

**Experiment Number:** 20515 - 03

**P18: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE (a) WITH  
AVERAGE SEVERITY GRADES[b]**

**Date Report Requested:** 05/08/2013

**Test Type:** CHRONIC

Metal working fluids (CIMSTAR 3800)

**Time Report Requested:** 08:51:01

**Route:** RESPIRATORY EXPOSURE WHOLE BODY

**CAS Number:** CIMSTAR3800

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

**Species/Strain:** RATS/Wistar Han

**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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Metal working fluids (CIMSTAR 3800)

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CAS Number: CIMSTAR3800

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

Species/Strain: RATS/Wistar Han

Lab: BNW

Wistar Han RATS MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
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**Disposition Summary**

<b>Animals Initially In Study</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>
<b>Early Deaths</b>				
<b>Moribund Sacrifice</b>	<b>17</b>	<b>12</b>	<b>13</b>	<b>15</b>
<b>Natural Death</b>		<b>4</b>	<b>3</b>	<b>2</b>
<b>Survivors</b>				
<b>Terminal Sacrifice</b>	<b>33</b>	<b>34</b>	<b>34</b>	<b>33</b>
<b>Animals Examined Microscopically</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>

## ALIMENTARY SYSTEM

Esophagus	(50)	(50)	(50)	(50)
Intestine Large, Cecum	(50)	(48)	(47)	(49)
Inflammation, Acute		1 [2.0]		
Necrosis		1 [3.0]		
Intestine Large, Colon	(50)	(49)	(47)	(49)
Inflammation, Acute		1 [3.0]		
Necrosis		1 [3.0]		
Intestine Large, Rectum	(48)	(47)	(47)	(48)
Intestine Small, Duodenum	(50)	(48)	(47)	(49)
Intestine Small, Ileum	(50)	(48)	(47)	(49)
Intestine Small, Jejunum	(50)	(48)	(47)	(49)
Diverticulum		1 [4.0]		
Inflammation, Chronic				1 [3.0]
Lymphatic, Angiectasis				1 [4.0]
Liver	(50)	(50)	(50)	(50)
Angiectasis	3 [2.0]	7 [1.0]	8 [1.0]	7 [1.4]
Basophilic Focus	11	20	18	18
Clear Cell Focus	29	26	17	26
Congestion		1 [1.0]		
Eosinophilic Focus			1	
Fatty Change				1 [2.0]
Inflammation, Granulomatous		1 [1.0]		
Mixed Cell Focus	3			1
Necrosis	2 [2.5]	3 [2.7]	1 [2.0]	1 [1.0]

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

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Species/Strain: RATS/Wistar Han

Lab: BNW

Wistar Han RATS MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Bile Duct, Cyst	1	1		
Bile Duct, Dilatation	3 [3.3]	2 [2.0]	2 [2.5]	4 [3.5]
Bile Duct, Hyperplasia	1 [2.0]	2 [1.5]		
Bile Duct, Inflammation, Chronic Active	1 [2.0]			
Mesentery	(7)	(7)	(1)	(2)
Fat, Necrosis	6 [2.0]	7 [2.0]	1 [2.0]	
Oral Mucosa	(1)	(0)	(1)	(0)
Developmental Malformation	1		1	
Pancreas	(50)	(50)	(49)	(50)
Atrophy	1 [1.0]	4 [1.5]	4 [1.5]	5 [1.2]
Basophilic Focus	2	4 [2.0]	2	1
Inflammation, Acute		1 [2.0]		
Salivary Glands	(50)	(50)	(50)	(50)
Atrophy			1 [1.0]	
Stomach, Forestomach	(50)	(50)	(50)	(50)
Hyperplasia, Squamous	1 [3.0]			1 [3.0]
Inflammation, Chronic Active	1 [4.0]			
Ulcer		1 [2.0]		2 [3.0]
Stomach, Glandular	(50)	(50)	(49)	(50)
Necrosis			1 [1.0]	
Tooth	(0)	(1)	(0)	(1)
Dysplasia				1 [2.0]
Inflammation, Chronic Active		1 [4.0]		

## CARDIOVASCULAR SYSTEM

Blood Vessel	(50)	(50)	(50)	(50)
Heart	(50)	(50)	(50)	(50)
Cardiomyopathy	28 [1.3]	40 [1.2]	32 [1.3]	33 [1.2]
Necrosis			1 [1.0]	

## ENDOCRINE SYSTEM

Adrenal Cortex	(50)	(50)	(49)	(50)
Accessory Adrenal Cortical Nodule	1 [3.0]			

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

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Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: CIMSTAR3800

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

Species/Strain: RATS/Wistar Han

Lab: BNW

Wistar Han RATS MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Degeneration, Cystic	2 [1.0]	1 [1.0]	3 [1.3]	2 [1.5]
Hyperplasia	26 [2.0]	25 [2.0]	28 [2.0]	26 [2.2]
Hypertrophy	20 [2.0]	21 [2.0]	14 [1.9]	16 [2.1]
Adrenal Medulla	(50)	(48)	(49)	(50)
Angiectasis				1 [3.0]
Hyperplasia	2 [2.0]	1 [2.0]	4 [2.3]	1 [3.0]
Islets, Pancreatic	(50)	(50)	(49)	(50)
Parathyroid Gland	(43)	(43)	(44)	(47)
Hyperplasia	1 [1.0]		1 [2.0]	1 [2.0]
Pituitary Gland	(49)	(50)	(50)	(50)
Cyst	1 [2.0]			
Pars Distalis, Hyperplasia	14 [1.9]	21 [2.0]	13 [2.1]	16 [1.9]
Pars Intermedia, Hyperplasia	3 [2.3]	1 [2.0]	1 [2.0]	4 [2.3]
Thyroid Gland	(50)	(50)	(49)	(50)
C-cell, Hyperplasia	34 [1.4]	30 [1.4]	30 [1.4]	28 [1.5]
Follicular Cell, Hyperplasia	5 [2.0]	1 [2.0]	5 [1.8]	

## GENERAL BODY SYSTEM

Peritoneum	(1)	(0)	(0)	(0)
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## GENITAL SYSTEM

Coagulating Gland	(0)	(0)	(0)	(1)
Inflammation, Chronic Active				1 [3.0]
Epididymis	(50)	(50)	(50)	(50)
Granuloma Sperm	2 [3.0]			
Preputial Gland	(50)	(50)	(50)	(50)
Inflammation, Chronic Active	3 [1.7]	5 [2.6]	3 [2.7]	3 [2.7]
Duct, Ectasia				1 [3.0]
Prostate	(50)	(50)	(50)	(50)
Hyperplasia	12 [1.3]	17 [1.9]	12 [1.8]	11 [2.1]
Inflammation, Chronic Active	1 [3.0]	2 [2.5]	4 [2.5]	2 [2.5]
Seminal Vesicle	(50)	(50)	(48)	(50)
Hyperplasia	1 [2.0]			1 [2.0]

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Lab: BNW

Wistar Han RATS MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Inflammation, Chronic Active			2 [2.5]	1 [3.0]
Testes	(50)	(50)	(50)	(50)
Atrophy	15 [2.5]	8 [2.1]	5 [2.8]	5 [2.6]
Edema	16 [2.3]	11 [2.1]	18 [2.3]	11 [2.3]
Necrosis	1 [3.0]			
Artery, Inflammation, Chronic Active		2 [2.0]		
Interstitial Cell, Hyperplasia				1 [3.0]

## HEMATOPOIETIC SYSTEM

Bone Marrow	(50)	(50)	(49)	(50)
Lymph Node	(12)	(5)	(7)	(5)
Axillary, Ectasia				1 [1.0]
Axillary, Infiltration Cellular, Plasma Cell	1 [1.0]			
Iliac, Ectasia	2 [2.5]		1 [2.0]	1 [3.0]
Iliac, Inflammation, Chronic Active			1 [4.0]	
Lumbar, Ectasia	2 [3.0]	2 [2.5]	2 [2.0]	
Lumbar, Hemorrhage	1 [2.0]			
Lumbar, Infiltration Cellular, Plasma Cell	5 [3.0]	1 [2.0]	2 [3.0]	
Pancreatic, Ectasia	1 [3.0]			
Pancreatic, Inflammation, Chronic Active	1 [4.0]			
Renal, Ectasia		2 [2.0]		2 [2.5]
Lymph Node, Bronchial	(42)	(40)	(37)	(35)
Ectasia				1 [4.0]
Hyperplasia, Lymphohistiocytic			10 [1.1]	28 [2.1]
Lymph Node, Mandibular	(46)	(46)	(44)	(45)
Ectasia	1 [3.0]	2 [2.5]		
Hyperplasia, Lymphoid		1 [3.0]		1 [3.0]
Infiltration Cellular, Plasma Cell		1 [2.0]	1 [4.0]	
Lymph Node, Mediastinal	(46)	(45)	(50)	(49)
Ectasia	1 [3.0]			
Hyperplasia, Lymphohistiocytic			4 [1.5]	29 [2.2]
Lymph Node, Mesenteric	(50)	(50)	(49)	(50)
Ectasia	2 [1.5]			
Hemorrhage				1 [4.0]

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Species/Strain: RATS/Wistar Han

Lab: BNW

Wistar Han RATS MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Infiltration Cellular, Plasma Cell Spleen	1 [3.0] (50)	(50)	(50)	(50)
Angiectasis			1 [3.0]	1 [2.0]
Hematopoietic Cell Proliferation	2 [2.5]		4 [2.8]	2 [3.5]
Inflammation, Granulomatous Necrosis		1 [3.0]	1 [2.0]	
Thymus	(40)	(43)	(44)	(46)
Atrophy	1 [4.0]			
Cyst			1 [3.0]	
<b>INTEGUMENTARY SYSTEM</b>				
Mammary Gland	(6)	(6)	(3)	(4)
Galactocele	1 [1.0]			
Skin	(50)	(50)	(50)	(50)
Angiectasis				1 [3.0]
Cyst Epithelial Inclusion	1	1		1
Inflammation, Chronic Active	31 [3.7]	23 [3.7]	30 [3.8]	22 [3.5]
Thrombosis				1 [3.0]
<b>MUSCULOSKELETAL SYSTEM</b>				
Bone	(50)	(50)	(50)	(50)
Hyperostosis	1 [2.0]			
Inflammation, Chronic Active			1 [4.0]	
Skeletal Muscle	(1)	(2)	(1)	(0)
Necrosis		1 [3.0]		
<b>NERVOUS SYSTEM</b>				
Brain	(50)	(50)	(50)	(50)
Compression				1 [2.0]
Hemorrhage			1 [1.0]	
Peripheral Nerve	(5)	(4)	(6)	(6)

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Species/Strain: RATS/Wistar Han

Lab: BNW

Wistar Han RATS MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Spinal Cord	(5)	(4)	(7)	(6)
<b>RESPIRATORY SYSTEM</b>				
Larynx	(50)	(50)	(50)	(50)
Foreign Body			1	
Inflammation, Acute		1 [1.0]		
Inflammation, Chronic				1 [2.0]
Inflammation, Chronic Active		2 [1.0]	2 [1.5]	
Metaplasia, Squamous	1 [2.0]	47 [1.5]	50 [2.2]	50 [2.7]
Epiglottis, Fibrosis				1 [1.0]
Epiglottis, Ulcer				1 [3.0]
Lung	(50)	(50)	(50)	(50)
Foreign Body	1			
Hemorrhage	1 [2.0]			
Inflammation, Lymphohistiocytic	6 [1.2]	14 [1.0]	41 [1.1]	47 [1.8]
Inflammation, Acute		2 [1.5]		
Metaplasia, Squamous		1 [1.0]		
Alveolar Epithelium, Hyperplasia	4 [1.3]	6 [1.8]	11 [1.9]	13 [2.4]
Bronchus-associated Lymphoid Tissue, Hyperplasia, Lymphohistiocytic		1 [1.0]	5 [1.0]	19 [2.0]
Nose	(50)	(50)	(50)	(50)
Foreign Body			1	1
Inflammation, Acute		1 [2.0]	1 [2.0]	1 [1.0]
Inflammation, Chronic Active	4 [1.0]	1 [3.0]	1 [4.0]	
Glands, Olfactory Epithelium, Hyperplasia	1 [1.0]	39 [1.5]	47 [2.0]	50 [2.6]
Goblet Cell, Hyperplasia		20 [1.1]	25 [1.1]	34 [1.3]
Olfactory Epithelium, Accumulation, Hyaline Droplet	19 [1.6]	50 [2.8]	50 [3.0]	50 [3.5]
Respiratory Epithelium, Accumulation, Hyaline Droplet		17 [1.1]	25 [1.1]	29 [1.2]
Trachea	(50)	(49)	(50)	(50)
Inflammation, Acute		1 [1.0]		

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Wistar Han RATS MALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
<b>SPECIAL SENSES SYSTEM</b>				
Ear	(0)	(0)	(1)	(0)
Eye	(50)	(50)	(48)	(50)
Cataract	2 [2.0]	3 [3.0]	1 [4.0]	
Cornea, Inflammation, Chronic Active		1 [3.0]		1 [2.0]
Retina, Atrophy	2 [2.5]	3 [2.7]	2 [2.0]	1 [3.0]
Harderian Gland	(50)	(50)	(50)	(50)
Atrophy	1 [2.0]			
Hyperplasia	17 [1.5]	7 [1.3]	12 [1.6]	6 [1.2]
Hypertrophy	2 [2.0]	3 [1.3]		
Zymbal's Gland	(3)	(2)	(1)	(0)

**URINARY SYSTEM**

Kidney	(50)	(50)	(49)	(50)
Cyst	4 [2.3]	1 [2.0]	3 [2.0]	
Hydronephrosis		1 [2.0]	2 [2.5]	
Infarct				1 [4.0]
Inflammation, Suppurative		3 [1.7]	2 [1.5]	4 [2.3]
Nephropathy	43 [1.8]	38 [1.8]	38 [1.9]	38 [1.9]
Renal Tubule, Hyperplasia				3 [1.3]
Transitional Epithelium, Hyperplasia	1 [2.0]	1 [3.0]	1 [2.0]	
Urinary Bladder	(50)	(50)	(48)	(49)
Calculus Gross Observation		1 [2.0]		
Inflammation, Chronic Active		1 [1.0]		1 [3.0]
Transitional Epithelium, Hyperplasia		1 [2.0]		1 [3.0]

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

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Wistar Han RATS FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
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**Disposition Summary**

<b>Animals Initially In Study</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>
<b>Early Deaths</b>				
<b>Accidentally Killed</b>		<b>1</b>		
<b>Moribund Sacrifice</b>	<b>13</b>	<b>16</b>	<b>14</b>	<b>19</b>
<b>Natural Death</b>	<b>2</b>			<b>1</b>
<b>Survivors</b>				
<b>Moribund Sacrifice</b>	<b>1</b>	<b>1</b>		<b>1</b>
<b>Terminal Sacrifice</b>	<b>34</b>	<b>32</b>	<b>36</b>	<b>29</b>
<b>Animals Examined Microscopically</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>

## ALIMENTARY SYSTEM

Esophagus	(50)	(50)	(50)	(50)
Inflammation, Acute	1 [4.0]			
Necrosis	1 [4.0]			
Intestine Large, Cecum	(49)	(50)	(50)	(49)
Intestine Large, Colon	(49)	(49)	(50)	(49)
Intestine Large, Rectum	(46)	(50)	(47)	(46)
Intestine Small, Duodenum	(49)	(50)	(50)	(49)
Muscularis, Hypertrophy, Focal			1 [2.0]	
Intestine Small, Ileum	(49)	(50)	(50)	(49)
Intestine Small, Jejunum	(49)	(50)	(50)	(49)
Diverticulum	1 [2.0]			
Inflammation, Acute	1 [4.0]			
Inflammation, Chronic Active			1 [2.0]	
Necrosis	1 [4.0]			
Liver	(50)	(50)	(50)	(50)
Angiectasis	4 [2.0]	5 [1.2]	5 [1.8]	1 [2.0]
Basophilic Focus	34	33	35	32
Clear Cell Focus	14	6	17	14
Degeneration, Cystic				1 [2.0]
Eosinophilic Focus	1		1	1
Fatty Change	3 [2.3]	1 [2.0]	2 [1.5]	1 [2.0]
Hematopoietic Cell Proliferation	1 [2.0]			

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Wistar Han RATS FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Hepatodiaphragmatic Nodule	1		1	
Mixed Cell Focus	2			
Necrosis	1 [1.0]	1 [3.0]	1 [1.0]	
Bile Duct, Cyst	1	1		1
Bile Duct, Cyst, Multiple		4	1	3
Bile Duct, Dilatation	1 [4.0]		2 [4.0]	3 [3.7]
Bile Duct, Hyperplasia	5 [1.8]	2 [1.0]	3 [2.0]	6 [1.3]
Bile Duct, Inflammation, Chronic Active	1 [3.0]			
Mesentery	(7)	(8)	(8)	(5)
Inflammation, Chronic Active				1 [2.0]
Fat, Necrosis	7 [2.0]	8 [2.3]	8 [2.0]	4 [2.0]
Oral Mucosa	(0)	(0)	(0)	(1)
Developmental Malformation				1
Inflammation, Chronic Active				1 [4.0]
Pancreas	(49)	(50)	(50)	(50)
Atrophy	6 [1.3]	4 [1.0]	2 [1.5]	5 [1.6]
Basophilic Focus		1		
Salivary Glands	(50)	(50)	(50)	(50)
Basophilic Focus	1	1		
Stomach, Forestomach	(50)	(50)	(50)	(50)
Hyperplasia, Squamous	1 [2.0]			
Inflammation, Acute	1 [3.0]		2 [2.5]	
Inflammation, Chronic Active		1 [4.0]	1 [3.0]	
Ulcer	1 [4.0]	1 [4.0]	1 [3.0]	2 [3.0]
Stomach, Glandular	(50)	(50)	(50)	(50)
Inflammation, Acute	1 [2.0]			
Inflammation, Chronic Active				1 [2.0]
Mineralization	1 [1.0]		1 [2.0]	
Necrosis	2 [1.5]			
Tongue	(1)	(0)	(0)	(0)
Inflammation, Granulomatous	1 [2.0]			

## CARDIOVASCULAR SYSTEM

Blood Vessel	(50)	(50)	(50)	(50)
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Lab: BNW

Wistar Han RATS FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Heart	(50)	(50)	(50)	(50)
Cardiomyopathy	16 [1.0]	17 [1.1]	16 [1.1]	14 [1.1]
Mineralization				1 [2.0]
Endocardium, Hyperplasia	1 [3.0]			

## ENDOCRINE SYSTEM

Adrenal Cortex	(50)	(50)	(50)	(50)
Accessory Adrenal Cortical Nodule	1 [3.0]			
Angiectasis	1 [2.0]	1 [2.0]	1 [2.0]	2 [2.0]
Degeneration, Cystic	26 [2.3]	23 [2.1]	29 [2.3]	35 [2.1]
Hyperplasia	17 [2.1]	20 [2.0]	27 [2.1]	22 [2.0]
Hypertrophy	14 [2.1]	20 [2.1]	24 [2.0]	21 [2.1]
Metaplasia, Osseous		1 [3.0]		
Necrosis	1 [2.0]	1 [2.0]		
Adrenal Medulla	(49)	(50)	(49)	(49)
Hyperplasia	2 [2.0]	2 [2.0]	1 [2.0]	
Islets, Pancreatic	(49)	(50)	(50)	(50)
Hyperplasia			1 [2.0]	1 [3.0]
Parathyroid Gland	(47)	(44)	(40)	(42)
Pituitary Gland	(50)	(50)	(50)	(50)
Pars Distalis, Hyperplasia	8 [2.4]	11 [2.0]	10 [2.4]	9 [2.1]
Pars Intermedia, Hyperplasia	1 [2.0]			1 [2.0]
Thyroid Gland	(50)	(50)	(50)	(49)
C-cell, Hyperplasia	37 [1.9]	44 [1.8]	43 [2.3]	35 [1.5]
Follicular Cell, Hyperplasia	2 [1.5]		1 [1.0]	1 [2.0]

## GENERAL BODY SYSTEM

None

## GENITAL SYSTEM

Clitoral Gland	(50)	(46)	(50)	(49)
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a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Metal working fluids (CIMSTAR 3800)

Time Report Requested: 08:51:01

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: CIMSTAR3800

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

Species/Strain: RATS/Wistar Han

Lab: BNW

Wistar Han RATS FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Inflammation, Chronic			1 [3.0]	
Inflammation, Chronic Active	6 [2.7]	4 [3.0]	1 [3.0]	1 [4.0]
Ovary	(50)	(50)	(50)	(50)
Cyst	11 [2.4]	9 [2.9]	5 [2.2]	11 [2.1]
Interstitial Cell, Hyperplasia				1 [3.0]
Uterus	(50)	(50)	(50)	(50)
Adenomyosis			1 [3.0]	
Cervix, Cyst, Squamous			1 [3.0]	
Cervix, Hypertrophy	2 [2.5]		1 [2.0]	1 [2.0]
Endometrium, Hyperplasia, Cystic	11 [1.7]	4 [3.0]	9 [2.3]	5 [2.4]
Vagina	(0)	(1)	(0)	(1)

## HEMATOPOIETIC SYSTEM

Bone Marrow	(50)	(50)	(50)	(50)
Lymph Node	(2)	(2)	(1)	(0)
Lumbar, Ectasia		1 [2.0]		
Lumbar, Hemorrhage		1 [3.0]		
Lumbar, Hyperplasia, Lymphoid			1 [1.0]	
Lumbar, Pigmentation, Hemosiderin	1 [3.0]			
Renal, Ectasia	1 [2.0]			
Renal, Pigmentation, Hemosiderin	1 [4.0]			
Lymph Node, Bronchial	(38)	(35)	(32)	(35)
Hyperplasia, Lymphohistiocytic			7 [1.1]	30 [1.6]
Lymph Node, Mandibular	(49)	(47)	(43)	(49)
Ectasia		1 [3.0]		2 [2.5]
Lymph Node, Mediastinal	(49)	(46)	(45)	(47)
Hemorrhage			1 [2.0]	
Hyperplasia, Lymphohistiocytic			4 [1.3]	23 [1.7]
Hyperplasia, Lymphoid				1 [3.0]
Lymph Node, Mesenteric	(49)	(50)	(50)	(50)
Ectasia	1 [3.0]	1 [2.0]		1 [2.0]
Spleen	(50)	(50)	(50)	(50)
Hematopoietic Cell Proliferation	1 [4.0]	2 [3.5]	3 [2.7]	1 [4.0]
Thymus	(48)	(48)	(45)	(45)

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

Metal working fluids (CIMSTAR 3800)

Time Report Requested: 08:51:01

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: CIMSTAR3800

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

Species/Strain: RATS/Wistar Han

Lab: BNW

Wistar Han RATS FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Cyst Hyperplasia, Tubular		1 [2.0]	1 [4.0]	
<b>INTEGUMENTARY SYSTEM</b>				
Mammary Gland	(50)	(50)	(50)	(50)
Galactoceles	3 [2.3]	1 [2.0]	2 [3.0]	1 [4.0]
Hyperplasia	1 [2.0]			1 [2.0]
Inflammation, Chronic Active				2 [2.0]
Skin	(50)	(50)	(50)	(50)
Angiectasis	1 [4.0]			
Inflammation, Chronic Active	2 [3.5]	4 [3.3]	5 [3.6]	4 [2.8]
Subcutaneous Tissue, Hemorrhage		1 [1.0]		
Subcutaneous Tissue, Necrosis		1 [3.0]		
<b>MUSCULOSKELETAL SYSTEM</b>				
Bone	(50)	(50)	(50)	(50)
Callus	1 [3.0]			
Skeletal Muscle	(0)	(1)	(0)	(0)
<b>NERVOUS SYSTEM</b>				
Brain	(50)	(50)	(50)	(50)
Meninges, Hyperplasia	1 [1.0]			1 [1.0]
Peripheral Nerve	(2)	(9)	(5)	(6)
Spinal Cord	(2)	(9)	(5)	(6)
<b>RESPIRATORY SYSTEM</b>				
Larynx	(50)	(50)	(50)	(50)
Foreign Body				1
Inflammation, Acute				4 [1.0]

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

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Test Type: CHRONIC

Metal working fluids (CIMSTAR 3800)

Time Report Requested: 08:51:01

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: CIMSTAR3800

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

Species/Strain: RATS/Wistar Han

Lab: BNW

Wistar Han RATS FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Metaplasia, Squamous	1 [2.0]	50 [1.7]	50 [2.5]	50 [2.8]
Lung	(50)	(50)	(50)	(50)
Inflammation, Lymphohistiocytic	3 [1.0]	20 [1.0]	42 [1.0]	50 [1.9]
Alveolar Epithelium, Hyperplasia	4 [2.3]	3 [2.0]	1 [3.0]	7 [2.1]
Bronchus-associated Lymphoid Tissue, Hyperplasia, Lymphohistiocytic				5 [1.0]
Nose	(50)	(50)	(50)	(50)
Inflammation, Acute				1 [1.0]
Inflammation, Chronic Active	2 [1.0]		1 [1.0]	
Thrombosis	1 [2.0]			
Glands, Olfactory Epithelium, Hyperplasia	1 [1.0]	32 [1.6]	48 [2.0]	49 [2.6]
Goblet Cell, Hyperplasia		25 [1.0]	34 [1.1]	42 [1.2]
Olfactory Epithelium, Accumulation, Hyaline Droplet	16 [1.6]	50 [2.6]	50 [2.9]	50 [3.5]
Respiratory Epithelium, Accumulation, Hyaline Droplet	1 [1.0]	24 [1.1]	31 [1.1]	34 [1.2]
Trachea	(49)	(50)	(50)	(50)

## SPECIAL SENSES SYSTEM

Eye	(49)	(50)	(50)	(50)
Cataract			1 [4.0]	
Cornea, Inflammation, Chronic Active				1 [4.0]
Retina, Atrophy	3 [1.3]	4 [2.0]	4 [2.3]	2 [2.5]
Harderian Gland	(49)	(50)	(50)	(50)
Hyperplasia	3 [1.7]	3 [1.0]	5 [1.4]	4 [1.3]
Zymbal's Gland	(0)	(0)	(0)	(1)

## URINARY SYSTEM

Kidney	(50)	(50)	(50)	(50)
Cyst		1 [4.0]	2 [2.0]	
Hydronephrosis		1 [3.0]		1 [3.0]
Inflammation, Suppurative	1 [4.0]	2 [1.5]		
Mineralization		1 [2.0]		1 [2.0]

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Experiment Number: 20515 - 03

**P18: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE (a) WITH AVERAGE SEVERITY GRADES[b]**

Date Report Requested: 05/08/2013

Test Type: CHRONIC

Metal working fluids (CIMSTAR 3800)

Time Report Requested: 08:51:01

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: CIMSTAR3800

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

Species/Strain: RATS/Wistar Han

Lab: BNW

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Wistar Han RATS FEMALE	Control	10 mg/m3	30 mg/m3	100 mg/m3
Nephropathy	17 [1.4]	16 [1.2]	19 [1.2]	18 [1.3]
Renal Tubule, Hyperplasia				1 [1.0]
Transitional Epithelium, Hyperplasia	1 [4.0]	3 [1.0]	1 [1.0]	
Urinary Bladder	(50)	(50)	(50)	(50)

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

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

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)