Test Type: CHRONIC
Route: DOSED FEED
Species/Strain: RATS/HSD

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

Perfluorooctanoic Acid CAS Number: 335-67-1

Date Report Requested: 07/25/2018 Time Report Requested: 12:58:26 First Dose M/F: 10/27/08 / 10/28/08

Lab: BAT

Final 1\_Core Only

NTP Study Number: C20614

**Lock Date:** 01/10/2012

Cage Range: ALL

Date Range: ALL

Reasons For Removal: 25021 TSAC 25020 NATD 25019 MSAC

Removal Date Range: ALL

Treatment Groups: Include ALL

Study Gender: Both

**TDMSE Version:** 3.0.2.3\_002

**PWG Approval Date:** 07/25/2018

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

Test Type: CHRONIC
Route: DOSED FEED
Species/Strain: RATS/HSD

Experiment Number: 20614 - 01

Perfluorooctanoic Acid **CAS Number:** 335-67-1

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Harlan Sprague Dawley RATS FEMALE	0/0 ppm	0/300 ppm	150/300 ppm	0/1000 ppm	300/1000 ppm	
Disposition Summary						
Animals Initially In Study	60	60	60	60	60	
Early Deaths						
Moribund Sacrifice	15	16	11	20	17	
Natural Death	12	6	7	7	10	
Survivors						
Natural Death		2			1	
Terminal Sacrifice	23	26	32	23	22	
Animals Examined Microscopically	50	50	50	50	50	
ALIMENTARY SYSTEM						
Esophagus	(50)	(50)	(50)	(48)	(50)	
Intestine Large, Cecum	(50)	(49)	(50)	(49)	(50)	
Intestine Large, Colon	(50)	(49)	(50)	(49)	(50)	
Parasite Metazoan	1 (2%)	7 (14%)	8 (16%)	2 (4%)	7 (14%)	
Intestine Large, Rectum	(50)	(49)	(50)	(49)	(50)	
Inflammation, Focal		1 (2%)				
Intestine Small, Duodenum	(50)	(50)	(50)	(49)	(50)	
Intestine Small, Ileum	(50)	(49)	(50)	(49)	(50)	
Intestine Small, Jejunum	(50)	(49)	(50)	(49)	(50)	
Liver	(50)	(50)	(50)	(49)	(50)	
Angiectasis	2 (4%)	1 (2%)		1 (2%)		
Basophilic Focus	11 (22%)	8 (16%)	12 (24%)	6 (12%)	6 (12%)	
Cholangiofibrosis					1 (2%)	
Clear Cell Focus	11 (22%)	9 (18%)	8 (16%)	8 (16%)	5 (10%)	
Degeneration, Cystic	1 (2%)	·	1 (2%)	1 (2%)	1 (2%)	
Eosinophilic Focus	8 (16%)	1 (2%)	12 (24%)	6 (12%)	2 (4%)	
Extramedullary Hematopoiesis	13 (26%)	7 (14%)	10 (20%)	2 (4%)	1 (2%)	
Fatty Change, Focal		1 (2%)	·			
Hepatodiaphragmatic Nodule	2 (4%)	1 (2%)			1 (2%)	
Infiltration Cellular, Mixed Cell	1 (2%)	,				
Inflammation, Focal	6 (12%)	10 (20%)	6 (12%)	7 (14%)	6 (12%)	
Mixed Cell Focus	1 (2%)	,	1 (2%)	,	•	
Necrosis	,	1 (2%)	4 (8%)	8 (16%)	5 (10%)	

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

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

Test Type: CHRONIC
Route: DOSED FEED
Species/Strain: RATS/HSD

Experiment Number: 20614 - 01

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arlan Sprague Dawley RATS FEMALE	0/0 ppm	0/300 ppm	150/300 ppm	0/1000 ppm	300/1000 ppm	
Pigment	3 (6%)	5 (10%)	10 (20%)	43 (88%)	40 (80%)	
Bile Duct, Cyst	9 (18%)	6 (12%)	5 (10%)	2 (4%)	5 (10%)	
Bile Duct, Hyperplasia	16 (32%)	25 (50%)	27 (54%)	22 (45%)	27 (54%)	
Centrilobular, Fatty Change, Microvesicular, Diffuse				1 (2%)		
Centrilobular, Necrosis		4 (8%)	2 (4%)	3 (6%)	3 (6%)	
Hepatocyte, Cytoplasmic Alteration		9 (18%)	17 (34%)	49 (100%)	49 (98%)	
Hepatocyte, Hyperplasia				1 (2%)		
Hepatocyte, Hypertrophy		11 (22%)	16 (32%)	48 (98%)	49 (98%)	
Hepatocyte, Increased Mitoses	2 (4%)	3 (6%)	5 (10%)	4 (8%)	10 (20%)	
Hepatocyte, Single Cell Death		4 (8%)	5 (10%)	29 (59%)	32 (64%)	
Kupffer Cell, Hyperplasia				1 (2%)		
Oval Cell, Hyperplasia	1 (2%)			2 (4%)	3 (6%)	
Mesentery	(2)	(0)	(0)	(2)	(0)	
Hemorrhage				2 (100%)		
Oral Mucosa	(0)	(0)	(0)	(0)	(1)	
Pancreas	(50)	(50)	(50)	(49)	(50)	
Basophilic Focus			1 (2%)			
Inflammation, Chronic Active			1 (2%)			
Necrosis				1 (2%)		
Acinus, Atrophy		3 (6%)	4 (8%)	2 (4%)	1 (2%)	
Acinus, Hyperplasia		1 (2%)		1 (2%)	1 (2%)	
Duct, Inflammation, Granulomatous				1 (2%)		
Salivary Glands	(49)	(50)	(50)	(48)	(50)	
Stomach, Forestomach	(50)	(50)	(50)	(49)	(50)	
Inflammation, Chronic Active			1 (2%)			
Mineral			` ,	1 (2%)		
Ulcer	2 (4%)	2 (4%)	1 (2%)	9 (18%)	11 (22%)	
Epithelium, Hyperplasia	4 (8%)	5 (10%)	3 (6%)	22 (45%)	21 (42%)	
Muscularis, Degeneration	, ,	, ,	, ,	,	1 (2%)	
Submucosa, Inflammation, Chronic Active	3 (6%)	2 (4%)	2 (4%)	16 (33%)	18 (36%)	
Stomach, Glandular	(50)	(50)	(50)	(49)	(50)	
Inflammation	` '	, ,	` '	, ,	1 (2%)	
Epithelium, Necrosis				1 (2%)	,	
Mucosa, Mineral		1 (2%)		2 (4%)	2 (4%)	
Submucosa, Inflammation, Chronic Active		, ,		` ,	2 (4%)	

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

Test Type: CHRONIC
Route: DOSED FEED
Species/Strain: RATS/HSD

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

Perfluorooctanoic Acid CAS Number: 335-67-1

Date Report Requested: 07/25/2018 Time Report Requested: 12:58:26 First Dose M/F: 10/27/08 / 10/28/08

Harlan Sprague Dawley RATS FEMALE	0/0 ppm	0/300 ppm	150/300 ppm	0/1000 ppm	300/1000 ppm	
Submucosa, Mineral					1 (2%)	
CARDIOVASCULAR SYSTEM						
Blood Vessel	(50)	(50)	(50)	(49)	(50)	
Inflammation		1 (2%)	2 (4%)	1 (2%)		
Aorta, Mineral	1 (2%)	1 (2%)	2 (4%)		1 (2%)	
Heart	(50)	(50)	(50)	(48)	(50)	
Cardiomyopathy	8 (16%)	5 (10%)	13 (26%)	4 (8%)	4 (8%)	
Mineral		1 (2%)	1 (2%)		1 (2%)	
Necrosis, Acute			1 (2%)			
Schwann Cell, Hyperplasia	1 (2%)					
ENDOCRINE SYSTEM						
Adrenal Cortex	(50)	(50)	(50)	(49)	(50)	
Atrophy			1 (2%)			
Degeneration, Cystic	11 (22%)	8 (16%)	11 (22%)	9 (18%)	7 (14%)	
Hypertrophy	2 (4%)	2 (4%)	5 (10%)		3 (6%)	
Hypertrophy, Focal					1 (2%)	
Necrosis		1 (2%)			1 (2%)	
Vacuolization Cytoplasmic	1 (2%)	1 (2%)		5 (10%)	4 (8%)	
Zona Fasciculata, Hyperplasia			2 (4%)			
Adrenal Medulla	(50)	(50)	(50)	(49)	(50)	
Hyperplasia	7 (14%)	14 (28%)	8 (16%)	12 (24%)	8 (16%)	
Islets, Pancreatic	(50)	(50)	(50)	(49)	(50)	
Hyperplasia	3 (6%)			1 (2%)	1 (2%)	
Parathyroid Gland	(47)	(47)	(42)	(46)	(48)	
Cytoplasmic Alteration					1 (2%)	
Hyperplasia, Focal	1 (2%)					
Pituitary Gland	(50)	(50)	(50)	(49)	(50)	
Angiectasis		1 (2%)				
Cyst		1 (2%)				
Necrosis					1 (2%)	
Pars Distalis, Hyperplasia	14 (28%)	18 (36%)	26 (52%)	13 (27%)	7 (14%)	

Test Type: CHRONIC Route: DOSED FEED Species/Strain: RATS/HSD

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

Perfluorooctanoic Acid **CAS Number:** 335-67-1

Date Report Requested: 07/25/2018 Time Report Requested: 12:58:26 First Dose M/F: 10/27/08 / 10/28/08

Lab: BAT

Harlan Sprague Dawley RATS FEMALE	0/0 ppm	0/300 ppm	150/300 ppm	0/1000 ppm	300/1000 ppm
Rathke's Cleft, Hyperplasia			1 (2%)		
Thyroid Gland	(50)	(50)	(50)	(48)	(50)
C-cell, Hyperplasia	10 (20%)	4 (8%)	6 (12%)	7 (15%)	11 (22%)
Follicular Cell, Hypertrophy	4 (8%)	8 (16%)	9 (18%)	28 (58%)	19 (38%)

### **GENERAL BODY SYSTEM**

None

SENITAL SYSTEM					
Clitoral Gland	(50)	(49)	(50)	(48)	(50)
Hyperplasia, Squamous	1 (2%)	1 (2%)		1 (2%)	
Inflammation	1 (2%)				1 (2%)
Duct, Cyst			1 (2%)		
Duct, Metaplasia, Squamous	1 (2%)				
Ovary	(50)	(49)	(50)	(49)	(50)
Atrophy	35 (70%)	32 (65%)	40 (80%)	28 (57%)	31 (62%)
Cyst	16 (32%)	20 (41%)	16 (32%)	16 (33%)	23 (46%)
Inflammation		1 (2%)			
Oviduct	(0)	(1)	(0)	(0)	(0)
Uterus	(50)	(49)	(50)	(49)	(50)
Adenomyosis	1 (2%)				
Dilation	2 (4%)	3 (6%)		3 (6%)	3 (6%)
Hemorrhage				1 (2%)	
Inflammation		1 (2%)			
Inflammation, Suppurative			3 (6%)	4 (8%)	1 (2%)
Inflammation, Acute				1 (2%)	1 (2%)
Inflammation, Chronic Active	2 (4%)				
Thrombus		1 (2%)			
Cervix, Hypertrophy		1 (2%)	1 (2%)		
Cervix, Inflammation, Suppurative				1 (2%)	
Cervix, Stromal Hyperplasia			1 (2%)		
Endometrium, Hyperplasia		1 (2%)			
Endometrium, Hyperplasia, Cystic	20 (40%)	22 (45%)	31 (62%)	18 (37%)	18 (36%)

number of animals examined microscopically at site and number of animals with lesion

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

Perfluorooctanoic Acid CAS Number: 335-67-1

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Harlan Sprague Dawley RATS FEMALE	0/0 ppm	0/300 ppm	150/300 ppm	0/1000 ppm	300/1000 ppm	
Endometrium, Metaplasia, Squamous Lymphatic, Angiectasis	18 (36%)	17 (35%)	21 (42%) 1 (2%)	10 (20%)	11 (22%)	
Vagina	(0)	(0)	(0)	(1)	(0)	
HEMATOPOIETIC SYSTEM						
Bone Marrow	(50)	(50)	(50)	(50)	(50)	
Atrophy	1 (2%)			4 (8%)	1 (2%)	
Hyperplasia	21 (42%)	20 (40%)	22 (44%)	29 (58%)	28 (56%)	
Lymph Node	(1)	(3)	(0)	(3)	(1)	
Mediastinal, Ectasia	. ,		. ,	1 (33%)	* *	
Mediastinal, Hyperplasia, Lymphoid				1 (33%)		
Lymph Node, Mandibular	(48)	(49)	(49)	(45)	(48)	
Atrophy			1 (2%)	1 (2%)		
Atrophy, Lymphoid	4 (8%)	2 (4%)	1 (2%)	8 (18%)	10 (21%)	
Hyperplasia, Lymphoid	1 (2%)		1 (2%)	1 (2%)	•	
Infiltration Cellular, Plasma Cell		1 (2%)	2 (4%)	1 (2%)		
Lymph Node, Mesenteric	(49)	(48)	(50)	(48)	(48)	
Atrophy, Lymphoid	4 (8%)	3 (6%)	2 (4%)	8 (17%)	10 (21%)	
Hyperplasia, Lymphoid			1 (2%)			
Spleen	(50)	(50)	(50)	(49)	(50)	
Extramedullary Hematopoiesis	34 (68%)	33 (66%)	36 (72%)	29 (59%)	28 (56%)	
Infarct				1 (2%)		
Pigment	30 (60%)	21 (42%)	30 (60%)	25 (51%)	31 (62%)	
Lymphoid Follicle, Atrophy	7 (14%)	9 (18%)	8 (16%)	13 (27%)	20 (40%)	
Lymphoid Follicle, Hyperplasia		2 (4%)	2 (4%)	1 (2%)		
Thymus	(49)	(48)	(50)	(47)	(47)	
Atrophy	42 (86%)	46 (96%)	45 (90%)	46 (98%)	46 (98%)	
NTEGUMENTARY SYSTEM						
Mammary Gland	(50)	(50)	(50)	(48)	(50)	
Galactocele		4= 4===4	2 (4%)		(- ()	
Hyperplasia Inflammation	13 (26%)	15 (30%) 1 (2%)	13 (26%)	19 (40%)	15 (30%)	

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

Perfluorooctanoic Acid CAS Number: 335-67-1

Date Report Requested: 07/25/2018 Time Report Requested: 12:58:26 First Dose M/F: 10/27/08 / 10/28/08

Harlan Sprague Dawley RATS FEMALE	0/0 ppm	0/300 ppm	150/300 ppm	0/1000 ppm	300/1000 ppm	
Skin	(50)	(50)	(50)	(49)	(50)	
Cyst Epithelial Inclusion			1 (2%)			
Ulcer	1 (2%)					
Epidermis, Sebaceous Gland, Hyperplasia	1 (2%)					
Subcutaneous Tissue, Inflammation			1 (2%)			
MUSCULOSKELETAL SYSTEM						
Bone	(50)	(50)	(50)	(50)	(50)	
Skeletal Muscle	(0)	(1)	(1)	(2)	(0)	
NERVOUS SYSTEM						
Brain	(50)	(50)	(50)	(49)	(50)	
Gliosis, Diffuse	1 (2%)	()	()	( - /	()	
Hemorrhage	2 (4%)			1 (2%)		
Necrosis	2 (4%)		1 (2%)	, ,		
Peripheral Nerve	(0)	(0)	(0)	(1)	(0)	
Degeneration	, ,		, ,	1 (100%)	. ,	
Spinal Cord	(1)	(0)	(0)	(0)	(0)	
RESPIRATORY SYSTEM						
Lung	(50)	(50)	(50)	(48)	(50)	
Cyst				1 (2%)		
Foreign Body				1 (2%)		
Inflammation, Granulomatous, Multifocal	1 (2%)	1 (2%)	1 (2%)	3 (6%)	5 (10%)	
Inflammation, Chronic Active	2 (4%)	2 (4%)	7 (14%)	7 (15%)	7 (14%)	
Alveolus, Infiltration Cellular, Histiocyte	36 (72%)	33 (66%)	31 (62%)	40 (83%)	42 (84%)	
Nose	(50)	(50)	(50)	(50)	(50)	
Foreign Body					1 (2%)	
Inflammation	3 (6%)	1 (2%)	1 (2%)		3 (6%)	
Olfactory Epithelium, Metaplasia	1 (2%)					
Respiratory Epithelium, Hyperplasia	1 (2%)					

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Harlan Sprague Dawley RATS FEMALE	0/0 ppm	0/300 ppm	150/300 ppm	0/1000 ppm	300/1000 ppm	
Respiratory Epithelium, Metaplasia, Squamous Trachea	1 (2%) (50)	(50)	(50)	(48)	(50)	
SPECIAL SENSES SYSTEM						
Eye Choroid, Inflammation	(50)	(50)	(50) 1 (2%)	(50)	(50)	
Retina, Degeneration Harderian Gland Hyperplasia	1 (2%) (50)	5 (10%) (50)	(50)	1 (2%) (49)	2 (4%) (50)	
Zymbal's Gland	1 (2%) (0)	(0)	(0)	(0)	(1)	
URINARY SYSTEM						
Kidney	(50)	(50)	(50)	(49)	(50)	
Accumulation, Hyaline Droplet	3 (6%)	1 (2%)		1 (2%)		
Calculus Micro Observation Only	11 (22%)	14 (28%)	12 (24%)	19 (39%)	16 (32%)	
Hemorrhage				1 (2%)		
Infarct		2 (4%)		5 (10%)	6 (12%)	
Inflammation, Chronic Active				1 (2%)		
Nephropathy, Chronic Progressive	37 (74%)	38 (76%)	35 (70%)	37 (76%)	46 (92%)	
Thrombus			- 4	1 (2%)	1 (2%)	
Cortex, Cyst Epithelium, Renal Tubule, Cytoplasmic Alteration		2 (4%) 1 (2%)	2 (4%)			
Papilla, Necrosis				12 (24%)	22 (44%)	
Papilla, Urothelium, Hyperplasia	4 (8%)	21 (42%)	8 (16%)	40 (82%)	45 (90%)	
Pelvis, Dilation	()	(/	- ( /	2 (4%)	1 (2%)	
Pelvis, Hemorrhage				` ,	1 (2%)	
Pelvis, Inflammation, Suppurative					1 (2%)	
Pelvis, Inflammation, Chronic	1 (2%)			4 (8%)	2 (4%)	
Renal Tubule, Dilation	•	1 (2%)		•	1 (2%)	
Renal Tubule, Hyperplasia, Atypical			1 (2%)	1 (2%)		
Renal Tubule, Inflammation, Suppurative					1 (2%)	
Renal Tubule, Mineral	5 (10%)	6 (12%)	8 (16%)	16 (33%)	8 (16%)	

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**Test Type:** CHRONIC **Route:** DOSED FEED

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

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Harlan Sprague Dawley RATS FEMALE	0/0 ppm	0/300 ppm	150/300 ppm	0/1000 ppm	300/1000 ppm	
Renal Tubule, Necrosis					1 (2%)	
Urinary Bladder	(50)	(49)	(50)	(48)	(50)	
Inflammation				4 (8%)	1 (2%)	
Metaplasia, Squamous					1 (2%)	

<sup>\*\*\*</sup> END OF REPORT \*\*\*