

# **NTP Historical Controls Report**

# By Route and Vehicle

# Harlan Sprague-Dawley RATS

August 2016

This report shows the tumor rates of control group animals from selected studies. The studies used are shown on the Study Summary page.

This report is broken up into sections based on the route and vehicle used to deliver the chemical. The Table of Contents on Page 3 shows the different Route/Vehicle combinations. To see the data from all routes and vehicles combined into one set, you must run the "All Routes" report.

The individual tumor rates shown on the data pages of the report relate to the Study Summary page as follows: the tumor rates are shown in the same order as the Study Summary page, except that they are grouped horizontally in sets of three, with the males in the first set of three and the females in the second set. For example if the study summary showed the studies like this:

Male M1 M2 M3 M4 M5 Female F1 F2 F3 F4 F5

the data would be shown as:

	Male			Female	
M1	M2	M3	F1	F2	F3
M4	M5		F4	F5	

Directly beneath the individual tumor rates on the data pages are the overall totals for that tumor/site combination. This includes the total tumors/animals, the overall mean (in parentheses), the mean of the study means, and the standard deviation of the study means.

Studies with no control animals of a particular gender are listed on the summary page with the Number of Animals shown as zero and the Start Date and Length of Study shown as "N/A". On the data pages there are blank spaces where tumor rates for these studies would normally be found, so that the male and female rates for the remaining studies can be easily compared.

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#### Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC

#### Toxicology Data Management System Tumor Incidence for Selected Control Animal Groups Route: GAVAGE Vehicle: CORN OIL

	Study Summary										
Laboratory Name	Study Number	Study Start Date	Length of Study in Days	Number of Animals Total and (#/Cage)	Number Surviving and (Mean Life Span)	Maximum Mean Weekly Body Weight	Chemical				
					Male						
Battelle Columbus Laboratory	052000603	03/14/07	727	50(3)	20(644)	584.8	Indole-3-carbinol				
					Female						
Battelle Columbus Laboratory	052000603	03/15/07	729	50(5)	21(637)	353.0	Indole-3-carbinol				

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC			<b>Toxico</b> Tumor Incide	Page: 5 Report Dat	<b>e:</b> 08/09/2016			
			Male				Female	
#All Organs: Benign Tumors Overall Incidence	Total	27/50 (54%) 27/50 (54%)	Mean 54%	SD 0%	Total	40/50 (80%) 40/50 (80%)	Mean 80%	SD 0%
#All Organs: Malignant Tumors		12/50 (24%)				14/50 (28%)		
Overall Incidence	Total	12/50 (24%)	Mean 24%	SD 0%	Total	14/50 (28%)	Mean 28%	SD 0%
#All Organs: Malignant and Benign Tumo Overall Incidence	<b>rs</b> Total	33/50 (66%) 33/50 (66%)	Mean 66%	SD 0%	Total	46/50 (92%) 46/50 (92%)	Mean 92%	SD 0%
#All Organs: Hemangioma Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
#All Organs: Hemangiosarcoma		1/50 (2%)				1/50 (2%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%
#All Organs: Hemangiosarcoma or Hema	ngioma	1/50 (2%)				1/50 (2%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: GAVAGE Vehicle: CORN OI		Page: 6 Report Date: 08/09/2016		
			Male				Female	
#All Organs: Histiocytic Sarcoma Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%
		. ,				. ,		
#All Organs: Leukemia: Granulocytic		0/50 (0%)				0/50 (0%)		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
#All Organs: Leukemia: Lymphocytic, Mc Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
#All Organs: Mesothelioma: Benign, Mali						0/50 (0%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
#All Organs: Mesothelioma: Malignant		1/50 (2%)				0/50 (0%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
*Adrenal Cortex: Adenoma		0/50 (0%)				0/50 (0%)		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme Ince for Selected Contr Route: GAVAGE Vehicle: CORN OII		Page: 7 Report Date: 08/09/2016		
			Male				Female	
*Adrenal Medulla: Pheochromocytoma Benign Overall Incidence		5/50 (10%)	Moon 10%	SD 0%	Total	0/50 (0%)	Moon 0%	SD 0%
	Total	5/50 (10%)	Mean 10%	SD 0%	TOLA	0/50 (0%)	Mean 0%	50 0%
*Adrenal Medulla: Pheochromocytoma Comple	ex	1/50 (2%)				0/50 (0%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
*Adrenal Medulla: Pheochromocytoma Maligna		2/50 (4%)				0/50 (0%)		
Overall Incidence	Total	2/50 (4%)	Mean 4%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
*Adrenal Medulla: Pheochromocytoma: Benig						0/50 (0%)		
Overall Incidence	Total	8/50 (16%)	Mean 16%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
*Brain: Glioma Malignant		0/50 (0%)				0/50 (0%)		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
*Brain: Granular Cell Tumor Benign		0/50 (0%)				1/50 (2%)		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: GAVAGE Vehicle: CORN OI		Page: 8 Report Dat	e: 08/09/2016					
			Male		Female							
*Brain: Oligodendroglioma, Glioma, or Astrocytoma 0/50 (0%) 0/50 (0%)												
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%				
*Brain: Schwannoma Malignant		0/50 (0%)				0/50 (0%)						
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%				
*Epididymis: Sarcoma Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%								
#Eye: Leiomyoma		0/50 (0%)				0/50 (0%)						
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%				
*Heart: Schwannoma Malignant		1/50 (2%)				0/50 (0%)						
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%				
#Intestine Large: Colon/Rectu Leiomyoma		0/50 (0%)				0/50 (0%)						
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%				

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC			Toxic Tumor Incide		Page: 9 Report Dat	<b>te:</b> 08/09/2016		
			Male				Female	<u>.</u>
#Intestine Small: Jejunum: Leiomyosarcoma Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
#Intestine Small: Site Unspeci								
Leiomyosarcoma						0/50 (00()		
Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
*Islets, Pancreatic: Adenoma Overall Incidence	Total	2/50 (4%) 2/50 (4%)	Mean 4%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
tialata Dananatia								
*Islets, Pancreatic: Carcinoma		0/50 (0%)				0/50 (0%)	•• ••	<b>25</b> <i>au</i>
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
*Islets, Pancreatic: Carcinoma or Adenoma		2/50 (4%)				0/50 (0%)		
Overall Incidence	Total	2/50 (4%)	Mean 4%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
*Kidney: Renal Tubule: Adenoma		1/50 (2%)				0/50 (0%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: GAVAGE Vehicle: CORN OI	ol Animal Groups		Page: 10 Report Date: 08/09/2016		
			Male				Female		
*Kidney: Renal Tubule: Carcinoma or Adenoma		1/50 (2%	5)			0/50 (0%)			
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
*Liver: Hepatocellular Adenoma		1/50 (2%				2/50 (4%)			
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	2/50 (4%)	Mean 4%	SD 0%	
*Liver: Hepatocellular Carcinoma o Overall Incidence	r <b>Hepatocel</b> Total	1/50 (2% 1/50 (2%)	Mean 2%	SD 0%	Total	2/50 (4%) 2/50 (4%)	Mean 4%	SD 0%	
'Liver: Hepatocellular Carcinoma, H	-	lar Adenoma, or Hep 1/50 (2%	b)			2/50 (4%)			
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	2/50 (4%)	Mean 4%	SD 0%	
<sup>•</sup> Lung: Alveolar/Bronchiolar Adenor	ma	0/49 (0%	5)			1/50 (2%)			
Overall Incidence	Total	0/49 (0%)	Mean 0%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%	
Lung: Alveolar/Bronchiolar Carcine						1/50 (2%)			
Overall Incidence	Total	0/49 (0%)	Mean 0%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%	
*: Denominator is number of animals	with tissues e		, ,						

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		Male		Female			
<b>-</b>	0/49 (0%)		<b>65</b> 99/	<b>T</b> / 1	1/50 (2%)		<b>25</b> av/
	, ,				. ,	Mean 2%	SD 0%
	1/50 (2%)				0/50 (0%)		
Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
	0/50 (0%)				2/50 (6%)		
Total	0/50 (0%)	Mean 0%	SD 0%	Total	3/50 (6%)	Mean 6%	SD 0%
Total	0/50 (0%)	Mean 0%	SD 0%	Total	3/50 (6%)	Mean 6%	SD 0%
	0/50 (0%)				6/50 (12%)		
Total	0/50 (0%)	Mean 0%	SD 0%	Total	6/50 (12%)	Mean 12%	SD 0%
					29/50 (58%)		
Total	1/50 (2%)	Mean 2%	SD 0%	Total	29/50 (58%)	Mean 58%	SD 0%
	Total Total Total Total	Total $0/49 (0\%)$ 1/50 (2%)           Total $1/50 (2\%)$ Total $1/50 (2\%)$ Total $0/50 (0\%)$	Male           Male           Total         0/49 (0%) 0/49 (0%)         Mean 0%           Total         1/50 (2%) 1/50 (2%)         Mean 2%           Total         0/50 (0%) 0/50 (0%)         Mean 0%           1/50 (2%)         Mean 0%         1/50 (2%)	Tumor Incidence for Selected Contr           Route: GAVAGE           Male           Male           1/50         (0%)           Total         0/49         (0%)           Mean 0%         SD 0%           Total         1/50         (2%)           Total         1/50         (2%)           Mean 2%         SD 0%           Total         0/50         (0%)           Mean 0%         SD 0%           1/50         (2%)	Vehicle: CORN OIL           Male         Male           Total         0/49 (0%)         Mean 0%         SD 0%         Total           Total         1/50 (2%)         Mean 2%         SD 0%         Total           Total         1/50 (2%)         Mean 2%         SD 0%         Total           Total         0/50 (0%)         Mean 0%         SD 0%         Total           1/50 (2%)         Mean 0%         SD 0%         Total           1/50 (2%)         Mean 0%         SD 0%         Total	Tumor Incidence for Selected Control Animal Groups Route: GAVAGE Vehicle: CORN OIL           Male         Male           Total         0/49 (0%)         Mean 0%         SD 0%         Total         1/50 (2%)           Total         0/49 (0%)         Mean 0%         SD 0%         Total         1/50 (2%)           Total         1/50 (2%)         Mean 2%         SD 0%         Total         0/50 (0%)           Total         0/50 (0%)         Mean 2%         SD 0%         Total         0/50 (0%)           Total         0/50 (0%)         Mean 0%         SD 0%         Total         3/50 (6%)           Total         0/50 (0%)         Mean 0%         SD 0%         Total         3/50 (6%)           Total         0/50 (0%)         Mean 0%         SD 0%         Total         3/50 (6%)           Total         0/50 (0%)         Mean 0%         SD 0%         Total         3/50 (6%)           Total         0/50 (0%)         Mean 0%         SD 0%         Total         3/50 (6%)           Total         0/50 (0%)         Mean 0%         SD 0%         Total         3/50 (6%)           1/50 (2%)         Mean 0%         SD 0%         Total         6/50 (12%)           1/50 (2%)	Tumor Incidence for Selected Control Animal Groups Route: GAVACE Vehicle: CORN OIL         Report Data Route: GAVACE Vehicle: CORN OIL           Male         Female           Total         0/49 (0%)         Mean 0%         SD 0%         Total         1/50 (2%)         Mean 2%           Total         1/50 (2%)         Mean 0%         SD 0%         Total         0/50 (0%)         Mean 2%           Total         1/50 (2%)         Mean 2%         SD 0%         Total         0/50 (0%)         Mean 0%           Total         0/50 (0%)         Mean 0%         SD 0%         Total         3/50 (6%)         Mean 0%           Total         0/50 (0%)         Mean 0%         SD 0%         Total         3/50 (6%)         Mean 6%           Total         0/50 (0%)         Mean 0%         SD 0%         Total         3/50 (6%)         Mean 6%           Total         0/50 (0%)         Mean 0%         SD 0%         Total         3/50 (6%)         Mean 6%           Main         0/50 (0%)         Mean 0%         SD 0%         Total         6/50 (12%)         Mean 12%           1/50 (2%)         Mean 0%         SD 0%         Total         6/50 (12%)         Mean 12%

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC			<b>Toxic</b> Tumor Incide		Page: 12 Report Date: 08/09/2016			
			Male			Female		
#Mammary Gland: Fibroma, Fibroadenoma or	Adenoma	1/50 (2%)				30/50 (60%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	30/50 (60%)	Mean 60%	SD 0%
#Mammary Gland: Fibroma, Fibroadenoma, C						32/50 (64%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	32/50 (64%)	Mean 64%	SD 0%
#Mammary Gland: Myoepithelioma Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%
#Oral Cavity (Oral Mucosa, To Squamous Cell Carcinoma	ongue, Phary					0/50 (0%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
#Oral Cavity (Oral Mucosa, To Squamous Cell Carcinoma	ongue, Phary	vnx, Tooth, Gingiva):				0/50 (0%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
#Oral Mucosa: Squamous Cell Carcinoma		1/50 (2%)				0/50 (0%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawle Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: GAVAGE Vehicle: CORN OI		Page: 13 Report Da	t <b>e:</b> 08/09/2016	
			Male				Female	
*Ovary: Granulosa Cell Tumor Ber	ian							
Overall Incidence	•				Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
*Ovary: Granulosa Cell Tumor: Be								
Overall Incidence	ingn, mangna	in, 100			Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
*Ovary: Granulosa-Theca Tumor B	enian							
Overall Incidence					Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%
*Ovary: Thecoma Benign								
Overall Incidence					Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
*Ovary: Tubulostromal Carcinoma								
Overall Incidence					Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%
*Pancreas: Adenoma								
Overall Incidence	Total	5/50 (10%) 5/50 (10%)	Mean 10%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC			Page: 14 Report Date: 08/09/2016						
			Male			Female			
*Pancreas: Carcinoma or Adenoma		5/50 (10%)				0/50 (0%)			
Overall Incidence	Total	5/50 (10%)	Mean 10%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
*Pituitary Gland: Pars Distalis Adenoma		fied Site:							
Overall Incidence	Total	5/50 (10%) 5/50 (10%)	Mean 10%	SD 0%	Total	18/50 (36%) 18/50 (36%)	Mean 36%	SD 0%	
*Pituitary Gland: Pars Distalis Carcinoma or Adenoma		fied Site:							
Overall Incidence	Total	5/50 (10%) 5/50 (10%)	Mean 10%	SD 0%	Total	18/50 (36%) 18/50 (36%)	Mean 36%	SD 0%	
*Salivary Glands: Schwannoma Malignant		1/50 (2%)				0/50 (0%)			
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
#Skeletal Muscle: Liposarcoma						- / / /			
Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	
#Skeletal Muscle: Sarcoma									
Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%	

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				logy Data Manageme nce for Selected Cont Route: GAVAGE Vehicle: CORN O	rol Animal Groups	Page: 15 Report Date: 08/09/2016		
			Male				Female	
#Skin: Basal Cell Carcinoma								
Overall Incidence	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
#Skin:								
Basal Cell Carcinoma or Ba	asosquamou	s Tumor (malignant or No 1/50 (2%)	DS)			0/50 (0%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
#Skin: Basal Cell Carcinoma, Bas: NOS), or Trichoepithelioma		•	nor (benign, maligna	int or		0/50 (00/)		
Overall Incidence	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
#Skin: Basal or Sq. Cell Carcinom Adenoma, Papilloma, Sq Pa Overall Incidence	apilloma, Kei Total	a, Basosq. Tumor (M or B ratoacanthoma, Trichoep 6/50 (12%) 6/50 (12%)	ithelioma Mean 12%	ma, SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
#Skin: Fibroma		5/50 (10%)				1/50 (2%)		
Overall Incidence	Total	5/50 (10%)	Mean 10%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%
#Skin: Fibroma, Fibrosarcoma, Sa						2/50 (4%)		
Overall Incidence	Total	7/50 (14%)	Mean 14%	SD 0%	Total	2/50 (4%)	Mean 4%	SD 0%
*: Denominator is number of animal #: Denominator is number of animal		xamined microscopically						

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC			Page: 16 Report Date: 08/09/2016						
			Male			Female			
#Skin: Fibrosarcoma		1/50 (2%)				1/50 (2%)			
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%	
#Skin: Fibrosarcoma, Sarcoma, My		2/50 (4%)				1/50 (2%)	<b>M</b> - 66/		
Overall Incidence	Total	2/50 (4%)	Mean 4%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%	
#Skin: Fibrous Histiocytoma Overall Incidence	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	
#Skin: Hemangioma		0/50 (0%)				0/50 (0%)			
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
#Skin: Hemangiosarcoma		0/50 (0%)				1/50 (2%)			
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%	
#Skin: Keratoacanthoma		4/50 (8%)				0/50 (0%)			
Overall Incidence	Total	4/50 (8%)	Mean 8%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: GAVAGE Vehicle: CORN OI		Page: 17 Report Date: 08/09/2016				
			Male			Female				
#Skin: Lipoma		0/50 (0%)					2/52 (001)			
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%		
#Skin: Neurofibrosarcoma or Schw						1/50 (2%)				
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%		
#Skin: Neurofibrosarcoma, Neurofi Overall Incidence	ibroma, or \$ Total	Schwannoma (benign, ma 0/50 (0%) 0/50 (0%)	alignant or NOS) Mean 0%	SD 0%	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%		
#Skin: Schwannoma Malignant		0/50 (0%)				1/50 (2%)				
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%		
#Skin: Squamous Cell Carcinoma		1/50 (20/)				0/50 (00/)				
Overall Incidence	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%		
#Skin: Squamous Cell Carcinoma, or Carcinoma				nt or NOS),		0/50 (0%)				
Overall Incidence	Total	2/50 (4%)	Mean 4%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%		
*: Denominator is number of animals #: Denominator is number of animals	with tissues e	· · · · · · · · · · · · · · · · · · ·								

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC			Page: 18 Report Date: 08/09/2016								
			Male				Female				
#Skin: Squamous Cell Papilloma 1/50 (2%) 0/50 (0%)											
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
#Skin: Squamous Cell Papilloma o						0/50 (0%)					
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
#Skin: Squamous Cell Papilloma, F Overall Incidence	Total	5/50 (10%) 5/50 (10%)	Mean 10%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%			
#Skin: Squamous Cell Papilloma, F						0/50 (0%)					
Overall Incidence	Total	5/50 (10%)	Mean 10%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
#Skin: Sebaceous Gland: Adenoma		0/50 (0%)				0/50 (0%)					
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
#Skin: Sebaceous Gland: Carcinoma or Adenoma		0/50 (0%)				0/50 (0%)					
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC			Page: 19 Report Date: 08/09/2016								
			Male			Female					
#Stomach, Forestomach: Squamous Cell Carcinoma         1/50 (2%)         1/50 (2%)           Overall Incidence         Total         1/50 (2%)         Mean 2%         SD 0%         Total         1/50 (2%)         Mean 2%         SD 0%											
		. ,		SD 0%		· · /	Mean 2%	SD 0%			
#Stomach, Forestomach: Squamous Cell Carcinoma o	or Papillom	a Squamous 1/50 (2%)				1/50 (2%)					
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%			
*Testes: Adenoma Overall Incidence	Total	3/49 (6%) 3/49 (6.12%)	Mean 6.12%	SD 0%							
*Thymus: Thymoma Benign		1/46 (2%)				0/47 (0%)					
Overall Incidence	Total	1/46 (2.17%)	Mean 2.17%	SD 0%	Total	0/47 (0%)	Mean 0%	SD 0%			
*Thymus: Thymoma: Benign, Malignar		1/46 (2%)				0/47 (0%)					
Overall Incidence	Total	1/46 (2.17%)	Mean 2.17%	SD 0%	Total	0/47 (0%)	Mean 0%	SD 0%			
*Thyroid Gland: C-Cell: Adenoma		13/50 (26%)				11/49 (22%)					
Overall Incidence	Total	13/50 (26%)	Mean 26%	SD 0%	Total	11/49 (22.45%)	Mean 22.45%	SD 0%			

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC			Page: 20 Report Date: 08/09/2016					
			Male				Female	
*Thyroid Gland: C-Cell: Carcinoma		0/50 (0%)						
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/49 (0%) 0/49 (0%)	Mean 0%	SD 0%
*Thyroid Gland: C-Cell: Carcinoma or Adenoma		13/50 (26%)				11/49 (22%)		
Overall Incidence	Total	13/50 (26%)	Mean 26%	SD 0%	Total	11/49 (22.45%)	Mean 22.45%	SD 0%
#Tooth: Odontoma								
Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
#Uterus: Carcinoma								
Overall Incidence					Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
#Uterus: Polyp Stromal								
Overall Incidence					Total	10/50 (20%) 10/50 (20%)	Mean 20%	SD 0%
#Uterus: Sarcoma Stromal								
Overall Incidence					Total	2/50 (4%) 2/50 (4%)	Mean 4%	SD 0%
	with tissues e	examined microscopically				2/30 (470)		

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: GAVAGE Vehicle: CORN OII		Page: 21 Report Date: 08/09/2016		
			Male				Female	
#Uterus: Sarcoma Stromal or Polyp	Stromal							
Overall Incidence	otromar				Total	12/50 (24%) 12/50 (24%)	Mean 24%	SD 0%
#Uterus: Squamous Cell Carcinoma								
Overall Incidence					Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
#Vagina: Granular Cell Tumor Benig	n							
Overall Incidence					Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
#Vagina: Polyp								
Overall Incidence					Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%
#Vagina: Schwannoma Malignant								
Overall Incidence					Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%
#Zymbal's Gland: Carcinoma		0/50 (0%)				0/50 (0%)		
Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: GAVAGE Vehicle: CORN OI	rol Animal Groups	Page: 22 Report Date: 08/09/2016		
			Male				Female	
#Zymbal's Gland: Carcinoma or Adenoma		0/50 (0%)				0/50 (0%)		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
*: Denominator is number of animals	with tissues e	xamined microscopically			••••••			

#### Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC

#### Toxicology Data Management System Tumor Incidence for Selected Control Animal Groups Route: INHALATION Vehicle: AIR

Study Summary										
Laboratory Name	Study Number	Study Start Date	Length of Study in Days	Number of Animals Total and (#/Cage)	Number Surviving and (Mean Life Span)	Maximum Mean Weekly Body Weight	Chemical			
Male										
Battelle Northwest	051047203	01/17/11	729	50(5)	25(661)	609.4	p-Chloro-a,a,a-trifluorotoluene			
Female										
Battelle Northwest	051047203	01/17/11	731	50(5)	22(626)	377.3	p-Chloro-a,a,a-trifluorotoluene			

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC			Page: 24 Report Date: 08/09/2016						
			Male			Female			
#All Organs: Benign Tumors		30/50 (60%)				39/50 (78%)			
Overall Incidence	Total	30/50 (60%)	Mean 60%	SD 0%	Total	39/50 (78%)	Mean 78%	SD 0%	
#All Organs: Malignant Tumors		12/50 (24%)				11/50 (22%)			
Overall Incidence	Total	12/50 (24%)	Mean 24%	SD 0%	Total	11/50 (22%)	Mean 22%	SD 0%	
#All Organs: Malignant and Benign Tumo Overall Incidence	ors Total	37/50 (74%) 37/50 (74%)	Mean 74%	SD 0%	Total	41/50 (82%) 41/50 (82%)	Mean 82%	SD 0%	
#All Organs: Hemangioma		1/50 (2%)				0/50 (0%)			
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
#All Organs: Hemangiosarcoma		0/50 (0%)				0/50 (0%)			
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
#All Organs: Hemangiosarcoma or Hema	angioma	1/50 (2%)				0/50 (0%)			
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
*: Denominator is number of animals									

		Page: 25 Report Date: 08/09/2016						
	<u>.</u>	Male			Female			
0/50 (0%) 0/50 (						(0%)		
Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
	nonuclear, or Undifferen 3/50 (6%)		SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	
	. ,				. ,			
Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
	1/50 (2%)				0/50 (0%)			
Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
	3/50 (6%)				0/50 (0%)			
Total	3/50 (6%)	Mean 6%	SD 0%	Total	( )	Mean 0%	SD 0%	
	Total onocytic, Mo Total gnant, NOS Total Total	Total         0/50 (0%)           1/50 (2%)         1/50 (2%)           Total         1/50 (2%)           mocytic, Mononuclear, or Undifferen 3/50 (6%)           Total         3/50 (6%)           gnant, NOS         1/50 (2%)           Total         1/50 (2%)           Total         1/50 (2%)           Total         1/50 (2%)           3/50 (6%)         3/50 (6%)	Tumor Incide           Male           Male $0/50$ (0%)         Mean 0%           Total $0/50$ (2%)           Total $1/50$ (2%)           Mean 2%           mocytic, Mononuclear, or Undifferentiated $3/50$ (6%)           Total $3/50$ (6%)           Total $1/50$ (2%)           Mean 6%           gnant, NOS $1/50$ (2%)           Total $1/50$ (2%)           Total $1/50$ (2%)           Total $1/50$ (2%)           Mean 2% $3/50$ (6%)	Tumor Incidence for Selected Contr         Route: INHALATIO         Male         Male         0/50 (0%)       Mean 0%       SD 0%         Total       0/50 (0%)       Mean 0%       SD 0%         1/50 (2%)       Mean 2%       SD 0%         mocytic, Mononuclear, or Undifferentiated       3/50 (6%)       Mean 6%       SD 0%         mocytic, Mononuclear, or Undifferentiated       3/50 (6%)       Mean 6%       SD 0%         gnant, NOS       1/50 (2%)       Mean 2%       SD 0%         Total       1/50 (2%)       Mean 2%       SD 0%         1/50 (2%)       Mean 2%       SD 0%         1/50 (2%)       Mean 2%       SD 0%         3/50 (6%)       Mean 2%       SD 0%	Male $0/50$ (0%)         Mean 0%         SD 0%         Total $1/50$ (2%)         Mean 2%         SD 0%         Total $1/50$ (2%)         Mean 2%         SD 0%         Total           mocytic, Mononuclear, or Undifferentiated $3/50$ (6%)         Total         Total $3/50$ (6%)         Mean 6%         SD 0%         Total           gnant, NOS $1/50$ (2%)         Mean 2%         SD 0%         Total $3/50$ (6%)         Mean 2%         SD 0%         Total $3/50$ (6%)         Mean 2%         SD 0%         Total	Tumor Incidence for Selected Control Animal Groups Route: INHALATION Vehicle: AIR           Male $Male$ 0/50 (0%)         Mean 0%         SD 0%         Total         0/50 (0%)           Total         0/50 (0%)         Mean 0%         SD 0%         Total         0/50 (0%)           Total         1/50 (2%)         Mean 2%         SD 0%         Total         0/50 (0%)           mocytic, Mononuclear, or Undifferentiated         0/50 (6%)         0/50 (0%)         0/50 (0%)           mocytic, Mononuclear, or Undifferentiated         0/50 (0%)         0/50 (0%)         0/50 (0%)           gnant, NOS         1/50 (2%)         Mean 2%         SD 0%         Total         0/50 (0%)           Total         1/50 (2%)         Mean 2%         SD 0%         Total         0/50 (0%)           Total         1/50 (2%)         Mean 2%         SD 0%         Total         0/50 (0%)           Total         1/50 (2%)         Mean 2%         SD 0%         Total         0/50 (0%)           3/50 (6%)         Mean 2%         SD 0%         Total         0/50 (0%)         0/50 (0%)	Tumor Incidence for Selected Control Animal Groups Route: INHALATION Vehicle: AIR         Report Dat Note: INHALATION Vehicle: AIR           Male         Female           0/50 (0%)         Mean 0%         SD 0%         Total         0/50 (0%)         Mean 0%           Total         0/50 (0%)         Mean 0%         SD 0%         Total         0/50 (0%)         Mean 0%           Total         1/50 (2%)         Mean 2%         SD 0%         Total         0/50 (0%)         Mean 0%           mocytic, Mononuclear, or Undifferentiated 3/50 (6%)         Mean 8%         SD 0%         Total         0/50 (0%)         Mean 0%           gnant, NOS         1/50 (2%)         Mean 2%         SD 0%         Total         0/50 (0%)         Mean 0%           Total         1/50 (2%)         Mean 2%         SD 0%         Total         0/50 (0%)         Mean 0%           Total         1/50 (2%)         Mean 2%         SD 0%         Total         0/50 (0%)         Mean 0%           Total         1/50 (2%)         Mean 2%         SD 0%         Total         0/50 (0%)         Mean 0%           3/50 (6%)         Mean 2%         SD 0%         Total         0/50 (0%)         Mean 0%           3/50 (6%)         Mean 2%	

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				nce for Selected Contr Route: INHALATIO Vehicle: AIR	ol Animal Groups		Page: 26 Report Dat	6 <b>Date:</b> 08/09/2016	
			Male		TION R <b>Female</b> 0/49 (0%) Total 0/49 (0%) Mean 0% 0/49 (0%) Mean 0% 0/49 (0%) Mean 0%				
*Adrenal Medulla: Pheochromocytoma Benign		12/50 (24%)				0/49 (0%)			
Overall Incidence	Total	12/50 (24%)	Mean 24%	SD 0%	Total	0/49 (0%)	Mean 0%	SD 0%	
*Adrenal Medulla: Pheochromocytoma Comple	ex	0/50 (0%)				0/49 (0%)			
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%		0/49 (0%)	Mean 0%	SD 0%	
*Adrenal Medulla: Pheochromocytoma Maligna	ant	2/50 (4%)				0/49 (0%)		<b>25</b> av	
Overall Incidence	Total	2/50 (4%)	Mean 4%	SD 0%		, ,	Mean 0%	SD 0%	
*Adrenal Medulla: Pheochromocytoma: Benig	n, Complex,	, <b>Malignant, NOS</b> 14/50 (28%)				0/49 (0%)			
Overall Incidence	Total	14/50 (28%)	Mean 28%	SD 0%		( )	Mean 0%	SD 0%	
*Brain: Glioma Malignant		2/50 (4%)							
Overall Incidence	Total	2/50 (4%)	Mean 4%	SD 0%	Total	· · ·	Mean 2%	SD 0%	
*Brain: Granular Cell Tumor Benign		0/50 (0%)				0/50 (0%)			
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: INHALATIO Vehicle: AIR	ol Animal Groups		Page: 27 Report Dat	<b>e:</b> 08/09/2016			
			Male				Report Date: 08/09/2016           Female         Pemale         Pemale<				
*Brain: Oligodendroglioma, Glioma, or Astrocytoma											
Overall Incidence	Total	2/50 (4%) 2/50 (4%)	Mean 4%	SD 0%	Total	1/50 (2%) 1/50 (2%)					
'Brain: Schwannoma Malignant		0/50 (00/)									
Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%			
Epididymis: Sarcoma		1/50 (2%)									
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%							
∉Eye: Leiomyoma		1/50 (2%)				0/50 (0%)					
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
Heart: Schwannoma Malignant		0/50 (0%)				0/50 (0%)					
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
#Intestine Large: Colon/Rectur Leiomyoma		1/50 (2%)				0/50 (0%)					
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC			<b>Toxico</b> Tumor Incide		Page: 28 Report Date: 08/09/2016				
			Male				Female		
#Intestine Small: Jejunum: Leiomyosarcoma		1/50 (2%)				0/50 (0%)			
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
#Intestine Small: Site Unspeci Leiomyosarcoma		1/50 (2%)				0/50 (0%)			
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
*Islets, Pancreatic: Adenoma		8/50 (16%)				1/50 (2%)			
Overall Incidence	Total	8/50 (16%)	Mean 16%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%	
*Islets, Pancreatic: Carcinoma		0/50 (0%)				1/50 (2%)			
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%	
*Islets, Pancreatic: Carcinoma or Adenoma		8/50 (16%)				2/50 (4%)			
Overall Incidence	Total	8/50 (16%)	Mean 16%	SD 0%	Total	2/50 (4%)	Mean 4%	SD 0%	
*Kidney: Renal Tubule: Adenoma		0/50 (0%)				1/50 (2%)			
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%	

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: INHALATIO Vehicle: AIR	ol Animal Groups		t <b>e:</b> 08/09/2016	
			Male				Female	
*Kidney: Renal Tubule: Carcinoma or Adenoma		0/50 (0%)				1/50 (2%)		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%
*Liver: Hepatocellular Adenoma		0/50 (0%)				2/50 (4%)		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	2/50 (4%)	Mean 4%	SD 0%
*Liver: Hepatocellular Carcinoma o Overall Incidence			Mean 0%	SD 0%	Total	2/50 (4%) 2/50 (4%)	Mean 4%	SD 0%
*Liver: Hepatocellular Carcinoma, H Overall Incidence				SD 0%	Total		Mean 4%	SD 0%
*Lung:		·····				·····		
Alveolar/Bronchiolar Adeno	ma	0/50 (0%)				0/50 (0%)		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
*Lung: Alveolar/Bronchiolar Carcin		eolar/Bronchiolar Adenor 0/50 (0%)				0/50 (0%)		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%
*: Denominator is number of animals #: Denominator is number of animals	with tissues e	examined microscopically						

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: INHALATIO Vehicle: AIR	ol Animal Groups		Page: 30 Report Dat	<b>e:</b> 08/09/2016
			Male			Pres         Female           0/50 (0%) 0/50 (0%)         Mean 0%         SD (0)           0/50 (0%) 0/50 (0%)         Mean 0%         SD (0)           0/50 (0%) 0/50 (0%)         Mean 0%         SD (0)           4/50 (8%) 4/50 (8%)         Mean 8%         SD (0)           5/50 (10%)         Mean 10%         SD (0)           9/50 (18%)         Mean 10%         SD (0)		
*Lung: Sarcoma		0/50 (0%)				0/50 (0%)		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	. ,	Mean 0%	SD 0%
#Lymph Node, Mesenteric: Hemangiosarcoma		0/50 (0%)						
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total		Mean 0%	SD 0%
#Mammary Gland: Adenoma		0/50 (0%)				4/50 (99/ )		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	4/50 (8%)	Mean 8%	SD 0%
#Mammary Gland: Carcinoma		0/50 (0%)						
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	. ,	Mean 10%	SD 0%
#Mammary Gland: Carcinoma or Adenoma		0/50 (0%)				9/50 (18%)		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	. ,	Mean 18%	SD 0%
#Mammary Gland: Fibroadenoma		2/50 (4%)				20/50 (40%)		
Overall Incidence	Total	2/50 (4%)	Mean 4%	SD 0%	Total	20/50 (40%)	Mean 40%	SD 0%

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: INHALATIO Vehicle: AIR	ol Animal Groups		Page: 31         Report Date: 08/09/2016         Female         Mean 46%       SD 0%         Mean 54%       SD 0%				
			Male				Female				
#Mammary Gland: Fibroma, Fibroadenoma d	or Adenoma	2/50 (4%)				23/50 (46%)					
Overall Incidence	Total	2/50 (4%)	Mean 4%	SD 0%	Total	23/50 (46%)	Mean 46%	SD 0%			
#Mammary Gland: Fibroma, Fibroadenoma,						27/50 (54%)					
Overall Incidence	Total	2/50 (4%)	Mean 4%	SD 0%	Total	27/50 (54%)	Mean 54%	SD 0%			
#Mammary Gland: Myoepithelioma Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%			
#Oral Cavity (Oral Mucosa, Squamous Cell Carcinom	Tongue, Phary										
Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%			
#Oral Cavity (Oral Mucosa, Squamous Cell Carcinom	Tongue, Phary	/nx, Tooth, Gingiva):				0/50 (0%)					
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
#Oral Mucosa: Squamous Cell Carcinom											
Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%			

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley				ology Data Manageme ence for Selected Cont Route: INHALATIC Vehicle: AIR	rol Animal Groups		Page: 32 Report Date: 08/09/2016			
Length of Study: CHRONIC										
			Male				Female			
*Ovary: Granulosa Cell Tumor Benigr	1									
-						3/50 (6%)				
Overall Incidence					Total	3/50 (6%)	Mean 6%	SD 0%		
*Ovary: Granulosa Cell Tumor: Benig	n, Malignar	nt, NOS								
_						3/50 (6%)				
Overall Incidence					Total	3/50 (6%)	Mean 6%	SD 0%		
*Ovary: Granulosa-Theca Tumor Ben	ign									
Overall Incidence					Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%		
*Ovary: Thecoma Benign										
-						1/50 (2%)				
Overall Incidence					Total	1/50 (2%)	Mean 2%	SD 0%		
*Ovary: Tubulostromal Carcinoma										
Overall Incidence					Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%		
*Pancreas: Adenoma		0/50 (0%)				0/50 (0%)				
Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%		

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: INHALATIO Vehicle: AIR	ol Animal Groups		Page: 33 Report Dat	e: 08/09/2016
			Male				Female	
*Pancreas: Carcinoma or Adenoma Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%
*Pituitary Gland: Pars Distalis Adenoma		fied Site:						
Overall Incidence	Total	11/50 (22%) 11/50 (22%)	Mean 22%	SD 0%	Total	18/50 (36%) 18/50 (36%)	Mean 36%	SD 0%
*Pituitary Gland: Pars Distalis Carcinoma or Adenoma Overall Incidence			Mean 22%	SD 0%	Total	18/50 (36%) 18/50 (36%)	Mean 36%	SD 0%
*Salivary Glands: Schwannoma Malignant Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total		Mean 0%	SD 0%
		0/50 (0%)				( )		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%
#Skeletal Muscle: Sarcoma		0/50 (0%)				0/50 (0%)		
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%

Version: Aug2016 Contract/Lab: All Laboratorie: Species: RATS Strain: Harlan Sprague-Dawle Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: INHALATIO Vehicle: AIR	ol Animal Groups		Page: 34         Report Date: 08/09/2016         Female         Mean 2%       SD 0%         Mean 2%       SD 0%			
			Male				Female			
#Skin: Basal Cell Carcinoma										
Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%		
#Skin:										
Basal Cell Carcinoma or B	Basosquamou	s Tumor (malignant or N 0/50 (0%)	OS)			1/50 (2%)				
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%)				
#Skin: Basal Cell Carcinoma, Bas NOS), or Trichoepitheliom	sal Cell Adenc a	oma, Basosquamous Tur 0/50 (0%)	mor (benign, maligna	ant or		1/50 (2%)				
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%		
#Skin: Basal or Sq. Cell Carcinon Adenoma, Papilloma, Sq F Overall Incidence	na, Carcinoma Papilloma, Ker Total	a, Basosq. Tumor (M or E ratoacanthoma, Trichoep 4/50 (8%) 4/50 (8%)	B), Basal Cell Adeno bithelioma Mean 8%	<b>ma,</b> SD 0%	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%		
#Skin: Fibroma		0/50 (0%)				0/50 (0%)				
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%		
#Skin: Fibroma, Fibrosarcoma, S	arcoma, Myxc			1		0/50 (0%)				
		( )				()				

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: INHALATIO Vehicle: AIR	ol Animal Groups		Page: 35 Report Date: 08/09/2016				
			Male				Female				
#Skin: Fibrosarcoma	Tatal	0/50 (0%)	Maar 00/		Tatal	0/50 (0%)	Maga 00/				
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
#Skin: Fibrosarcoma, Sarcoma, My	xosarcoma	, or Fibrous Histiocyton 1/50 (2%)	na			0/50 (0%)					
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
#Skin: Fibrous Histiocytoma Overall Incidence	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%			
						( )					
#Skin: Hemangioma		1/50 (2%)				0/50 (0%)					
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
#Skin: Hemangiosarcoma		0/50 (0%)				0/50 (0%)					
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
#Skin: Keratoacanthoma		3/50 (6%)				0/50 (0%)					
Overall Incidence	Total	3/50 (6%)	Mean 6%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				ology Data Manageme ence for Selected Contr Route: INHALATIO Vehicle: AIR		Page: 36 Report Date: 08/09/2016				
			Male				Female			
#Skin: Lipoma										
Overall Incidence	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%		
∕Skin: Neurofibrosarcoma or Scł										
Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%		
#Skin: Neurofibrosarcoma, Neuro Overall Incidence	ofibroma, or S Total	<b>Schwannoma (benign, m</b> a 0/50 (0%) 0/50 (0%)	alignant or NOS) Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%		
Skin: Schwannoma Malignant		0/50 (0%)				0/50 (0%)				
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%		
#Skin: Squamous Cell Carcinoma	1	0/50 (0%)				0/50 (0%)				
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%		
/Skin: Squamous Cell Carcinoma or Carcinoma				nt or NOS),		1/50 (2%)				
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	1/50 (2%)	Mean 2%	SD 0%		

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC			Toxicology Data Management System Tumor Incidence for Selected Control Animal Groups Route: INHALATION Vehicle: AIR				Page: 37 Report Date: 08/09/2016				
			Male				Report Date: 08/09/2016         Female         %)       Mean 0%       SD 0%         %)       Mean 0%       SD 0%				
#Skin: Squamous Cell Papilloma		1/50 (2%)				0/50 (0%)					
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)					
#Skin: Squamous Cell Papilloma or		1/50 (2%)				0/50 (0%)					
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
#Skin: Squamous Cell Papilloma, P Overall Incidence	Total	4/50 (8%) 4/50 (8%)	Mean 8%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%			
#Skin: Squamous Cell Papilloma, P						0/50 (0%)					
Overall Incidence	Total	4/50 (8%)	Mean 8%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
#Skin: Sebaceous Gland: Adenoma		1/50 (2%)				0/50 (0%)					
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			
#Skin: Sebaceous Gland: Carcinoma or Adenoma		1/50 (2%)				0/50 (0%)					
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%			

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC		Toxicology Data Management System Tumor Incidence for Selected Control Animal Groups Route: INHALATION Vehicle: AIR						Page: 38 Report Date: 08/09/2016		
			Male		Female					
#Stomach, Forestomach: Squamous Cell Carcinoma Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%		
Squamous Cell Carcinoma	or Papilloma	0/50 (0%)				0/50 (0%)				
Overall Incidence	Total	0/50 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%		
*Testes: Adenoma Overall Incidence	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%						
*Thymus: Thymoma Benign		0/48 (0%)				0/50 (0%)				
Overall Incidence	Total	0/48 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%		
*Thymus: Thymoma: Benign, Maligna	nt, NOS	0/48 (0%)				0/50 (0%)				
Overall Incidence	Total	0/48 (0%)	Mean 0%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%		
*Thyroid Gland: C-Cell: Adenoma		2/50 (4%)				2/50 (4%)				
Overall Incidence	Total	2/50 (4%)	Mean 4%	SD 0%	Total	2/50 (4%)	Mean 4%	SD 0%		

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC	Toxicology Data Management System Tumor Incidence for Selected Control Animal Groups Route: INHALATION Vehicle: AIR							Page: 39 Report Date: 08/09/2016	
*Thyroid Gland: C-Cell: Carcinoma Overall Incidence			Male	Female					
	Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	
		( )		30 0%	TOLAI	0/50 (0%)		30 0%	
*Thyroid Gland: C-Cell: Carcinoma or Adenoma		3/50 (6%)				2/50 (4%)			
Overall Incidence	Total	3/50 (6%)	Mean 6%	SD 0%	Total	2/50 (4%)	Mean 4%	SD 0%	
#Tooth: Odontoma		1/50 (2%)				0/50 (0%)			
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%	
#Uterus: Carcinoma						1/50 (2%)			
Overall Incidence					Total	1/50 (2%)	Mean 2%	SD 0%	
#Uterus: Polyp Stromal									
Overall Incidence					Total	7/50 (14%) 7/50 (14%)	Mean 14%	SD 0%	
#Uterus: Sarcoma Stromal									
Overall Incidence					Total	0/50 (0%) 0/50 (0%)	Mean 0%	SD 0%	

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC			<b>Toxic</b> Tumor Incide		Page: 40 Report Date: 08/09/2016			
			Male		Female			
#Uterus:								
Sarcoma Stromal or Polyp St	tromal					7/50 (14%)		
Overall Incidence					Total	7/50 (14%)	Mean 14%	SD 0%
#Uterus:								
Squamous Cell Carcinoma								
Overell Incidence					Tatal	1/50 (2%)	Maga 20/	
Overall Incidence					Total	1/50 (2%)	Mean 2%	SD 0%
#Vagina: Granular Cell Tumor Benign								
Overall Incidence					Total	1/50 (2%) 1/50 (2%)	Mean 2%	SD 0%
#Vagina:								
Polyp								
						0/50 (0%)		
Overall Incidence					Total	0/50 (0%)	Mean 0%	SD 0%
#Vagina:								
Schwannoma Malignant								
_						1/50 (2%)		
Overall Incidence					Total	1/50 (2%)	Mean 2%	SD 0%
#Zymbal's Gland:								
Carcinoma								
		1/50 (2%)				0/50 (0%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%

Version: Aug2016 Contract/Lab: All Laboratories Species: RATS Strain: Harlan Sprague-Dawley Length of Study: CHRONIC				nce for Selected Contr Route: INHALATIO Vehicle: AIR	Page: 41 Report Date: 08/09/2016			
			Male				Female	
#Zymbal's Gland: Carcinoma or Adenoma		1/50 (2%)				0/50 (0%)		
Overall Incidence	Total	1/50 (2%)	Mean 2%	SD 0%	Total	0/50 (0%)	Mean 0%	SD 0%