

**Experiment Number:** 20701 - 02

**Test Type:** 90-DAY

**Route:** RESPIRATORY EXPOSURE NASAL

**Species/Strain:** MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Nanoscale material (Fullerene-C60 1 micron)

**CAS Number:** 99685-96-8

**Date Report Requested:** 02/22/2013

**Time Report Requested:** 07:59:02

**First Dose M/F:** 11/05/07 / 11/05/07

**Lab:** BNW

F2\_Rev.1\_M3

**NTP Study Number:** C20701

**Lock Date:** 02/24/2009

**Cage Range:** ALL

**Date Range:** ALL

**Reasons For Removal:** ALL

**Removal Date Range:** ALL

**Treatment Groups:** Include ALL

**Study Gender:** Both

**TDMSE Version:** 3.0.1.1\_001

**PWG Approval Date:** NONE

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B6C3F1 MICE MALE	DAY ON TEST	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
0 mg/m <sup>3</sup>	ANIMAL ID	8	8	8	8	8	8	8	8	8	8
		9	9	9	9	9	9	9	9	9	9
		0	0	0	0	0	0	0	0	0	0
		1	1	1	1	1	1	1	1	1	1
		0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0

**\* TOTALS****ALIMENTARY SYSTEM**

Esophagus	+	+	+	+	+	+	+	+	+	+	+	10
Gallbladder	+	+	+	+	+	+	+	+	+	M		9
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+		10
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+		10
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+		10
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+		10
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+		10
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+		10
Liver Necrosis	+	+	+	+	+	+	+	+	+	+		10
											1	1.0
Pancreas	+	+	+	+	+	+	+	+	+	+		10
Salivary Glands	+	+	+	+	+	+	+	+	+	+		10
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	+		10
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+		10

**CARDIOVASCULAR SYSTEM**

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

+ .. Tissue examined microscopically

M .. Missing tissue

X .. Lesion present

A .. Autolysis precludes evaluation

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B6C3F1 MICE MALE	DAY ON TEST	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
0 mg/m <sup>3</sup>	ANIMAL ID	8	8	8	8	8	8	8	8	8	8
		9	9	9	9	9	9	9	9	9	9
Blood Vessel		0	0	0	0	0	0	0	0	0	0
		1	1	1	1	1	1	1	1	1	1
Heart		0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	1
ENDOCRINE SYSTEM		1	2	3	4	5	6	7	8	9	0
		* TOTALS									
Blood Vessel		+	+	+	+	+	+	+	+	+	10
Heart		+	+	+	+	+	+	+	+	+	10
Adrenal Cortex		+	+	+	+	+	+	+	+	+	10
Adrenal Medulla		+	+	+	+	+	+	+	+	+	10
Islets, Pancreatic		+	+	+	+	+	+	+	+	+	10
Parathyroid Gland		+	M	M	+	M	M	+	M	+	5
Pituitary Gland		+	+	+	+	+	+	+	+	+	10
Thyroid Gland		+	+	+	+	+	+	+	+	+	10
<b>GENERAL BODY SYSTEM</b>											
NONE											
<b>GENITAL SYSTEM</b>											
Epididymis		+	+	+	+	+	+	+	+	+	10
Preputial Gland		+	+	+	+	+	+	+	+	+	10
Prostate		+	+	+	+	+	+	+	+	+	10
Seminal Vesicle		+	+	+	+	+	+	+	+	+	10

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		0	0	0	0	0	0	0	0	0	0
0 mg/m <sup>3</sup>	ANIMAL ID	8	8	8	8	8	8	8	8	8	8
		9	9	9	9	9	9	9	9	9	9
Testes		0	0	0	0	0	0	0	0	0	0
		1	1	1	1	1	1	1	1	1	1
HEMATOPOIETIC SYSTEM		0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	1
Bone Marrow		1	2	3	4	5	6	7	8	9	0
		* TOTALS									
Testes		+	+	+	+	+	+	+	+	+	10
<b>HEMATOPOIETIC SYSTEM</b>											
Bone Marrow		+	+	+	+	+	+	+	+	+	10
Lymph Node, Bronchial Pigmentation		+	M	+	M	M	+	+	+	+	M
		1				1					
Lymph Node, Mandibular		M	+	+	M	M	+	+	+	M	M
Lymph Node, Mediastinal		M	M	M	M	M	M	M	+	M	M
Lymph Node, Mesenteric		+	M	+	+	+	+	+	+	+	+
Spleen		+	+	+	+	+	+	+	+	+	+
Thymus		+	+	+	+	+	+	+	+	+	+
<b>INTEGUMENTARY SYSTEM</b>											
Mammary Gland		M	M	M	M	M	M	M	M	M	M
Skin		+	+	+	+	+	+	+	+	+	+
<b>MUSCULOSKELETAL SYSTEM</b>											
Bone		+	+	+	+	+	+	+	+	+	+
<b>NERVOUS SYSTEM</b>											

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		0	0	0	0	0	0	0	0	0	0
0 mg/m <sup>3</sup>	ANIMAL ID	8	8	8	8	8	8	8	8	8	8
		9	9	9	9	9	9	9	9	9	9
		0	0	0	0	0	0	0	0	0	0
		1	1	1	1	1	1	1	1	1	1
		0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0
		* TOTALS									
Brain		+	+	+	+	+	+	+	+	+	10
<b>RESPIRATORY SYSTEM</b>											
Larynx		+	+	+	+	+	+	+	+	+	10
Metaplasia, Squamous											1 1.0
Lung		+	+	+	+	+	+	+	+	+	10
Nose		+	+	+	+	+	+	+	+	+	10
Trachea		+	+	+	+	+	+	+	+	+	10
<b>SPECIAL SENSES SYSTEM</b>											
Eye		+	+	+	+	+	+	+	+	+	10
Harderian Gland		+	+	+	+	+	+	+	+	+	10
Inflammation, Acute		2	1	1	3	2		2		2	7 1.9
<b>URINARY SYSTEM</b>											
Kidney		+	+	+	+	+	+	+	+	+	10
Nephropathy											1 1.0
Papilla, Infiltration Cellular, Polymorphonuclear											1 2.0
Renal Tubule, Necrosis											1 2.0
Urinary Bladder		+	+	+	+	+	+	+	+	+	10

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Lab: BNW

		DAY ON TEST									
		ANIMAL ID									
B6C3F1 MICE MALE		0	0	0	0	0	0	0	0	0	0
2 mg/m3		0	0	0	0	0	0	0	0	0	0
		8	8	8	8	8	6	8	8	8	8
		9	9	9	9	9	3	9	9	9	9
		0	0	0	0	0	0	0	0	0	0
		1	1	1	1	1	1	1	1	1	1
		2	2	2	2	2	2	2	2	2	2
		0	0	0	0	0	0	0	0	1	
		1	2	3	4	5	6	7	8	9	0

**\* TOTALS****ALIMENTARY SYSTEM**

Esophagus	+	1
Gallbladder	+	1
Intestine Large, Cecum	+	1
Intestine Large, Colon	+	1
Intestine Large, Rectum	+	1
Intestine Small, Duodenum	+	1
Intestine Small, Ileum	+	1
Intestine Small, Jejunum	+	1
Liver	+	1
Pancreas	+	1
Salivary Glands	+	1
Stomach, Forestomach	+	1
Hyperplasia, Squamous	2	1 2.0
Ulcer	1	1 1.0
Stomach, Glandular	+	1

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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
	ANIMAL ID	8	8	8	8	8	6	8	8	8	8
		9	9	9	9	9	3	9	9	9	9
		0	0	0	0	0	0	0	0	0	0
		1	1	1	1	1	1	1	1	1	1
		2	2	2	2	2	2	2	2	2	2
		0	0	0	0	0	0	0	0	1	
		1	2	3	4	5	6	7	8	9	0

**\* TOTALS**

Heart

+

**1****ENDOCRINE SYSTEM**

Adrenal Cortex

+

**1**

Adrenal Medulla

+

**1**

Islets, Pancreatic

+

**1**

Parathyroid Gland

+

**1**

Pituitary Gland

+

**1**

Thyroid Gland

+

**1****GENERAL BODY SYSTEM**

NONE

**GENITAL SYSTEM**

Epididymis

+ + + + + + + + + +

**10**

Preputial Gland

+

**1**

Prostate

+

**1**

Seminal Vesicle

+

**1**

Testes

+ + + + + + + + + +

**10**

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Lab: BNW

B6C3F1 MICE MALE	2 mg/m <sup>3</sup>	DAY ON TEST	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0
B6C3F1 MICE MALE	2 mg/m <sup>3</sup>	ANIMAL ID	8	8	8	8	8	6	8	8	8
			9	9	9	9	9	3	9	9	9
B6C3F1 MICE MALE	2 mg/m <sup>3</sup>	ANIMAL ID	0	0	0	0	0	0	0	0	0
			1	1	1	1	1	1	1	1	1
B6C3F1 MICE MALE	2 mg/m <sup>3</sup>	ANIMAL ID	2	2	2	2	2	2	2	2	2
			0	0	0	0	0	0	0	0	1
B6C3F1 MICE MALE	2 mg/m <sup>3</sup>	ANIMAL ID	1	2	3	4	5	6	7	8	9
			1	2	3	4	5	6	7	8	9
B6C3F1 MICE MALE	2 mg/m <sup>3</sup>	ANIMAL ID	1	2	3	4	5	6	7	8	9
			1	2	3	4	5	6	7	8	9
B6C3F1 MICE MALE	2 mg/m <sup>3</sup>	ANIMAL ID	1	2	3	4	5	6	7	8	9
			1	2	3	4	5	6	7	8	9

\* TOTALS

## HEMATOPOIETIC SYSTEM

Bone Marrow		+										1
Lymph Node, Bronchial Pigmentation	M	M	+	M	M	+	M	+	+ M			4
Lymph Node, Mandibular												1
Lymph Node, Mediastinal												0
Lymph Node, Mesenteric												1
Spleen												1
Thymus												1

## INTEGUMENTARY SYSTEM

Mammary Gland		M										0
Skin			+									1

## MUSCULOSKELETAL SYSTEM

Bone		+										1
------	--	---	--	--	--	--	--	--	--	--	--	---

## NERVOUS SYSTEM

Brain		+										1
-------	--	---	--	--	--	--	--	--	--	--	--	---

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		DAY ON TEST																			
		ANIMAL ID																			
B6C3F1 MICE MALE		2 mg/m <sup>3</sup>																			
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	8	8	8	8	8	8	6	8	8	8	8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	3	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	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2	3	4	5	6	7	8	9	9	0	0	0	0	0	0	0	0	0	0	0	0

**\* TOTALS****RESPIRATORY SYSTEM**

Larynx		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	9	1	2.0
Squamous Epithelium, Hyperplasia																					
Lung	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	10	1	1.0
Hemorrhage																					
Nose																					
Trachea																					

**SPECIAL SENSES SYSTEM**

Eye																					1	
Harderian Gland																					1	

**URINARY SYSTEM**

Kidney	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	10	2	1.0
Nephropathy																					
Urinary Bladder																					1

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

\* TOTALS

**MUSCULOSKELETAL SYSTEM**

NONE

**NERVOUS SYSTEM**

NONE

**RESPIRATORY SYSTEM**Larynx  
Metaplasia, Squamous

+	+	+	+	+	+	+	+	+	+	+	10
				1		1		1	1	1	5 1.0

Lung  
Infiltration Cellular, Histiocyte  
Inflammation, Chronic Active  
Pigmentation

+	+	+	+	+	+	+	+	+	+	+	10
4	4	3	4	2	1	2	2	3	4		10 2.9
1	1	1	1	1	1	1	1	1	1		10 1.0
4	4	3	2	3	3	3	3	3	4		10 3.2

**SPECIAL SENSES SYSTEM**

NONE

**URINARY SYSTEM**Kidney  
Renal Tubule, Necrosis

+	+	+	+	+	+	+	+	+	+	+	10
					1						1 1.0

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B6C3F1 MICE MALE	30 mg/m3	DAY ON TEST	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0
ANIMAL ID			8	8	8	8	8	8	8	8	8	8
			9	9	9	9	9	9	9	9	9	9
<b>* TOTALS</b>												

**ALIMENTARY SYSTEM**

Esophagus	+	+	+	+	+	+	+	+	+	+	+	10
Gallbladder	+	+	M	M	+	+	+	+	+	+	+	8
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+	+	10
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+	+	10
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+	+	10
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+	+	10
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+	+	10
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+	+	10
Liver Inflammation, Granulomatous	+	+	+	+	+	+	+	+	+	+	1	10 1 1.0
Pancreas	+	+	+	+	+	+	+	+	+	+	+	10
Salivary Glands	+	+	+	+	+	+	+	+	+	+	+	10
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	+	+	10
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+	+	10

**CARDIOVASCULAR SYSTEM**

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

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20701 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE NASAL

Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Nanoscale material (Fullerene-C60 1 micron)

CAS Number: 99685-96-8

Date Report Requested: 02/22/2013

Time Report Requested: 07:59:02

First Dose M/F: 11/05/07 / 11/05/07

Lab: BNW

B6C3F1 MICE MALE	30 mg/m <sup>3</sup>	DAY ON TEST													* TOTALS	
			0 0 8 9	0 0 8 9	0 0 8 9											
		ANIMAL ID	0 1 6 0 1	1 1 6 0 2	1 1 6 0 3	1 1 6 0 4	1 1 6 0 5	1 1 6 0 6	1 1 6 0 7	1 1 6 0 8	1 1 6 0 9	1 1 6 0 0				
Blood Vessel			+	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	9	
Heart			+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	10	
<b>ENDOCRINE SYSTEM</b>																
Adrenal Cortex			+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	10
Adrenal Medulla			+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	10
Islets, Pancreatic			+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	10
Parathyroid Gland			M M + +	M M + +	M M + +	M M + +	M M + +	M M + +	M M + +	M M + +	M M + +	M M + +	M M + +	M M + +	M M + +	6
Pituitary Gland			+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	10
Thyroid Gland			+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	10
<b>GENERAL BODY SYSTEM</b>																
NONE																
<b>GENITAL SYSTEM</b>																
Epididymis			+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	10
Preputial Gland			+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	10
Prostate			+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	10
Seminal Vesicle			+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	+ + + + +	10

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

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20701 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE NASAL

Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Nanoscale material (Fullerene-C60 1 micron)

CAS Number: 99685-96-8

Date Report Requested: 02/22/2013

Time Report Requested: 07:59:02

First Dose M/F: 11/05/07 / 11/05/07

Lab: BNW

B6C3F1 MICE MALE	30 mg/m3	DAY ON TEST											* TOTALS
			0 0 8 9										
		ANIMAL ID	0 1 6 0 1	0 1 6 0 2	0 1 6 0 3	0 1 6 0 4	0 1 6 0 5	0 1 6 0 6	0 1 6 0 7	0 1 6 0 8	0 1 6 0 9	0 1 6 0 0	
Testes			+ + + + + + + + + +										10
<b>HEMATOPOIETIC SYSTEM</b>													
Bone Marrow			+ + + + + + + + + +										10
Lymph Node, Bronchial Pigmentation			+ + + + M + + + + +										9
			3 3 3 3 3 3 3 3 3 2										9 2.9
Lymph Node, Mandibular			+ M + M M + + M M M										4
Lymph Node, Mediastinal			+ M M + M + + M M M										4
Lymph Node, Mesenteric			+ + + + + + + + + +										10
Spleen			+ + + + + + + + + +										10
Thymus			+ + + + + + + + + +										10
<b>INTEGUMENTARY SYSTEM</b>													
Mammary Gland			M M M M M M M M M M										0
Skin			+ + + + + + + + + +										10
<b>MUSCULOSKELETAL SYSTEM</b>													
Bone			+ + + + + + + + + +										10
<b>NERVOUS SYSTEM</b>													

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

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

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1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20701 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE NASAL

Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Nanoscale material (Fullerene-C60 1 micron)

CAS Number: 99685-96-8

Date Report Requested: 02/22/2013

Time Report Requested: 07:59:02

First Dose M/F: 11/05/07 / 11/05/07

Lab: BNW

B6C3F1 MICE MALE	30 mg/m <sup>3</sup>	DAY ON TEST											* TOTALS
			0 0 8 9										
		ANIMAL ID	0 1 6 0 1	0 1 6 0 2	0 1 6 0 3	0 1 6 0 4	0 1 6 0 5	0 1 6 0 6	0 1 6 0 7	0 1 6 0 8	0 1 6 0 9	0 1 6 0 0	
Brain			+	+	+	+	+	+	+	+	+	+	10
<b>RESPIRATORY SYSTEM</b>													
Larynx			+	+	+	+	+	+	+	+	+	+	10
Metaplasia, Squamous			1 1	1 1	1 1	1 1	2 1	1 1	1 1	1 1	1 1	1 1	9 1.1
Lung			+	+	+	+	+	+	+	+	+	+	10
Infiltration Cellular, Histiocyte			4 4	4 4	3 4	4 4	10 3.9						
Inflammation, Chronic Active			2 2	2 2	1 2	2 2	10 1.9						
Pigmentation			4 4	4 4	3 4	4 4	4 4	4 4	4 4	4 4	4 4	3 3	10 3.8
Nose			+	+	+	+	+	+	+	+	+	+	10
Olfactory Epithelium, Accumulation, Hyaline													1 1.0
Droplet													
Respiratory Epithelium, Accumulation, Hyaline							1						1 1.0
Droplet													
Trachea			+	+	+	+	+	+	+	+	+	+	10
<b>SPECIAL SENSES SYSTEM</b>													
Eye			+	+	+	+	+	+	+	+	+	+	10
Harderian Gland			+	+	+	+	+	+	+	+	+	+	10
Inflammation, Acute			1		2	1	2	1	2	1			7 1.4
<b>URINARY SYSTEM</b>													
Kidney			+	+	+	+	+	+	+	+	+	+	10
Nephropathy						1			1				2 1.0

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

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

**Experiment Number:** 20701 - 02

## P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

**Date Report Requested:** 02/22/2013

**Test Type:** 90-DAY

Nanoscale material (Fullerene-C60 1 micron)

**Time Report Requested:** 07:59:02

**Route:** RESPIRATORY EXPOSURE NASAL

**CAS Number:** 99685-96-8

**First Dose M/F:** 11/05/07 / 11/05/07

**Species/Strain:** MICE/B6C3F1

## Lab: BNW

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

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

+ .. Tissue examined microscopically

M .. Missing tissue

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild      4) Marked

Experiment Number: 20701 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE NASAL

Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Nanoscale material (Fullerene-C60 1 micron)

CAS Number: 99685-96-8

Date Report Requested: 02/22/2013

Time Report Requested: 07:59:02

First Dose M/F: 11/05/07 / 11/05/07

Lab: BNW

B6C3F1 MICE FEMALE	0 mg/m <sup>3</sup>	DAY ON TEST	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0
ANIMAL ID			8	8	8	8	8	8	8	8	8	8
			9	9	9	9	9	9	9	9	9	9
			0	0	0	0	0	0	0	0	0	0
			1	1	1	1	1	1	1	1	1	1
			1	1	1	1	1	1	1	1	1	1
			0	0	0	0	0	0	0	0	0	1
			1	2	3	4	5	6	7	8	9	0

\* TOTALS

**ALIMENTARY SYSTEM**

Esophagus	+	+	+	+	+	+	+	+	+	+	+	10
Gallbladder	+	+	+	+	+	+	+	+	+	+	+	10
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+	+	10
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+	+	10
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+	+	10
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+	+	10
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+	+	10
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+	+	10
Liver	+	+	+	+	+	+	+	+	+	+	+	10
Pancreas	+	+	+	+	+	+	+	+	+	+	+	10
Salivary Glands	+	+	+	+	+	+	+	+	+	+	+	10
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	+	+	10
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+	+	10

**CARDIOVASCULAR SYSTEM**

Blood Vessel	+	+		+		+	M	+	+	+	+	7
--------------	---	---	--	---	--	---	---	---	---	---	---	---

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

+ .. Tissue examined microscopically

X .. Lesion present

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1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

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Experiment Number: 20701 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE NASAL

Species/Strain: MICE/B6C3F1

## P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Nanoscale material (Fullerene-C60 1 micron)

CAS Number: 99685-96-8

Date Report Requested: 02/22/2013

Time Report Requested: 07:59:02

First Dose M/F: 11/05/07 / 11/05/07

Lab: BNW

B6C3F1 MICE FEMALE	0 mg/m <sup>3</sup>	DAY ON TEST													* TOTALS
			0 0 8 9	0 0 8 9	0 0 8 9										
		ANIMAL ID	0 1 1 0 1	0 1 1 0 2	0 1 1 0 3	0 1 1 0 4	0 1 1 0 5	0 1 1 0 6	0 1 1 0 7	0 1 1 0 8	0 1 1 0 9	0 1 1 0 0			
Lymph Node, Bronchial Pigmentation		M	M	+	M	M	+	M	+	+	+			5	2 1.0
Lymph Node, Mandibular		+	M	+	+	+	M	+	+	M	M			6	
Lymph Node, Mediastinal		M	M	M	M	M	+	M	M	+	M			2	
Lymph Node, Mesenteric		+	+	+	M	+	+	+	+	+	+			9	
Spleen		+	+	+	+	+	+	+	+	+	+			10	
Thymus		+	+	+	+	+	+	+	+	+	+			10	
<b>INTEGUMENTARY SYSTEM</b>															
Mammary Gland		+	+	+	+	+	+	+	+	+	+			10	
Skin		+	+	+	+	+	+	+	+	+	+			10	
<b>MUSCULOSKELETAL SYSTEM</b>															
Bone		+	+	+	+	+	+	+	+	+	+			10	
<b>NERVOUS SYSTEM</b>															
Brain		+	+	+	+	+	+	+	+	+	+			10	
<b>RESPIRATORY SYSTEM</b>															
Larynx		+	+	+	+	+	+	+	+	+	+			10	

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

+ .. Tissue examined microscopically

X .. Lesion present

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1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20701 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE NASAL

Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Nanoscale material (Fullerene-C60 1 micron)

CAS Number: 99685-96-8

Date Report Requested: 02/22/2013

Time Report Requested: 07:59:02

First Dose M/F: 11/05/07 / 11/05/07

Lab: BNW

B6C3F1 MICE FEMALE	0 mg/m <sup>3</sup>	ANIMAL ID	DAY ON TEST	0	0	0	0	0	0	0	0	0	0
				0	0	0	0	0	0	0	0	0	0
<b>* TOTALS</b>													
Lung				+	+	+	+	+	+	+	+	+	10
Hemorrhage													1 1.0
Nose				+	+	+	+	+	+	+	+	+	10
Respiratory Epithelium, Accumulation, Hyaline Droplet				1	1		1	1	1	1	1	1	5 1.0
Trachea				+	+	+	+	+	+	+	+	+	10
<b>SPECIAL SENSES SYSTEM</b>													
Eye				+	+	+	+	+	+	+	+	+	10
Cornea, Necrosis													1 1.0
Harderian Gland				+	+	+	+	+	+	+	+	+	10
Inflammation, Acute				1	1		1						3 1.0
<b>URINARY SYSTEM</b>													
Kidney				+	+	+	+	+	+	+	+	+	10
Nephropathy													1 1.0
Urinary Bladder				+	+	+	+	+	+	+	+	+	10

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

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

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1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20701 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE NASAL

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Nanoscale material (Fullerene-C60 1 micron)

CAS Number: 99685-96-8

Date Report Requested: 02/22/2013

Time Report Requested: 07:59:02

First Dose M/F: 11/05/07 / 11/05/07

Lab: BNW

B6C3F1 MICE FEMALE	2 mg/m <sup>3</sup>	ANIMAL ID	DAY ON TEST											
			0 0 8 9											
			0 1 3 0 1	0 1 3 0 2	0 1 3 0 3	0 1 3 0 4	0 1 3 0 5	0 1 3 0 6	0 1 3 0 7	0 1 3 0 8	0 1 3 0 9	0 1 3 0 0	0 1 3 0 1	0 1 3 0 1

\* TOTALS

### ALIMENTARY SYSTEM

NONE

### CARDIOVASCULAR SYSTEM

NONE

### ENDOCRINE SYSTEM

NONE

### GENERAL BODY SYSTEM

NONE

### GENITAL SYSTEM

NONE

### HEMATOPOIETIC SYSTEM

Lymph Node, Bronchial  
Pigmentation

M M M + + + + M + +  
1 1 1

6  
3 1.0

### INTEGUMENTARY SYSTEM

NONE

### MUSCULOSKELETAL SYSTEM

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

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20701 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE NASAL

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Nanoscale material (Fullerene-C60 1 micron)

CAS Number: 99685-96-8

Date Report Requested: 02/22/2013

Time Report Requested: 07:59:02

First Dose M/F: 11/05/07 / 11/05/07

Lab: BNW

B6C3F1 MICE FEMALE 2 mg/m <sup>3</sup>	ANIMAL ID	DAY ON TEST									
		0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
		8	8	8	8	8	8	8	8	8	8
		9	9	9	9	9	9	9	9	9	9
		0	0	0	0	0	0	0	0	0	0
		1	1	1	1	1	1	1	1	1	1
		3	3	3	3	3	3	3	3	3	3
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0

\* TOTALS

NONE

### NERVOUS SYSTEM

NONE

### RESPIRATORY SYSTEM

Larynx

+	+	+	+		+	+	+		+	8	
										1	1 1.0

Metaplasia, Squamous

Lung

+	+	+	+	+	+	+	+	+	+	10
---	---	---	---	---	---	---	---	---	---	----

### SPECIAL SENSES SYSTEM

NONE

### URINARY SYSTEM

NONE

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

+ .. Tissue examined microscopically

M .. Missing tissue

X .. Lesion present

A .. Autolysis precludes evaluation

I .. Insufficient tissue

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20701 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE NASAL

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Nanoscale material (Fullerene-C60 1 micron)

CAS Number: 99685-96-8

Date Report Requested: 02/22/2013

Time Report Requested: 07:59:02

First Dose M/F: 11/05/07 / 11/05/07

Lab: BNW

B6C3F1 MICE FEMALE 15 mg/m <sup>3</sup>	DAY ON TEST	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
ANIMAL ID		8	8	8	8	8	8	8	8	8	8
		9	9	9	9	9	9	9	9	9	9
		0	0	0	0	0	0	0	0	0	0
		1	1	1	1	1	1	1	1	1	1
		5	5	5	5	5	5	5	5	5	5
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0

\* TOTALS

### ALIMENTARY SYSTEM

NONE

### CARDIOVASCULAR SYSTEM

NONE

### ENDOCRINE SYSTEM

NONE

### GENERAL BODY SYSTEM

NONE

### GENITAL SYSTEM

NONE

### HEMATOPOIETIC SYSTEM

Lymph Node, Bronchial  
Pigmentation

M + M M + + M + + M  
1

5  
1 1.0

### INTEGUMENTARY SYSTEM

NONE

### MUSCULOSKELETAL SYSTEM

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

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

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1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

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Experiment Number: 20701 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE NASAL

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Nanoscale material (Fullerene-C60 1 micron)

CAS Number: 99685-96-8

Date Report Requested: 02/22/2013

Time Report Requested: 07:59:02

First Dose M/F: 11/05/07 / 11/05/07

Lab: BNW

B6C3F1 MICE FEMALE 15 mg/m3	DAY ON TEST ANIMAL ID	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
		8	8	8	8	8	8	8	8	8	8
		9	9	9	9	9	9	9	9	9	9
		0	0	0	0	0	0	0	0	0	*
		1	1	1	1	1	1	1	1	1	*
		5	5	5	5	5	5	5	5	5	*
		0	0	0	0	0	0	0	0	1	*
		1	2	3	4	5	6	7	8	9	*

\* TOTALS

NONE

## NERVOUS SYSTEM

NONE

## RESPIRATORY SYSTEM

Larynx

Metaplasia, Squamous

+	+	+	+	+	+	+	+	+	+	+
1	1			1	1	1	1			

10  
6 1.0

Lung

Infiltration Cellular, Histiocyte

Inflammation, Chronic Active

Pigmentation

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

10  
10 2.4  
3 1.0  
10 2.9

## SPECIAL SENSES SYSTEM

NONE

## URINARY SYSTEM

NONE

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+ .. Tissue examined microscopically

M .. Missing tissue

X .. Lesion present

A .. Autolysis precludes evaluation

I .. Insufficient tissue

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

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

Experiment Number: 20701 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE NASAL

Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Nanoscale material (Fullerene-C60 1 micron)

CAS Number: 99685-96-8

Date Report Requested: 02/22/2013

Time Report Requested: 07:59:02

First Dose M/F: 11/05/07 / 11/05/07

Lab: BNW

B6C3F1 MICE FEMALE 30 mg/m3	DAY ON TEST	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
B6C3F1 MICE FEMALE 30 mg/m3	ANIMAL ID	8	8	8	8	8	8	8	8	8	8
		9	9	9	9	9	9	9	9	9	9
B6C3F1 MICE FEMALE 30 mg/m3	ANIMAL ID	0	0	0	0	0	0	0	0	0	0
		1	1	1	1	1	1	1	1	1	1
B6C3F1 MICE FEMALE 30 mg/m3	ANIMAL ID	7	7	7	7	7	7	7	7	7	7
		0	0	0	0	0	0	0	0	0	1
B6C3F1 MICE FEMALE 30 mg/m3	ANIMAL ID	1	2	3	4	5	6	7	8	9	0

**\* TOTALS****ALIMENTARY SYSTEM**

Esophagus	+	+	+	+	+	+	+	+	+	+	10
Gallbladder	+	+	M	I	+	M	+	+	+	+	7
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+	10
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+	10
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+	10
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+	10
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+	10
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+	10
Liver Necrosis	+	+	+	+	+	+	+	+	+	+	10
											1 2.0
Pancreas	+	+	+	+	+	+	+	+	+	+	10
Salivary Glands	+	+	+	+	+	+	+	+	+	+	10
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	+	10
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+	10

**CARDIOVASCULAR SYSTEM**

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1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

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Experiment Number: 20701 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE NASAL

Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Nanoscale material (Fullerene-C60 1 micron)

CAS Number: 99685-96-8

Date Report Requested: 02/22/2013

Time Report Requested: 07:59:02

First Dose M/F: 11/05/07 / 11/05/07

Lab: BNW

B6C3F1 MICE FEMALE	30 mg/m <sup>3</sup>	DAY ON TEST													* TOTALS
			0 0 8 9	0 0 8 9	0 0 8 9										
		ANIMAL ID	0 1 7 0 1	1 1 7 0 2	1 1 7 0 3	1 1 7 0 4	1 1 7 0 5	1 1 7 0 6	1 1 7 0 7	1 1 7 0 8	1 1 7 0 9	1 1 7 0 0			
Blood Vessel			+ + + + + + + + + +												10
Heart			+ + + + + + + + + +												10
<b>ENDOCRINE SYSTEM</b>															
Adrenal Cortex			+ + + + + + + + + +												10
Adrenal Medulla			+ M + M + + + + + +												8
Islets, Pancreatic			+ + + + + + + + + +												10
Parathyroid Gland			M + + M M M M + M +												4
Pituitary Gland			+ + + + + + + + + +												10
Thyroid Gland			+ + + + + + + + + +												10
<b>GENERAL BODY SYSTEM</b>															
NONE															
<b>GENITAL SYSTEM</b>															
Clitoral Gland			+ M + + + M + + + +												8
Ovary			+ + + + + + + + + +												10
Uterus			+ + + + + + + + + +												10
<b>HEMATOPOIETIC SYSTEM</b>															

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Experiment Number: 20701 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE NASAL

Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Nanoscale material (Fullerene-C60 1 micron)

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Date Report Requested: 02/22/2013

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First Dose M/F: 11/05/07 / 11/05/07

Lab: BNW

B6C3F1 MICE FEMALE	30 mg/m <sup>3</sup>	DAY ON TEST													* TOTALS
			0 0 8 9												
		ANIMAL ID	0 1 7 0 1	0 1 7 0 2	0 1 7 0 3	* TOTALS									
Bone Marrow			+	+	+	+	+	+	+	+	+	+	+	+	10
Lymph Node, Bronchial Pigmentation			+	+	M	M	+	I	M	+	+	+	+	+	6
			3	2			3			3	2	3			6 2.7
Lymph Node, Mandibular			+	M	M	+	+	+	M	M	+	+	+	+	6
Lymph Node, Mediastinal			+	M	M	M	M	+	M	+	+	M			4
Lymph Node, Mesenteric			+	+	+	+	+	+	+	+	+	+	+	+	10
Spleen			+	+	+	+	+	+	+	+	+	+	+	+	10
Thymus			+	+	+	+	+	+	+	+	+	+	+	+	10
<b>INTEGUMENTARY SYSTEM</b>															
Mammary Gland Inflammation, Acute			+	+	+	+	+	+	+	+	+	+	+	+	10
															1 1.0
Skin			+	+	+	+	+	+	+	+	+	+	+	+	10
<b>MUSCULOSKELETAL SYSTEM</b>															
Bone			+	+	+	+	+	+	+	+	+	+	+	+	10
<b>NERVOUS SYSTEM</b>															
Brain			+	+	+	+	+	+	+	+	+	+	+	+	10
<b>RESPIRATORY SYSTEM</b>															

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B6C3F1 MICE FEMALE	30 mg/m <sup>3</sup>	DAY ON TEST											* TOTALS	
			0 0 8 9	0 0 8 9	0 0 8 9									
ANIMAL ID	0 1 7 0 1	0 1 7 0 2	0 1 7 0 3	0 1 7 0 4	0 1 7 0 5	0 1 7 0 6	0 1 7 0 7	0 1 7 0 8	0 1 7 0 9	0 1 7 0 0				
Larynx	+ + + + + + + + + +										10			
Metaplasia, Squamous	1 1	1 1	1 1	1 1	1 1	2 1	1 1	2 1	1 1	1 1	9	1.2		
Lung	+ + + + + + + + + +										10			
Infiltration Cellular, Histiocyte	4 4	10	4.0											
Inflammation, Chronic Active	2 2	10	2.0											
Pigmentation	4 4	10	4.0											
Nose	+ + + + + + + + + +										10			
Olfactory Epithelium, Accumulation, Hyaline											2	1.0		
Droplet											1	1		
Respiratory Epithelium, Accumulation, Hyaline											4	1.3		
Droplet											1			
Trachea	+ + + + + + + + + +										10			
<b>SPECIAL SENSES SYSTEM</b>														
Eye	+ + + + + + + + + +										10			
Harderian Gland	+ + + + + + + + + +										10			
Inflammation, Acute	1 1	7	1.0											
<b>URINARY SYSTEM</b>														
Kidney	+ + + + + + + + + +										10			
Nephropathy											1	1.0		
Urinary Bladder	+ + + + + + + + + +										10			

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**Route:** RESPIRATORY EXPOSURE NASAL

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

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