

Experiment Number: 60311 - 05
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt
CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
Time Report Requested: 14:48:12
First Dose M/F: 05/08/06 / 05/08/06
Lab: BNW

F2_RD

NTP Study Number: C60311
Lock Date: 12/03/2008
Cage Range: ALL
Date Range: ALL
Reasons For Removal: ALL
Removal Date Range: ALL
Treatment Groups: Include ALL
Study Gender: Both
TDMSE Version: 2.6.0.0_007
PWG Approval Date: NONE

Note: Animals arranged according to days on test.

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First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

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		
FISCHER 344-TACONIC RATS MALE		3	3	4	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
Control		7	8	4	1	1	4	6	8	9	1	1	1	2	6	6	6	7	7	7	7	8	8	8	8	8		
ANIMAL ID		6	3	1	4	9	2	2	3	8	1	3	6	6	3	3	8	0	5	6	8	2	2	3	8	8		
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		0	0	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	0	4	3	3	1	1	2	4	0	3	0	0	1	3	2	4	4	0	4	0	3	2	1	2	2	males (cont...)
		0	1	0	9	6	2	5	1	8	2	1	7	3	1	3	4	6	3	9	9	6	2	0	7	5	5	

ALIMENTARY SYSTEM

Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+	+	+	+	+	+
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+	+	+	A	+	+
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+	+	+	A	+	+
Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mesentery		+	+		+								+	+			+	+	+			+				
Pancreas Mixed Tumor Malignant	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Salivary Glands Adenoma, Tubular	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

CARDIOVASCULAR SYSTEM

Blood Vessel																											+
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* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
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M .. Missing tissue
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DAY ON TEST	FISCHER 344-TACONIC RATS MALE																								males (cont...)	
	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055	056	057	058	059		
Control	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000		
ANIMAL ID	050	004	033	031	011	011	022	041	008	002	001	007	003	001	003	004	006	003	009	009	006	002	000	007	005	

Heart Schwannoma Malignant	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
																										X

ENDOCRINE SYSTEM

Adrenal Cortex	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Adrenal Medulla	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Pheochromocytoma Benign					X									X	X		X	X								
Pheochromocytoma Malignant																X										
Bilateral, Pheochromocytoma Benign										X												X				
Islets, Pancreatic Carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
																						X			X	
Parathyroid Gland	+	+	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Pituitary Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Pars Distalis, Adenoma			X	X					X	X	X			X	X	X		X	X	X	X	X	X	X	X	
Thyroid Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
C-cell, Adenoma											X														X	
C-cell, Carcinoma																										
Follicular Cell, Carcinoma																X										

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

Epididymis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
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* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
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FISCHER 344-TACONIC RATS MALE	DAY ON TEST																								males (cont...)	
	0376	0383	0441	0551	0554	0555	0555	0555	0555	0666	0666	0666	0666	0666	0666	0666	0666	0666	0666	0666	0666	0666	0666			
Control	ANIMAL ID																									
	00050	00010	00040	00039	00036	00012	00015	00021	00048	00008	00012	00007	00033	00001	00031	00004	00024	00044	00003	00049	00009	00006	00002	00007		
Preputial Gland Adenoma Carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Prostate Adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Seminal Vesicle	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Testes Bilateral, Interstitial Cell, Adenoma Interstitial Cell, Adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
			X			X		X	X			X	X			X			X		X	X				
HEMATOPOIETIC SYSTEM																										
Bone Marrow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Lymph Node										+						+	+		+		+					
Lymph Node, Bronchial	M	M	+	+	+	M	M	+	+	M	+	M	M	M	+	+	+	+	M	M	+	+	M	+	M	
Lymph Node, Mandibular	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	+	+		
Lymph Node, Mediastinal	+	M	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Lymph Node, Mesenteric	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Spleen	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Thymus	+	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	M	+	+	+	
INTEGUMENTARY SYSTEM																										

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DAY ON TEST	FISCHER 344-TACONIC RATS MALE																								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		
3	3	4	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
7	8	4	1	1	4	6	8	9	1	1	1	2	6	6	6	7	7	7	7	8	8	8	8	8		
6	3	1	4	9	2	2	3	8	1	3	6	6	3	3	8	0	5	6	8	2	2	3	8	8		
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		
	5	0	4	3	3	1	1	2	4	0	3	0	0	1	3	2	4	4	0	4	0	3	2	1	2	
	0	1	0	9	6	2	5	1	8	2	1	7	3	1	3	4	6	3	9	9	6	2	0	7	5	

Pheochromocytoma Malignant, Metastatic, Adrenal Medulla

Squamous Cell Carcinoma, Metastatic, Skin

Nose + + + + + + + + + + + + + + + + + A + + + + I + +

Trachea +

SPECIAL SENSES SYSTEM

Ear

Eye +

Harderian Gland +

Zymbal's Gland Adenoma + X +
 Carcinoma X

URINARY SYSTEM

Kidney +

Urinary Bladder +

SYSTEMIC LESIONS

Multiple Organ +
 Leukemia Mononuclear X X X X X X X X
 Mesothelioma Malignant X

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FISCHER 344-TACONIC RATS MALE	DAY ON TEST																								* TOTALS
	0691	0696	0697	0700	0701	0702	0703	0704	0707	0708	0709	0710	0711	0712	0713	0714	0717	0718	0719	0720	0721	0722	0723	0724	
Control	00035	00042	00044	00022	00018	00003	00007	00008	00005	00000	00004	00006	00007	00008	00009	00000	00004	00007	00011	00015	00008	00003	00009	00006	50

ALIMENTARY SYSTEM

Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	49
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48
Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Mesentery				+	+					+	+				+						+		+	+	18
Pancreas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Mixed Tumor Malignant																						X			1
Salivary Glands	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Adenoma, Tubular		X																							1
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50

CARDIOVASCULAR SYSTEM

Blood Vessel																									1
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	0691	0666	0667	0670	0671	0672	0673	0674	0675	0676	0677	0678	0679	0680	0681	0682	0683	0684	0685	0686	0687	0688	0689	0690	
Control	00035	00042	00044	00022	00018	00003	00007	00008	00005	00000	00004	00006	00007	00008	00009	00000	00004	00007	00001	00005	00008	00003	00009	00006	501
Heart Schwannoma Malignant	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	501
ENDOCRINE SYSTEM																									
Adrenal Cortex	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Adrenal Medulla	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Pheochromocytoma Benign						X	X	X						X				X	X						11
Pheochromocytoma Malignant		X																							2
Bilateral, Pheochromocytoma Benign				X	X																				4
Islets, Pancreatic Carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	502
Parathyroid Gland	+	+	M	+	+	+	M	M	+	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+	45
Pituitary Gland Pars Distalis, Adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	5027
Thyroid Gland	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	49
C-cell, Adenoma															X								X	4	
C-cell, Carcinoma																									1
Follicular Cell, Carcinoma										X															2
GENERAL BODY SYSTEM																									
NONE																									
GENITAL SYSTEM																									
Epididymis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50

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FISCHER 344-TACONIC RATS MALE	DAY ON TEST																								* TOTALS
	0691	0696	0697	0700	0701	0702	0703	0704	0705	0706	0707	0708	0709	0710	0711	0712	0713	0714	0715	0716	0717	0718	0719	0720	
Control	0035	0042	0044	0022	0018	0003	0007	0008	0005	0000	0004	0006	0007	0008	0009	0020	0024	0027	0031	0033	0039	0046	0058	0064	
Preputial Gland Adenoma Carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
			X										X												
Prostate Adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
																							X		
Seminal Vesicle	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Testes Bilateral, Interstitial Cell, Adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Interstitial Cell, Adenoma	X	X	X			X			X	X				X	X	X	X	X	X	X	X		X		
					X		X	X			X	X	X												
HEMATOPOIETIC SYSTEM																									
Bone Marrow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Lymph Node			+			+	+			+	+		+												
Lymph Node, Bronchial	M	+	+	M	M	+	M	+	+	+	M	+	+	M	M	+	M	+	+	M	+	+	M	M	
Lymph Node, Mandibular	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	
Lymph Node, Mediastinal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+	M	+	+	+	+	
Lymph Node, Mesenteric	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Spleen	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Thymus	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
INTEGUMENTARY SYSTEM																									

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

FISCHER 344-TACONIC RATS MALE	DAY ON TEST																								* TOTALS
	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	
Control	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	
Mammary Gland	+	M	+	M	+	+	+	M	+	+	M	M	M	M	+	+	M	+	+	+	+	+	+	+	
Carcinoma																									
Fibroadenoma																						X			
Skin	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Basal Cell Adenoma																						X			
Hamartoma																									
Keratoacanthoma													X												
Squamous Cell Carcinoma									X																
Trichoepithelioma				X																					
Subcutaneous Tissue, Fibroma					X																				
Subcutaneous Tissue, Lipoma																									
MUSCULOSKELETAL SYSTEM																									
Bone	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Skeletal Muscle																								+	
NERVOUS SYSTEM																									
Brain	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Astrocytoma Malignant																									
Spinal Cord																									
RESPIRATORY SYSTEM																									
Larynx	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Lung	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Alveolar/Bronchiolar Adenoma																									
Alveolar/Bronchiolar Adenoma, Multiple																								X	

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 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

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First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

FISCHER 344-TACONIC RATS MALE	DAY ON TEST																								* TOTALS		
	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691	0691			
Control	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035	0035			
Pheochromocytoma Malignant, Metastatic, Adrenal Medulla		X																							1		
Squamous Cell Carcinoma, Metastatic, Skin									X																1		
Nose	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48		
Trachea	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
SPECIAL SENSES SYSTEM																											
Ear																									+	1	
Eye	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Harderian Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Zymbal's Gland Adenoma																										+	4
Zymbal's Gland Carcinoma																										X	1
																										X	3
URINARY SYSTEM																											
Kidney	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Urinary Bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
SYSTEMIC LESIONS																											
Multiple Organ	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Leukemia Mononuclear	X		X	X		X			X	X	X		X		X		X		X								21
Mesothelioma Malignant																										X	2

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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

FISCHER 344-TACONIC RATS MALE	DAY ON TEST																								males (cont...)
	0 4 1 3	0 4 3 9	0 5 4 0	0 5 6 2	0 5 7 7	0 5 8 0	0 5 8 3	0 5 9 3	0 5 9 6	0 6 0 3	0 6 1 0	0 6 1 8	0 6 2 4	0 6 3 4	0 6 4 1	0 6 6 3	0 6 6 7	0 6 6 7	0 6 7 4	0 6 7 5	0 6 8 3	0 6 8 4	0 6 8 4		
1.25 mg/m3	0 0 4 4	0 0 0 6	0 0 0 1	0 0 4 2	0 0 2 3	0 0 2 4	0 0 1 7	0 0 5 0	0 0 3 6	0 0 3 5	0 0 3 2	0 0 4 0	0 0 0 4	0 0 1 6	0 0 4 3	0 0 2 2	0 0 2 2	0 0 2 2	0 0 1 9	0 0 4 8	0 0 0 1	0 0 1 6	0 0 2 2	0 0 4 4	
ANIMAL ID	0 0 4 4	0 0 4 6	0 0 0 1	0 0 4 2	0 0 2 3	0 0 2 4	0 0 1 7	0 0 5 0	0 0 3 6	0 0 3 5	0 0 3 2	0 0 4 0	0 0 0 4	0 0 1 6	0 0 4 3	0 0 2 2	0 0 2 2	0 0 2 2	0 0 1 9	0 0 4 8	0 0 0 1	0 0 1 6	0 0 2 2	0 0 4 4	

ALIMENTARY SYSTEM

Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+
Liver Hepatocellular Adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mesentery							+				+													+
Pancreas Acinus, Adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Salivary Glands	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Stomach, Forestomach Squamous Cell Papilloma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Tooth																								

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 BLANK .. Not examined microscopically

Experiment Number: 60311 - 05
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
Time Report Requested: 14:48:12
First Dose M/F: 05/08/06 / 05/08/06
Lab: BNW

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	males (cont...)
FISCHER 344-TACONIC RATS MALE		4	4	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
1.25 mg/m3		1	3	4	6	7	8	8	9	9	0	1	1	2	3	4	6	6	6	7	7	7	8	8	
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	
		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
		4	4	0	4	2	3	1	5	3	3	3	4	0	1	4	2	4	2	2	1	0	4	0	
		4	6	1	2	3	4	7	0	6	5	2	0	4	6	3	2	9	0	1	9	8	1	6	

CARDIOVASCULAR SYSTEM

Blood Vessel

Heart
 Alveolar/Bronchiolar Carcinoma, Metastatic, Lung
 Schwannoma Malignant

+ X

ENDOCRINE SYSTEM

Adrenal Cortex

+ +

Adrenal Medulla
 Pheochromocytoma Benign
 Pheochromocytoma Malignant
 Bilateral, Pheochromocytoma Benign

+ X
 X
 X

Islets, Pancreatic
 Adenoma
 Carcinoma

+
 X

Parathyroid Gland

M +

Pituitary Gland
 Pars Distalis, Adenoma
 Pars Intermedia, Adenoma

+
 X

Thyroid Gland
 C-cell, Adenoma
 C-cell, Carcinoma
 Follicular Cell, Carcinoma

+
 X
 X

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 + .. Tissue examined microscopically
 X .. Lesion present
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 M .. Missing tissue
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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | males
(cont...) | | |
|---|-----------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| | 0
4
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3 | 0
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9 | 0
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0 | 0
5
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2 | 0
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7 | 0
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3 | 0
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3 | 0
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6 | 0
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3 | 0
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0 | 0
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4 | 0
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4 |
| ANIMAL ID | 0
0
2
4
4 | 0
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6 | 0
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4
2 | 0
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4 | 0
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7 | 0
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3
4 | 0
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6 | 0
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3 | 0
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4
2 | 0
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2
4
9 | 0
0
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0 | 0
0
0
2
1
9 | 0
0
0
2
0
8 | 0
0
0
2
0
6 | 0
0
0
2
1
2 | 0
0
0
2
1
4 |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Penis | | | | | | | | | | | | | | | | | | | | | | | | + |
| Preputial Gland
Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Prostate | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Seminal Vesicle | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Testes
Bilateral, Interstitial Cell, Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Interstitial Cell, Adenoma | | | | X | | | | | | X | | | X | | X | X | X | | X | X | X | X | X | X |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Lymph Node | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Bronchial | M | M | + | M | + | + | + | + | M | + | M | + | + | M | + | + | + | M | M | + | M | M | M | + | M |
| Lymph Node, Mandibular
Carcinoma, Metastatic, Zymbal'S Gland | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Lymph Node, Mediastinal | + | M | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |

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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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) | | | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|--------------------|------------------|------------------|---|
| | 0
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9 | 0
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2 | 0
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7 | 0
5
8
0 | 0
5
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3 | 0
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3 | 0
5
9
6 | 0
6
0
3 | 0
6
1
0 | 0
6
1
8 | 0
6
2
4 | 0
6
3
4 | 0
6
4
1 | 0
6
6
3 | 0
6
6
7 | 0
6
7
4 | 0
6
7
5 | 0
6
8
3 | | | 0
6
8
4 | 0
6
8
4 | |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Thymus | M | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | M | + | + | + | + | + | + | | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland
Fibroadenoma | M | M | + | M | + | + | + | + | + | M | + | M | + | + | M | + | M | M | + | + | + | + | M | + | + |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Keratoacanthoma | | | | | | | X | | | | | | | | | | | | X | | | | | | |
| Squamous Cell Papilloma | | | | | | | | | | | | | | | | | | | | | | | X | | |
| Lip, Squamous Cell Papilloma | | | | | | | | | | | | | X | | | | | | | | | | | | |
| Pinna, Neural Crest Tumor | | | | | | | | | | | | | | | | | | | | | | | X | | |
| Subcutaneous Tissue, Fibroma | | | | | | | | | | | | | | | | | | | | | | | X | | |
| Subcutaneous Tissue, Lipoma | | | | | | | | | | | | | | | | | | | | | | | | | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma, Metastatic, Zymbal'S Gland | | | | | | | | | | | | X | | | | | | | | | | | | | |
| Oligodendroglioma Malignant | | | | | | | | | | | | | | | | | | | | | | | X | | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

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 X .. Lesion present
 I .. Insufficient tissue

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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) | |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------------------------|-----------|--------------------|--|
| | 0
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8 | 0
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2
4 | 0
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4 | 0
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1 | 0
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3 | 0
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7 | 0
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7 | 0
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7
4 | 0
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7
5 | 0
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8
3 | 0
6
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4 | 0
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8
4 | | | | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 0
0
2
4
4
6 | + | | |
| Alveolar/Bronchiolar Adenoma | | | | | X | | | | X | | | | | X | | | | | | | | | | | | | |
| Alveolar/Bronchiolar Adenoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma | | | | | | X | | | X | | | | | | X | | | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | | | | | | | | | | | | | | | | | | | X | | | | | |
| Carcinoma, Metastatic, Zymbal's Gland | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cystic Keratinizing Epithelioma | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mediastinum, Alveolar/Bronchiolar Carcinoma,
Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | X | | | | | | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | I | + | A | + | | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ear | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | | |
| Zymbal's Gland
Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | | |
| Renal Tubule, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | | |

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

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

Experiment Number: 60311 - 05

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Date Report Requested: 01/18/2012

Test Type: CHRONIC

Cobalt

Time Report Requested: 14:48:12

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: 7440-48-4

First Dose M/F: 05/08/06 / 05/08/06

Species/Strain: RATS/F344/N Tac

Lab: BNW

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------------|
| | | 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 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| FISCHER 344-TACONIC RATS MALE | | 1 | 3 | 4 | 6 | 7 | 8 | 8 | 9 | 9 | 0 | 1 | 1 | 2 | 3 | 4 | 6 | 6 | 6 | 7 | 7 | 8 | 8 | |
| 1.25 mg/m3 | | 3 | 9 | 0 | 2 | 7 | 0 | 3 | 3 | 6 | 3 | 0 | 8 | 4 | 4 | 1 | 3 | 3 | 7 | 7 | 4 | 5 | 4 | |
| | 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 | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | | 4 | 4 | 0 | 4 | 2 | 3 | 1 | 5 | 3 | 3 | 3 | 4 | 0 | 1 | 4 | 2 | 4 | 2 | 2 | 1 | 0 | 4 | |
| | | 4 | 6 | 1 | 2 | 3 | 4 | 7 | 0 | 6 | 5 | 2 | 0 | 4 | 6 | 3 | 2 | 9 | 0 | 1 | 9 | 8 | 2 | males
(cont...) |

SYSTEMIC LESIONS

Multiple Organ
Leukemia Mononuclear
Mesothelioma Malignant

| | | | | | | | | | | | | | | | | | | | | | | |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Multiple Organ | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear | | | X | | | | | X | | | | | X | | X | X | | X | X | | X | X |
| Mesothelioma Malignant | | | | | | | | | | | | | | | X | | X | | | | | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| DAY ON TEST | FISCHER 344-TACONIC RATS MALE | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|-------------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|----------|
| | 0699 | 0705 | 0708 | 0711 | 0715 | 0719 | 0722 | 0729 | 0732 | 0739 | 0742 | 0749 | 0752 | 0759 | 0762 | 0769 | 0772 | 0779 | 0782 | 0789 | 0792 | 0799 | | |
| 1.25 mg/m3 | 00215 | 00239 | 00305 | 00341 | 00408 | 00473 | 00509 | 00576 | 00641 | 00706 | 00771 | 00836 | 00901 | 00966 | 01031 | 01096 | 01161 | 01226 | 01291 | 01356 | 01421 | 01486 | 50 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Rectum | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hepatocellular Adenoma | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | + | | 4 |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Acinus, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Squamous Cell Papilloma | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Tooth | | | | | | | | | | | | | | | | | | | | | | + | | 2 |

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

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

Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| DAY ON TEST | FISCHER 344-TACONIC RATS MALE | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|-------------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------|
| | 0699 | 0705 | 0708 | 0705 | 0711 | 0712 | 0719 | 0722 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | 0729 | | 0729 |
| 1.25 mg/m3 | 00215 | 00223 | 00230 | 00234 | 00240 | 00243 | 00247 | 00250 | 00253 | 00256 | 00259 | 00262 | 00265 | 00268 | 00271 | 00274 | 00277 | 00280 | 00283 | 00286 | 00289 | 00292 | 00295 | 00298 | 00301 | 50 |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Blood Vessel | | | | | | | | | | | | | | | | | | | | | | | | | + | 1 |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | X | | | | | | | | | | | | | | | | | | | | | 2 |
| Schwannoma Malignant | | | | X | | | | | | | | | | | | | | | | | | | | | 1 | |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|--|--|--|--|--|---|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | | | | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | | | | |
| Pheochromocytoma Benign | | | | | | | | | | | | | X | | X | | X | X | | X | | | | | | 10 | | | | | | |
| Pheochromocytoma Malignant | | | | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | 2 |
| Bilateral, Pheochromocytoma Benign | X | X | | X | X | | X | | X | X | X | | | | | | | | X | | | | X | | X | 13 | | | | | | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | | | | |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| Parathyroid Gland | M | + | + | M | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | M | 45 | | | | | | | |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | | | | |
| Pars Distalis, Adenoma | X | X | | X | X | X | X | X | X | | X | | | X | X | X | | | | | | X | | X | 32 | | | | | | | |
| Pars Intermedia, Adenoma | | | | | | | | | X | | | | | | | | | | | | | | | | | 1 | | | | | | |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | | | | |
| C-cell, Adenoma | | | | | | | | X | | | | | | | X | X | | X | | | | | | X | | 8 | | | | | | |
| C-cell, Carcinoma | | | | | | | | | | | X | | | X | | | | | | | | | 2 | | | | | | | | | |
| Follicular Cell, Carcinoma | | | | | | | | | | | | | | | | | | | X | | 2 | | | | | | | | | | | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| DAY ON TEST | FISCHER 344-TACONIC RATS MALE | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|-------------|-------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|
| | 0699 | 0705 | 0708 | 0701 | 0709 | 0702 | 0709 | 0709 | 0709 | 0709 | 0709 | 0709 | 0709 | 0709 | 0709 | 0709 | 0709 | 0709 | 0709 | 0709 | | 0709 |
| 1.25 mg/m3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 |
| ANIMAL ID | 0011 | 0012 | 0013 | 0014 | 0015 | 0016 | 0017 | 0018 | 0019 | 0020 | 0021 | 0022 | 0023 | 0024 | 0025 | 0026 | 0027 | 0028 | 0029 | 0030 | 0031 | 50 |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------|
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Penis | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Preputial Gland Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 |
| Prostate | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Seminal Vesicle | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Testes | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Bilateral, Interstitial Cell, Adenoma | | X | X | X | | X | | | X | X | X | | X | X | | X | X | X | X | X | | X | | 21 |
| Interstitial Cell, Adenoma | X | | | | X | | | X | X | | | X | | | X | | | | | X | | X | | 18 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Lymph Node | | | | | + | | + | | | | | | | | | | | + | | | | + | + | 9 |
| Lymph Node, Bronchial | M | + | M | + | + | + | + | M | M | M | M | + | M | + | + | M | M | + | + | M | M | M | + | 25 |
| Lymph Node, Mandibular Carcinoma, Metastatic, Zymbal'S Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49
1 |
| Lymph Node, Mediastinal | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |

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

M .. Missing tissue
 A .. Autolysis precludes evaluation
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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
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P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| | 0699 | 0705 | 0708 | 0709 | 0712 | 0719 | 0722 | 0729 | 0732 | 0739 | 0742 | 0749 | 0752 | 0759 | 0762 | 0769 | 0772 | 0779 | 0782 | 0789 | |
| ANIMAL ID | 00215 | 00305 | 00408 | 00511 | 00618 | 00723 | 00830 | 00937 | 01044 | 01151 | 01258 | 01365 | 01472 | 01579 | 01686 | 01793 | 01800 | 01907 | 02014 | 02121 | |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Thymus | + | + | + | + | + | + | + | M | + | + | + | + | + | + | M | + | + | + | + | + | 44 |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland
Fibroadenoma | + | + | M | + | + | + | + | M | M | M | + | M | + | M | M | + | + | X | + | + | 32
1 |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Keratoacanthoma | | | | X | | | | | | | X | | X | | | | | | | | 6 |
| Squamous Cell Papilloma | | | | | | | | | | | | | | | | | | | | | 1 |
| Lip, Squamous Cell Papilloma | | | | | | | | | | | | | | | | | | | | | 1 |
| Pinna, Neural Crest Tumor | | | | | | | | | | | | | | | | | | | | | 1 |
| Subcutaneous Tissue, Fibroma | | | | | | | | | | | | | | X | | | | X | | | 3 |
| Subcutaneous Tissue, Lipoma | | | | | | | | | | | | | | | | | | | | X | 1 |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma, Metastatic, Zymbal'S Gland | | | | | | | | | | | | | | | | | | | | | 1 |
| Oligodendroglioma Malignant | | | | | | | | | | | | | | | X | | | | | | 2 |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | |
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

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

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

Experiment Number: 60311 - 05
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 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

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First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|
| | 0699 | 0705 | 0708 | 0709 | 0712 | 0719 | 0722 | 0729 | 0732 | 0739 | 0742 | 0749 | 0752 | 0759 | 0762 | 0769 | 0772 | 0779 | 0782 | 0789 | |
| ANIMAL ID | 0015 | 0009 | 0005 | 0001 | 0008 | 0003 | 0007 | 0009 | 0000 | 0001 | 0004 | 0005 | 0006 | 0007 | 0008 | 0003 | 0007 | 0008 | 0007 | 0002 | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Alveolar/Bronchiolar Adenoma | X | | | | | | X | | | X | | | | | | | | | | X | 7 |
| Alveolar/Bronchiolar Adenoma, Multiple | | | | | | | | | X | X | | | | | | | | | X | | 3 |
| Alveolar/Bronchiolar Carcinoma | X | X | X | X | | | | | | | | | | X | | X | | | | X | 10 |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | | X | | | | | | | X | | X | | | X | X | | | 6 |
| Carcinoma, Metastatic, Zymbal'S Gland | | | X | | | | | | | | | | | | | | | | | | 1 |
| Cystic Keratinizing Epithelioma | | | | | | | | | | | X | | | | | | | | | | 1 |
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | X | | | | | | | | | | | | | | | | 2 |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | |
| Ear | | | | | | | | | | | | | | | | | | + | | + | 5 |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Zymbal's Gland | | | | + | | | | | | | + | | | | | | | | | | 3 |
| Carcinoma | | | X | | | | | | | | X | | | | | | | | | | 3 |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Renal Tubule, Adenoma | | | | | | | | | | | | | | | | | | | | X | 1 |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------|---|-----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY ON TEST | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| FISCHER 344-TACONIC RATS MALE | | 9 | 0 | 0 | 1 | 1 | 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 | |
| | | 9 | 5 | 8 | 5 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 1.25 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 | |
| | | 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 | |
| | | 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 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | 1 | 3 | 0 | 3 | 4 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 0 | 1 | 1 | 2 | 3 | 4 | 0 | 1 | 1 | 2 | 3 | 4 | 4 | 5 | |
| 5 | 9 | 5 | 1 | 8 | 3 | 7 | 9 | 0 | 1 | 4 | 5 | 6 | 7 | 8 | 3 | 7 | 8 | 7 | 2 | 3 | 8 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| * TOTALS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SYSTEMIC LESIONS

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|-----------|
| Multiple Organ | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear | | | | | | X | X | | X | X | X | | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | 25 | |
| Mesothelioma Malignant | | | | | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | 3 |

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | males
(cont...) |
|-------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | 0
4
7
2 | 0
5
3
5 | 0
5
4
8 | 0
5
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2 | 0
5
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3 | 0
5
9
8 | 0
6
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9 | 0
6
1
1 | 0
6
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8 | 0
6
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8 | 0
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2
5 | 0
6
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8 | 0
6
4
6 | 0
6
5
2 | 0
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4 | 0
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4 | 0
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7 | 0
6
7
8 | 0
6
8
0 | 0
6
8
3 | 0
6
8
8 | 0
6
8
8 | 0
6
8
9 | 0
6
8
9 | |
| 2.5 mg/m3 | 0
0
4
3
9 | 0
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4
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2
4 | 0
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4
2
3 | 0
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4
2
7 | 0
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4
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1 | 0
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4
4
2 | 0
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6 | 0
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3
1 | 0
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2
6 | 0
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1 | 0
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4 | 0
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5 | 0
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8 | 0
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8 | 0
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5 | 0
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4
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2 | 0
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3 | 0
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5 | 0
0
4
3
7 | 0
0
4
0
6 | 0
0
4
1
0 | 0
0
4
1
8 | 0
0
4
2
9 | 0
0
4
2
6 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + |
| Intestine Large, Colon
Carcinoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | A | + | + | + | A | + |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | A | + | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Mesentery
Lipoma | + | + | | | | | | | | | | | + | + | | | | | | | | | | | + |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + |
| Salivary Glands
Schwannoma Malignant | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

CARDIOVASCULAR SYSTEM

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | males
(cont...) | | | | | |
|-------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------|---|---|---|---|--|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | | | |
| 2.5 mg/m3 | 4 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 9 | | | | |
| | 7 | 3 | 4 | 8 | 8 | 9 | 0 | 1 | 1 | 1 | 2 | 2 | 4 | 5 | 5 | 5 | 6 | 7 | 8 | 8 | 8 | | 8 | 9 | | |
| ANIMAL ID | | 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 | | | | |
| | 3 | 4 | 2 | 2 | 2 | 3 | 1 | 4 | 2 | 3 | 2 | 1 | 1 | 0 | 3 | 2 | 4 | 0 | 4 | 3 | 0 | 1 | 1 | 2 | 2 | |
| | 9 | 0 | 4 | 3 | 7 | 1 | 2 | 6 | 1 | 6 | 2 | 4 | 5 | 8 | 8 | 5 | 2 | 3 | 5 | 7 | 6 | 0 | 8 | 9 | 6 | |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Carcinoma, Metastatic Schwannoma Malignant | | | | | | | | | | | | | | | | | | | | | | | | | X |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Pheochromocytoma Benign | | | | X | | | | | | | X | | X | | | | | | X | | | | X | X | |
| Pheochromocytoma Malignant | | | | | | | | | | | X | X | | | | | | | X | | | | X | X | |
| Bilateral, Pheochromocytoma Benign | | | | | | X | | | X | X | | | | X | X | | | X | | X | X | | | | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | |
| Adenoma | | | | | | | | | X | | | | | | | | | | | | | | | X | |
| Carcinoma | | | | | | | | | X | | | | | X | | | | | | | | | | | |
| Parathyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | M | + | + | |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Pars Distalis, Adenoma | X | X | | X | X | | | | | X | X | | X | X | X | | X | X | | X | X | X | | X | |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| C-cell, Adenoma | | | X | | | X | | | | | | | | | | | | | | | | | X | X | |
| C-cell, Carcinoma | | | | | | | | | X | | | | | | | | | | | | | | | | |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | males
(cont...) |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------------------|
| | 0
4 | 0
5 | 0
5 | 0
5 | 0
5 | 0
5 | 0
6 | 0
6 | 0
6 | 0
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6 | 0
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6 | 0
6 | 0
6 | 0
6 | 0
6 | 0
6 | 0
6 | 0
6 | 0
6 | 0
6 | 0
6 | |
| 2.5 mg/m3 | 7 | 3 | 4 | 8 | 8 | 9 | 0 | 1 | 1 | 1 | 2 | 2 | 4 | 5 | 5 | 5 | 6 | 6 | 7 | 8 | 8 | 8 | 8 | 8 | |
| | 2 | 5 | 8 | 2 | 3 | 8 | 9 | 1 | 8 | 8 | 5 | 8 | 6 | 2 | 2 | 4 | 4 | 7 | 8 | 0 | 3 | 8 | 8 | 9 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | 3 | 4 | 2 | 2 | 2 | 3 | 1 | 4 | 2 | 3 | 2 | 1 | 1 | 0 | 3 | 2 | 4 | 0 | 4 | 3 | 0 | 1 | 1 | 2 | |
| | 9 | 0 | 4 | 3 | 7 | 1 | 2 | 6 | 1 | 6 | 2 | 4 | 5 | 8 | 8 | 5 | 2 | 3 | 5 | 7 | 6 | 0 | 8 | 9 | |
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Preputial Gland
Carcinoma | + | + | + | + | + | X | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | |
| Prostate
Pheochromocytoma Malignant, Metastatic,
Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Seminal Vesicle | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Testes
Bilateral, Interstitial Cell, Adenoma
Interstitial Cell, Adenoma | + | + | X | + | + | + | + | + | + | + | + | X | + | + | X | + | + | X | X | X | + | X | X | + | |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Lymph Node | | | | | | | | | | | | + | | | | | | | | + | | + | | | |
| Lymph Node, Bronchial | M | + | + | M | M | M | M | + | + | + | M | + | M | M | + | M | M | M | + | + | M | M | M | + | |
| Lymph Node, Mandibular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Lymph Node, Mediastinal | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| DAY ON TEST | FISCHER 344-TACONIC RATS MALE | | | | | | | | | | | | | | | | | | | | | | | | males
(cont...) |
|-------------|-------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|---|--------------------|
| | 0
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8 | 0
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2 | 0
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3 | 0
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1 | 0
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8 | 0
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5 | 0
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8 | 0
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8 | 0
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8
3 | 0
6
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8 | 0
6
8
8 | 0
6
8
9 | 0
6
8
9 | | |
| 2.5 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 | |
| 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 | |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | 3 | 4 | 2 | 2 | 2 | 3 | 1 | 4 | 2 | 3 | 2 | 1 | 1 | 0 | 3 | 2 | 4 | 0 | 4 | 3 | 0 | 1 | 1 | 2 | |
| | 9 | 0 | 4 | 3 | 7 | 1 | 2 | 6 | 1 | 6 | 2 | 4 | 5 | 8 | 8 | 5 | 2 | 3 | 5 | 7 | 6 | 0 | 8 | 9 | |

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland | + | + | + | M | + | + | M | M | + | + | + | M | M | + | M | + | + | + | + | + | + | + | + | M |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Basal Cell Adenoma | | | | | | | | | | | | | | | | | | | | | | | | |
| Basal Cell Carcinoma | | | | | | | | | | | | | | | | X | | | | | | | | |
| Keratoacanthoma | | | | X | X | | | | | | | | | X | | | X | | | | | | | |
| Sebaceous Gland, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | |
| Subcutaneous Tissue, Fibroma | | | | | | | | | | | X | | | | | | | | | | | X | | |

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Alveolar/Bronchiolar Adenoma | | X | | | | X | | | | | X | X | | | | | | | | | | | | | |
| Alveolar/Bronchiolar Adenoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma | X | | | | | | | | | | | | | X | X | X | | | | X | X | | | | |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | | | | | X | | | | | | | | X | | | | | | X | | X | |
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | X | |
| Nose | A | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | I | A | + | + | + | I | + |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | males
(cont...) |
|--|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|--------------------|
| | 04 | 05 | 05 | 05 | 05 | 05 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | | |
| 2.5 mg/m3 | 72 | 35 | 48 | 82 | 83 | 98 | 09 | 11 | 11 | 22 | 22 | 48 | 55 | 55 | 66 | 67 | 88 | 88 | 88 | 88 | 89 | 89 | 89 | | |
| ANIMAL ID | 0043 | 0044 | 0042 | 0022 | 0022 | 0031 | 0044 | 0042 | 0034 | 0021 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | | |
| Multiple Organ | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Histiocytic Sarcoma | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leukemia Mononuclear | | | | X | | | | X | X | | | | | | X | | X | X | X | X | X | X | X | | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|
| | 073 | 074 | 075 | 075 | 076 | 076 | 079 | 079 | 079 | 079 | 079 | 079 | 079 | 079 | 079 | 079 | 079 | 079 | 079 | 079 | 079 | 079 | 079 | | 079 |
| ANIMAL ID | 00413 | 00441 | 00404 | 00434 | 00402 | 00404 | 00401 | 00409 | 00400 | 00404 | 00405 | 00407 | 00406 | 00408 | 00400 | 00403 | 00403 | 00404 | 00404 | 00401 | 00411 | 00403 | 00403 | 00404 | 00400 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | 48 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Large, Colon
Carcinoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49
1 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Mesentery
Lipoma | | | | | | | | | + | | | | | | | | | | | | | + | | | 9
1 |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Salivary Glands
Schwannoma Malignant | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | 49 |

CARDIOVASCULAR SYSTEM

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|-------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | 0
7
0
3 | 0
7
0
4 | 0
7
0
5 | 0
7
0
5 | 0
7
1
6 | 0
7
1
6 | 0
7
1
9 | 0
7
2
1 | 0
7
2
5 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
2
9 | 0
7
3
0 | 0
7
3
0 | 0
7
3
0 | 0
7
3
0 | | 0
7
3
0 |
| 2.5 mg/m3 | 0
4
1
3 | 0
4
4
7 | 0
4
0
2 | 0
4
4
9 | 0
4
3
2 | 0
4
4
4 | 0
4
0
1 | 0
4
0
9 | 0
4
4
0 | 0
4
4
4 | 0
4
0
5 | 0
4
0
7 | 0
4
0
6 | 0
4
0
8 | 0
4
0
0 | 0
4
0
3 | 0
4
4
1 | 0
4
4
1 | 0
4
1
7 | 0
4
3
9 | 0
4
3
3 | 0
4
3
0 |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Alveolar/Bronchiolar Carcinoma, Metastatic | | | | | | | | | | | | | | | | | | | | | X | | | 1 |
| Schwannoma Malignant | | | | | | | | | | | | | | | | | | | | | | | | 1 |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Pheochromocytoma Benign | | | | X | | | | | | X | X | | | X | | | X | | X | X | | X | 15 | |
| Pheochromocytoma Malignant | | | | X | | | | | | | | | | X | | | | | X | | | X | 9 | |
| Bilateral, Pheochromocytoma Benign | X | X | | | X | X | | X | X | X | X | | | X | X | | X | | | | X | X | 22 | |
| Islets, Pancreatic | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 | |
| Adenoma | | | X | | | | X | X | | | | | | | | | X | | | | | | 6 | |
| Carcinoma | | | | | | | | | | | | | | | | | X | | X | X | | | 5 | |
| Parathyroid Gland | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 | |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | 49 | |
| Pars Distalis, Adenoma | X | X | X | X | X | | X | | | | | X | X | | X | X | X | X | X | | | X | X | 31 |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| C-cell, Adenoma | | | | | | | X | X | | | | | X | | | | | | | X | | | 8 | |
| C-cell, Carcinoma | | | | | | | | | | | X | | | X | | | | | | | | | 3 | |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|---------|
| | 073 | 074 | 075 | 075 | 076 | 076 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | | 077 |
| ANIMAL ID | 00413 | 00447 | 00448 | 00449 | 00452 | 00453 | 00454 | 00455 | 00456 | 00457 | 00458 | 00459 | 00460 | 00461 | 00462 | 00463 | 00464 | 00465 | 00466 | 00467 | 00468 | |
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Preputial Gland
Carcinoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49
1 |
| Prostate
Pheochromocytoma Malignant, Metastatic,
Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 |
| Seminal Vesicle | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Testes
Bilateral, Interstitial Cell, Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Interstitial Cell, Adenoma | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | 17 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Lymph Node | | | | | | | | + | + | | | | | | | | | | | | | 5 |
| Lymph Node, Bronchial | + | + | M | + | + | M | M | + | M | + | M | M | M | M | + | + | M | + | M | + | M | 21 |
| Lymph Node, Mandibular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Lymph Node, Mediastinal | + | + | M | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | 46 |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | 49 |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Thymus | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | M | + | + | 47 |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| DAY ON TEST | FISCHER 344-TACONIC RATS MALE | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | | | |
|-------------|-------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|------|------|------|------|------|------|
| | 0703 | 0704 | 0705 | 0706 | 0707 | 0708 | 0709 | 0710 | 0711 | 0712 | 0713 | 0714 | 0715 | 0716 | 0717 | 0718 | 0719 | 0720 | 0721 | 0722 | | 0723 | 0724 | 0725 | 0726 | 0727 | 0728 | 0729 |
| 2.5 mg/m3 | 003 | 004 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 013 | 014 | 015 | 016 | 017 | 018 | 019 | 020 | 021 | 022 | 023 | 024 | 025 | 026 | 027 | 028 | 029 | 030 |
| ANIMAL ID | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 | 004 |

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---|----|
| Mammary Gland | M | + | M | + | + | + | + | M | M | M | M | M | + | M | M | + | + | M | + | + | + | M | + | M | M | 30 | | |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Basal Cell Adenoma | | | X | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Basal Cell Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Keratoacanthoma | X | | X | | X | | | | | | | | | | | | | | | | | | | | | | | 7 |
| Sebaceous Gland, Adenoma | | | | | | | | | | | | | | | | | | | | | | | X | | | | | 1 |
| Subcutaneous Tissue, Fibroma | | | | | | | | | | | | | | | | | | | | | | | X | | | | | 3 |

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Alveolar/Bronchiolar Adenoma | | X | X | | X | | | | | | | | | | | | | | | | | | | X | | | | 8 |
| Alveolar/Bronchiolar Adenoma, Multiple | | | | | | | | X | | | | | | | | | | | X | | | | | | | | | 2 |
| Alveolar/Bronchiolar Carcinoma | X | X | | X | | | X | X | | X | X | | X | X | | X | | X | X | X | | X | X | | X | | 20 | |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | X | | X | X | | X | X | | X | | X | | X | | X | X | | | | X | | | | | 14 |
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | X | X | X | | X | | | | | | | | | | | 5 |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 45 |

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

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

Experiment Number: 60311 - 05

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Date Report Requested: 01/18/2012

Test Type: CHRONIC

Cobalt

Time Report Requested: 14:48:12

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: 7440-48-4

First Dose M/F: 05/08/06 / 05/08/06

Species/Strain: RATS/F344/N Tac

Lab: BNW

| FISCHER 344-TACONIC RATS MALE
2.5 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 | * TOTALS |
|--|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|
| | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | 3 | 4 | 5 | 5 | 6 | 6 | 9 | 1 | 5 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | | 1 | 4 | 0 | 4 | 3 | 4 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 2 | 3 | 3 | 4 | 4 | 1 | 1 | 1 | 3 | 3 | |
| | | 3 | 7 | 2 | 9 | 2 | 4 | 1 | 9 | 0 | 4 | 5 | 7 | 6 | 8 | 0 | 3 | 1 | 8 | 1 | 7 | 9 | 4 | 5 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| | Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| | Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | X | | | | | | | | | | | | | | | | | | 1 |
| | Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Multiple Organ | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| | Histiocytic Sarcoma | | | | | | | | | | | | | | | | | | | | X | | | | 1 |
| | Leukemia Mononuclear | | X | | | | X | | X | X | | | | X | X | X | | | | X | | X | X | X | 22 |

* .. Total animals with tissue examined microscopically; Total animals with tumor

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | males
(cont...) | |
|-------------------------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------|--|
| | 04 | 04 | 04 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | | |
| 5.0 mg/m3 | 7 | 7 | 9 | 1 | 5 | 6 | 7 | 7 | 9 | 1 | 1 | 1 | 2 | 4 | 4 | 5 | 6 | 6 | 7 | 8 | 8 | 8 | 9 | 9 | | |
| | 0 | 8 | 1 | 6 | 2 | 1 | 2 | 2 | 0 | 1 | 8 | 9 | 8 | 6 | 6 | 2 | 0 | 0 | 9 | 8 | 9 | 9 | 1 | 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 | |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| | 2 | 3 | 4 | 0 | 0 | 3 | 1 | 5 | 4 | 3 | 4 | 2 | 0 | 0 | 3 | 3 | 3 | 4 | 0 | 4 | 1 | 2 | 0 | 2 | 4 | |
| | 4 | 1 | 0 | 4 | 5 | 7 | 7 | 0 | 8 | 9 | 6 | 1 | 3 | 6 | 8 | 2 | 0 | 9 | 9 | 2 | 8 | 6 | 2 | 0 | 5 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | X | | | | | | | | | |
| Carcinoma, Metastatic, Kidney | | | | | | | | | | | | | | | | | | | | | | | | |
| Hemangiosarcoma | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Adenoma | | | | | | | | | | | | | | | | X | | | | | | | | |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | | | + |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma, Metastatic, Kidney | | | | | | | | | | | | | | | | | | | | | | | | |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | males
(cont...) |
|-------------------------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------|
| | 04 | 04 | 04 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | |
| 5.0 mg/m3 | 7 | 7 | 9 | 1 | 5 | 6 | 7 | 7 | 9 | 1 | 1 | 1 | 2 | 4 | 4 | 5 | 6 | 6 | 7 | 8 | 8 | 8 | 9 | 9 | |
| ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| | 2 | 3 | 4 | 0 | 0 | 3 | 1 | 5 | 4 | 3 | 4 | 2 | 0 | 0 | 3 | 3 | 3 | 4 | 0 | 4 | 1 | 2 | 0 | 2 | |
| | 4 | 1 | 0 | 4 | 5 | 7 | 7 | 0 | 8 | 9 | 6 | 1 | 3 | 6 | 8 | 2 | 0 | 9 | 9 | 2 | 8 | 6 | 2 | 0 | |

Stomach, Glandular

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Carcinoma, Metastatic | | | | | | | | | | X | X | | | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | X | | | | | | | | | | | | | | |
| Pheochromocytoma Malignant, Metastatic, Adrenal Medulla | | | | | | | | | | | | | | | | | | | | | | | |
| Schwannoma Malignant | | | | | | | | | | | | | | | | | | | | | | | |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Pheochromocytoma Benign | | | | | | X | X | | | X | X | | | | | | | | | X | | | |
| Pheochromocytoma Malignant | | | | | | | | | | | | | | | | | | | | X | | | |
| Bilateral, Pheochromocytoma Benign | | | | | | | | | X | X | | | X | X | | X | X | | X | | X | | |
| Bilateral, Pheochromocytoma Malignant | | | | | | | | | | | | X | | | | | X | | | | | | X |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | |
| Carcinoma | | | | | | | | | | | | | | | | | | | X | | | X | X |
| Parathyroid Gland | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Pars Distalis, Adenoma | X | X | | | | | X | X | X | | | | | X | X | X | | X | | X | | X | X |
| Thyroid Gland | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Bilateral, C-cell, Adenoma | | | | | | | | | | X | | | | | | | | | | | | | |

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

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

Experiment Number: 60311 - 05

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Date Report Requested: 01/18/2012

Test Type: CHRONIC

Cobalt

Time Report Requested: 14:48:12

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: 7440-48-4

First Dose M/F: 05/08/06 / 05/08/06

Species/Strain: RATS/F344/N Tac

Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | males
(cont...) | |
|-------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------|---|
| | 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 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | 6 |
| 5.0 mg/m3 | 7 | 7 | 9 | 1 | 5 | 6 | 7 | 7 | 9 | 1 | 1 | 1 | 2 | 4 | 4 | 5 | 6 | 6 | 7 | 8 | 8 | 8 | |
| | 0 | 8 | 1 | 6 | 2 | 1 | 2 | 2 | 0 | 1 | 8 | 9 | 8 | 6 | 6 | 2 | 0 | 0 | 9 | 8 | 9 | 9 | |
| 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 | |
| | | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| | | 2 | 3 | 4 | 0 | 0 | 3 | 1 | 5 | 4 | 3 | 4 | 2 | 0 | 0 | 3 | 3 | 3 | 4 | 0 | 4 | 1 | |
| | | 4 | 1 | 0 | 4 | 5 | 7 | 7 | 0 | 8 | 9 | 6 | 1 | 3 | 6 | 8 | 2 | 0 | 9 | 9 | 2 | 8 | |
| | | | | | | | | | | | | | | | | | | | | | | | |

C-cell, Adenoma
C-cell, Carcinoma

X

GENERAL BODY SYSTEM

Peritoneum

GENITAL SYSTEM

Epididymis

+ +

Preputial Gland
Carcinoma+ M
X

Prostate

+ +

Seminal Vesicle
Carcinoma, Metastatic, Kidney

+ +

Testes
Bilateral, Interstitial Cell, Adenoma
Interstitial Cell, Adenoma+
X X X X X X
X X X**HEMATOPOIETIC SYSTEM**

Bone Marrow

+ +

Lymph Node
Renal, Pheochromocytoma Malignant,
Metastatic, Adrenal Medulla

+ +

Lymph Node, Bronchial

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

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | males
(cont...) | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | 0
4
7
0 | 0
4
7
8 | 0
4
9
1 | 0
5
1
6 | 0
5
5
2 | 0
5
6
1 | 0
5
7
2 | 0
5
7
2 | 0
5
9
0 | 0
6
1
1 | 0
6
1
8 | 0
6
1
9 | 0
6
2
8 | 0
6
4
6 | 0
6
4
6 | 0
6
5
2 | 0
6
6
0 | 0
6
6
0 | 0
6
7
9 | 0
6
8
8 | | 0
6
8
9 | 0
6
8
9 | 0
6
9
1 | 0
6
9
1 | 0
6
9
6 |
| ANIMAL ID | 0
0
6
2
4 | 0
0
6
3
1 | 0
0
6
4
0 | 0
0
6
0
4 | 0
0
6
0
5 | 0
0
6
3
7 | 0
0
6
1
7 | 0
0
6
5
0 | 0
0
6
4
8 | 0
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9 | 0
0
6
4
6 | 0
0
6
2
1 | 0
0
6
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3 | 0
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6
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6 | 0
0
6
3
8 | 0
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3
2 | 0
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6
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0 | 0
0
6
2
5 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lymph Node, Mandibular | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + |
| Lymph Node, Mediastinal
Alveolar/Bronchiolar Carcinoma, Metastatic,
Lung | + | M | + | + | + | + | + | + | + | X | X | X | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Thymus
Alveolar/Bronchiolar Carcinoma, Metastatic,
Lung | + | + | + | + | + | + | + | + | + | X | X | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + |

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland
Fibroadenoma | + | + | M | + | M | + | M | M | M | + | M | + | + | + | M | M | + | + | + | M | + | + | + | M | M | |
| Skin
Basal Cell Adenoma
Keratoacanthoma
Trichoepithelioma
Subcutaneous Tissue, Fibrous Histiocytoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | X | + | + | + | + |

MUSCULOSKELETAL SYSTEM

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

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | males (cont...) |
|-------------------------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------------|
| | 04 | 04 | 04 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | |
| 5.0 mg/m3 | 70 | 78 | 79 | 91 | 56 | 67 | 77 | 77 | 90 | 01 | 11 | 11 | 22 | 44 | 44 | 56 | 66 | 77 | 88 | 88 | 99 | 99 | |
| ANIMAL ID | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | |
| | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | |
| | 23 | 44 | 00 | 00 | 33 | 11 | 55 | 44 | 33 | 44 | 22 | 00 | 00 | 33 | 33 | 33 | 44 | 00 | 44 | 11 | 22 | 00 | |
| | 41 | 00 | 04 | 05 | 07 | 07 | 00 | 08 | 09 | 06 | 01 | 03 | 06 | 08 | 02 | 00 | 09 | 09 | 02 | 08 | 06 | 02 | |

Alveolar/Bronchiolar Carcinoma, Metastatic, Lung

X

X

Carcinoma, Metastatic, Kidney

Fibrous Histiocytoma, Metastatic, Skin

X

NERVOUS SYSTEM

Brain

+ +

RESPIRATORY SYSTEM

Larynx

+ +

Lung

+ +

Alveolar/Bronchiolar Adenoma

X

X

X

X

Alveolar/Bronchiolar Adenoma, Multiple

X

X

X

Alveolar/Bronchiolar Carcinoma

X

X

X

X

Alveolar/Bronchiolar Carcinoma, Multiple

X

X

X

X

X

X

X

X

X

X

X

X

Carcinoma, Metastatic, Kidney

Carcinoma, Metastatic, Zymbal'S Gland

Cystic Keratinizing Epithelioma

X

Pheochromocytoma Malignant, Metastatic, Adrenal Medulla

Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung

X

X

X

Mediastinum, Carcinoma, Metastatic, Kidney

Mediastinum, Carcinoma, Metastatic, Uncertain Primary Site

X

Nose

+ +

Trachea

+ +

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| 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 |
|-------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|
| FISCHER 344-TACONIC RATS MALE | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 7 | 7 | 9 | 1 | 5 | 6 | 7 | 7 | 9 | 1 | 1 | 1 | 2 | 4 | 4 | 5 | 6 | 6 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 9 |
| | 0 | 8 | 1 | 6 | 2 | 1 | 2 | 2 | 0 | 1 | 8 | 9 | 6 | 6 | 6 | 2 | 0 | 0 | 9 | 8 | 9 | 9 | 1 | 1 | 6 | 6 |
| 5.0 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 | 0 | 0 | 0 | 0 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 2 | 3 | 4 | 0 | 0 | 3 | 1 | 5 | 4 | 3 | 4 | 2 | 0 | 0 | 3 | 3 | 3 | 4 | 0 | 4 | 1 | 2 | 0 | 2 | 4 | |
| | 4 | 1 | 0 | 4 | 5 | 7 | 7 | 0 | 8 | 9 | 6 | 1 | 3 | 6 | 8 | 2 | 0 | 9 | 9 | 2 | 8 | 6 | 2 | 0 | 5 | |
| ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | | | males (cont...) |

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Zymbal's Gland | | | | | | | | | | | | | | | | | | | | | | | | | |
| Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | X | | | | | | |
| Renal Tubule, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | |
| Renal Tubule, Adenoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | X |
| Renal Tubule, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | X |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

SYSTEMIC LESIONS

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Multiple Organ | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Leukemia Mononuclear | | X | X | X | X | X | | X | | | | | X | X | X | | X | X | X | X | | | | X | X |
| Mesothelioma Malignant | | | | | | | | | | | | | | | | | | | | | | | | | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| | ANIMAL ID | | 0698 | 0722 | 0735 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | |
| | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 | 00610 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Esophagus | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Intestine Large, Cecum | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Colon | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Rectum | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | 49 |
| Intestine Small, Duodenum | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Ileum | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Jejunum | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Liver | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Carcinoma, Metastatic, Kidney Hemangiosarcoma | | | | | | | | | | | | | | X | | | | | | | | | | 1 |
| Hepatocellular Adenoma | | | | | | | | | | | | | | | | | | | | | | X | | 1 |
| Mesentery | | | | + | | | | | | | | | + | | | | | | | | | | | 3 |
| Pancreas | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma, Metastatic, Kidney | | | | | | | | | | | | | | X | | | | | | | | | | 1 |
| Salivary Glands | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Forestomach | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

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

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Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| DAY ON TEST | FISCHER 344-TACONIC RATS MALE | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|-------------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|
| | 0698 | 0702 | 0703 | 0705 | 0707 | 0708 | 0709 | 0712 | 0713 | 0714 | 0715 | 0716 | 0717 | 0718 | 0719 | 0722 | 0723 | 0724 | 0725 | 0726 | | 0727 |
| 5.0 mg/m3 | 0010 | 0006 | 0006 | 0004 | 0001 | 0002 | 0009 | 0003 | 0001 | 0004 | 0005 | 0006 | 0002 | 0003 | 0005 | 0007 | 0008 | 0003 | 0004 | 0003 | 0004 | 0001 |
| ANIMAL ID | 00610 | 00664 | 00664 | 00611 | 00620 | 00601 | 00611 | 00611 | 00611 | 00611 | 00611 | 00611 | 00622 | 00622 | 00622 | 00622 | 00633 | 00633 | 00644 | 00644 | 00600 | 00600 |

Stomach, Glandular + 50

CARDIOVASCULAR SYSTEM

| | | |
|---|---|----|
| Heart | + | 50 |
| Alveolar/Bronchiolar Carcinoma, Metastatic | | 2 |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | 1 |
| Pheochromocytoma Malignant, Metastatic, Adrenal Medulla | X | 1 |
| Schwannoma Malignant | X | 2 |

ENDOCRINE SYSTEM

| | | |
|---------------------------------------|---|----|
| Adrenal Cortex | + | 50 |
| Adrenal Medulla | + | 50 |
| Pheochromocytoma Benign | X | 13 |
| Pheochromocytoma Malignant | X | 9 |
| Bilateral, Pheochromocytoma Benign | X | 21 |
| Bilateral, Pheochromocytoma Malignant | X | 7 |
| Islets, Pancreatic | + | 49 |
| Adenoma | X | 3 |
| Carcinoma | X | 6 |
| Parathyroid Gland | + + + + + + + + M M + M + + + + + + + + + + + + | 46 |
| Pituitary Gland | + + + + + + + + + + + + + + + + M + + + + + + + + | 49 |
| Pars Distalis, Adenoma | X | 24 |
| Thyroid Gland | + | 49 |
| Bilateral, C-cell, Adenoma | X | 1 |

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

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

| 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 | | | | |
|-------------------------------|--|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|---|--|
| FISCHER 344-TACONIC RATS MALE | | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | |
| 5.0 mg/m3 | | 9 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | | | | |
| ANIMAL ID | | 8 | 2 | 2 | 3 | 5 | 7 | 7 | 2 | 2 | 3 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | 0 | | | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | | 0 | 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 | | | | |
| | | 1 | 4 | 4 | 1 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 0 | 0 | | | | |
| | | 0 | 1 | 7 | 2 | 9 | 8 | 9 | 3 | 1 | 4 | 5 | 6 | 2 | 3 | 5 | 7 | 8 | 3 | 4 | 3 | 4 | 4 | | | | |
| | | * TOTALS | | | | | | | | | | | | | | | | | | | | | | | | | |
| C-cell, Adenoma | | X | | | X | | | | | | | | X | | | X | | X | | X | | X | | X | | 6 | |
| C-cell, Carcinoma | | X | | | | | | | | 1 | | | | | | | | | | | | | | | | | |

GENERAL BODY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|------------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|
| Peritoneum | + | | | | | | | | | | | | | | | | | | | | | | 1 |
|------------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Preputial Gland | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | 48 |
| Carcinoma | | | | X | | | | | | | | | X | | | | | | | | | | | 3 |
| Prostate | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Seminal Vesicle | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma, Metastatic, Kidney | | | | | | | | | | | | X | | | | | | | | | | | | 1 |
| Testes | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Bilateral, Interstitial Cell, Adenoma | X | | | | | X | | | | | | | X | | | | X | | | X | | X | X | 12 |
| Interstitial Cell, Adenoma | | | X | X | X | X | | X | X | X | | | | X | X | | | | X | | | | | 17 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---|----|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Lymph Node | | | | | | | | | + | | | | + | | | + | | | | | | | | 9 | | |
| Renal, Pheochromocytoma Malignant, Metastatic, Adrenal Medulla | | | | | | | | X | | | | | | | | | | | | | | | | 1 | | |
| Lymph Node, Bronchial | + | + | M | M | M | M | + | M | + | M | M | M | + | M | M | + | + | + | + | M | + | + | M | + | + | 20 |

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

M .. Missing tissue
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| FISCHER 344-TACONIC RATS MALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|--|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|-----|
| | 068 | 072 | 072 | 073 | 075 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | 077 | | 077 |
| ANIMAL ID | 001 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 | 006 |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---------|
| Lymph Node, Mandibular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 | |
| Lymph Node, Mediastinal
Alveolar/Bronchiolar Carcinoma, Metastatic,
Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | 48
3 |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Thymus
Alveolar/Bronchiolar Carcinoma, Metastatic,
Lung | M | + | M | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | 46
2 |

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------|
| Mammary Gland
Fibroadenoma | M | + | + | + | M | + | M | M | + | + | M | M | + | + | X | + | M | + | + | + | + | + | + | M | 31
1 |
| Skin
Basal Cell Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
3 |
| Keratoacanthoma | X | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| Trichoepithelioma | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Subcutaneous Tissue, Fibrous Histiocytoma | | | | | | | | | | | | | | | | | | | | | | | | | 2 |

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------|
| Bone
Alveolar/Bronchiolar Carcinoma, Metastatic,
Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | 4 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
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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 |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|---|---|
| FISCHER 344-TACONIC RATS MALE | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | 9 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | |
| | 8 | 2 | 2 | 3 | 5 | 7 | 7 | 2 | 3 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | 0 | 0 | 0 | |
| 5.0 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 | |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| | 1 | 4 | 4 | 1 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 0 | 0 | 3 | 3 | |
| | 0 | 1 | 7 | 2 | 9 | 8 | 9 | 3 | 1 | 4 | 5 | 6 | 2 | 3 | 5 | 7 | 8 | 3 | 4 | 3 | 4 | 1 | 7 | 5 | 6 |
| | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | |

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Zymbal's Gland | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | 1 |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Renal Tubule, Adenoma | | | | | | | | | | | | | | | | | | | | | | X | X | | 2 |
| Renal Tubule, Adenoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Renal Tubule, Carcinoma | | | | | | | | | | | | X | | | | | | | | | | | | | 2 |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

SYSTEMIC LESIONS

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|
| Multiple Organ | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Leukemia Mononuclear | | X | | | X | | | X | X | | | X | | | X | | | | | | X | | | | 22 |
| Mesothelioma Malignant | | | | | | | | | | | | | | X | | | | | | | | | | | 1 |

*** END OF MALE DATA ***

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
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8 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum
Carcinoma, Metastatic, Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon
Carcinoma, Metastatic, Islets, Pancreatic | X | | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + |
| Intestine Small, Ileum
Carcinoma
Carcinoma, Metastatic, Islets, Pancreatic
Fibrous Histiocytoma, Metastatic, Skin | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum
Carcinoma
Carcinoma, Metastatic, Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver
Carcinoma, Metastatic, Islets, Pancreatic
Fibrous Histiocytoma, Metastatic, Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Mesentery
Carcinoma, Metastatic, Islets, Pancreatic | + | | | | | | + | | | | | | | | | | | | | | | + | | + | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------|--|-----------|----------------------|
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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
1
1
6 | | | |

Acinus, Carcinoma, Metastatic, Islets, Pancreatic

X

Salivary Glands
Fibrous Histiocytoma, Metastatic, Skin

+
X

Stomach, Forestomach
Squamous Cell Papilloma

+ +

Stomach, Glandular

+ +

Tongue
Squamous Cell Papilloma

Tooth

+

CARDIOVASCULAR SYSTEM

Heart
Carcinoma, Metastatic, Islets, Pancreatic
Fibrous Histiocytoma, Metastatic, Skin

+
X
X

ENDOCRINE SYSTEM

Adrenal Cortex
Carcinoma, Metastatic, Islets, Pancreatic

+
X

Adrenal Medulla
Pheochromocytoma Benign
Bilateral, Fibrous Histiocytoma, Metastatic, Skin
Bilateral, Pheochromocytoma Benign

+
X X

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

M .. Missing tissue
 A .. Autolysis precludes evaluation
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Cobalt

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 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| | | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
|---|-----------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|
| FISCHER 344-TACONIC RATS
FEMALE
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 | |
| | | 2 | 3 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | | 3 | 1 | 1 | 3 | 5 | 1 | 4 | 5 | 6 | 7 | 7 | 8 | 9 | 9 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Islets, Pancreatic Carcinoma | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Parathyroid Gland | | + | + | M | M | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | M | + | + | + | + | |
| Pituitary Gland
Pars Distalis, Adenoma | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Thyroid Gland
Bilateral, C-cell, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C-cell, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C-cell, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Follicular Cell, Carcinoma | | | | X | | | | | | | | | | | | | | | | | | | | | | |
| GENERAL BODY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Peritoneum | | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Carcinoma, Metastatic, Islets, Pancreatic | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| GENITAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Clitoral Gland | | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ovary | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Carcinoma, Metastatic, Islets, Pancreatic | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| Uterus | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Carcinoma, Metastatic, Islets, Pancreatic | | X | | | | | | | | | | | | | | | | | | | | | | | | |
| Hemangiosarcoma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leiomyoma | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

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Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------|-----------|----------------------|
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Polyp Stromal X X X X X X

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node | + | + | | | | | + | | | | | | | + | | | | | | | | | | |
| Deep Cervical, Fibrous Histiocytoma, Metastatic, Skin | | X | | | | | | | | | | | | | | | | | | | | | | |
| Lumbar, Renal, Carcinoma, Metastatic, Islets, Pancreatic | X | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Bronchial | M | + | M | + | M | M | M | M | M | M | + | + | M | + | M | + | + | M | M | + | M | + | M | + |
| Fibrous Histiocytoma, Metastatic, Skin | | X | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Mandibular | + | + | + | + | + | + | M | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + |
| Fibrous Histiocytoma, Metastatic, Skin | | X | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Mediastinal | + | + | + | + | M | + | + | + | + | + | + | + | + | M | + | + | M | + | + | + | + | + | + | + |
| Carcinoma, Metastatic, Islets, Pancreatic | | X | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma, Metastatic, Islets, Pancreatic | | X | | | | | | | | | | | | | | | | | | | | | | |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma, Metastatic, Islets, Pancreatic | | X | | | | | | | | | | | | | | | | | | | | | | |
| Fibrous Histiocytoma, Metastatic, Skin | | | X | | | | | | | | | | | | | | | | | | | | | |
| Thymus | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

INTEGUMENTARY SYSTEM

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

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

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

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Cobalt
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 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------|--|-----------|----------------------|
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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | |
| Carcinoma | | | | | | | | | | | | | | | X | | | | | | | | | | |
| Fibroadenoma | | X | | | | | X | | X | | | X | | | | | | | X | | | X | | | |
| Fibroadenoma, Multiple | | | | | | | | | | | | | | | | | | X | | | | | | | |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Basal Cell Adenoma | | | | | | | | | | | | | | | | | | | | | | | X | | |
| Squamous Cell Papilloma | | | | | | | | | | | | | | | | | | | X | | | | | | |
| Subcutaneous Tissue, Fibroma | | | | | | | | | | | X | | | | | | | | | | | | | | |
| Subcutaneous Tissue, Fibrous Histiocytoma | | X | | | | | | | | | | | | | | | | | | | | | | | |
| Subcutaneous Tissue, Lipoma | | | X | | | | | | | | | | | | | | | | | | | | | | |
| Subcutaneous Tissue, Schwannoma Malignant | | | | | | | | | | | | | | | | | | | | | | | | | |

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Skeletal Muscle | + | | | | | | | | | | | | | | | | | | | | | | | | |
| Carcinoma, Metastatic, Islets, Pancreatic | X | | | | | | | | | | | | | | | | | | | | | | | | |

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Alveolar/Bronchiolar Adenoma | | | | | | | | | | | | | | X | | X | | | | | | | | | |
| Carcinoma, Metastatic, Islets, Pancreatic | X | | | | | | | | | | | | | | | | | | | | | | | | |
| Fibrous Histiocytoma, Metastatic, Skin | | X | | | | | | | | | | | | | | | | | | | | | | | |

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

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Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|--|
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| Acinus, Carcinoma, Metastatic, Islets, Pancreatic | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Salivary Glands
Fibrous Histiocytoma, Metastatic, Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| Stomach, Forestomach
Squamous Cell Papilloma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Tongue
Squamous Cell Papilloma | | | | | | | | | | | | | | | | | | | | | | | | | | 1
1 | |
| Tooth | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heart
Carcinoma, Metastatic, Islets, Pancreatic
Fibrous Histiocytoma, Metastatic, Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1
1 | |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex
Carcinoma, Metastatic, Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| Adrenal Medulla
Pheochromocytoma Benign
Bilateral, Fibrous Histiocytoma, Metastatic, Skin
Bilateral, Pheochromocytoma Benign | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
4
1
2 | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|----------|--|
| | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | | 0731 | |
| ANIMAL ID | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | |
| Islets, Pancreatic Carcinoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| Parathyroid Gland | M | + | + | + | M | + | + | + | M | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | 42 | |
| Pituitary Gland
Pars Distalis, Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
29 | |
| Thyroid Gland
Bilateral, C-cell, Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| C-cell, Adenoma | X | | | | | | | X | | | | | | | | | | X | | | | | | | | 7 | |
| C-cell, Carcinoma | | | | | | | | | | | | | | | | | | X | | | | | | | | 1 | |
| Follicular Cell, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| GENERAL BODY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Peritoneum
Carcinoma, Metastatic, Islets, Pancreatic | | | | | | | | | | | | | | | | | | | | | | | | | | 1
1 | |
| GENITAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Clitoral Gland
Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49
2 | |
| Carcinoma | | | X | | | | | | | | | | | | | | X | | | | | | | | | 4 | |
| Ovary
Carcinoma, Metastatic, Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| Uterus
Carcinoma, Metastatic, Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| Hemangiosarcoma | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Leiomyoma | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |

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

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

Experiment Number: 60311 - 05
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Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
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| Polyp Stromal | X | | | | | | X | | | | | X | | | | | | | X | | | | | X | 10 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Lymph Node | | | | | | | | | | | | | | | | | | | | | | | | | 4 | |
| Deep Cervical, Fibrous Histiocytoma, Metastatic, Skin | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Lumbar, Renal, Carcinoma, Metastatic, Islets, Pancreatic | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Lymph Node, Bronchial | + | + | + | + | + | + | + | M | M | + | + | M | M | M | M | M | + | + | M | + | + | M | + | M | + | 26 |
| Fibrous Histiocytoma, Metastatic, Skin | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Lymph Node, Mandibular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Fibrous Histiocytoma, Metastatic, Skin | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Lymph Node, Mediastinal | M | + | + | + | + | + | + | M | M | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | 42 |
| Carcinoma, Metastatic, Islets, Pancreatic | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma, Metastatic, Islets, Pancreatic | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Carcinoma, Metastatic, Islets, Pancreatic | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Fibrous Histiocytoma, Metastatic, Skin | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Thymus | + | + | + | + | + | + | M | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Mammary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
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| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Carcinoma | | | | X | | | | | | | | | | | | | | | | | | | | | | | 2 |
| Fibroadenoma | | | X | X | X | | | | | X | X | | | X | X | X | | | | | X | X | X | | | 17 | |
| Fibroadenoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Basal Cell Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Squamous Cell Papilloma | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Subcutaneous Tissue, Fibroma | | | | | | | | | | | | | | | | | | | | | | | | X | | 2 | |
| Subcutaneous Tissue, Fibrous Histiocytoma | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Subcutaneous Tissue, Lipoma | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Subcutaneous Tissue, Schwannoma Malignant | | | | | | | | | | | | | | | | | | | | | | | X | | | 1 | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Carcinoma, Metastatic, Islets, Pancreatic | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Alveolar/Bronchiolar Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | |
| Carcinoma, Metastatic, Islets, Pancreatic | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Fibrous Histiocytoma, Metastatic, Skin | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |

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

M .. Missing tissue
 A .. Autolysis precludes evaluation
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FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|--|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|----------|
| | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | | 0731 |
| ANIMAL ID | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 |
| Mediastinum, Fibrous Histiocytoma, Metastatic, Skin | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ear | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Urinary Bladder
Carcinoma, Metastatic, Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Multiple Organ
Leukemia Mononuclear | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
16 |

* .. Total animals with tissue examined microscopically; Total animals with tumor
 + .. Tissue examined microscopically
 X .. Lesion present
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Lab: BNW

| | | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
|---------------------------------|------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| FISCHER 344-TACONIC RATS | FEMALE | 4 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| | | 2 | 1 | 7 | 9 | 9 | 9 | 1 | 1 | 2 | 2 | 4 | 4 | 4 | 7 | 8 | 8 | 8 | 9 | 9 | 0 | 0 | 0 | 1 | 3 |
| 1.25 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 | |
| | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | 4 | 1 | 4 | 0 | 1 | 2 | 3 | 2 | 4 | 0 | 3 | 0 | 2 | 2 | 0 | 4 | 1 | 0 | 2 | 3 | 2 | 4 | 0 | |
| | | 1 | 6 | 6 | 4 | 5 | 7 | 6 | 2 | 3 | 2 | 0 | 8 | 7 | 5 | 0 | 9 | 8 | 1 | 8 | 2 | 6 | 7 | 6 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Fibrous Histiocytoma, Metastatic, Skin | | | | | | | | | | | | | | | | | | | | | | | X |
| Hepatocellular Adenoma | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatocellular Carcinoma | | | | | | | | | | | | | X | | | | | | | | | | |
| Mesentery | | | | | | | + | + | + | + | | + | + | | + | + | | + | + | | | | + |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

CARDIOVASCULAR SYSTEM

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------|-----------|----------------------|
| | 0
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9
8 | 0
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8 | 0
6
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1 | 0
6
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8 | 0
6
2
4 | 0
6
2
4 | 0
6
4
1 | 0
6
4
6 | 0
6
6
6 | 0
6
7
0 | 0
6
8
1 | 0
6
8
4 | 0
6
9
1 | 0
6
9
7 | 0
7
0
2 | 0
7
0
8 | 0
7
0
9 | 0
7
1
6 | 0
7
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
3
4
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
3
4
1 | | |

Blood Vessel
 Alveolar/Bronchiolar Carcinoma, Metastatic, Lung
 Aorta, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung

Heart +

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Pheochromocytoma Benign | | | | | | | X | | | X | | | | X | | | | | | X | X | | | |
| Pheochromocytoma Malignant | | | | | | | | | | | | | | | | | | | | | | | | |
| Bilateral, Pheochromocytoma Benign | | | | | | | | | | | | X | | | X | | | | | | | | | |
| Bilateral, Pheochromocytoma Malignant | | | | | | | | | | | | | | | | | | | | | | | | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Parathyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | M | + | + |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Pars Distalis, Adenoma | | | | | X | X | | | | X | | | | X | | X | X | | | | X | X | X | |
| Pars Distalis, Carcinoma | | | | X | | | X | | | | | | | | | | | | | | | | | |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| C-cell, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | |
| C-cell, Carcinoma | | | | | | | | | | | | | | | | | X | | | | | | X | |

GENERAL BODY SYSTEM

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

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

Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|--|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------|----------------------|
| | 04 | 05 | 05 | 05 | 05 | 05 | 05 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 06 | 07 | 07 | 07 | 07 | | |
| | 2 | 1 | 7 | 9 | 9 | 9 | 9 | 1 | 1 | 2 | 2 | 4 | 4 | 4 | 7 | 8 | 8 | 8 | 9 | 9 | 0 | 0 | 0 | 1 | 3 | |
| | 2 | 6 | 8 | 0 | 3 | 8 | 8 | 1 | 8 | 4 | 4 | 1 | 6 | 6 | 0 | 1 | 4 | 6 | 1 | 7 | 2 | 8 | 9 | 6 | 0 | |
| | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | |
| | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | | |
| | 41 | 44 | 40 | 41 | 42 | 43 | 42 | 44 | 40 | 43 | 40 | 42 | 40 | 42 | 40 | 44 | 41 | 40 | 42 | 43 | 42 | 44 | 40 | 46 | | |
| | 16 | 6 | 6 | 4 | 5 | 7 | 6 | 2 | 3 | 2 | 0 | 8 | 7 | 5 | 0 | 9 | 9 | 8 | 1 | 8 | 2 | 6 | 7 | 3 | | |

Peritoneum
Fibrous Histiocytoma, Metastatic, Skin

+
X

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clitoral Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adenoma | | | | | X | | | | | | | | | X | | | | X | | | | | | |
| Carcinoma | | | | | | | | | | | | | X | | | | X | | | X | | | | X |
| Bilateral, Adenoma | | | | | | | | | | X | | | | | | | | | | | | | | |
| Ovary | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Cystadenocarcinoma | | | | | | | | | | | | | | | | | | | | | | | | |
| Uterus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | X |
| Leiomyoma | | | | | | | | | | | | | | | | | | | | | | | | |
| Polyp Stromal | | | | | | | | | | | X | | X | | | | | | | | | | X | |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Bronchial | M | + | M | + | + | + | + | + | + | M | M | + | + | + | M | M | M | M | + | M | + | M | + | + |
| Lymph Node, Mandibular | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + |
| Lymph Node, Mediastinal | M | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | M |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

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

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

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FEMALE
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(cont...) | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | 0
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6 | 0
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7 | 0
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3
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6 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Thymus | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M |

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland Adenoma | + | + | + | + | + | + | + | + | + | X | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma | | | X | | | | | | | | | | | | | | | | | | | X | | | |
| Fibroadenoma | | | | X | | | X | | | | | X | | | | | | X | | | | | X | X | |
| Fibroadenoma, Multiple | | X | | | | | | | | | | | | | | | | | | | | | | | |
| Skin Papilloma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Subcutaneous Tissue, Fibroma | | | | | | | | | | | | | | | | | | | | | | | | | |
| Subcutaneous Tissue, Fibrous Histiocytoma | X | | | | | | | | | | | | | | | | | | | | | | | X | |

MUSCULOSKELETAL SYSTEM

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

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brain Carcinoma, Metastatic, Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | X | | | | X | | | | | | | | | | | | | | | | | | |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

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

Experiment Number: 60311 - 05
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Cobalt

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Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------|-----------|----------------------|
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8 | 0
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4
4 | 0
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1 | 0
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7
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8 | 0
7
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9 | 0
7
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6 | 0
7
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
3
4
1 | | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | |
| Alveolar/Bronchiolar Adenoma | | | | X | | | | | | X | | | | | | | | | | | | | | | | |
| Alveolar/Bronchiolar Adenoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cystic Keratinizing Epithelioma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mediastinum, Alveolar/Bronchiolar Carcinoma,
Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | |

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
| Ear | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Zymbal's Gland
Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
| Kidney
Transitional Epithelium, Papilloma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |

SYSTEMIC LESIONS

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

M .. Missing tissue
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FEMALE
1.25 mg/m3 | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|----------------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|----------------------|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 4 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | | |
| 2 | 1 | 7 | 9 | 9 | 9 | 9 | 1 | 1 | 2 | 2 | 4 | 4 | 4 | 4 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 0 | 0 | 1 | 3 | |
| 2 | 6 | 8 | 0 | 3 | 8 | 8 | 1 | 8 | 4 | 4 | 1 | 6 | 6 | 0 | 1 | 4 | 6 | 1 | 7 | 2 | 8 | 9 | 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 | 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 | | |
| 4 | 1 | 4 | 0 | 1 | 2 | 3 | 2 | 4 | 0 | 3 | 0 | 0 | 2 | 2 | 0 | 4 | 1 | 0 | 2 | 3 | 2 | 4 | 0 | 0 | | |
| 1 | 6 | 6 | 4 | 5 | 7 | 6 | 2 | 3 | 2 | 0 | 8 | 7 | 5 | 0 | 9 | 9 | 8 | 1 | 8 | 2 | 6 | 7 | 3 | 6 | | |
| Multiple Organ | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Leukemia Mononuclear | | | X | X | X | | X | X | | X | X | X | X | X | | X | X | | | X | X | | X | X | | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
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4 | 0
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7 | 0
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9 | 0
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1 | 0
0
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3
3 | 0
0
3
3
9 | 0
0
3
3
4 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Fibrous Histiocytoma, Metastatic, Skin | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Hepatocellular Adenoma | | | | | | | | | | | | | | X | | | | | | | | | | | | 1 |
| Hepatocellular Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Mesentery | | | | + | | | | | | | | | | + | | | | | | | | | | + | + | 15 |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

CARDIOVASCULAR SYSTEM

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| | | 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 | | 0 | 0 | |
| FISCHER 344-TACONIC RATS
FEMALE
1.25 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 | 0 | 0 | | |
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | | 3 | 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 | |
| | | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 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 | |
| | | 1 | 3 | 3 | 4 | 4 | 5 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 4 | 4 | 5 | 5 | 7 | 7 | 7 | 9 | 9 | 9 | 9 | 9 | 9 | |
| | | 9 | 4 | 8 | 2 | 8 | 0 | 5 | 0 | 1 | 1 | 2 | 3 | 4 | 5 | 7 | 4 | 5 | 4 | 7 | 1 | 2 | 3 | 3 | 3 | 4 | 0 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | 50 | |
| Blood Vessel | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | |
| Aorta, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | |
| Heart | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Adrenal Medulla | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Pheochromocytoma Benign | | | | | | | | X | | X | | | | | | | | | | | | | | | | | X | 8 | |
| Pheochromocytoma Malignant | | | | | | | | | | | | | | | | | | | | | | | | | | | X | 1 | |
| Bilateral, Pheochromocytoma Benign | | | | | | | | | | | | X | | | | | | | X | | | | | | | | | 4 | |
| Bilateral, Pheochromocytoma Malignant | | | | | | | | | | | | | X | | | | | | | | | | | | | | | 1 | |
| Islets, Pancreatic | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Parathyroid Gland | | + | + | + | + | + | + | + | + | + | M | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | M | 45 | |
| Pituitary Gland | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Pars Distalis, Adenoma | | X | | X | X | X | X | | X | | X | | X | | X | | X | | X | | X | X | X | X | X | | | 23 | |
| Pars Distalis, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | X | | 3 | |
| Thyroid Gland | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | 49 | |
| C-cell, Adenoma | | X | | | | | | | | X | | X | | X | | | | | | | | | | | | | | 6 | |
| C-cell, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | X | | X | | | 2 | |

GENERAL BODY SYSTEM

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

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

Experiment Number: 60311 - 05
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Cobalt

CAS Number: 7440-48-4

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First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
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Peritoneum 1
 Fibrous Histiocytoma, Metastatic, Skin 1

GENITAL SYSTEM

Clitoral Gland + + + + + M + + + + + M + + + + + + M + + + 47
 Adenoma X 4
 Carcinoma X 5
 Bilateral, Adenoma 1

Ovary + X 50
 Cystadenocarcinoma 1

Uterus + 50
 Carcinoma 1
 Leiomyoma X 1
 Polyp Stromal X X X 7

HEMATOPOIETIC SYSTEM

Bone Marrow + 50

Lymph Node + 3

Lymph Node, Bronchial M + + M M M M M M M M M M M M M M M M + M M M M M M 18

Lymph Node, Mandibular + 48

Lymph Node, Mediastinal M M + + + M + + + + + + + + + + M + + + + + 43

Lymph Node, Mesenteric + 50

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

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

Experiment Number: 60311 - 05
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FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------|
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| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Thymus | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | 46 | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | X | | | 2 | |
| Carcinoma | | | | | | | | | | | | X | X | | | | | | | | X | | | | 5 | |
| Fibroadenoma | X | X | | X | X | | X | X | | X | X | | X | X | | | | X | | X | X | | | X | 21 | |
| Fibroadenoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | X | 1 | |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Papilloma | | | | | | | | | | | | | | | | X | | | | | | | | | 1 | |
| Subcutaneous Tissue, Fibroma | | | | | | | | | | | | | | | | | | | | | X | | | | 1 | |
| Subcutaneous Tissue, Fibrous Histiocytoma | | | | | | | | | | | | | | | | | | | | | | | | | 2 | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Skeletal Muscle | | | | | | | | | | | | | | + | | | | | | | | | | | 1 | |
| Lipoma | | | | | | | | | | | | | X | | | | | | | | | | | | 1 | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Carcinoma, Metastatic, Pituitary Gland | | | | | | | | | | | | | | | | | | | | | | | | X | 3 | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |

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

M .. Missing tissue
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FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|
| | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | | 0733 |
| ANIMAL ID | 0031 | 0033 | 0034 | 0038 | 0042 | 0044 | 0048 | 0050 | 0055 | 0060 | 0061 | 0062 | 0063 | 0064 | 0065 | 0067 | 0068 | 0069 | 0070 | 0071 | 0072 | 0073 | 0074 | 0075 | 0076 | 0077 | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Alveolar/Bronchiolar Adenoma | | | | | | | | | | | X | | | | | X | | | | | | | X | | | 6 | |
| Alveolar/Bronchiolar Adenoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | X | | 1 | |
| Alveolar/Bronchiolar Carcinoma | | | | X | X | X | | | | | | | | | X | | | X | | | | | | | | 5 | |
| Alveolar/Bronchiolar Carcinoma, Multiple | | X | | | | | | | | | | | X | | | X | | | | | | | | X | | 4 | |
| Cystic Keratinizing Epithelioma | | | | | | | | X | | | | | X | | | X | | X | | | | | | | | 4 | |
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | X | | | | | | | | | | | | | | | | X | | | 2 | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ear | | | | | | | | | | | + | | | | | | | | | | | | | | | 4 | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Zymbal's Gland | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | X | 1 | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Transitional Epithelium, Papilloma | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | | ANIMAL ID | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|--|-------------|------|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|------|------|-----------|
| | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | | 0730 | 0730 | 0730 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | 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 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | |
| | 1 | 3 | 3 | 4 | 4 | 5 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | |
| | 9 | 4 | 8 | 2 | 8 | 0 | 5 | 0 | 1 | 2 | 3 | 3 | 4 | 5 | 7 | 4 | 5 | 4 | 7 | 1 | 9 | 1 | 3 | 9 | 0 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | 50 |
| Multiple Organ | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 29 |
| Leukemia Mononuclear | X | | X | | | X | X | | | X | | X | | X | | X | X | X | X | | | X | X | X | | | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | | | |
|---|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------|----------------------|----|----|----|----|
| | 01 | 02 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | | | 05 | 05 | 07 | 07 |
| | 1 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 7 | 0 |
| | 7 | 9 | 2 | 4 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 0 | 1 | 1 | 2 | 3 | 3 | 5 | 6 | 7 | 8 | 8 | 9 | 9 | 0 | 0 |
| | 1 | 1 | 3 | 1 | 7 | 9 | 0 | 0 | 1 | 3 | 5 | 8 | 8 | 8 | 2 | 3 | 4 | 1 | 7 | 7 | 8 | 8 | 0 | 5 | 2 | 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 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 3 | 1 | 1 | 2 | 1 | 3 | 2 | 4 | 2 | 3 | 3 | 2 | 4 | 4 | 1 | 0 | 3 | 2 | 0 | 0 | 1 | 0 | 4 | 2 | 1 | 5 |
| | 2 | 1 | 8 | 9 | 2 | 0 | 7 | 5 | 6 | 5 | 6 | 4 | 6 | 1 | 7 | 9 | 1 | 3 | 3 | 6 | 0 | 1 | 5 | 0 | 6 | 6 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | A | + | + | + | + |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | A | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Mesentery | | + | | | | | + | + | + | | | | | + | | | | | | | | | | | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Tongue | | | | | | | | | | | | | | | | | | | | | | | | | |
| Squamous Cell Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tooth | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|----------------------|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 1 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | | |
| | 1 | 9 | 2 | 4 | 8 | 8 | 9 | 9 | 9 | 9 | 0 | 1 | 1 | 2 | 3 | 3 | 5 | 6 | 7 | 8 | 8 | 9 | 9 | 0 | | |
| | 7 | 1 | 3 | 1 | 7 | 9 | 0 | 0 | 1 | 3 | 5 | 8 | 8 | 8 | 2 | 3 | 4 | 1 | 7 | 7 | 8 | 8 | 0 | 9 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | |
| | 3 | 1 | 1 | 2 | 1 | 3 | 2 | 4 | 2 | 3 | 3 | 2 | 4 | 4 | 1 | 0 | 3 | 2 | 0 | 1 | 0 | 4 | 2 | 1 | | |
| | 2 | 1 | 8 | 9 | 2 | 0 | 7 | 5 | 6 | 5 | 6 | 4 | 6 | 1 | 7 | 9 | 1 | 3 | 3 | 6 | 0 | 9 | 0 | 6 | | |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Schwannoma Malignant | | | | | | | | | | | | | | | | | | | | | X | | | |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Pheochromocytoma Benign | | | | | | | X | | X | | | | | | | | | | X | | | | | |
| Pheochromocytoma Malignant | | | | | | | | | | | | | | | | | | | | | | | | |
| Bilateral, Pheochromocytoma Benign | | | | | | | | | | | | | | | | X | | | X | | X | | X | X |
| Bilateral, Pheochromocytoma Malignant | | | | | | | | | | | | | | | | | | | | | | | | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Parathyroid Gland | + | + | + | + | + | M | + | + | + | + | M | + | M | + | + | + | M | + | + | + | M | M | + | M |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + |
| Pars Distalis, Adenoma | | X | | | X | | | | X | X | | | X | | | | X | X | | X | X | X | | X |
| Pars Distalis, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + |
| Bilateral, C-cell, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | |
| C-cell, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | |
| C-cell, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | |
| Follicular Cell, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | |

GENERAL BODY SYSTEM

NONE

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

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

Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| | | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) | | | | | |
|--|-----------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|---|---|---|--|--|
| FISCHER 344-TACONIC RATS
FEMALE
2.5 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 | | |
| | | 1 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | 6 | 7 | 7 | | |
| | | 1 | 9 | 2 | 4 | 8 | 8 | 9 | 9 | 9 | 9 | 0 | 1 | 1 | 2 | 3 | 3 | 5 | 6 | 7 | 8 | 8 | 9 | 9 | 0 | | 0 | 0 | 0 | | |
| | | 7 | 1 | 3 | 1 | 7 | 9 | 0 | 0 | 1 | 3 | 5 | 8 | 8 | 8 | 2 | 3 | 4 | 1 | 7 | 7 | 8 | 8 | 0 | 5 | 2 | 9 | 9 | | | |
| | 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 | | | |
| | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | |
| | | 3 | 1 | 1 | 2 | 1 | 3 | 2 | 4 | 2 | 3 | 3 | 3 | 2 | 4 | 4 | 1 | 0 | 3 | 2 | 0 | 0 | 1 | 0 | 4 | 2 | 1 | 5 | | | |
| | | 2 | 1 | 8 | 9 | 2 | 0 | 7 | 5 | 6 | 5 | 6 | 4 | 6 | 1 | 7 | 9 | 1 | 3 | 3 | 6 | 0 | 5 | 9 | 0 | 6 | 6 | 6 | | | |

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clitoral Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Carcinoma | | | | | | | | | | | | | X | | | | | | | | | | | | | | X | |
| Ovary | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Granulosa Cell Tumor Malignant | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Uterus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Carcinoma | | | | | | | | | | X | | | | | | | | | | | | | | | | | | |
| Polyp Stromal | | | | X | X | | | | | | | | | | X | | | | | | | | | | | | | |

HEMATOPOIETIC SYSTEM

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

INTEGUMENTARY SYSTEM

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
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P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

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First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | |
|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|----------------------|----------------------|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | 1 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 0 | |
| | 1 | 9 | 2 | 4 | 8 | 8 | 9 | 9 | 9 | 9 | 0 | 1 | 1 | 2 | 3 | 3 | 5 | 6 | 7 | 8 | 8 | 9 | 9 | 0 | 0 | 5 | |
| | 7 | 1 | 3 | 1 | 7 | 9 | 0 | 0 | 1 | 3 | 5 | 8 | 8 | 8 | 2 | 3 | 4 | 1 | 7 | 7 | 8 | 0 | 5 | 2 | 9 | 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 | 5 | |
| | 0 | 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 | 1 | 1 | 2 | 1 | 3 | 2 | 4 | 2 | 3 | 3 | 2 | 4 | 4 | 1 | 0 | 3 | 2 | 0 | 0 | 1 | 0 | 4 | 2 | 1 | 2 | |
| | 2 | 1 | 8 | 9 | 2 | 0 | 7 | 5 | 6 | 5 | 6 | 4 | 6 | 1 | 7 | 9 | 1 | 3 | 3 | 6 | 0 | 5 | 9 | 0 | 6 | | females
(cont...) |

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Mammary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Adenocarcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fibroadenoma | | | | | | | | | X | X | | | | | | X | | | X | X | | | | | | |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Keratoacanthoma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Squamous Cell Papilloma | | | | | | | | | | | | | | | | | | | | | | | | | | |

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Carcinoma, Metastatic, Pituitary Gland | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Glioma Malignant | | | | | | | | | | | | | | | | | | | | | | | | | | |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Alveolar/Bronchiolar Adenoma | | | | | X | | | | | | | | | | | | | | | | | | | | | |
| Alveolar/Bronchiolar Adenoma, Multiple | | | | | | | | | | | | | | | | | | | X | | | | | | | |
| Alveolar/Bronchiolar Carcinoma | | | | | | | | | | | | | | | | | | | | | | X | X | X | | |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cystic Keratinizing Epithelioma | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | I | + | + | + | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
2.5 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 | 0 | 0 | 0 | 0 | ANIMAL ID | females
(cont...) |
|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|----------------------|
| | | 1 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | | |
| | | 1 | 9 | 2 | 4 | 8 | 8 | 9 | 9 | 9 | 9 | 0 | 1 | 1 | 2 | 3 | 3 | 5 | 6 | 6 | 7 | 8 | 8 | 9 | 9 | 0 | 0 | | | |
| | | 7 | 1 | 3 | 1 | 7 | 9 | 0 | 0 | 1 | 3 | 5 | 8 | 8 | 8 | 2 | 3 | 4 | 1 | 7 | 7 | 8 | 8 | 0 | 5 | 2 | 9 | | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | |
| | | 3 | 1 | 1 | 2 | 1 | 3 | 2 | 4 | 2 | 3 | 3 | 2 | 4 | 4 | 1 | 0 | 3 | 2 | 0 | 1 | 0 | 4 | 2 | 1 | 2 | 1 | | | |
| | | 2 | 1 | 8 | 9 | 2 | 0 | 7 | 5 | 6 | 3 | 6 | 4 | 6 | 1 | 7 | 9 | 1 | 3 | 3 | 6 | 0 | 5 | 9 | 0 | 6 | 0 | | | |
| Trachea | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | | | | |
| Harderian Gland | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | |
| Urinary Bladder | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Multiple Organ | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | |
| Leukemia Mononuclear | | X | | X | X | | X | X | | X | X | X | | | X | | X | X | X | | | X | | | X | | X | | | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|
| | 0715 | 0713 | 0710 | 0707 | 0704 | 0701 | 0628 | 0625 | 0622 | 0619 | 0616 | 0613 | 0610 | 0607 | 0604 | 0601 | 0528 | 0525 | 0522 | 0519 | 0516 | 0513 | 0510 | 0507 | 0504 | |
| ANIMAL ID | 0050 | 0051 | 0053 | 0054 | 0055 | 0059 | 0052 | 0055 | 0054 | 0052 | 0058 | 0053 | 0054 | 0058 | 0053 | 0057 | 0058 | 0052 | 0057 | 0059 | 0053 | 0054 | 0052 | 0054 | 0050 | 0054 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Intestine Small, Jejunum | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Mesentery | | | | | | | | | | + | | | | | | | | | | | | | | | | | 8 |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Tongue | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Squamous Cell Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Tooth | | | | | | | | | | | | | | | | | | | | | | | | | + | | 2 |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|
| | 0715 | 0713 | 0710 | 0707 | 0704 | 0701 | 0628 | 0625 | 0622 | 0619 | 0616 | 0613 | 0610 | 0607 | 0604 | 0601 | 0528 | 0525 | 0522 | 0519 | 0516 | 0513 | 0510 | 0507 | 0504 | |
| ANIMAL ID | 0058 | 0055 | 0051 | 0047 | 0044 | 0041 | 0038 | 0035 | 0032 | 0029 | 0026 | 0023 | 0020 | 0017 | 0014 | 0011 | 0008 | 0005 | 0002 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Schwannoma Malignant | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Pheochromocytoma Benign | X | | | X | X | X | X | | | | | X | | | X | | | X | X | X | X | | | | | | 14 |
| Pheochromocytoma Malignant | X | | | | | | | | | | | | | | | | | | | X | | | | | | | 2 |
| Bilateral, Pheochromocytoma Benign | | X | | | | | | X | | | | | X | | | | | | | | | | | | | | 8 |
| Bilateral, Pheochromocytoma Malignant | | | | | | | | | | | | | | | | | | | | | | | | | X | | 1 |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Parathyroid Gland | M | + | + | M | + | + | + | + | M | M | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | 38 |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Pars Distalis, Adenoma | | | X | | | X | X | X | X | X | X | X | | | | | | X | X | | X | X | | | | | 26 |
| Pars Distalis, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | X | | | | 1 |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Bilateral, C-cell, Adenoma | | | | X | | | | | | | | | | X | | | | | | | | | | | | | 2 |
| C-cell, Adenoma | | | | | | | | | | | | | | | | X | | | | | | | | | X | | 2 |
| C-cell, Carcinoma | | | | | | | | | X | | | | | | | | | | | | | | | | | | 1 |
| Follicular Cell, Adenoma | | | | | | | | | | | X | | | | | | | | | | | | | | | | 1 |

GENERAL BODY SYSTEM

NONE

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
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Date Report Requested: 01/18/2012
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| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|
| | 0715 | 0713 | 0730 | 0733 | 0735 | 0737 | 0739 | 0741 | 0743 | 0745 | 0747 | 0749 | 0751 | 0753 | 0755 | 0757 | 0759 | 0801 | 0803 | 0805 | 0807 | 0809 | 0811 | 0813 | |
| ANIMAL ID | 0050 | 0051 | 0053 | 0054 | 0055 | 0059 | 0061 | 0062 | 0064 | 0065 | 0068 | 0069 | 0070 | 0071 | 0072 | 0073 | 0074 | 0075 | 0076 | 0077 | 0078 | 0079 | 0080 | 0081 | 0082 |

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---|
| Clitoral Gland Adenoma | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | M | + | + | + | 47 | |
| Clitoral Gland Carcinoma | | | X | | X | | | X | | | | | | | | | | | | | X | | X | | 6 | |
| Ovary Granulosa Cell Tumor Malignant | | | | | | | | | | | | | | X | | | | | | | | | | | 50 | |
| Uterus Carcinoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Uterus Polyp Stromal | | | | | | | | | | | | | | | | | | | | | | | X | X | X | 6 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Lymph Node | | | | | | | | | | | | | | | | | | | | | | | | | 7 |
| Lymph Node, Bronchial | M | M | + | + | + | + | + | M | + | + | M | M | M | + | M | M | M | + | M | M | + | M | M | M | 22 |
| Lymph Node, Mandibular | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Lymph Node, Mediastinal | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | 48 |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | M | + | + | + | M | + | 46 |

INTEGUMENTARY SYSTEM

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

M .. Missing tissue
 A .. Autolysis precludes evaluation
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Experiment Number: 60311 - 05
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FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|--|
| | 0715 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | 0730 | | |
| ANIMAL ID | 0058 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | |
| Mammary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Adenocarcinoma | | | | | X | | | | | | | | | | | | | | | | | | | | | 1 | |
| Adenoma | | | | | X | | | | | | | | | | | | | | | | | | | | | 1 | |
| Fibroadenoma | X | | | | | | X | | X | | | X | | X | | X | X | X | | | | X | | X | | 15 | |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Keratoacanthoma | | | | | | | X | | | | | | | | | | | | | | X | | | | | 2 | |
| Squamous Cell Papilloma | | | | | | | | | | | | | | | | | | | | | | | | X | | 1 | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Carcinoma, Metastatic, Pituitary Gland | | | | | | | | | | | | | | | | | | | | | | | X | | | 1 | |
| Glioma Malignant | | | | | X | | | | | | | | | | | | | | | | | | | | | 1 | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Alveolar/Bronchiolar Adenoma | X | | | X | | | | | | | | | | | | X | X | | | | | | X | | | 6 | |
| Alveolar/Bronchiolar Adenoma, Multiple | | | | | | X | | | | | | | | | | | X | | | | | | | | | 3 | |
| Alveolar/Bronchiolar Carcinoma | | | X | X | | X | | | X | X | | | | X | | X | | X | X | | | | X | | | 14 | |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | | X | | X | | | | | | | | | X | | | | | | | | | | 3 | |
| Cystic Keratinizing Epithelioma | | | | | | | | | | | | | | | | | | | | | | X | | | | 1 | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| | | 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 | | |
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | |
| FISCHER 344-TACONIC RATS
FEMALE
2.5 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 | 0 | | |
| | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | 8 | 1 | 3 | 4 | 5 | 9 | 1 | 2 | 5 | 4 | 2 | 2 | 8 | 3 | 4 | 8 | 3 | 4 | 7 | 8 | 2 | 7 | 9 | 0 | | | |
| Trachea | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | | |
| Harderian Gland | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Urinary Bladder | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Multiple Organ | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Leukemia Mononuclear | | X | | X | | X | | X | | X | X | | X | X | X | | X | | X | | X | X | X | 28 | | | |

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

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

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------|----------------------------|----------------------------|----------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------------------|
| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | 0
4
7
1 | 0
4
7
3 | 0
4
7
8 | 0
4
8
9 | 0
5
0
6 | 0
5
3
0 | 0
5
7
9 | 0
5
7
9 | 0
6
0
0 | 0
6
0
3 | 0
6
1
8 | 0
6
2
1 | 0
6
3
4 | 0
6
4
1 | 0
6
7
0 | 0
6
7
0 | 0
6
7
4 | 0
6
9
1 | 0
7
1
2 | 0
7
1
7 | 0
7
1
7 | 0
7
2
5 | 0
7
2
6 | females
(cont...) |
| | ANIMAL ID | 0
0
7
2
8 | 0
0
7
0
6 | 0
0
7
0
4 | 0
0
7
1
7 | 0
0
7
1
6 | 0
0
7
3
7 | 0
0
7
4
2 | 0
0
7
3
7 | 0
0
7
4
1 | 0
0
7
0
7 | 0
0
7
2
7 | 0
0
7
3
4
9 | 0
0
7
3
3
5 | 0
0
7
1
3
9 | 0
0
7
3
4
9 | 0
0
7
4
4 | 0
0
7
7
6 | 0
0
7
1
4 | 0
0
7
1
1 | 0
0
7
4
3 | 0
0
7
4
7 | 0
0
7
0
8 | 0
0
7
4
8 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Mesentery | | | | + | | | | | | | + | + | | | | | | | | | | | | + | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Stomach, Forestomach Squamous Cell Papilloma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Tooth | | | | | | | | | | | | | | | | | | | | | | | | + | |

CARDIOVASCULAR SYSTEM

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

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

Experiment Number: 60311 - 05
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
Cobalt
CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
Time Report Requested: 14:48:12
First Dose M/F: 05/08/06 / 05/08/06
Lab: BNW

| | | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
|------------------------------------|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------------------|
| FISCHER 344-TACONIC RATS
FEMALE | | 0
4 | 0
4 | 0
4 | 0
4 | 0
5 | 0
5 | 0
5 | 0
5 | 0
5 | 0
6 | 0
6 | 0
6 | 0
6 | 0
6 | 0
6 | 0
6 | 0
6 | 0
6 | 0
6 | 0
7 | 0
7 | 0
7 | 0
7 | 0
7 | | |
| 5.0 mg/m3 | | 7
1 | 7
3 | 7
8 | 8
9 | 0
6 | 3
0 | 7
9 | 7
9 | 9
0 | 0
0 | 0
3 | 0
8 | 0
1 | 0
2 | 0
3 | 0
4 | 0
4 | 0
7 | 0
7 | 0
7 | 0
9 | 1
1 | 1
1 | 1
1 | 1
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 | |
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | | 2 | 0 | 0 | 2 | 1 | 1 | 3 | 4 | 3 | 0 | 2 | 3 | 4 | 3 | 3 | 1 | 3 | 4 | 2 | 1 | 1 | 4 | 4 | 0 | 0 | |
| | | 8 | 6 | 4 | 1 | 7 | 6 | 7 | 2 | 4 | 1 | 7 | 4 | 9 | 3 | 5 | 9 | 9 | 4 | 4 | 6 | 4 | 5 | 8 | 8 | 1 | |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Pheochromocytoma Malignant, Metastatic, Adrenal Medulla | | | | | | | | | | | | | | | | | | | | | | | | | X |
| Pericardium, Rhabdomyosarcoma, Metastatic, Uncertain Primary Site | | | | | | | | X | | | | | | | | | | | | | | | | | |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Pheochromocytoma Benign | | | | | | | | X | X | X | | | | | | X | | | X | | X | X | | | |
| Pheochromocytoma Malignant | | | | | | | | | | | | | | | | | | | | | | X | | | |
| Bilateral, Pheochromocytoma Benign | | | | | | | | | | | | | X | X | X | | | | X | | | | | X | X |
| Bilateral, Pheochromocytoma Malignant | | | | | | | | | | | | | | | | | | | | | | | | X | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | |
| Carcinoma | | | | | | X | | X | | | | | | | | | | | | | | | | | |
| Parathyroid Gland | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | M | + | + | + | + | + | + |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Pars Distalis, Adenoma | | | | | | X | | X | | | | X | | | X | X | X | X | X | | X | | X | | X |
| Pars Distalis, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| C-cell, Adenoma | | | | | | X | | | | | | | | | | | | | | | | | | | |
| C-cell, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | |
| Follicular Cell, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | |

GENERAL BODY SYSTEM

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
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 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|
| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | 0
4
7
1 | 0
4
7
3 | 0
4
7
8 | 0
4
8
9 | 0
5
0
6 | 0
5
3
0 | 0
5
7
9 | 0
5
7
9 | 0
5
9
0 | 0
6
0
3 | 0
6
0
8 | 0
6
1
1 | 0
6
2
3 | 0
6
3
4 | 0
6
4
6 | 0
6
7
0 | 0
6
7
4 | 0
6
9
1 | 0
7
1
2 | 0
7
1
7 | 0
7
1
7 | 0
7
2
5 | 0
7
2
6 | females
(cont...) |
| | ANIMAL ID | 0
0
7
2
8 | 0
0
7
0
6 | 0
0
7
0
4 | 0
0
7
1
7 | 0
0
7
1
6 | 0
0
7
3
7 | 0
0
7
4
2 | 0
0
7
3
7 | 0
0
7
4
7 | 0
0
7
3
1 | 0
0
7
2
7 | 0
0
7
4
7 | 0
0
7
3
9 | 0
0
7
3
3 | 0
0
7
3
5 | 0
0
7
3
9 | 0
0
7
4
9 | 0
0
7
4
4 | 0
0
7
1
4 | 0
0
7
1
5 | 0
0
7
4
3 | 0
0
7
4
8 | 0
0
7
0
8 | |

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clitoral Gland | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Adenoma | | | | | | | | | | | | | | | | | | | | | | | | | |
| Carcinoma | | | X | | | | | | | | | | | | | | | | | | | | | | X |
| Ovary | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Thecoma Benign | | | | | | | | | | | | X | | | | | | | | | | | | | |
| Uterus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Polyp Stromal | | | | | | | | | | | | | | | X | X | | X | | | | X | | | |

HEMATOPOIETIC SYSTEM

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

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

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

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Cobalt

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 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------|-----------|----------------------|
| | 0
4
7
1 | 0
4
7
3 | 0
4
7
8 | 0
4
8
9 | 0
5
0
6 | 0
5
3
0 | 0
5
7
9 | 0
5
7
9 | 0
5
9
0 | 0
6
0
0 | 0
6
1
3 | 0
6
2
8 | 0
6
3
1 | 0
6
4
4 | 0
6
7
6 | 0
6
7
0 | 0
6
7
4 | 0
6
7
1 | 0
6
9
2 | 0
7
1
7 | 0
7
1
7 | 0
7
1
5 | 0
7
2
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
7
2
8 | | |

Thymus
 Alveolar/Bronchiolar Carcinoma, Metastatic,
 Lung

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

INTEGUMENTARY SYSTEM

Mammary Gland
 Adenoma
 Carcinoma
 Fibroadenoma

+ +

Skin
 Keratoacanthoma
 Subcutaneous Tissue, Fibroma
 Subcutaneous Tissue, Schwannoma Malignant

+ X

MUSCULOSKELETAL SYSTEM

Bone
 Skeletal Muscle
 Schwannoma Malignant, Metastatic, Skin

+
 +
 X

NERVOUS SYSTEM

Brain
 Carcinoma, Metastatic, Pituitary Gland

+ +

RESPIRATORY SYSTEM

Larynx

+ +

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

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| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|-----------------------|-----------------------|----------------------|
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8 | 0
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9 | 0
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1 | 0
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2 | 0
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1
7 | 0
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1
7 | 0
7
1
7 | 0
7
2
5 | | | 0
7
2
6 | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 0
0
7
2
8 | females
(cont...) | |
| Alveolar/Bronchiolar Adenoma | | | | | | | | X | | | X | | | | | | | | | | | | | X | | 0
0
7
2
8 | females
(cont...) | |
| Alveolar/Bronchiolar Adenoma, Multiple | | | | | | | | | | | | | | | | | | | X | | | | | | | 0
0
7
2
8 | females
(cont...) | |
| Alveolar/Bronchiolar Carcinoma | X | | | | | | | | | | X | | | | | | | | | | | | | X | | 0
0
7
2
8 | females
(cont...) | |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | | X | | | | | | | | | | | | | | | | | | | | | 0
0
7
2
8 | females
(cont...) | |
| Cystic Keratinizing Epithelioma | | | | | | | | | | | X | | | | | | | | | | | | | | | 0
0
7
2
8 | females
(cont...) | |
| Pheochromocytoma Malignant, Metastatic, Adrenal Medulla | | | | | | | | | | | | | | | | | | | | | | | | | X | 0
0
7
2
8 | females
(cont...) | |
| Squamous Cell Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | | | 0
0
7
2
8 | females
(cont...) | |
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | | | | | | | | | | | | | | | | | 0
0
7
2
8 | females
(cont...) | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 0
0
7
2
8 | females
(cont...) | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 0
0
7
2
8 | females
(cont...) | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ear | | | | | | | | | | | | | | | | | | | | | | | | | | | 0
0
7
2
8 | females
(cont...) |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 0
0
7
2
8 | females
(cont...) | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 0
0
7
2
8 | females
(cont...) | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 0
0
7
2
8 | females
(cont...) | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 0
0
7
2
8 | females
(cont...) | |
| Schwannoma Malignant, Metastatic, Skin | | | | | | | | | | | | | | | | | | | | | | | | | X | 0
0
7
2
8 | females
(cont...) | |

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

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

Experiment Number: 60311 - 05
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | 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 | 0 | | 0 |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | 7 |
| ANIMAL ID | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | 0 | 0 | 3 | 3 | 4 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 0 | 1 | 2 | 2 | 2 | 4 | 5 | |
| | 2 | 5 | 2 | 8 | 7 | 1 | 3 | 0 | | | | | | | | | | | | | | | | | | | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Mesentery | | | | | + | | | | | + | + | | | | | | + | | | + | | | | | | | 9 |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Squamous Cell Papilloma | X | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Tooth | | | + | | | | | | | | | | | | | | | | | | | | | | | | 2 |

CARDIOVASCULAR SYSTEM

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------|--|--|
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7
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5 | 0
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0 | | | |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Pheochromocytoma Malignant, Metastatic,
Adrenal Medulla | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Pericardium, Rhabdomyosarcoma, Metastatic,
Uncertain Primary Site | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Pheochromocytoma Benign | X | X | | | X | X | | | | | | | | X | X | X | | | | | | X | X | 17 | | | |
| Pheochromocytoma Malignant | | X | | | X | | | | | | | | | X | X | X | | | | | | X | | 7 | | | |
| Bilateral, Pheochromocytoma Benign | | | X | X | | | X | X | X | | X | X | | | X | | X | X | X | | | | | 19 | | | |
| Bilateral, Pheochromocytoma Malignant | | | | | | | X | | | X | | | | | | | | | | | | X | | 4 | | | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Adenoma | | | | | | | | | X | | | | | | | | | | | | | | | 1 | | | |
| Carcinoma | | | | | | | | X | | | | | | | | | | | | | | | | 3 | | | |
| Parathyroid Gland | M | + | + | + | + | + | + | + | + | M | + | + | + | + | + | M | + | + | + | + | + | + | + | 45 | | | |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Pars Distalis, Adenoma | X | | | | X | | | X | X | X | | X | X | | X | | | X | X | X | | X | | 22 | | | |
| Pars Distalis, Carcinoma | | | | | | | | | | | | | | | | | X | | | | | | | 1 | | | |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| C-cell, Adenoma | | | | | | | | | | | | | | | | | | | | | X | | | 2 | | | |
| C-cell, Carcinoma | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | |
| Follicular Cell, Adenoma | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | |

GENERAL BODY SYSTEM

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
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NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|
| Clitoral Gland
Adenoma
Carcinoma | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | M | + | + | + | + | X | + | + | + | + | 46 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| | | | | | | | | | | | | | | | X | X | | | | | | | | | | | | | | 4 | |
| Ovary
Thecoma Benign | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Uterus
Polyp Stromal | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| | | | | | X | | | X | | | | | | | X | X | | | X | | | X | | | | X | | | | 10 | |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Lymph Node | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 |
| Lymph Node, Bronchial
Alveolar/Bronchiolar Carcinoma, Metastatic,
Lung | M | M | M | M | M | + | + | + | + | M | M | + | + | + | M | M | M | M | + | M | + | M | + | M | M | | | | 17 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Lymph Node, Mandibular | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | 47 | |
| Lymph Node, Mediastinal | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

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

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

Experiment Number: 60311 - 05
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Cobalt

CAS Number: 7440-48-4

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Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|--|
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| Thymus
Alveolar/Bronchiolar Carcinoma, Metastatic,
Lung | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | 47
1 | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland
Adenoma
Carcinoma
Fibroadenoma | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1
3
5 | |
| Skin
Keratoacanthoma
Subcutaneous Tissue, Fibroma
Subcutaneous Tissue, Schwannoma Malignant | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1
1
1 | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone
Skeletal Muscle
Schwannoma Malignant, Metastatic, Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1
1 | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain
Carcinoma, Metastatic, Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |

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

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

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P17: NEOPLASMS BY INDIVIDUAL ANIMAL (SYSTEMIC LESIONS ABRIDGED)

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | 0730 | 0733 | |
| ANIMAL ID | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Alveolar/Bronchiolar Adenoma | | | | | | | | | | | X | | | | | X | | | | | X | X | | 9 | |
| Alveolar/Bronchiolar Adenoma, Multiple | X | X | | | | | | | | | | | | | | | | | | | X | | | 4 | |
| Alveolar/Bronchiolar Carcinoma | X | | X | X | | | | | | | | X | | | | | X | X | | | | | X | 12 | |
| Alveolar/Bronchiolar Carcinoma, Multiple | | | | | X | X | X | X | X | X | | | X | X | X | | | | X | X | X | | X | 18 | |
| Cystic Keratinizing Epithelioma | | | | | | X | | | | | | | | | | | | | | | | | | 2 | |
| Pheochromocytoma Malignant, Metastatic, Adrenal Medulla | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Squamous Cell Carcinoma | | | | | | | | | | | | | | | | | | X | | | | | | 1 | |
| Mediastinum, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung | | | | | | | | | | X | | | | | | | | | | | | | | 1 | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ear | | | + | | | | | | | | | | | + | | | | | | | | + | | 3 | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Schwannoma Malignant, Metastatic, Skin | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| SYSTEMIC LESIONS | | | | | | | | | | | | | | | | | | | | | | | | | |

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

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

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| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|---|-------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|----|---|
| | 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 | |
| | | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | | | 0 | 0 | 3 | 3 | 4 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 0 | 1 | 2 | 2 | 4 | |
| | | | 2 | 5 | 2 | 8 | 7 | 1 | 3 | 0 | 1 | 2 | 3 | 3 | 4 | 0 | 6 | 0 | 6 | 9 | 8 | 0 | 2 | 5 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Multiple Organ | | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Leukemia Mononuclear | | | | X | X | | | X | X | X | | | | | | X | | X | X | | | X | X | 27 | |

*** END OF REPORT ***

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 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

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