2
3 | 0
7
3
3 | 0
6
3
0 | 0
7
3
1 | 0
5
8
6 | 0
6
7
0 | 0
6
3
9 | | | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 0
0
7
0
1 | females
(cont...) |
| Inflammation, Acute | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Glands, Olfactory Epithelium, Hyperplasia | 2 | | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | | |
| Goblet Cell, Hyperplasia | 1 | 1 | 1 | | 1 | 1 | 1 | 2 | | 1 | 1 | 2 | | 1 | 1 | 1 | 1 | 2 | | 2 | 1 | 1 | 1 | 1 | 2 | | |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 3 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 4 | | |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | | | 1 | | 1 | 1 | 1 | 1 | | | 3 | 1 | 1 | | 1 | 1 | 1 | | | 1 | 1 | 1 | 1 | 2 | | | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Cornea, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Retina, Atrophy | | | | | | | | | | | | | | | | | | | | | | | | | | 4 | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Zymbal's Gland | | | | | | | | | | | | | | | | | | | | | | | | | | + | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Hydronephrosis | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mineralization | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nephropathy | 1 | 2 | | | | | 4 | | | 2 | | | 1 | | | 1 | | | 1 | | | 1 | | 1 | | | |
| Renal Tubule, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
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 CAS Number: CIMSTAR3800

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 Lab: BNW

| Wistar Han Rats Female | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) | |
|------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|--|
| | 100 mg/m3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 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 | | |
| | 7 | 7 | 7 | 6 | 7 | 7 | 6 | 5 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 6 | 7 | 7 | 7 | 6 | 7 | 5 | 6 | 6 | | |
| | 1 | 3 | 0 | 3 | 3 | 3 | 6 | 2 | 1 | 0 | 3 | 3 | 3 | 3 | 9 | 3 | 3 | 2 | 3 | 3 | 3 | 8 | 7 | 3 | | |
| | 5 | 1 | 3 | 3 | 2 | 2 | 3 | 3 | 7 | 3 | 3 | 1 | 5 | 1 | 2 | 1 | 2 | 3 | 5 | 3 | 0 | 1 | 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 | 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 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |

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| WISTAR HAN RATS FEMALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| | 0732 | 0733 | 0730 | 0732 | 0738 | 0736 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | |
| 100 mg/m3 | 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 |
| ANIMAL ID | 00726 | 00707 | 00708 | 00709 | 00710 | 00711 | 00712 | 00713 | 00714 | 00715 | 00716 | 00717 | 00718 | 00719 | 00720 | 00721 | 00722 | 00723 | 00724 | 00725 | 00726 | 00727 | 00728 | 00729 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-----|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 46 | |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Angiectasis | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2.0 |
| Basophilic Focus | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | 32 | |
| Clear Cell Focus | | | | X | | X | X | | | X | | | X | | | | | | | | | X | X | X | 14 | |
| Degeneration, Cystic | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2.0 |
| Eosinophilic Focus | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Fatty Change | | | | | | | 2 | | | | | | | | | | | | | | | | | | 1 | 2.0 |
| Bile Duct, Cyst | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Bile Duct, Cyst, Multiple | | | | | | | | | | | | | | | | | | | | | | X | | | 3 | |
| Bile Duct, Dilatation | | | | | | | | | | | | | | | | | | | | | | | | | 3 | 3.7 |
| Bile Duct, Hyperplasia | | | | | | | | 1 | | | | | | | | | | | | | | | | | 6 | 1.3 |
| Mesentery | | | | | | | + | | + | | | | | | | | | | | | | | | | 5 | |
| Inflammation, Chronic Active | | | | | | | 2 | | | | | | | | | | | | | | | | | | 1 | 2.0 |

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|-------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---|----------|
| | 0732 | 0733 | 0730 | 0732 | 0738 | 0736 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | |
| ANIMAL ID | 00726 | 00707 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | |
| Fat, Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 4 2.0 |
| Oral Mucosa | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Developmental Malformation | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | | | 2 | 5 1.6 |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Ulcer | | | | | | | | | | | | | | | | | | | | | | | | 3 | 2 3.0 |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2.0 |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blood Vessel | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Cardiomyopathy | | | | | | | | | | | | | | | | | | | | | | | | 1 2 1 1 1 | 14 1.1 |
| Mineralization | | | | | | | | | | | | | | | | | | | | | | | | 1 1 1 | 1 2.0 |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Angiectasis | | | | | | | | | | | | | | | | | | | | | | | | 2 | 2 2.0 |
| Degeneration, Cystic | | | | | | | | | | | | | | | | | | | | | | | | 3 4 2 2 3 2 1 | 35 2.1 |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | 2 | 22 2.0 |

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100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
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| | 0732 | 0733 | 0730 | 0732 | 0735 | 0736 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | 0737 | | |
| ANIMAL ID | 00726 | 00707 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | |
| Hypertrophy | | | | | | | | | | | | | | | | | | | | | | | | | 21 2.1 | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Islets, Pancreatic
Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 3.0 | |
| Parathyroid Gland | + | + | + | + | M | + | M | + | + | M | + | + | + | M | + | + | + | + | + | + | + | + | I | + | 42 | |
| Pituitary Gland
Pars Distalis, Hyperplasia
Pars Intermedia, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
9 2.1
1 2.0 | |
| Thyroid Gland
C-cell, Hyperplasia
Follicular Cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49
35 1.5
1 2.0 | |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------------|
| Clitoral Gland
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49
1 4.0 |
| Ovary
Cyst
Interstitial Cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
11 2.1
1 3.0 |
| Uterus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE
100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|---|---|----|-----|-----|
| | 0
7
3
2 | 0
7
3
3 | 0
7
3
0 | 0
7
2
5 | 0
6
8
1 | 0
6
7
3 | 0
7
3
1 | 0
7
3
2 | 0
7
3
3 | 0
7
3
3 | 0
7
3
3 | 0
7
3
2 | 0
7
3
3 | 0
6
4
5 | 0
7
3
1 | 0
7
1
9 | 0
7
3
1 | 0
7
3
1 | 0
7
3
3 | 0
7
3
1 | | 0
7
3
2 | 0
7
3
2 | | | | | | | |
| ANIMAL ID | 0
0
7
2
6 | 0
0
7
2
7 | 0
0
7
2
8 | 0
0
7
2
9 | 0
0
7
3
0 | 0
0
7
3
1 | 0
0
7
3
2 | 0
0
7
3
3 | 0
0
7
3
4 | 0
0
7
3
5 | 0
0
7
3
6 | 0
0
7
3
7 | 0
0
7
3
8 | 0
0
7
3
9 | 0
0
7
4
0 | 0
0
7
4
1 | 0
0
7
4
2 | 0
0
7
4
3 | 0
0
7
4
4 | 0
0
7
4
5 | 0
0
7
4
6 | 0
0
7
4
7 | 0
0
7
4
8 | 0
0
7
4
9 | 0
0
7
5
0 | | | | | |
| Cervix, Hypertrophy | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | 1 | 2.0 | |
| Endometrium, Hyperplasia, Cystic | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | 5 | 2.4 |
| Vagina | | | | | | | | | | | | | | | | | | | | | | | | | | | | + | 1 | |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Lymph Node, Bronchial
Hyperplasia, Lymphohistiocytic | + | + | + | + | M | + | + | + | M | + | + | + | M | + | M | + | M | + | + | M | + | + | + | + | + | + | + | 35 | 30 | 1.6 |
| Lymph Node, Mandibular
Ectasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | 49 | 2 | 2.5 |
| Lymph Node, Mediastinal
Hyperplasia, Lymphohistiocytic
Hyperplasia, Lymphoid | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 | 23 | 1.7 |
| Lymph Node, Mesenteric
Ectasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 | 2.0 |
| Spleen
Hematopoietic Cell Proliferation | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 | 4.0 |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 45 | | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland
Galactocele | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 | 4.0 |

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

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE
100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-----|-----|-----|
| | 0732 | 0733 | 0730 | 0735 | 0761 | 0763 | 0771 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | | | | |
| ANIMAL ID | 00726 | 00707 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | | | | |
| Hyperplasia
Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | 2 | 2 | 1 | 2.0 |
| Skin
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 4 | 2.8 | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain
Meninges, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 | 1.0 | |
| Peripheral Nerve | | | | | | | | | | | | | | | | | | | | | | | | | 6 | | | |
| Spinal Cord | | | | | | | | | | | | | | | | | | | | | | | | | 6 | | | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Larynx
Foreign Body
Inflammation, Acute
Metaplasia, Squamous | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 | 4 | 1.0 |
| Lung
Inflammation, Lymphohistiocytic
Alveolar Epithelium, Hyperplasia
Bronchus-associated Lymphoid Tissue,
Hyperplasia, Lymphohistiocytic | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 3 | 50 | 7 | 2.1 | | |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 50 | 5 | 1.0 | |
| | | | | | | 1 | | | | | | | | | | | 4 | | | | | 1 | 2 | | | | | |
| | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
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Experiment Number: 20515 - 03
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Metal working fluids (CIMSTAR 3800)
 CAS Number: CIMSTAR3800

Date Report Requested: 05/08/2013
 Time Report Requested: 08:51:01
 First Dose M/F: 04/14/08 / 04/14/08
 Lab: BNW

| WISTAR HAN RATS FEMALE
100 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|
| | 07326 | 07330 | 07334 | 07338 | 07342 | 07346 | 07350 | 07354 | 07358 | 07362 | 07366 | 07370 | 07374 | 07378 | 07382 | 07386 | 07390 | 07394 | 07398 | 07402 | 07406 | 07410 | 07414 | 07418 | |
| ANIMAL ID | 007226 | 007227 | 007228 | 007229 | 007230 | 007231 | 007232 | 007233 | 007234 | 007235 | 007236 | 007237 | 007238 | 007239 | 007240 | 007241 | 007242 | 007243 | 007244 | 007245 | 007246 | 007247 | 007248 | 007249 | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Inflammation, Acute | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 | |
| Glands, Olfactory Epithelium, Hyperplasia | 3 | 3 | 3 | 2 | 1 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 1 | 49 2.6 | |
| Goblet Cell, Hyperplasia | | 1 | 1 | | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | | 1 | 1 | 1 | | 1 | 1 | 1 | 42 1.2 | |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 50 3.5 | |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | | 1 | 2 | | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | | 1 | | | 1 | 1 | 1 | | 1 | 1 | 1 | 34 1.2 | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Cornea, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 | |
| Retina, Atrophy | | | | | | | | 3 | | | | | | | | | | | 2 | | | | | 2 2.5 | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Hyperplasia | | | | 2 | | 1 | | 1 | | | | | | | | | | | | | | 1 | | 4 1.3 | |
| Zymbal's Gland | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Hydronephrosis | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| Mineralization | | | | | | | | | | | | | | | | | | | 2 | | | | | 1 2.0 | |
| Nephropathy | 1 | | 1 | 2 | | | | | | 1 | 1 | | | 1 | | | | 1 | | | 1 | | 1 | 18 1.3 | |
| Renal Tubule, Hyperplasia | | | | | 1 | | | | | | | | | | | | | | | | | | | 1 1.0 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
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