

**Experiment Number:** 04049 - 01  
**Test Type:** 28-DAY  
**Route:** GAVAGE  
**Species/Strain:** RATS/HSD

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

Perfluorononanoic Acid  
**CAS Number:** 375-95-1

**Date Report Requested:** 02/06/2018  
**Time Report Requested:** 12:36:11  
**First Dose M/F:** 02/02/12 / 02/03/12  
**Lab:** BAT

PFNA\_Final 1

**NTP Study Number:** C04049  
**Lock Date:** 01/22/2016  
**Cage Range:** ALL  
**Date Range:** ALL  
**Reasons For Removal:** ALL  
**Removal Date Range:** ALL  
**Treatment Groups:** Include ALL  
**Study Gender:** Both  
**TDMSE Version:** 3.0.2.3\_002  
**PWG Approval Date:** NONE

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Harlan Sprague Dawley RATS MALE

0 mg/kg/d M

0.625mg/kg/d M

1.25 mg/kg/d M

2.5 mg/kg/d M

5 mg/kg/d M

10 mg/kg/d M

## Disposition Summary

	0 mg/kg/d M	0.625mg/kg/d M	1.25 mg/kg/d M	2.5 mg/kg/d M	5 mg/kg/d M	10 mg/kg/d M
Animals Initially In Study	10	10	10	10	10	10
Early Deaths						
Natural Death					8	10
Survivors						
Terminal Sacrifice	10	10	10	10	2	
Animals Examined Microscopically	10	10	10	10	10	10

## ALIMENTARY SYSTEM

Esophagus	(10)	(0)	(0)	(10)	(10)	(10)
Intestine Large, Cecum	(10)	(0)	(0)	(10)	(9)	(10)
Intestine Large, Colon	(10)	(0)	(0)	(10)	(8)	(10)
Intestine Large, Rectum	(10)	(0)	(0)	(10)	(10)	(10)
Intestine Small, Duodenum	(10)	(0)	(0)	(10)	(8)	(10)
Intestine Small, Ileum	(10)	(0)	(0)	(10)	(9)	(10)
Intestine Small, Jejunum	(10)	(0)	(0)	(10)	(9)	(10)
Liver	(10)	(10)	(10)	(10)	(9)	(10)
Infiltration Cellular, Mixed Cell	2 (20%)		1 (10%)		1 (11%)	
Hepatocyte, Cytoplasmic Alteration		10 (100%)	10 (100%)	10 (100%)	9 (100%)	10 (100%)
Hepatocyte, Hypertrophy		7 (70%)	10 (100%)	10 (100%)	9 (100%)	10 (100%)
Hepatocyte, Necrosis			1 (10%)	5 (50%)	6 (67%)	9 (90%)
Hepatocyte, Vacuolization Cytoplasmic			6 (60%)	9 (90%)		
Pancreas	(10)	(10)	(10)	(10)	(8)	(10)
Salivary Glands	(10)	(0)	(0)	(10)	(9)	(10)
Stomach, Forestomach	(10)	(10)	(10)	(10)	(8)	(10)
Inflammation, Chronic Active				5 (50%)		
Ulcer				2 (20%)		
Epithelium, Hyperplasia				6 (60%)	6 (75%)	8 (80%)
Stomach, Glandular	(10)	(0)	(0)	(10)	(9)	(10)

## CARDIOVASCULAR SYSTEM

Blood Vessel	(10)	(0)	(0)	(10)	(10)	(10)
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a - Number of animals examined microscopically at site and number of animals with lesion

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Lab: BAT

Harlan Sprague Dawley RATS MALE	0 mg/kg/d M	0.625mg/kg/d M	1.25 mg/kg/d M	2.5 mg/kg/d M	5 mg/kg/d M	10 mg/kg/d M
Heart	(10)	(0)	(0)	(10)	(10)	(10)
Infiltration Cellular, Mixed Cell	2 (20%)					
<b>ENDOCRINE SYSTEM</b>						
Adrenal Cortex	(10)	(0)	(0)	(10)	(10)	(10)
Adrenal Medulla	(10)	(0)	(0)	(10)	(10)	(10)
Parathyroid Gland	(6)	(0)	(0)	(7)	(9)	(9)
Pituitary Gland	(10)	(0)	(0)	(10)	(10)	(10)
Thyroid Gland	(10)	(10)	(10)	(10)	(10)	(10)
<b>GENERAL BODY SYSTEM</b>						
None						
<b>GENITAL SYSTEM</b>						
Epididymis	(10)	(10)	(10)	(10)	(9)	(10)
Granuloma Sperm						4 (40%)
Hypospermia				2 (20%)	9 (100%)	10 (100%)
Duct, Exfoliated Germ Cell				6 (60%)	9 (100%)	10 (100%)
Epithelium, Apoptosis					8 (89%)	10 (100%)
Epithelium, Exfoliated Germ Cell					1 (11%)	
Preputial Gland	(10)	(0)	(0)	(10)	(10)	(10)
Prostate	(10)	(0)	(0)	(10)	(10)	(10)
Seminal Vesicle	(10)	(0)	(0)	(10)	(10)	(10)
Testes	(10)	(10)	(10)	(10)	(9)	(10)
Germinal Epithelium, Degeneration				6 (60%)	9 (100%)	10 (100%)
Interstitial Cell, Atrophy			1 (10%)	10 (100%)	9 (100%)	10 (100%)
Seminiferous Tubule, Spermatid Retention				6 (60%)	9 (100%)	10 (100%)
<b>HEMATOPOIETIC SYSTEM</b>						

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Harlan Sprague Dawley RATS MALE	0 mg/kg/d M	0.625mg/kg/d M	1.25 mg/kg/d M	2.5 mg/kg/d M	5 mg/kg/d M	10 mg/kg/d M
Bone Marrow	(10)	(10)	(10)	(10)	(10)	(10)
Hypocellularity				10 (100%)	10 (100%)	10 (100%)
Lymph Node, Mandibular	(10)	(10)	(10)	(10)	(7)	(10)
Atrophy				2 (20%)	5 (71%)	5 (50%)
Lymph Node, Mesenteric	(10)	(10)	(10)	(10)	(8)	(10)
Atrophy				3 (30%)	6 (75%)	9 (90%)
Spleen	(10)	(10)	(10)	(10)	(8)	(10)
Atrophy					7 (88%)	9 (90%)
Thymus	(10)	(10)	(10)	(10)	(10)	(8)
Atrophy				10 (100%)	10 (100%)	8 (100%)
<b>INTEGUMENTARY SYSTEM</b>						
Mammary Gland	(10)	(0)	(0)	(10)	(10)	(10)
Skin	(10)	(0)	(0)	(10)	(10)	(10)
<b>MUSCULOSKELETAL SYSTEM</b>						
Bone	(10)	(0)	(0)	(10)	(10)	(10)
<b>NERVOUS SYSTEM</b>						
Brain	(10)	(0)	(0)	(10)	(10)	(10)
<b>RESPIRATORY SYSTEM</b>						
Lung	(10)	(0)	(0)	(10)	(10)	(10)
Infiltration Cellular, Mixed Cell	3 (30%)					1 (10%)
Artery, Thrombus, Focal					1 (10%)	
Nose	(10)	(10)	(10)	(10)	(10)	(10)
Olfactory Epithelium, Degeneration					1 (10%)	3 (30%)
Olfactory Epithelium, Inflammation, Suppurative					1 (10%)	2 (20%)
Respiratory Epithelium, Hyperplasia						1 (10%)

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Respiratory Epithelium, Inflammation, Chronic Active	1 (10%)	5 (50%)				
Trachea	(10)	(0)	(0)	(10)	(10)	(10)
<hr/>						
SPECIAL SENSES SYSTEM						
Eye	(10)	(0)	(0)	(10)	(10)	(10)
Harderian Gland	(10)	(0)	(0)	(10)	(10)	(10)
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URINARY SYSTEM						
Kidney	(10)	(10)	(10)	(10)	(10)	(10)
Nephropathy, Chronic Progressive	8 (80%)	8 (80%)	5 (50%)	6 (60%)	4 (40%)	
Urinary Bladder	(10)	(0)	(0)	(10)	(10)	(10)

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

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Harlan Sprague Dawley RATS FEMALE	0 mg/kg/d F	1.56mg/kg/d F	3.12mg/kg/d F	6.25mg/kg/d F	12.5mg/kg/d F	25mg/kg/d F
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**Disposition Summary**

<b>Animals Initially In Study</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>Early Deaths</b>						
<b>Natural Death</b>					<b>9</b>	<b>10</b>
<b>Survivors</b>						
<b>Terminal Sacrifice</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>1</b>	
<b>Animals Examined Microscopically</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>

## ALIMENTARY SYSTEM

Esophagus	(10)	(0)	(0)	(10)	(10)	(10)
Intestine Large, Cecum	(10)	(0)	(0)	(10)	(10)	(10)
Intestine Large, Colon	(10)	(0)	(0)	(10)	(10)	(10)
Intestine Large, Rectum	(10)	(0)	(0)	(10)	(10)	(10)
Intestine Small, Duodenum	(10)	(0)	(0)	(10)	(9)	(10)
Intestine Small, Ileum	(10)	(0)	(0)	(10)	(9)	(10)
Intestine Small, Jejunum	(10)	(0)	(0)	(10)	(9)	(10)
Liver	(10)	(10)	(10)	(10)	(10)	(10)
Clear Cell Focus	1 (10%)					
Infiltration Cellular, Mixed Cell	2 (20%)			1 (10%)		
Hepatocyte, Cytoplasmic Alteration		5 (50%)	10 (100%)	10 (100%)	9 (90%)	
Hepatocyte, Hypertrophy			2 (20%)	10 (100%)	10 (100%)	10 (100%)
Hepatocyte, Necrosis					4 (40%)	3 (30%)
Pancreas	(10)	(10)	(10)	(10)	(10)	(10)
Salivary Glands	(10)	(0)	(0)	(10)	(10)	(10)
Stomach, Forestomach	(10)	(10)	(10)	(10)	(10)	(10)
Inflammation, Chronic Active						1 (10%)
Epithelium, Hyperplasia					7 (70%)	6 (60%)
Stomach, Glandular	(10)	(0)	(0)	(10)	(10)	(10)

## CARDIOVASCULAR SYSTEM

Blood Vessel	(10)	(0)	(0)	(10)	(10)	(10)
Heart	(10)	(0)	(0)	(10)	(10)	(10)

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ENDOCRINE SYSTEM

Adrenal Cortex	(10)	(0)	(0)	(10)	(10)	(10)
Adrenal Medulla	(10)	(0)	(0)	(10)	(10)	(10)
Parathyroid Gland	(7)	(0)	(0)	(9)	(7)	(8)
Pituitary Gland	(10)	(0)	(0)	(8)	(10)	(10)
Thyroid Gland	(10)	(10)	(10)	(10)	(10)	(10)

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GENERAL BODY SYSTEM

None

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GENITAL SYSTEM

Clitoral Gland	(10)	(0)	(0)	(10)	(10)	(10)
Ovary	(10)	(10)	(10)	(10)	(10)	(10)
Uterus	(10)	(0)	(0)	(10)	(10)	(10)
Bilateral, Dilation	1 (10%)					

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HEMATOPOIETIC SYSTEM

Bone Marrow	(10)	(10)	(10)	(10)	(10)	(10)
Hypocellularity					10 (100%)	10 (100%)
Lymph Node, Mandibular	(10)	(10)	(10)	(10)	(8)	(9)
Atrophy					8 (100%)	9 (100%)
Lymph Node, Mesenteric	(10)	(10)	(10)	(10)	(9)	(10)
Atrophy					8 (89%)	9 (90%)
Spleen	(10)	(10)	(10)	(10)	(10)	(10)
Atrophy					8 (80%)	10 (100%)
Thymus	(10)	(10)	(10)	(10)	(10)	(10)
Atrophy					9 (90%)	10 (100%)

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<b>INTEGUMENTARY SYSTEM</b>						
Mammary Gland	(10)	(0)	(0)	(10)	(10)	(10)
Skin	(10)	(0)	(0)	(10)	(10)	(10)
<b>MUSCULOSKELETAL SYSTEM</b>						
Bone	(10)	(0)	(0)	(10)	(10)	(10)
<b>NERVOUS SYSTEM</b>						
Brain	(10)	(0)	(0)	(10)	(10)	(10)
<b>RESPIRATORY SYSTEM</b>						
Lung	(10)	(0)	(0)	(10)	(10)	(10)
Infiltration Cellular, Mixed Cell Arteriole, Thrombus, Focal Vein, Thrombus	1 (10%)					1 (10%)
Nose	(10)	(10)	(10)	(10)	1 (10%) (10)	(10)
Olfactory Epithelium, Degeneration						5 (50%)
Olfactory Epithelium, Hyperplasia						1 (10%)
Olfactory Epithelium, Inflammation, Suppurative						3 (30%)
Trachea	(10)	(0)	(0)	(10)	(10)	(10)
<b>SPECIAL SENSES SYSTEM</b>						
Eye	(10)	(0)	(0)	(10)	(10)	(10)
Harderian Gland	(10)	(0)	(0)	(10)	(10)	(10)
<b>URINARY SYSTEM</b>						

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Kidney	(10)	(10)	(10)	(10)	(10)	(10)
Cyst, Focal						1 (10%)
Nephropathy, Chronic Progressive	6 (60%)	3 (30%)	5 (50%)	3 (30%)	1 (10%)	3 (30%)
Urinary Bladder	(10)	(0)	(0)	(10)	(10)	(10)

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

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