NATIONAL TOXICOLOGY PROGRAM Technical Report Series No. 277

TOXICOLOGY AND CARCINOGENESIS STUDIES OF TREMOLITE (CAS NO. 14567-73-8) IN F344/N RATS (FEED STUDIES) U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES Public Health Service National Institutes of Health

FOREWORD

The National Toxicology Program (NTP), established in 1978, develops and evaluates scientific information about potentially toxic and hazardous chemicals. This knowledge can be used for protecting the health of the American people and for the primary prevention of disease. By bringing together the relevant programs, staff, and resources from the U.S. Public Health Service, DHHS, the National Toxicology Program has centralized and strengthened activities relating to toxicology research, testing and test development/validation efforts, and the dissemination of toxicological information to the public and scientific communities and to the research and regulatory agencies.

The NTP is made up of four charter DHHS agencies: the National Cancer Institute (NCI), National Institutes of Health; the National Institute of Environmental Health Sciences (NIEHS), National Institutes of Health; the National Center for Toxicological Research (NCTR), Food and Drug Administration; and the National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control. In July 1981, the Carcinogenesis Bioassay Testing Program, NCI, was transferred to the NIEHS.

This study was conducted under contract to the National Institute of Environmental Health Sciences, National Toxicology Program. The studies described in this Technical Report have been conducted in compliance with NTP chemical health and safety requirements and must meet or exceed all applicable Federal, state, and local health and safety regulations. Animal care and use were in accordance with the U.S. Public Health Service Policy on Humane Care and Use of Animals. All NTP toxicology and carcinogenesis studies are subjected to a data audit before being presented for peer review.

These NTP Technical Reports are available for sale from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161 (703-487-4650). Single copies of this Technical Report are available without charge (and while supplies last) from the NTP Public Information Office, National Toxicology Program, P.O. Box 12233, Research Triangle Park, NC 27709.

Special Note: This Technical Report was peer reviewed in public session and approved by the NTP Board of Scientific Counselers' Technical Reports Review Subcommittee on September 22, 1982 [see page 7]. Thereafter, the NTP adopted the policy that the experimental data and laboratory records from all NTP toxicology and carcinogenesis studies not yet printed and distributed would be audited. The audit report was reviewed by NTP staff, who determined that none of the discrepancies influenced the final interpretation of the results of these studies. The audit report is on file at the NIEHS/NTP Quality Assurance Office and is available for review.

Because printing and distribution of this Technical Report have been delayed, the format differs from that of Technical Reports peer reviewed more recently. The categories of evidence of carcinogenicity adopted by the NTP in June 1983 were not used to evaluate these data. This final Technical Report supersedes all previous drafts of this report that have been distributed.

NTP TECHNICAL REPORT

ON THE

TOXICOLOGY AND CARCINOGENESIS STUDIES OF TREMOLITE

(CAS NO. 14567-73-8)

IN F344/N RATS

(FEED STUDIES)

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NATIONAL TOXICOLOGY PROGRAM P.O. Box 12233 Research Triangle Park, NC 27709

March 1990

NTP TR 277

NIH Publication No. 90-2531

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES Public Health Service National Institutes of Health

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TREMOLITE

CAS No. 14567-73-8

$Ca_2Mg_5Si_8O_{22}(OH)_2 \bullet Ca_2Mg_4FeSi_8O_{22}(OH)_2$

ABSTRACT

A carcinogenesis bioassay of blocky (nonfibrous) tremolite was conducted with male and female F344/N rats. Tremolite was administered at a concentration of 1% in pelleted diet for the entire life-time of the rats, starting with the dams of the study animals. The studies were started in 1978 and ended in 1981. Group sizes were 118 male and female controls and 250 male and female tremolite-exposed rats.

Litter size was not affected by the administration of tremolite to the dams. The offspring from mothers exposed to tremolite were the same size at birth as the controls but were slightly smaller at weaning and remained so throughout their life. Survival was similar in the exposed and control groups. No toxicity or increase in incidence of neoplasia was observed in the tremolite-exposed animals compared with the concurrent controls.

Conclusions: Under the conditions of these feed studies, nonfibrous tremolite was not overtly toxic or carcinogenic for male or female F344/N rats, following lifetime ingestion of a diet containing 1% tremolite.

A summary of the Peer Review comments and the public discussion on this Toxicity Report appears on page 6.

CONTRIBUTORS

The NTP Technical Report on the Toxicology and Carcinogenesis Studies of Tremolite is based on the lifetime studies that began in February 1978 and ended in January/February 1981 at Hazleton Laboratories America, Inc. (Vienna, VA).

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PEER REVIEW PANEL

The members of the Peer Review Panel who evaluated the draft Technical Report on tremolite on September 22, 1982, are listed below. Panel members serve as independent scientists, not as representatives of any institution, company, or governmental agency. In this capacity, Panel members have five major responsibilities: (a) to ascertain that all relevant literature data have been adequately cited and interpreted, (b) to determine if the design and conditions of the NTP studies were appropriate, (c) to ensure that the Technical Report presents the experimental results and conclusions fully and clearly, (d) to judge the significance of the experimental results by scientific criteria, and (e) to assess the evaluation of the evidence of carcinogenicity and other observed toxic responses.

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SUMMARY OF PEER REVIEW COMMENTS ON THE TOXICOLOGY AND CARCINOGENESIS STUDIES OF TREMOLITE

On September 22, 1982, the draft Technical Report on the toxicology and carcinogenesis studies of tremolite received peer review by the National Toxicology Program Board of Scientific Counselors' Technical Reports Review Subcommittee and associated Panel of Experts. The review meeting was held in the Conference Center, Building 101, South Campus, National Institute of Environmental Health Sciences, Research Triangle Park, NC.

Dr. E.E. McConnell, NIEHS, introduced the studies by reviewing the experimental design, results, and proposed conclusions (not overtly toxic or carcinogenic for male or female rats, following lifetime ingestion of a diet containing 1% tremolite).

Dr. Vesselinovitch, a principal reviewer, agreed with the conclusions for male and female rats. As a second principal reviewer, Dr. Harper said that the Abstract should include the observation that the offspring of mothers exposed to tremolite were of normal size at birth but were smaller than control animals at weaning and remained smaller throughout their life.

As a third principal reviewer, Dr. Scala stressed the need to discuss whether a maximum tolerated dose had been achieved and noted that possible toxic effects may be seen in early weight gain differences between control and exposed neonatal animals which may never equalize. Dr. Scala asked why the study was conducted in the first place, especially if the major carcinogenic potential of this class of minerals resides in their fibrous nature; he questioned what could be gained from testing a non-fibrous material.

Dr. McConnell responded that this study was the first attempt to determine whether tremolite given orally had any potential for causing toxicity. Dr. Moore, NTP, noted that this form of crystalline tremolite was used widely and was found in food and pharmaceutical products. He added that the tremolite used has a fibrous contaminant that could be produced from the crushing process or could occur naturally. The fiber count for this contaminant will be indicated in the Report. Dr. R. Shapiro, NIEHS, said that the tremolite used was chosen to duplicate the commercial material to which humans had been exposed in the past.

Dr. Harper moved that the Report on the lifetime carcinogenesis studies of tremolite be accepted with the modifications discussed. Dr. Elashoff seconded the motion, and the Technical Report was approved unanimously by the Peer Review Panel.

I. INTRODUCTION

Definition Exposure Mutagenicity Background and Testing Rationale

TREMOLITE

CAS No. 14567-73-8

$Ca_2Mg_5Si_8O_{22}(OH)_2 \bullet Ca_2Mg_4FeSi_8O_{22}(OH)_2$

Definition

The term "asbestos" has a commercial/industrial derivation limited to naturally occurring fibrous minerals of the serpentine or amphibole series. Chrysotile is the only type of asbestos in the serpentine series, whereas the amphibole series is represented by crocidolite, amosite, actinolite, tremolite, and anthophyllite. The essential characteristic of asbestos minerals is their fibrous nature. Tremolite may also occur in a crystalline (nonfibrous) form in nature, but this nonfibrous form may assume fibrous characteristics during processing.

Excellent reviews of public health effects associated with past heavy asbestos exposure, primarily occupational exposure via the inhalation route, are those by Craighead and Mossman (1982), Peto and Schneiderman (1981), Selikoff (1980), the U.S. Environmental Protection Agency (EPA) (USEPA, 1980), Selikoff and Hammond (1979), and the International Agency for Research on Cancer (IARC, 1977). These studies clearly established an association between occupational inhalation exposure to chrysotile, amosite, crocidolite, and anthophyllite asbestos and an increased risk of lung cancer as well as mesothelioma. The latter form of cancer is perhaps unique in its association with these minerals.

Exposure

Large portions of the population ingest asbestos through consumption of food and water. Analyses of water samples from 365 cities found 45% to have detectable levels of various types of asbestos (Millette, 1979). Forty-one cities had asbestos concentrations in water which exceeded 10 million fibers per liter. Asbestos or other minerals of similar morphology may gain access to water supplies as a result of mining (Lake Superior), the presence of natural serpentine or amphibole deposits in watersheds (Seattle, WA, and San Francisco, CA), or under certain conditions, through the use of asbestos-cement pipe for municipal water supplies (USEPA, 1980). For the latter, erosion of the pipe with release of fibers is associated with the "aggressiveness" of the water, a term representing a mathematical expression of pH, alkalinity, and calcium content. The EPA estimated that 68.5% of U.S. water systems utilize water that has the potential to erode asbestos-cement pipe.

A number of studies have provided evidence that ingestion of asbestos in either food or water can result in the migration of asbestos fibers through the gastrointestinal mucosa and to distant organ sites in humans (Carter and Taylor, 1980), rats (Cunningham et al., 1977; Sebastien et al., 1980), and baboons (Storeygard and Brown, 1977; Patel-Mandlik, 1980). Electron microscopic studies confirmed the presence of amphibole mineral fibers in the urine of individuals who ingested water containing these fibers (Cook and Olson, 1979).

Harrington et al. (1978) failed to detect an association between the use of asbestos-cement pipe for municipal water supplies in Connecticut and the incidence of gastrointestinal cancer. In a study of cancer incidence in the San Francisco Bay area, Kanarek et al. (1980) reported a statistically significant trend for the increased incidence of several cancer types, including stomach, gallbladder, esophageal, and peritoneal cancer, when census tracts were analyzed on a gradient of low to high asbestos content in municipal water. Cooper et al. (1979) confirmed the association between asbestos concentrations in the San Francisco Bay area drinking water and cancer of the digestive tract.

Studies in animals have shown that inhalation of asbestos produces lung carcinomas and mesotheliomas in the pleural cavity (Wagner et al., 1974). A review of these studies is provided by Levine (1981). Intrapleural, intratracheal, or intraperitoneal injection of asbestos also induces neoplasia in several species of laboratory animals (Stanton et al., 1981).

Mutagenicity

Asbestos (chrysotile, amosite, and crocidolite) has been shown to be cytogenic in vitro to human embryonic intestine, mouse epithelial-like colon-derived cells, and rat liver epithelial cells (Reiss et al., 1979). However, chrysotile asbestos was far more cytotoxic than were the amphibole fibers, and the effects were more pronounced in the intestine-derived cells than in those from the liver. Asbestos was also cytotoxic to Syrian hamster peritoneal macrophages (Bey and Harrington, 1971). Using the HGPRT locus/resistance to 6-thioguanine assay system, Reiss et al. (1979) showed that these three forms of asbestos were not mutagenic. In addition, no mutagenic activity was demonstrated when chrysotile, amosite, or crocidolite asbestos was used in Escherichia coli or Salmonella typhimurium systems (Chamberlain and Tarmy, 1977).

Background and Testing Rationale

In November 1973, the National Institute of Environmental Health Sciences and the EPA cosponsored a symposium on the possible biologic effects of ingested asbestos (EHP, 1974). The participants at this conference concluded that a paucity of definitive data existed concerning the effects of ingested asbestos and that specific research was needed.

A subcommittee of the U.S. Department of Health, Education, and Welfare (now the U.S. Department of Health and Human Services) Committee to Coordinate Toxicology and Related Programs was established to review existing data and to prepare a draft research protocol that would be responsive to the potential public health implications of ingested asbestos. This protocol was distributed widely for comment within and outside the government, and a public meeting of the Subcommittee was held on February 11, 1975. On the basis of comments received, a revised protocol was developed which called for the use of long-term animal toxicology studies to evaluate the ingestion of several minerals for carcinogenic effects. As a result, the National Toxicology Program has investigated the carcinogenic potential of ingested chrysotile asbestos in hamsters (NTP, 1990a) and rats (NTP, 1985a), amosite asbestos in hamsters (NTP, 1985b) and rats (NTP, 1990b), crocidolite asbestos in rats (NTP, 1988), and tremolite in rats (this Report). All of the studies were to encompass the lifetime of the animal, including exposure of the dams from which the study animals were derived.

Crystalline tremolite was chosen for these studies because this form of asbestos was a common contaminant of the talc used in foods and pharmaceuticals 20 years ago. The grinding of tremolite in preparation for its intended use may result in the production of fibers that have the morphology of asbestos minerals. Stanton et al. (1981) speculated that the asbestos mineral hazard may be related directly to fiber size in contrast to chemical composition. Therefore, the study of crystalline tremolite was deemed appropriate because of past widespread exposure and because small amounts assume fiber characteristics when ground during the processing of talc.

This Technical Report represents the results of those studies undertaken to determine the effects of crystalline tremolite in the diet fed to

Tremolite, NTP TR 277

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II. MATERIALS AND METHODS

Study Material Study Diets Source and Specifications of Study Animals Animal Maintenance Safety Precautions Clinical Examinations and Pathology Statistical Methods

Study Material

The tremolite sample used in these studies was obtained from a single lense from the Governeur Talc Company (Governeur, NY). This 1,200-lb lense was taken from the 500-ft level, American vein, No. 4 footwall stope, lower portion of the footwall bedding. The lense was crushed in a Denver Jaw Crusher and then to -14 mesh in a roll crusher. This material was then wheeler milled at 204° C and bagged in 50-lb Kraft bags. The final particle size was nominally -325 mesh.

To develop homogeneity of the sample, approximately 960 lb of tremolite was blended in a 10ft³ V-type blender. After final blending, the samples were weighed to 25 ± 0.5 lb and placed in 38 sealed fiberboard drums. These drums were shipped to a special warehouse at Research Triangle Park, NC. Each drum received a color marking unique to the mineral type. Homogeneity of the samples was verified by fluorescent X-ray spectroscopy from samples collected from six randomly selected drums. No significant differences were detected.

The homogeneity of the samples and the physical and chemical properties of the materials were extensively characterized by the Bureau of Mines (1980) and by the Fine Particles Laboratories, Illinois Institute of Technology Research Institute (IITRI, Special Report). [Copies of these reports are available on request from the National Toxicology Program (Public Information Office, National Toxicology Program, P.O. Box 12233, Research Triangle Park, NC 27709).]

Selected chemical and physical properties of tremolite are presented in Tables 1 and 2 (Bureau of Mines, 1980). In an analysis of mineralogic composition, tremolite $(Ca_2Mg_5Si_8O_{22}$ $(OH)_2 \cdot Ca_2Mg_4FeSi_8O_{22}(OH)_2)$ was detected at a volume percent abundance of 72 and serpentine at 25; minor amounts of talc, calcite, phlogopite, and anthophyllite were found.

Study Diets

The feed used was NIH 31 Rat and Mouse Ration. Tremolite was incorporated into the study diet at a concentration of 1% by weight. Pilot studies determined that homogeneous mixing of tremolite and feed would occur in a blender loaded by alternate layering of feed and tremolite. Each batch of blended feed was analyzed for tremolite concentration, pesticide contamination, and nutrient content. Results of analyses for tremolite in feed are given in Table 3. Further details are given in Table 4.

Fiber characteristics	i		
Surface area (m²/g) Density (g/cm ³)		5.2 ± 0.5 2.91 ± 0.01	
Chemical instrument	al analysis (expressed as w	veight percent)	
Al ₂ O ₃	1.57	Li ₂ O	0.02
CaO	11.26	SnO	0.01
Fe_2O_3	0.27	SrO	0.03
MgO	26.71	Bi_2O_3	0.01
MgO K_2O SiO_2	0.18	CO_2°	0.78
SiO	54.00	H ₂ Õ –	0.24
Na ₂ O	0.80	$H_{2}O +$	3.73
TiO ₂	0.03	Benzene-extracted organics	0.003
MnŐ	0.05		

TABLE 1. FIBER CHARACTERISTICS AND CHEMICAL INSTRUMENTAL ANALYSIS OF TREMOLITE

	Length Interval (µm)										
	0-0.99	1-1.99	2-2.99	3-3.99	4-4.99	5-5.99	6-6.99	7-7.99	8-8.99	9-9.99	>10
Fremolite mean wi	idth			<u> </u>		<u> </u>		<u> </u>			
(µm)	0.48	0.88	0.97	1.51	2.05	2.19	2.79	3.29	2.96	3.13	5.22
Fremolite particles	5										
per interval	59	291	194	106	53	40	31	19	9	13	58
Percent of total tre	molite										
particles	6.8	33.4	22.3	12.2	6.1	4.6	3.6	2.2	1.0	1.4	6.4
Cumulative percer											
tremolite	6.8	40.2	62.5	74.7	80.8	85.4	89.0	91.2	92.2	93.6	100
Fremolite particles											
per interval	34	197	128	83	38	27	23	15	9	12	49
Volume percent											
tremolite (b)	5.5	32.0	20.8	13.5	6.2	4.4	3.7	2.4	1.5	2.0	8.0
Cumulative volum	e percent										
tremolite	5.5	37.5	58.3	71.8	78.0	82.4	86.1	88.5	9.0	92.0	100
Serpentine talc pai	rticles										
per interval	9	72	53	19	11	9	8	4	0	1	7
Number of other											
particles	16	22	10	4	2	4	0	0	0	0	2
Fremolite particles	s per lengt	h interval	, percent,	by aspect	ratio (b)						
1:1-2.9:1	100	92	75	67	76	67	65	66	67	30	35
3:1-4.9:1	0	8	22	29	18	30	30	20	22	35	37
5:1-9.9:1	0	0	3	4	6	3	5	7	11	35	18
10:1-19.9:1	0	0	0	0	0	0	0	7	0	0	4
20:1-49.9:1	0	0	0	0	0	0	0	0	0	0	4
50:1-99.9:1	0	0	0	0	0	0	0	0	0	0	0
100:1-199:1	0	0	0	0	0	0	0	0	0	0	2

TABLE 2. PARTICLE SIZE DISTRIBUTION OF TREMOLITE, SERPENTINE TALC, AND OTHER MINERALS BY PARTICLE NUMBER (a)

(a) From Bureau of Mines (1980). By electron micropscopy; total particles = 871; total tremolite = 615; total serpentine talc = 193; total others = 63.
(b) Data for aspect ratio were obtained from a second set of measurements.

Date Mixed	Determined Concentration in Feed for Target Concentration of 10,000 ppm (1%) (a)					
11/21/77	8,700 ± 1,000					
12/07/77	$10,800 \pm 1,500$					
02/01/78	$9,100 \pm 3,500$					
03/22/78	$10,400 \pm 6,300$					
05/22/78	8.300 ± 1.500					
07/11/78	$7,700 \pm 1,400$					
09/14/78	$10,000 \pm 1,000$					
10/30/78	$7,500 \pm 2,600$					
12/15/78	$10,300 \pm 800$					
02/15/79	$11,600 \pm 200$					
04/02/79	$11,100 \pm 600$					
05/19/79	$10,700 \pm 200$					
06/26/79	$9,600 \pm 400$					
08/28/79	$8,400 \pm 1,100$					
10/16/79	$10,300 \pm 500$					
12/03/79	$9,700 \pm 1,000$					
01/10/80	$9,200 \pm 700$					
02/27/80	$10,700 \pm 800$					
04/18/80	$9,500 \pm 1,400$					
05/19/80	$9,700 \pm 1,100$					
07/18/80	$10,300 \pm 1,200$					
08/26/80	$10,000 \pm 900$					
10/13/80	$10,300 \pm 1,700$					
	Mean = $9,700 \pm 2,100$					

TABLE 3. RESULTS OF ANALYSIS OF FORMULATED DIETS IN THE LIFETIME FEED STUDIES OF TREMOLITE

(a) Average of five samples

TABLE 4. EXPERIMENTAL DESIGN AND MATERIALS AND METHODS IN THE LIFETIME FEED STUDIES OF TREMOLITE

EXPERIMENTAL DESIGN

Size of Study Groups	F ₀ control: male, 25; female, 50; exposed: male, 70; female, 140; F ₁ control: 118; tremolite: 250 rats of each sex
Doses	0% or 1% (10,000 ppm) tremolite in feed
Date of First Dose	F ₀ obtained 11/1/77, bred starting 1/25/78; F ₁ date of weaning
Duration of Dosing	Lifetime until only 10% of the group remained
Type and Frequency of Observation	Observed 2 $ imes$ d; examined clinically 1 $ imes$ wk; weighed 1 $ imes$ wk
Necropsy and Histologic Examinations	Necropsy performed on all animals. Tissues examined histologically: adrenal glands; bone marrow (sternum); brain; bronchial, celiac, cervical, iliac, iliocolonic, mandibular, mesen- teric, pancreatic, and renal lymph nodes; cecum; colon (carpet rolled); duodenum; esopha- gus; heart; ileum; jejunum; kidneys; larynx; liver; lungs and bronchi; mammary gland; pan- creas; parathyroids; pituitary gland; prostate/testes or ovaries/uterus; salivary glands; small intestine; spleen; stomach; thigh muscle; thyroid gland; tissue masses; trachea; and urinary bladder. Epididymis, eyes, nasal cavity with turbinates, seminal vesicles, and spi- nal cord were examined microscopically if gross lesions were observed

ANIMALS AND ANIMAL MAINTENANCE

Strain and Species	F344/N rats
Animal Source	Charles River Breeding Laboratories (Wilmington, MA)
Study Laboratory	Hazleton Laboratories of America
Age When Placed on Study	F_{0} 15-16 wk prior to delivery of F_{1}
Age When Killed	Lifetime study; final 10% of F_1 killed at: male, 146 wk; female, 148 wk
Method of Animal Distribution	According to tables of computer-generated random numbers
Feed	NIH 31 Rat and Mouse Ration (Zeigler Bros., Inc., Gardners, PA); available ad libitum
Bedding	Sani Chips® (J.P. Murphy, Rochelle Park, NJ, and Shurfire, Baltimore, MD)
Water	Tap water ad libitum
Cages	Polycarbonate (Hazleton Systems, Aberdeen, MD); stored on Enviro-racks®
Cage Filters	Remay nonwoven polyester sheets (Nationwide Papers, Washington, DC)
Animals per Cage	$F_{0}\mbox{1}$ for males, 2 for females during breeding; 2 for males, 1 for females after breeding; $F_{1}\mbox{3}$
Other Chemicals on Study in the Same Room	None
Animal Room Environment	Temp23° \pm 2° C; hum50% \pm 10%; fluorescent light 12 h/d; 10-15 room air changes/h
CHEMISTRY	
Supplier	Governeur Talc Company (Governeur, NY)

TABLE 4. EXPERIMENTAL DESIGN AND MATERIALS AND METHODS IN THE LIFETIME FEED STUDIES OF TREMOLITE (Continued)

FORMULATED DIETS

Preparation

Tremolite and feed mixed in a 55-ft³ Patterson-Kelly[®] V-blender with intensifier bar; oval, 3/8-in \times 3/4-in pellets prepared with Sprout-Waldron pellet mill. Pelleted feed packaged in 25-lb aliquots in standard paper feed bags that were color coded to minimize the occurrence of feeding errors at the study laboratory

Source and Specifications of Study Animals

Parental Generation (F_0) : Weanling F344/N (cesarean-derived) rats, which were barrier sustained and specific pathogen free, were purchased from Charles River Breeding Laboratories. These animals constituted the F_0 generation and were received November 1, 1977 (Figure 1).

On arrival, animals were taken directly to the quarantine area and acclimated to laboratory conditions. Twenty-four hours after arrival, eight rats of each sex were selected and killed, and pathogen burden was determined for each animal. Pathogens examined for included ectoparasites (mites, fleas, and lice), intestinal parasites (fecal flotation), and bacteria (Mycoplasma sp., Salmonella sp., Diplococcus pneumoniae, Corynebacterium kutscheri, and Streptobacillus moniliformis). Serologic tests were conducted for viruses (Appendix C, Tables C1-C3).

After approximately 2 months in quarantine (the regular 3- to 4-week quarantine period was extended because of a shortage of cages), male and female rats (15-16 weeks old) were separated into two groups (control and exposed) according to tables of random numbers and were placed on the appropriate designated diets.

After exposure to the designated diets for at least 7 days, the rats (16-17 weeks old) were placed in breeding cages (one male to two females). During the breeding period, the rats continued to be fed the same diets. Twenty days later (on the average), females were separated and housed individually in polycarbonate cages. Males were removed from the breeding cages and rehoused two per cage. After the pups were born and placed on the lifetime feeding phase of the studies, ten rats (four males and six females) were selected from the F_0 generation for additional pathogen burden determinations (Tables C4-C6) to assure that the animals remained in acceptable health according to the infectious disease criteria.

Filial Generation (F_1) : The F_0 females were allowed to deliver their F_1 litters naturally, and these were culled to groups of no more than eight pups (four per sex if possible) per litter.

At birth, the litters from the F_0 dams within the control and exposed groups were assigned randomly to the corresponding lifetime feeding phase groups (control and exposed) such that birth dates were equally distributed. Twentyone days after birth, the pups were weaned, given a temporary number, and then assigned, according to a table of random numbers, to groups for the lifetime feed studies. Litters in which only one sex was present were excluded from those animals to be selected. At this time, 16 rats (8 rats per sex) were selected for pathogen burden determinations (Tables C7-C9). The extra weanlings were discarded.

Animal Maintenance

The control and tremolite-exposed rats were placed in separate rooms with monitored temperature and humidity and a controlled light cycle. Attempts were made to maintain the temperature at $74^{\circ} \pm 4^{\circ}$ F and humidity at $50\% \pm$ 10%. Racks and filters were changed approximately once every 2 weeks. The rats were housed three per cage. Cages and bedding were replaced twice per week. Bedding samples were collected periodically for analysis (Appendix D). Control and formulated diets and tap water via



FIGURE 1. SCHEDULE OF MAJOR EVENTS IN RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE

automatic waterers were available ad libitum. Two water samples were collected and submitted for analysis of asbestos content (Appendix E). Stainless steel feed containers were changed once every 2 weeks. Sources and description of the materials used for animal maintenance are presented in Table 4.

Safety Precautions

The incoming air to the animal rooms was filtered to remove particulate matter. Ten to 15 changes of room air per hour were provided. Before initiation of the studies, air samples were collected and analyzed for baseline tremolite determinations. Additional samples were collected approximately every 6 months for analysis to assure personnel safety (Appendix F).

Other measures used for personnel protection included the wearing of fully protective disposable suits, gloves, boots, and bouffant caps and the use of a dust/mist respirator mask approved by the Occupational Safety and Health Administration. Personnel leaving the animal rooms were required to dispose of their protective clothing and to take showers. In addition, physical examinations, including pulmonary function tests and chest radiographs, were conducted at the initiation of the studies, once per year thereafter, and at the end of the studies.

Clinical Examinations and Pathology

Rats were observed two times per day. Body weights by cage were recorded once per week for the duration of the studies. Mean body weights were calculated for each group. Moribund animals were killed, as were animals that survived to the end of the studies. A necropsy was performed on all animals, including those found dead unless they were excessively autolyzed or cannibalized. Thus, the number of animals from which particular organs or tissues were examined microscopically varies and is not necessarily equal to the number of animals that were placed on study in each group. Animals were killed when exhibiting any one of these conditions:

- 1. Palpable masses within the abdominal cavity (excluding retained testes)
- 2. Masses protruding from the rectum

- 3. Rectal discharge of bright red fluid (an indication of the presence of a bleeding colonic or rectal neoplasm)
- 4. Large ulcerated masses in the area of the ears or on the side of the face (Zymbal gland tumors)
- 5. Large subcutaneous masses that were ulcerated or infected
- 6. Masses that interfered with breathing and eating or that severely hampered locomotion
- 7. Huge tissue masses
- 8. Central nervous system signs accompanied by weight loss (head tilt, circling, incoordination, ataxia, paralysis)
- 9. Severe weight loss or emaciation
- 10. Coma or extreme weakness

When the remaining animals of the tremoliteexposed group of either sex reached 10% of those starting the study, that group and the corresponding control group for that sex were killed. Animals were killed by exsanguination under sodium pentobarbital anesthesia (Nembutal[®], Abbott Laboratories, Inc., North Chicago, IL, or Diabutal[®], Diamond Laboratories, Inc., Des Moines, IA). Final body weights were recorded, and necropsies included blood smears taken from animals killed in extremis or those killed at the end of the studies and touch preparations made from any enlarged spleen or lymphoid organ.

The gastrointestinal tract, chosen as one of the target organs before these studies began, was handled in a slightly different manner than in standard long-term rodent carcinogenesis studies. Before being placed in fixative, the entire esophagus was opened and pinned with the exterior surface adjacent to cardboard. The stomach and cecum were prepared similarly. Twocentimeter lengths of duodenum and ileum and two portions of jejunum were placed unopened in fixative. The remaining small intestine was opened, washed gently with saline, and carefully examined by transillumination on a radiograph viewing box. Suspected lesions were processed separately and identified individually as to location. Likewise, the entire colon with anus was opened, examined, and pinned to cardboard (serosal surface down) before fixation. The size and location of masses were recorded. Masses greater than 1 mm in diameter were removed as separate specimens for processing. After fixation and before embedding, the colon was "carpet-rolled" starting at the posterior end, with the mucosal surface inward.

Examinations for grossly visible lesions were performed on major tissues or organs. Tissues were preserved in 10% neutral buffered formalin, embedded in paraffin, sectioned, and stained with hematoxylin and eosin. Tissues examined microscopically are listed in Table 4.

When the pathology examination was completed, the slides, individual animal data records, and summary tables were sent to an independent quality assurance laboratory. Individual animal records and tables were compared for accuracy, slides and tissue counts were verified, and histotechnique was evaluated. All tumor diagnoses, all target tissues, and all tissues from a randomly selected 10% of the animals were evaluated by a quality assurance pathologist. Slides of all target tissues and those about which the original and quality assurance pathologists disagreed were submitted to the Chairperson of the Pathology Working Group (PWG) for evaluation. Representative coded slides selected by the Chairperson were reviewed by PWG pathologists, who reached a consensus and compared their findings with the original and quality assurance diagnoses. When diagnostic differences were found, the PWG sent the appropriate slides and comments to the original pathologist for review. This procedure has been described, in part, by Maronpot and Boorman (1982) and Boorman et al. (1985). The final diagnoses represent a consensus of contractor pathologists and the NTP Pathology Working Group.

Statistical Methods

Data Recording: Data on this experiment were recorded in the Carcinogenesis Bioassay Data System (Linhart et al., 1974). The data elements include descriptive information on the chemicals, animals, experimental design, survival, body weight, and individual pathology results, as recommended by the International Union Against Cancer (Berenblum, 1969). Survival Analyses: The probability of survival was estimated by the product-limit procedure of Kaplan and Meier (1958) and is presented in the form of graphs. Animals were censored from the survival analyses at the time they were found to be missing or dead from other than natural causes; animals dying from natural causes were not censored. Statistical analyses for a possible dose-related effect on survival used the method of Cox (1972) for testing two groups for equality. All reported P values for the survival analysis are two-sided.

Calculation of Incidence: The incidence of neoplastic or nonneoplastic lesions has been given as the ratio of the number of animals bearing such lesions at a specific anatomic site to the number of animals in which that site was examined. In most instances, the denominators include only those animals for which the site was examined histologically. However, when macroscopic examination was required to detect lesions (e.g., skin or mammary tumors) prior to histologic sampling, or when lesions could have appeared at multiple sites (e.g., lymphomas), the denominators consist of the number of animals on which a necropsy was performed.

Analysis of Tumor Incidence: Three statistical methods are used to analyze tumor incidence data: life table tests, incidental tumor analysis, and Fisher exact analysis. Tests of significance include pairwise comparisons of exposed groups with controls. For studies in which administration of the study compound has little effect on survival, the results of the three alternative analyses will generally be similar. When differing results are obtained by the three methods. the final interpretation of the data will depend on the extent to which the tumor under consideration is regarded as being the cause of death. Continuity-corrected tests are used in the analysis of tumor incidence, and reported P values are one-sided.

Life Table Analyses--The first method of analysis assumed that all tumors of a given type observed in animals dying before the end of the study were "fatal"; i.e., they either directly or indirectly caused the death of the animal. According to this approach, the proportions of

tumor-bearing animals in the dosed and control groups were compared at each point in time at which an animal died with a tumor of interest. The denominators of these proportions were the total number of animals at risk in each group. These results, including the data from animals killed at the end of the study, were then combined by the method of Mantel and Haenszel (1959) to obtain an overall P value. This method of adjusting for intercurrent mortality is the life table method of Cox (1972). The underlying variable considered by this analysis is time to death due to tumor. If the tumor is rapidly lethal, then time to death due to tumor closely approximates time to tumor onset. In this case, the life table test also provides a comparison of the timespecific tumor incidences.

Incidental Tumor Analyses--The second method of analysis assumed that all tumors of a given type observed in animals that died before the end of the study were "incidental"; i.e., they were merely observed at necropsy in animals dying of an unrelated cause. According to this approach, the proportions of tumor-bearing animals in dosed and control groups were compared in each of five time intervals: weeks 0-60, weeks 61-86, weeks 87-112, weeks 113-126, and beyond week 126. The denominators of these proportions were the number of animals actually examined for tumors during the time interval. The individual time interval comparisons were then combined by the previously described method to obtain a single overall result. (See Haseman, 1984, for the computational details of both methods.)

Fisher Exact Analysis--In addition to survivaladjusted methods, the results of the Fisher exact test for pairwise comparisons are given in the appendix containing the analyses of tumor incidence. This test is based on the overall proportion of tumor-bearing animals and does not adjust for survival differences.

Historical Control Data: Although the concurrent control group is always the first and most appropriate control group used for evaluation, there are certain instances in which historical control data can be helpful in the overall assessment of tumor incidence. Consequently, control tumor incidences from the NTP historical control data base (Haseman et al., 1984, 1985) are included for those tumors appearing to show compound-related effects.

III. RESULTS

Establishment of Study Groups Pathogen Burden Clinical Signs Body Weights and Feed Consumption Survival Pathology and Statistical Analyses of Results

Establishment of Study Groups

The studies were designed to evaluate the effects of ingested tremolite during the entire life of the animal, starting from the time the rats were able to eat solid food. For this reason, the mated female rats had been on the study diets for approximately 12 weeks when the first litters were born. To minimize the chance that the mothers would reject or cannibalize their young, the litters were not handled during lactation except for weighing and culling at birth.

Litter size and survival of offspring were unaffected by the presence of tremolite in the diet. The average number of live fetuses born to tremolite-exposed dams was 7.6 vs. 7.8 for the control groups. The average weight at birth of the pups, determined by dividing the weight of each litter by the number of live pups, was 4.7 g for both groups. Fetal weights were determined by dividing the weight of each litter by the number of live pups. The tremolite-exposed offspring were smaller at weaning than were controls (22.8 g vs. 26.3 g).

A summary of groups, number of animals, diets for the parental (F_0) animals, as well as the distribution of and diets for the filial (F_1) animals is presented in Figure 1 and Table 4.

Pathogen Burden

The tissues of the F₀ animals evaluated for pathogen burden revealed evidence of early spontaneous respiratory disease in the lungs of all rats examined (Appendix C). In two of the males, only small foci of mononuclear cells were present adjacent to the bronchioles. In the remaining rats, minimal-to-moderate peribronchial lymphoid hyperplasia was present, and perivascular lymphoid hyperplasia occurred in two of these rats. In the repeated pathogen burden examination of the F_0 animals, evidence of respiratory disease was noted in all animals. This disease was characterized by minimal-to-moderate peribronchial lymphoid hyperplasia in all rats with an accompanying bronchial exudate in three males. These lesions were slightly more pronounced than those observed at an earlier kill.

In the lungs of all F_1 rats examined, evidence of early spontaneous respiratory disease was present, characterized by minimal-to-slight peribronchial lymphoid hyperplasia.

No serologic evidence of Sendai virus was present in either F_0 or F_1 animals (Appendix C).

Clinical Signs

A summary of clinical signs from weeks 83 to 112 is presented in Appendix G. This time period was chosen for illustration because few signs were noted before week 83 and age-related signs complicated the observations after week 112.

The incidence of clinical signs occurred at essentially similar frequencies in the tremolite-exposed and control rats throughout the studies. These include: soft feces; urine stains; pale, thin, and/or hunched appearance; depression; localized alopecia or sores on head or body; rough hair coats; abnormal eyes (pale, cloudy, bloody crust, red, lacrimating, squinting, enlarged, sores, swollen, red discharge, protruding, small, and/or necrotic); head tilt; salivation; localized swellings; stains on fur; bloated appearance; necrotic or abscessed tail; discharge from anus or vagina; protruding penis or vagina; small or enlarged testis; wheezing; wasting feed or decreased feed consumption; and labored respiration and/or abnormal central nervous system responses (circling, hyperactivity, loss of equilibrium, tremors, isolated occurrences of paralysis and/or ataxia).

As the study proceeded, the incidence of clinical signs increased in all groups. At intervals during which a large number of moribund animals were killed in any one particular group, the clinical signs most frequently observed were supportive of the conditions for moribund kills as outlined in the Materials and Methods section.

Body Weights and Feed Consumption

Mean body weights of rats in the lifetime feed studies, body weights relative to controls, and survival are presented in Table 5; mean body weights are also shown in Figure 2.

Weeks on	С	ontrol		1% Tremolite	
Study (from birth)	Av. Wt. (grams)	No. of Survivors	Av. Wt. (grams)	Wt. (percent of controls)	No. of Survivors
MALE		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<u>'''''''</u>		
7	165	118	110	67	250
17	350	118	252	72	246
27	348	118	307	88	246
37	395	118	341	86	246
47	390	117	357	92	245
57	429	117	386	90	243
67	463	116	416	90	243
77	469	114	426	91	242
87	466	112	432	93	230
97	461	106	427	93	222
107	444	94	418	94	202
117	420	73	396	94	157
127	398	52	368	92	115
137	367	25	348	95	70
FEMALE					
7	126	118	105	83	250
17	182	118	166	91	250
27	199	117	185	93	250
37	220	117	199	90	247
47	224	117	214	96	247
57	251	116	233	93	246
67	281	116	265	94	245
77	303	115	277	91	243
87	323	110	298	92	236
97	323	106	295	91	219
107	330	94	303	92	197
117	320	78	293	92	153
127	316	53	286	91	116
137	299	35	264	88	59
147	283	14	255	90	22

TABLE 5. MEAN BODY WEIGHTS AND SURVIVAL OF RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE

Mean body weights were tabulated at 7 weeks after birth and every 10 weeks thereafter. The data revealed a 13% depressed mean body weight gain at weaning in exposed rats of each sex compared with the controls. The depression in body weight in the tremolite-exposed rats was most apparent at 7 weeks of age (33% for males and 17% for females); body weights then paralleled that of the controls for the remainder of the studies, remaining lower at all time points.

A summary of average weekly feed and compound consumption per rat and ratios for dosed

vs. control groups is given in Appendix H. In the tremolite-exposed male and female rats, the average weekly feed consumption was 96% that in the controls. Comparisons of the mean total feed consumption by control and exposed groups from the initiation of the studies through termination were generally similar, with no apparent trends. These was no apparent correlation between the decreased body weight gains in the exposed groups and the feed consumption values. The estimated amount of tremolite consumed per animal was 446 mg/kg per day for males and 528 mg/kg per day for females.



FIGURE 2. GROWTH CURVES FOR RATS FED DIETS CONTAINING 1% TREMOLITE IN LIFETIME STUDIES

Survival

Estimates of the probabilities of survival for male and female rats fed diets containing tremolite and for the controls are shown in the Kaplan and Meier curves in Figure 3. No significant differences in survival between the exposed and control groups were observed. Survival of males and females was approximately equal until week 112, after which a greater proportion of the females survived (Table 6).

Pathology and Statistical Analyses of Results

This section describes the statistically significant or biologically noteworthy changes in the incidences of rats with neoplastic or nonneoplastic lesions, including monocytic (mononuclear cell) leukemia, endocrine tumors, testicular interstitial cell tumors, skin neoplasms, and mammary gland neoplasms. Only positive histopathologic findings based on hematoxylin- and eosinstained sections are tabulated in the text. A few tissues were missing from occasional animals. Also, no diagnoses are given for several tissues in one exposed female rat because of autolysis.

Summaries of the incidences of neoplasms and nonneoplastic lesions, individual animal tumor diagnoses, statistical analyses of primary tumors that occurred with an incidence of at least 2% in at least one animal group, and historical control incidences for the neoplasms mentioned in this section are presented in Appendixes A and B for male and female rats, respectively.

TABLE 6. SURVIVAL OF RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE AT VARIOUSTIME POINTS AFTER WEEK 90

		Male		Female		
Group	Week	Number Alive/ Total Number	Percent Survival	Number Alive/ Total Number	Percent Survival	
Control	90	112/118	95	110/118	93	
	112	77/118	65	85/118	72	
	130	42/118	36	48/118	41	
	146	5/118	4	17/118	14	
	148			13/118	11	
Exposed	90	228/250	91	231/250	92	
-	112	177/250	71	174/250	70	
	130	95/250	38	88/250	35	
	146	35/250	14	28/250	11	
	148		••	22/250	9	



FIGURE 3. KAPLAN-MEIER SURVIVAL CURVES FOR RATS FED DIETS CONTAINING 1% TREMOLITE IN LIFETIME STUDIES

Neoplasms

Table 7 summarizes the incidence of neoplasia in exposed and control male and female rats. No obvious differences were found in the total incidence of tumors or in the total incidence of benign or malignant tumors. Also, the average number of tumors per animal does not appear to be related to exposure.

Stomach Neoplasms: Squamous cell papillomas occurred in the forestomach (nonglandular) and appeared as exophytic growths of thickened epithelium resting on a proliferative connective tissue stalk. Squamous cell carcinomas also occurred in the forestomach and were composed of proliferating small basophilic squamous cells that were growing down into the lamina propria and occasionally formed keratin pearls.

Intestinal Tract Neoplasms: The primary epithelial neoplasms in the tremolite studies were divided by the original pathologist into three major types, based on morphology and biologic behavior: adenomatous polyps, adenocarcinomas arising in an adenomatous polyp, and carcinomas.

Adenomatous polyps--The adenomatous polyps were exophytic lesions of the mucosa supported on a pedicle of fibrous tissue and/or elevated submucosa which appeared to extend up into the growth. The epithelial cells were usually deeply basophilic and hypertrophic and formed glands of varying sizes. Surface necrosis of these lesions was common and often accompanied by an inflammatory response. Invasion of the pedicle was not observed. These polyps often occurred as multiple neoplasms in the large intestine.

Adenocarcinomas arising in adenomatous polyps--These neoplasms were exophytic lesions of the mucosa composed of proliferating deeply basophilic hypertrophic epithelial cells similar to those described above. In addition, they often showed disorganization, loss of relationship to the basement membrane, and abnormal mitoses. Local invasion of the pedicle was a consistent finding; however, metastases were rarely observed.

Carcinomas--This classification includes signet ring cell carcinomas, adenocarcinomas, mucinous cystadenocarcinomas, and carcinomas. Biologically, all are similar and are usually characterized by transmural growth that penetrates the muscular tunics and serosa and spread throughout the coelomic cavity, inducing a severe desmoplastic response. Metastasis to regional lymph nodes was common; metastasis to the lung and mediastinum occurred to a lesser extent. Grossly, in advanced cases, the loops of intestines were fused into an inseparable mass of tumor and desmoplastic tissue. Classification was based on the most prominent feature at the primary site. Signet ring carcinomas are composed of masses of clear oval cells with eccentric nuclei. Mucinous cystadenocarcinomas are characterized by the formation of multiple large

TABLE 7.	INCIDENCE	OF	PRIMARY	NEOPL	ASMS	IN	RATS	IN	THE	LIFETIME	FEED	STUDIES (OF
					TREM	101	ITE						

	2	Male	Female		
	Control 1% Tremolite		Control	1% Tremolite	
No. of animals examined	118	250	118	250	
Total animals with primary tumors	117 (99%)	241 (96%)	115 (97%)	243 (97%)	
Total primary tumors	(a) 423 (3.6)	(a) 844 (3.5)	(a) 342 (3.0)	(a) 633 (2.6)	
Total animals with benign tumors	115 (97%)	238 (95%)	100 (85%)	201 (80%)	
Total benign tumors	(a) 266 (2.3)	(a) 526 (2.2)	(a) 192 (1.9)	(a) 356 (1.8)	
Total animals with malignant tumors	96 (81%)	199 (80%)	96 (81%)	188(75%)	
Total malignant tumors	(a) 147 (1.5)	(a) 309 (1.6)	(a) 145 (1.5)	(a) 264 (1.4)	

(a) Average number of tumors per tumor-bearing animal is in parentheses.

ectatic glands or spaces that were filled with mucus and cellular debris. Adenocarcinomas consist of clusters of cells and/or glands in pools of mucus or sequestered in desmoplastic tissue. The carcinomas are anaplastic neoplasms lacking acinar formations. In some cases, there is an overlap of cell types in the same tumor, suggesting that the above morphologic types probably have the same histogenesis.

A few mesenchymal neoplasms of fibrous connective tissue or smooth muscle origin also were observed in the gastrointestinal tract. The incidences of these and of epithelial neoplasms are shown in Table 8. No statistically significant differences (P < 0.05) between the control and exposed groups were observed. The apparent increased trend in mesenchymal neoplasms (4 vs. 0) in male rats was discounted because these lesions were composed of one connective tissue neoplasm, two smooth muscle neoplasms, and one sarcoma of unknown origin. Evaluation of the incidence of the three categories of epithelial intestinal neoplasia by site and week of occurrence within the alimentary tract does not indicate any significant (P < 0.05) compound-related effect (Tables 9 and 10), although a positive trend is suggested in the small and large intestine of male rats. This becomes more apparent when the neoplasms are divided into benign and malignant categories.

In addition, the incidences of nonneoplastic lesions of the gastrointestinal tract, such as enteritis, ulceration, and inflammation, were generally similar in the control and tremolite-exposed rats (Table 11).

Miscellaneous Neoplasms: Occasionally, somewhat greater or lower incidences of commonly occurring neoplasms were observed in exposed groups, but these changes were not regarded as being chemically related (Table 12).

TABLE 8.	INCIDENCE OF GASTROINTESTINAL TRACT NEOPLASMS IN RATS IN THE LIFETIME
	FEED STUDIES OF TREMOLITE

		Male	Female		
	Control	1% Tremolite	Control	1% Tremolite	
No. of animals examined	118	250	118	250	
Total animals with neoplasms	4(3.4%)	13(5.2%)	5(4.2%)	3 (1.2%)	
Total animals with epithelial neoplasms	4(3.4%)	9 (3.6%)	1(0.8%)	1 (0.4%)	
Total animals with mesenchymal neoplasms	0(0%)	4 (1.6%)	4(3.4%)	2(0.8%)	

	Male		Female	
Site/Neoplasm	Control	1% Tremolite	Control	1% Tremolite
Number of animals examined	118	250	118	250
Total alimentary	7 (6%)	11 (4%)	2(2%)	6(2%)
Oral/pharynx				
Papilloma	1 (1%)	0(0%)	0 (0%)	1 (0.4%)
Carcinoma	2(2%)	2(1%)	1(1%)	4(2%)
Esophagus				
No lesions	0(0%)	0(0%)	0(0%)	0(0%)
Total gastrointestinal	4(3%)	9(3%)	1(1%)	1 (0.4%)
Total stomach	3 (3%)	2(1%)	0(0%)	0(0%)
Nonglandular				
Papilloma	2(2%)	1 (0.4%)	0(0%)	0(0%)
Carcinoma	1(1%)	1 (0.4%)	0(0%)	0(0%)
Glandular				
Polyp	0(0%)	0(0%)	0(0%)	0(0%)
Carcinoma	0(0%)	0 (0%)	0(0%)	0(0%)
Total small intestine	0(0%)	3(1%)	1(1%)	0(0%)
Polyp	0(0%)	1 (0.4%)	1(1%)	0(0%)
Polyp/carcinoma	0(0%)	0(0%)	0(0%)	0(0%)
Carcinoma	0(0%)	2(1%)	0(0%)	0(0%)
Total large intestine	1(1%)	4(2%)	0(0%)	1 (0.4%)
Cecum				
Polyp	0(0%)	1 (0.4%)	0(0%)	0(0%)
Polyp/carcinoma	0(0%)	0(0%)	0(0%)	0(0%)
Carcinoma	0(0%)	0(0%)	0(0%)	0(0%)
Colon	1 (1 M ·	1 (0.4%)	0 (0 %)	0.00
Polyp	1(1%)	1 (0.4%)	0(0%)	0(0%)
Polyp/carcinoma	0(0%)	0(0%)	0(0%)	1 (0.4%)
Carcinoma	0(0%)	2(1%)	0(0%)	0(0%)

TABLE 9. NUMBERS OF RATS WITH PRIMARY ALIMENTARY TRACT EPITHELIAL NEOPLASMSIN THE LIFETIME FEED STUDIES OF TREMOLITE

TABLE 10. WEEK OF OCCURRENCE OF GASTROINTESTINAL TRACT EPITHELIAL NEOPLASMSIN RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE

	Male		Female	
Site/Neoplasm (Control	1% Tremolite	Control	1% Tremolite
Stomach (forestomach)				<u></u>
Squamous cell papilloma 1	25, 143	109		
Squamous cell carcinoma	145	146		
Duodenum				
Mucinous cystadenocarcinoma		130		
lleum				
Adenomatous polyp		138		••
Jejunum				
Adenomatous polyp			121	
Mucinous cystadenocarcinoma		119		
Cecum				
Adenomatous polyp		138		••
Colon (ascending)				
Adenomatous polyp		128		
Mucinous cystadenocarcinoma		86		
Colon (descending)				
Adenocarcinoma arising in adenomatous polyg)			111
Colon (transverse)				
Adenomatous polyp	126			
Mucinous cystadenocarcinoma		110		

	Ν	fale	Female	
	Control	1% Tremolite	Control	1% Tremolite
Number of animals examined	118	250	118	250
Palate/tongue				
Inflammation	0(0%)	0(0%)	0(0%)	4(2%)
Necrosis	0(0%)	0(0%)	0(0%)	1(0.4%)
Hyperkeratosis	0(0%)	1 (0.4%)	0(0%)	2(1%)
Acanthosis	1(1%)	3(1%)	1(1%)	1 (0.4%)
Esophagus				
Inflammation	1(1%)	0(0%)	0(0%)	1(0.4%)
Necrosis	2(2%)	1 (0.4%)	0(0%)	0(0%)
Hyperkeratosis	9 (8%)	18(7%)	3(3%)	4(2%)
Acanthosis	1(1%)	0(0%)	0(0%)	1 (0.4%)
Nonglandular stomach				
Mineralization	10 (8%)	4 (2%)	4(3%)	2(1%)
Inflammation, chronic	19(16%)	39(16%)	25 (21%)	38(15%)
Ulceration	10 (8%)	17 (7%)	9(8%)	11(4%)
Necrosis	19(16%)	46 (18%)	17 (14%)	31 (12%)
Hyperplasia	2 (2%)	1 (0.4%)	0(0%)	2(1%)
Hyperkeratosis	17(14%)	34 (14%)	15(13%)	29(12%)
Acanthosis	26 (22%)	54 (22%)	23 (19%)	45 (18%)
Glandular stomach				
Hyperplasia	7 (6%)	1 (0.4%)	3(3%)	0(0%)
Small intestine				
Inflammation	0(0%)	2(1%)	0(0%)	1(0.4%)
Necrosis	2(2%)	1 (0.4%)	1(1%)	3(1%)
Ulceration	0(0%)	1 (0.4%)	0(0%)	0(0%)
Colon				
Parasitism	5(4%)	32 (13%)	5(4%)	2(1%)
Inflammation	0(0%)	5(2%)	3(3%)	0(0%)
Necrosis	0(0%)	3(1%)	1(1%)	1(0.4%)
Hyperplasia	0(0%)	1 (0.4%)	0(0%)	1 (0.4%)
Cecum				
Parasitism	0(0%)	2(1%)	2(2%)	1 (0.4%)
Inflammation	1(1%)	$\frac{1}{2}(1\%)$	4(4%)	1 (0.4%)
Necrosis	1 (1%)	4(2%)	1(1%)	3(1%)
Hyperplasia	0(0%)	0(0%)	0(0%)	1 (0.4%)
lectum				
Necrosis	0(0%)	1 (0.4%)	0 (0%)	0(0%)
Anus				
No lesions				

TABLE 11. INCIDENCE OF NONNEOPLASTIC LESIONS IN THE ALIMENTARY TRACT IN RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE

TABLE 12. INCIDENCE OF PRIMARY NEOPLASMS IN RATS IN THE LIFETIME FEED STUDIES OF
TREMOLITE (a)

	Male		Female	
Site/Lesion	Control	1% Tremolite	Control	1% Tremolite
kin	118	250	118	250
Squamous cell papilloma	3 (3%)	9(4%)	1 (1%)	7 (3%)
Squamous cell carcinoma	2 (2%)	4 (2%)	0(0%)	1 (0,4%)
Basal cell carcinoma	4(3%)	8 (3%)	0(0%)	0(0%)
Keratoacanthoma	6(5%)	13 (5%)	0(0%)	2(1%)
itegumentary system	118	250	118	250
Fibroma	14(12%)	36 (14%)	6(5%)	10(4%)
Fibrosarcoma	3 (3%)	12 (5%)	2(2%)	5(2%)
Neurofibroma	2(2%)	6 (2%)	3 (3%)	2(1%)
ung	118	250	118	250
Alveolar/bronchiolar carcinoma	2(2%)	2(1%)	3 (3%)	2(1%)
ematopoietic system	118	250	118	250
Leukemia	43 (36%)	102 (41%)	56 (47%)	101 (40%)
Lymphoma	5(4%)	(b) 1 (0.4%)	2 (2%)	1 (0.4%)
irculatory system	118	250	118	250
Hemangiosarcoma	2 (2%)	8 (3%)	1(1%)	1 (0.4%)
iver	118	250	118	250
Neoplastic nodule	10 (8%)	(b) 8 (3%)	2 (2%)	10(4%)
Hepatocellular carcinoma	6 (5%)	(c) 6 (2%)	0(0%)	0(0%)
ancreas	118	250	118	250
Acinar cell adenoma	10 (8%)	22 (9%)	0 (0%)	3(1%)
Mixed tumor, benign	3 (3%)	3(1%)	0(0%)	0(0%)
idney	118	250	118	250
All tumors	2 (2%)	230 8 (3%)	0(0%)	230 5 (2%)
	2(2)0)	0(0,0)	0(0)07	0(2,6)
tuitary gland	118	247	117	248
Adenoma	20 (17%)	37 (15%)	51 (44%)	93 (38%)
Carcinoma	2 (2%)	4(2%)	5(4%)	11 (4%)
drenal gland	118	250	118	250
Cortical adenoma	1(1%)	2(1%)	9 (8%)	13 (5%)
Pheochromocytoma, benign	38 (32%)	(c) 62 (25%)	22 (19%)	32 (13%)
Pheochromocytoma, malignant	3 (3%)	7 (3%)	1(1%)	4(2%)
nyroid gland	117	247	118	250
Follicular cell adenoma	5(4%)	12(5%)	3(3%)	7 (3%)
Follicular cell carcinoma	6(5%)	13 (5%)	5(4%)	15(6%)
C-Cell adenoma	11 (9%)	22 (9%)	7(6%)	8(3%)
C-Cell carcinoma	16(14%)	48 (19%)	18 (15%)	41 (16%)
arathyroid	109	236	113	238
Adenoma	2(2%)	4(2%)	1(1%)	0(0%)
ncreatic islets	118	250	118	250
Islet cell adenoma	5(4%)	12 (5%)	5(4%)	8(3%)
Islet cell carcinoma	7 (6%)	11 (4%)	3 (3%)	6(2%)
ammary gland	118	250	118	250
All tumors	20 (17%)	37 (15%)	70 (59%)	140 (56%)
Adenoma	1(1%)	1 (0.4%)	2(2%)	4 (2%)
Adenocarcinoma	2(2%)	3 (1%)	24(20%)	(b) 21 (8%)
Fibroadenoma	17 (14%)	(c) 32 (13%)	62 (53%)	127 (51%)

TABLE 12. INCIDENCE OF PRIMARY NEOPLASMS IN RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE (Continued)

	Male		Female	
Site/Lesion	Control	1% Tremolite	Control	1% Tremolite
Preputial/clitoral gland Squamous cell carcinoma	118 6 (5%)	250 14(6%)	118 6 (5%)	250 15 (6%)
Festis Interstitial cell tumor	118 114 (97%)	250 (c) 237 (95%)		
Uterus Endometri al st romal polyp			118 15(13%)	249 28 (11%)
Ovary Granulosa cell tumor			118 3 (3%)	249 3 (1%)
Brain Astrocytoma	118 7 (6%)	250 (c) 6 (2%)	118 1(1%)	250 2 (1%)
Zymbal gland Squamous cell carcinoma	118 3 (3%)	250 9(4%)	118 3 (3%)	250 6(2%)
All sites Malignant mesothelioma	118 10 (8%)	250 (b)8(3%)	118 0(0%)	250 0(0%)

(a) Incidence of all neoplasms (other than those in the alimentary tract) that occurred at an incidence of 2% or more in at least (a) Incluence of an acceptative (controls)
(b) P<0.05 (decrease) relative to controls
(c) P<0.05 (decrease) relative to controls (life table test only)

Nonneoplastic Findings

A plethora of incidental lesions of aging was found in all groups. Statistical analyses showed no obvious correlation between the incidence of specific lesion types and compound exposure. Histopathologic findings are summarized in Appendixes A and B. Nonneoplastic lesions that were observed in more than 5% of the rats in any of the study groups are shown in Table 13.

TABLE 13. NONNEOPLASTIC LESIONS OBSERVED IN MORE THAN 5% OF RATS IN THE LIFETIMEFEED STUDIES OF TREMOLITE

Lung: chronic inflammation, hemorrhage, alveolar hyperplasia Spleen: fibrosis, hemosiderosis, extramedullary hematopoiesis Lymph nodes (various): lymphoid or reticulum cell hyperplasia, lymphangiectasis, pigmentation, hemorrhage Heart: thrombosis, chronic inflammation Liver: degeneration, necrosis, fatty metamorphosis, toxic hepatitis, granulomas, pigmentation, focal cellular change Bile duct (extrahepatic): chronic inflammation, mucosal hyperplasia Pancreas (exocrine): atrophy, hyperplasia Kidney: chronic progressive nephropathy, cysts, pigmentation Pituitary gland: cysts, angiectasis, hyperplasia Adrenal gland (cortex): fatty metamorphosis, hyperplasia Adrenal gland (medulla): hyperplasia Thyroid gland: follicular cysts, C-cell hyperplasia Parathyroid: hyperplasia Testis: seminiferous degeneration, interstitial cell hyperplasia Seminal vesicles: cysts Preputal gland: inflammation Ovary: follicular cysts Uterus: hydrometra, endometrial cysts Mammary gland: cystic ducts, galactocele, inflammation Mesentery: fat necrosis Eye: cataract, hemorrhage, inflammation, retinal degeneration, rupture of the lens, posterior synechia
Eye: cataract, hemorrhage, inflammation, retinal degeneration, rupture of the lens, posterior synechia
Zymbal gland: cystic ducts Bone: osteopetrosis
Bone marrow: hyperplasia, hypoplasia

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IV. DISCUSSION AND CONCLUSIONS

Tremolite was administered at a concentration of 1% in the diet to male and female F344/N rats for their lifetime; the dams were exposed before and during gestation. Although the natural form of tremolite used in these studies is considered crystalline or nonfibrous, a small amount assumes a fibrous character during the crushing and milling processes. The milling process used in the preparation of the tremolite for these studies was identical to that used commercially.

The clinicopathologic results showed that the ingestion of tremolite did not adversely affect the fertility of the mothers or the litter size of the F_1 animals. However, the average weight of the offspring at weaning from mothers exposed to tremolite during gestation and lactation was about 13% less than that of the offspring of nonexposed mothers. This effect was not due to in utero exposure to tremolite, since birth weights of the tremolite-exposed pups were similar to those of concurrent controls. Body weight gain differences became more apparent by 8 weeks of age, after which body weights of the tremoliteexposed rats paralleled those of the control rats, even though the exposed rats remained smaller throughout their life. The decreased body weight gain was not related to a decrease in food consumption, and therefore the reason for this effect is not known. The decrease in weight gain was not considered a toxic effect because lifespan was not altered and no compound-related lesions were observed.

No clinical signs were observed which could be attributed to the ingestion of tremolite. Also, the ingestion of 1% tremolite in the diet for the lifespan of the rats did not affect survival. In fact, survival of both male and female rats exposed to tremolite was almost identical to that of the control groups. The survival of the rats (control and exposed) in the current studies compares favorably with that in other long-term studies in the NTP program (Haseman, 1983). At 112 weeks of age (average age of rats at the end of a typical 2-year study), the percentages of rats alive in the current studies were as follows: male control, 65%; exposed male, 71%; control female, 72%; exposed female, 70%. In reviewing 25 NTP feed studies, Haseman (1983) found an average 66% of control males and 73% of control females alive at 112 weeks of age.

The survival of males was similar to that of females at 112 weeks of age. However, in most 2-year studies involving rats, females usually live longer than males. This was the case for the tremolite study, since after 146 weeks, better survival was observed in control females than in males. Based on these observations, it is clear that the maximum tolerated concentration was not exceeded. Possibly, the rats in these studies could have tolerated exposure at a higher concentration, although a dietary concentration of 1% for the entire life of the animal is considered substantial.

Ingestion of tremolite over the lifetime of these rats did not cause a significant (P < 0.05) increase in the number of neoplasms per animal or any increase in neoplasms at any particular anatomic site compared with the concurrent controls. Since the gastrointestinal tract was considered a target organ based on epidemiologic studies on asbestos exposure in humans (Cooper et al., 1979) and because tremolite was administered in the diet, the gastrointestinal tract in control and exposed rats was examined in particular detail. Overall, the incidence was low, and no significant (P < 0.05) differences were observed between the exposed and control groups for any anatomic site within the gastrointestinal tract. When the incidence of neoplasms of the glandular epithelium of the large and small intestines of male rats was examined, 7/250 (3%) tremolite-exposed animals had such neoplasms compared with 1/118 (1%) controls. If only malignant neoplasms of this tissue are evaluated, the incidence is 0/118 male controls and 4/250male tremolite-exposed rats. Based on these data, it might appear that tremolite is a potential intestinal carcinogen for rats. However, the incidence (2%) of epithelial intestinal neoplasms in the control male F344/N rats in the amosite asbestos study (a corollary study to the current one) (NTP, 1990b) was similar to that in the tremolite-exposed males.

The historical incidence of intestinal neoplasia in control male F344 rats in feed studies is 0.9%(13/1,477). The reasons the historical incidence is lower than in this study are: the tremolite study was a lifetime study, rather than the standard 2-year exposure study; and the gastrointestinal tract from rats in the tremolite study was examined much more carefully (i.e., transillumination and "carpet-rolling").

The morphologic appearance of the gastrointestinal neoplasms in the tremolite-exposed rats was similar to that observed in the control rats. In addition, the morphology was similar to that in neoplasms that occur in control rats (Pozharisski, 1973) or that are observed as the result of exposure to known intestinal carcinogens (Pozharisski, 1975).

In summary, these studies do not provide evidence for the carcinogenicity of tremolite after lifetime ingestion. A large variety of nonneoplastic lesions, primarily age related, was observed in all groups. There was no obvious correlation between exposure and specific lesions. Therefore, tremolite at a concentration of 1% in the diet did not appear to be toxic.

No other studies on the effects of long-term ingestion of tremolite are available. However, Stanton et al. (1981) showed that the intrapleural inoculation of two types of fibrous tremolite caused a high incidence of pleural sarcoma in Osborne-Mendel rats. In contrast, intrapleural studies of tremolite talc failed to show a carcinogenic response in hamsters (Smith, 1974). In similar studies, Wagner et al. (1982) found fibrous tremolite, but not the nonfibrous form, to be carcinogenic. They also considered the carcinogenic response to be correlated to the mineral's ability to induce in vitro cytotoxicity, enzyme release in mouse peritoneal macrophages, and giant cell formation in A549 cell cultures. The tremolite used in the NTP studies is a nonfibrous type and more closely resembles that used by Smith (1974) and Wagner et al. (1982).

Studies involving the long-term ingestion of asbestos are also few. Donham et al. (1980) reported equivocal results in F344 rats that were fed a diet containing 10% chrysotile for their lifetime. Although no significant (P < 0.05) increase in the number of tumors in exposed animals was observed, the authors believed that there was a trend towards increased colon lesions in general, evidence of penetration of asbestos into the colonic mucosa, and possible cytotoxicity to colonic tissues; they also suggested a

relationship to peritoneal mesothelioma. Another equivocal study was reported by Gibel et al. (1976), who described an increase in malignant tumors in the lung, kidney, liver, and reticuloendothelial system, but no increase in intestinal neoplasia, in Wistar rats fed asbestos filter material (20 mg per day) for 8-14 months. Cunningham et al. (1977) reported one 24month study and one 30-month study in male Wistar rats fed diets containing 1% chrysotile asbestos for 24 or 30 months. These authors concluded that trace amounts of ingested asbestos can penetrate the walls of the gastrointestinal tract but that evidence of carcinogenicity was inconclusive. No evidence of carcinogenicity was found by Gross et al. (1974), who fed rats diets containing 5% chrysotile asbestos for 21 months.

An oral asbestos study in hamsters was reported by Smith et al. (1980). Groups of 30 male and 30 female hamsters were exposed via drinking water for their lifetime to amosite asbestos, mine tailings, beach rock, or Lake Superior drinking water. No adverse effects on body weight or survival were observed in any of the groups. One peritoneal mesothelioma, one pulmonary carcinoma, and two squamous cell carcinomas of the nonglandular stomach were found in hamsters exposed to amosite, but the incidence was not statistically significant (P < 0.05). A subsequent study in rats using similar materials also failed to elicit a carcinogenic response (Hilding et al., 1981). In companion studies to this investigation, Syrian golden hamsters were exposed to either amosite asbestos (NTP, 1985b) or to short-range (fiber length) or intermediate-range chrysotile asbestos (NTP, 1990a) at a concentration of 1% in the diet for their natural lifespan. In both studies, no adverse effects were observed for body weight gain or survival and no asbestos-related neoplasms were diagnosed.

Except for the studies of Donham et al. (1980), Smith et al. (1980), and the NTP (1985b, 1990a), the other studies were conducted with relatively small numbers of animals. Also, some were conducted for an insufficient period of time to adequately test the carcinogenic potential of ingested asbestos. The laboratory records and data for the NTP Technical Report on tremolite were examined for accuracy, consistency, and completeness. The audit revealed no major problems with the conduct of the studies or with collection and documentation of the experimental data. The audit report was reviewed by NTP staff, who determined that none of the discrepancies influenced the final interpretation of the results of these studies. The audit report is on file at the NIEHS/NTP Quality Assurance Office and is available for review.

Under the conditions of these feed studies, nonfibrous tremolite was not overtly toxic or carcinogenic for male or female F344/N rats, following lifetime ingestion of a diet containing 1% tremolite.

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APPENDIX A

SUMMARY OF LESIONS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE

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TABLE A1. SUMMARY OF THE INCIDENCE OF NEOPLASMS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE

	Untreated	d Control	1% Tre	emolite
Animals initially in study	118		250	
Animals necropsied	118		250	
Animals examined histopathologically	118		250	
NTEGUMENTARY SYSTEM			····	
*Multiple organs	(118)		(250)	
Fibrous histiocytoma	1	(1%)		
Fibrous histiocytoma, malignant			2	(1%)
*Skin	(118)		(250)	
Squamous cell papilloma		(3%)		(4%)
Squamous cell carcinoma		(2%)		(2%)
Basal cell tumor		(2%)		(1%)
Basal cell carcinoma		(3%)		(3%)
Trichoepithelioma		(1%)		(0.4%)
Keratoacanthoma Fibrosarcoma	0	(5%)		(5%)
*Subcutaneous tissue	(110)			(0.4%)
	(118)	(10)	(250)	(0.4%)
Squamous cell carcinoma, invasive Sarcoma, NOS		(1%)		(0.4%) (1%)
Fibroma		(1%) (12%)		(1%)
Fibrosarcoma		(3%)		(14%) (4%)
Myxosarcoma		(1%)		(0.4%)
Liposarcoma	1	(170)		(0.4%)
Neurofibroma	9	(2%)		(2%)
Neurofibrosarcoma	2	(270)	-	(0.4%)
#Lung Squamous cell carcinoma Squamous cell carcinoma, metastatic Alveolar/bronchiolar adenoma Alveolar/bronchiolar carcinoma Follicular cell carcinoma, metastatic Cortical carcinoma, metastatic C-cell carcinoma, metastatic	2 1 2 1	(1%) (2%) (1%) (2%) (1%)	2 1 5	(0.4%) (1%) (0.4%) (2%)
Pheochromocytoma, metastatic	2	(2%)		(1%)
Sarcoma, NOS, metastatic				(0.4%)
Fibrosarcoma, metastatic Liposarcoma, metastatic				(0.4%) (1%)
Mesothelioma, metastatic	ť	(1%)	2	(170)
Osteosarcoma, metastatic		(1%)		
HEMATOPOIETIC SYSTEM				
*Multiple organs	(118)		(250)	
Malignant lymphoma, lymphocytic type		(2%)		(0.17)
Malignant lymphoma, histiocytic type	1	(1%)		(0.4%)
Myelomonocytic leukemia	10	(900)		(2%)
Monocytic leukemia Megakaryocytic leukemia	43	(36%)		(38%)
#Spleen	(118)		(250)	(0.4%)
Pheochromocytoma, metastatic	(118)			(0.4%)
Sarcoma, NOS, metastatic				(0.4%)
Fibroma				(0.4%)
				(0.4%)
Fibrosarcoma	9	(2%)	1	(0.470)
	2 (118)	(2%)	(250)	(0.470)

	Untreated Control	1% Tremolite
IEMATOPOIETIC SYSTEM (Continued)		
#Cervical lymph node	(118)	(250)
C-cell carcinoma, metastatic	()	1 (0.4%)
#Mediastinal lymph node	(118)	(250)
C-cell carcinoma, metastatic	•	1 (0.4%)
Fibrosarcoma, metastatic		1 (0.4%)
Mesothelioma, metastatic	2 (2%)	
#Mesenteric lymph node	(118)	(250)
Sarcoma, NOS, invasive		1 (0.4%)
#Renal lymph node	(118)	(250)
Carcinoma, NOS, metastatic	1 (1%)	1 (0.4%)
Pheochromocytoma, metastatic	(110)	(250) 1 (0.4%)
#Liver	(118)	(250) 2 (1%)
Monocytic leukemia	(89)	(196)
#Thymus	(89)	1 (1%)
Carcinoma, NOS		1 (1%) 1 (1%)
Squamous cell carcinoma	1 (1%)	▲ (▲/v)
Squamous cell carcinoma, metastatic	1 (170)	
CIRCULATORY SYSTEM		
*Sacral region	(118)	(250)
Hemangiopericytoma, NOS		1 (0.4%)
*Subcutaneous tissue	(118)	(250)
Hemangiosarcoma		3 (1%)
#Spleen	(118)	(250)
Hemangioma	1 (1%)	4 (00)
Hemangiosarcoma		4 (2%) (250)
#Mesenteric lymph node	(118)	(250)
Hemangiosarcoma	1 (1%)	(950)
#Heart	(118)	(250) 1 (0.4%)
Liposarcoma, metastatic		1 (0.4%)
Mesothelioma, invasive	1 (1%)	(050)
*Mesentery	(118)	(250) 1 (0.4%)
Hemangiosarcoma		1 (0.4%)
DIGESTIVE SYSTEM		
*Oral mucous membrane	(118)	(250)
Squamous cell papilloma	1 (1%)	1 (0.401)
Squamous cell carcinoma	2 (2%)	(245) 1 (0.4%)
#Salivary gland	(116)	(245) 3 (1%)
Sarcoma, NOS	1 (101)	$ \begin{array}{ccc} 3 & (1\%) \\ 2 & (1\%) \end{array} $
Fibrosarcoma	(118) (1%)	(250)
#Liver	(118)	(230) 1 (0.4%)
Bile duct carcinoma	10 (00)	8 (3%)
Neoplastic nodule	10 (8%) 6 (5%)	6 (3%) 6 (2%)
Hepatocellular carcinoma	6 (5%)	(250)
#Pancreas	(118)	1 (0.4%)
Transitional cell carcinoma, invasive	10 (8%)	22 (9%)
Acinar cell adenoma	10 (0%)	1 (0.4%)
Acinar cell carcinoma	3 (3%)	3 (1%)
Mixed tumor, benign #Pancreatic duct	(118)	(250)
	1 (1%)	1 (0.4%)
Carcinoma, NOS	(118)	(250)
		1 (0.4%)
*Pharynx Squamous cell carcinoma		
Squamous cell carcinoma	1 (1%)	
Squamous cell carcinoma Squamous cell carcinoma, invasive	1 (1%) (118)	(250)
Squamous cell carcinoma Squamous cell carcinoma, invasive #Stomach	(118)	(250) 1 (0.4%)
Squamous cell carcinoma Squamous cell carcinoma, invasive		

TABLE A1. SUMMARY OF THE INCIDENCE OF NEOPLASMS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

. I.

	Untreated	Control	1% Tre	molite
DIGESTIVE SYSTEM (Continued)				
#Duodenum	(118)		(250)	
Mucinous cystadenocarcinoma	(1-0)		1	(0.4%)
Fibroma			1	(0.4%)
#Jejunum	(118)		(250)	
Mucinous cystadenocarcinoma				(0.4%)
Sarcoma, NOS, metastatic				(0.4%)
Leiomyoma				(0.4%)
Leiomyosarcoma				(0.4%)
#Ileum	(118)		(250)	
Adenomatous polyp, NOS			-	(0.4%)
#Colon	(118)		(250)	
Carcinoma, NOS, invasive	1	(1%)		
#Cecum	(118)		(250)	
Adenomatous polyp, NOS				(0.4%)
#Ascending colon	(118)		(250)	
Adenomatous polyp, NOS				(0.4%)
Mucinous cystadenocarcinoma				(0.4%)
#Transverse colon	(118)		(250)	
Adenomatous polyp, NOS	1	(1%)	-	(0.49)
Mucinous cystadenocarcinoma			1	(0.4%)
URINARY SYSTEM				
#Kidney	(118)		(250)	(0.10)
Transitional cell carcinoma				(0.4%)
Tubular cell adenoma				(0.4%)
Tubular cell adenocarcinoma	1	(1%)		(2%)
Sarcoma, NOS			1	(0.4%)
Lipoma	1	(1%)		
#Urinary bladder	(118)		(250)	
Transitional cell carcinoma	1	(1%)		
ENDOCRINE SYSTEM				
#Pituitary	(118)		(247)	
Carcinoma, NOS	2	(2%)	4	(2%)
Adenoma, NOS	20	(17%)	37	(15%)
#Adrenal	(118)		(250)	
Cortical adenoma	1	(1%)	2	(1%)
Cortical carcinoma				(0.4%)
Pheochromocytoma	38	(32%)	62	(25%)
Pheochromocytoma, malignant		(3%)	7	(3%)
Ganglioneuroma				(0.4%)
#Thyroid	(117)		(247)	
Follicular cell adenoma		(4%)		(5%)
Follicular cell carcinoma		(5%)		(5%)
C-cell adenoma		(9%)		(9%)
C-cell carcinoma	16	(14%)		(19%)
#Parathyroid	(109)		(236)	
Adenoma, NOS	2	(2%)		(2%)
#Pancreatic islets	(118)		(250)	
Islet cell adenoma	5	(4%)		(5%)
Islet cell carcinoma	7	(6%)	11	(4%)
REPRODUCTIVE SYSTEM	<u> </u>			
*Mammary gland	(118)		(250)	
Adenoma, NOS		(1%)		(0.4%)
Adenocarcinoma, NOS		(2%)		(1%)
	-		1	(0.4%)
Papillary adenocarcinoma				
Papillary adenocarcinoma Papillary cystadenocarcinoma, NOS	1	(1%)		(13%)

TABLE A1. SUMMARY OF THE INCIDENCE OF NEOPLASMS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

Tremolite, NTP TR 277

TABLE A1. SUMMARY OF THE INCIDENCE OF NEOPLASMS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

	Untreated Control	1% Tremolite
REPRODUCTIVE SYSTEM (Continued)		
*Prepuce	(118)	(250)
Keratoacanthoma	<u> </u>	1 (0.4%)
*Preputial gland	(118)	(250)
Carcinoma, NOS	1 (1%)	
Squamous cell carcinoma	6 (5%)	14 (6%)
Keratoacanthoma	1 (1%)	
#Prostate	(118)	(249)
Leiomyosarcoma	1 (1%)	
#Testis	(118)	(250)
Carcinoma, NOS, metastatic	1 (1%)	
Interstitial cell tumor	114 (97%)	237 (95%)
*Epididymis	(118)	(250)
Lipoma		1 (0.4%)
Mesothelioma, invasive		(0.4%)
*Scrotum	(118)	(250) 1 (0.4%)
Mesothelioma, invasive		1 (0.4%)
NERVOUS SYSTEM		
#Cerebrum	(118)	(250)
Carcinoma, NOS, invasive	1 (1%)	1 (0.4%)
Glioma, NOS	1 (1%)	
Astrocytoma	6 (5%)	6 (2%)
#Cerebellum	(118)	(250)
Carcinoma, NOS, invasive	1 (1%)	1 (0.4%)
Astrocytoma	1 (1%)	
*Spinal cord	(118)	(250)
Astrocytoma		1 (0.4%)
SPECIAL SENSE ORGANS	· · · · · · · · · · · · · · · · · · ·	
*Zymbal gland	(118)	(250)
Carcinoma, NOS	(110) 1 (1%)	(200)
Squamous cell carcinoma	3 (3%)	9 (4%)
Keratoacanthoma	0 (0,0)	1 (0.4%)
MUSCULOSKELETAL SYSTEM		
*Skull	(118)	(250)
Fibrosarcoma, invasive	1 (1%)	
*Maxilla	(118)	(250)
Fibrosarcoma, invasive		1 (0.4%)
*Mandible	(118)	(250) 1 (0.4%)
Squamous cell carcinoma, invasive	(119)	(250) (0.4%)
*Vertebra Fibroma	(118) 1 (1%)	(250)
*Lumbar vertebra	(118)	(250)
Liposarcoma, invasive	(110)	1 (0.4%)
Osteosarcoma		1 (0.4%) 1 (0.4%)
*Rib	(118)	(250)
Osteosarcoma	1 (1%)	.=
*Muscle of neck	(118)	(250)
Fibrosarcoma, invasive	1 (1%)	·/
BODY CAVITIES		
*Mediastinum	(118)	(250)
Squamous cell carcinoma, metastatic	(118) 1 (1%)	(200)
	I (I/0)	1 (0.4%)
Fibrosarcoma invesive		
Fibrosarcoma, invasive Mesothelioma, malignant	1 (1%)	1 (0.470)

	Untreated	l Control	1% Tre	emolite
BODY CAVITIES (Continued)				
*Abdominal cavity	(118)		(250)	
Pheochromocytoma, invasive	1	(1%)		
*Peritoneum	(118)		(250)	
Fibrosarcoma				(0.4%)
Liposarcoma	1	(1%)	1	(0.4%)
*Pericardium	(118)		(250)	
Osteosarcoma, metastatic	1	(1%)		
*Mesentery	(118)		(250)	
Pheochromocytoma, metastatic			1	(0.4%)
Sarcoma, NOS			1	(0.4%)
Fibrosarcoma	1	(1%)	1	(0.4%)
Lipoma	-	(1%)		
*Tunica vaginalis	(118)	(2)0)	(250)	
Mesothelioma, malignant		(8%)	((3%)
Mesotnenoma, mangnant				
ALL OTHER SYSTEMS				
*Multiple organs	(118)		(250)	
Carcinoma, NOS, invasive				(0.4%)
Squamous cell carcinoma, invasive	1	(1%)	1	(0.4%)
Transitional cell carcinoma, metastatic			1	(0.4%)
Sarcoma, NOS, invasive			1	(0.4%)
Fibrosarcoma, invasive	1	(1%)	2	(1%)
Mesothelioma, invasive		(8%)	5	(2%)
Mesothelioma, metastatic	0		1	(0.4%)
			-	
Cranial cavity			1	
Osteoma				
ANIMAL DISPOSITION SUMMARY				
Animals initially in study	18		250	
Natural death	23		38	
Moribund sacrifice	9 0		180	
Terminal sacrifice	5		28	
Accidentally killed, nda	Ŭ		4	
TUMOR SUMMARY			241	
Total animals with primary tumors**	117		844	
Total primary tumors	423			
Total animals with benign tumors	115		238	
Total benign tumors	266		526	
Total animals with malignant tumors	96		199	
Total malignant tumors	147		309	
Total animals with secondary tumors##	21		37	
Total secondary tumors	37		47	
Total animals with tumors				
uncertain benign or malignant	10		9	
Total uncertain tumors	10		9	

TABLE A1. SUMMARY OF THE INCIDENCE OF NEOPLASMS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

* Number of animals receiving complete necropsy examination; all gross lesions including masses examined microscopically
 ** Primary tumors: all tumors except secondary tumors
 # Number of animals examined microscopically at this site
 ## Secondary tumors: metastatic tumors or tumors invasive into an adjacent organ

TABLE A2. INDIVIDUAL ANIMAL TUMOR PATHOLOGY OF MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE: CONTROL

ANIMAL NUMBER	7 9 6	7 9 7	7 9 8	7 9 9	8 0 0	8 0 1	8 0 2	8 0 3	8 0 4	8 0 5	8 0 6	8 0 7	8 0 8	8 0 9	8 1 0	8 1 1	8 1 2	8 1 3	8 1 4	8 1 5	8 1 6	8 1 7	8 1 8	8 1 9	8 2 0
WEEKS ON STUDY	1 0 4	1 3 0	1 3 7	1 4 3	1 4 1	1 4 6	1 3 9	1 4 6	1 4 6	1 3 7	1 0 5	1 3 4	1 4 0	1 1 2	1 3 0	0 3 8	1 3 4	1 4 6	$\frac{1}{2}$ 7	1 3 9	$1 \\ 2 \\ 7$	1 1 5	1 0 8	1 2 0	1 1 0
INTEGUMENTARY SYSTEM																									
Skin Squamous cell papilloma Squamous cell carcinoma Basal cell tumor Basal cell carcinoma Trichoepithelioma	+	*	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	x x	+	+	+	+	+	+	+	+
Keratoacanthoma Subcutaneous tissue Squamous ceil carcinoma, invasive Sarcoma, NOS	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+ x	+	+	+ x	+	+	+
Fibroma Fibrosarcoma Myxosarcoma Neurofibroma			X							л									л			^			
RESPIRATORY SYSTEM Lungs and bronchi Squamous cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X
Squamous cell carcinoma, metastatic Alveolar/bronchiolar carcinoma Follicular cell carcinoma, metastatic C-cell carcinoma, metastatic					x														х		x				л
Pheochromocytoma, metastatic Mesothelioma, metastatic Osteosarcoma, metastatic Trachea		-	-		Ā		-	+	Ŧ					+		_	т		.L.	±	Ŧ	ـ	+	+	+
Follicular cell carcinoma, invasive		T	1	Ŧ	Ŧ	Ŧ	T	r	T	,	-	F	,	r	1				1		,	·		·	
HEMATOPOIETIC SYSTEM Bone marrow Spleen	++++	+++	++++	+ +	+ +	+++++++++++++++++++++++++++++++++++++++	+ +	+ +	+ +	+ +	++++	++++	+++	+ +	+ +	+ +	+++++	++++	++++	++++	++++	+ +	++++	+ +	++++
Hemangioma Hemangiosarcoma Malignant lymphoma, histiocytic type Lymph nodes Carcinoma, NOS, metastatic	+	+	+	+	+	+	+	+	+	X +	+	X +	+	+	+	+	+	+	+	+	+	+	+	+	+
Mesothelioma, metastatic Hemangiosarcoma Thymus Squamous cell carcinoma, metastatic	+	+	+	+	+	+	+	-	+	+	~	+	+	-	+	+	+	÷	+	+	+	+	-	÷	+
CIRCULATORY SYSTEM Heart Mesothelioma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DIGESTIVE SYSTEM Oral cavity Squamous cell papilloma Squamous cell carcinoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N X	N	N	N	N	N	N	N	N	N	N
Squamous cell carcinoma, invasive Salivary gland Fibrosarcoma Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+
Neoplastic nodule Hepatocellular carcinoma Bile duct	+	* *	* X +	+	+	+	+ X +	+	+	х +	+	+	+	+	+	+	+	+	т Х +	x +	+	+	+	+	+
Gallbladder & common bile duct Pancreas Carcinoma, NOS Acinar cell adenoma	N +	N +	N +	N +	N +	N +	N + X	N +	N + X	N +	N +	N +	N +	N +	N + X	N +									
Mixed tumor, benign Esophagus Stomach	++++	+ +	+ +	++	+++	+ +	л + +	+ +	+	+ +	X X + +	+ +	+ +	+ +	+ +	+ +	+ + +	+ +							
Squamous cell papilloma Squamous cell carcinoma Small intestine Large intestine Carcinoma, NOS, invasive Adenomatous polyp, NOS	+++	+ +	+ +	X + +	+ +	+ +	+ +	++	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +						
URINARY SYSTEM Kidney Tubular cell adenocarcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	* x	+	+	+	+	+	+
Lipoma Urinary bladder Transitional cell carcinoma	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X

+: Tissue examined microscopically

 Required tissue not examined microscopically
 Tumor incidence
 Necropsy, no autolysis, no microscopic examination
 S: Animal missexed

: No tissue information submitted C: Necropsy, no histology due to protocol A: Autolysis M: Animal missing B: No necropsy performed

TABLE A2.	INDIVIDUAL ANIMAL TUMOR PATHOLOGY OF MALE RATS: CONTROL
	(Continued)

ANIMAL NUMBER	8 2 1	8 2 2	8 2 3	82 4	8 2 5	8 2 6	8 2 7	8 2 8	8 2 9	8 3 0	8 3 1	8 3 2	8 3 3	8 3 4	8 3 5	8 3 6	8 3 7	8 3 8	8 3 9	8 4 0	8 4 1	842	8 4 3	8 4 4	8 4 5
WEEKS ON STUDY	- 0 Э 1	1 1 0	1 3 4	1 2 0	1 0 4	1 3 3	1 3 0	1 3 4	1 0 6	1 1 4	0 6 1	1 1 2	1 1 5	0 9 3	1 2 8	1 1 0	1 1 1	1 3 4	0 7 7	$\begin{array}{c}1\\4\\2\end{array}$	1 1 1	1 1 9	1 2 1	1 1 8	1 2 6
INTEGUMENTARY SYSTEM																									
Skin Squamous cell papilloma Squamous cell carcinoma Basal cell tumor Basal cell carcinoma Trichoepithelioma	+	+	+	+	+	+	+	+	+	* x	+	+	+	+	+	+	+	+	+	+	+	+	+ X X	+ X	+
Keratoacanthoma Subcutaneous tissue Squamous cell carcinoma, invasive	+	+	+	+	+	+	+	+	+	X +	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+
Sarcoma, NOS Fibroma	x			x				x							х	A									
Fibrosarcoma Myxosarcoma Neurofibroma								x																	
RESPIRATORY SYSTEM Lungs and bronchi											_								_		_				
Squamous cell carcinoma Squamous cell carcinoma, metastatic Alveolar/bronchiolar adenoma Alveolar/bronchiolar carcinoma Follicular cell carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Mesothelioma, metastatic	+	+	+	+ v	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+
Osteosarcoma, metastatic Trachea Follicular cell carcinoma, invasive	+	+	+	X +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
HEMATOPOIETIC SYSTEM												-													
Bone marrow Spleen Hemangioma Hemangiosarcoma	. + . +	+ +	+	++	+ +	+ +	+ +	+ +	+ +	++	+	++	+ +	+ +	++	+ +	+ +	+							
Malignant lymphoma, histiocytic type Lymph nodes Carcinoma, NOS, metastatic Mesothelioma, metastatic Hemangiosarcoma	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Thymus Squamous cell carcinoma, metastatic	+	+	+	+	+	+	-	+	~	-	+	+	+	-	+	+	+	+	+	+	-	+	+	-	+
CIRCULATORY SYSTEM Heart Mesothelioma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+
DIGESTIVE SYSTEM Oral cavity Squamous cell papilloma Squamous cell carcinoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Squamous cell carcinoma, invasive Salivary gland Fibrosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	X +	+	-	+	+	+	+	+	+	+
Liver Neoplastic nodule Hepatocellular carcinoma	+	÷	+	+	+	+	, x	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bile duct Gallbladder & common bile duct Pancreas Carcinoma, NOS	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ Z +	+ Z +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +
Acinar cell adenoma Mixed tumor, benign Esophagus	+	+	+	+	+	Х +	X	+	+	+	+	+	+	+	+	+	+	+	+	X +	+	+	+	+	+
Stomach Squamous cell papilloma Squamous cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Squandus carcinoma Small intestine Large intestine Carcinoma, NOS, invasive Adenomatous polyp, NOS	+++	+ +	+ +	+ +	++	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +
URINARY SYSTEM Kidney Tubular cell adenocarcinoma	+	+	<u>+</u>	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Lipoma Urinary bladder	+	+	÷	+	+	+	÷	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+

ANIMAL NUMBER	8 4 6	8 4 7	8 4 8	8 4 9	8 5 0	8 5 1	8 5 2	8 5 3	8 5 4	8 5 5	8 5 6	8 5 7	8 5 8	8 5 9	8 6 0	8 6 1	8 6 2	8 6 3	8 6 4	8 6 5	8 6 6	8 6 7	8 6 8	8 6 9	8 7 0
WEEKS ON STUDY	1 1 9	1 3 0	1 3 4	1 0 8	0 7 6	1 2 9	1 1 1	1 4 4	1 2 0	1 0 5	1 4 1	1 2 6	1 3 4	$1\\1\\2$	1 2 3	1 2 0	1 0 2	1 0 5	1 1 5	1 3 1	1 4 0	$\frac{1}{2}$	0 8 5	0 8 5	$1 \\ 2 \\ 0$
NTEGUMENTARY SYSTEM																									
kin Squamous cell papilloma Squamous cell carcinoma Basal cell tumor Basal cell carcinoma Trichoepithelioma Keratoacanthoma	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Neiaodalithoma Uboutaneous tissue Squamous cell carcinoma, invasive Sarcoma, NOS Fibrosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ x	+
Myxosarcoma Neurofibroma							x																		
RESPIRATORY SYSTEM Jungs and bronchi Squamous cell carcinoma Squamous cell carcinoma, metastatic	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Alveolar/bronchiolar adenoma Alveolar/bronchiolar carcinoma Follicular ceil carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Mesothelioma, metastatic		x																			x				
Osteosarcoma, metastatic rachea Follicular cell carcinoma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	÷	+
EMATOPOIETIC SYSTEM							······	·····																	
oleen Hemangioma Hemangiosarcoma	++	+	+	+	+	+ +	+ +	+	+	+	+	+	+	+	+	+ +	+ +	+	+	+	+	+ +	+	+	+
Malignānt lymphoma, histiocytic type ymph nodes Garcinoma, NOS, metastatic Mesothelioma, metastatic Hemangiosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
hymus Squamous cell carcinoma, metastatic	+	-	+	-	+	+	-	+	+	-	+	+	+	-	+	+	+	-	+	-	+	+	-	+	+
IRCULATORY SYSTEM leart Mesothelioma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DIGESTIVE SYSTEM Dral cavity Squamous cell papilloma Squamous cell carcinoma Squamous cell carcinoma, invasive	N	N	N X	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N X
alivary gland Fibrosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	* X	+	+	+	+	+
iver Neoplastic nodule Hepatocellular carcinoma	+	+	+	+	+	+	+	* X	+	+	+	+	+	+	+	*	+	* X	+	*	+	+	+	+	+
ille duct iallbladder & common bile duct ancreas Carcinoma, NOS Acinar cell adenoma	+ N +	+ N +	+ N +	+ N +	+ N +	+ N + X	+ N +	+ N +	+ N + X	+ N +	+ N +	+ N +	+ N + X	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ Z +	+ N +	+ N +	+ N +
Mixed tumor, benign sophagus tomach Squamous cell papilloma	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	- +	+ +	+ +
Squamous cell carcinoma mall intestine arge intestino Carcinoma, NOS, invasive Adenomatous polyp, NOS	++++	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ + X	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +
RINARY SYSTEM idney Tubular cell adenocarcinoma		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Lipoma Irinary bladder Transitional cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

TABLE A2. INDIVIDUAL ANIMAL TUMOR PATHOLOGY OF MALE RATS: CONTROL

(Continued)

ANIMAL NUMBER	8 7 1	8 7 2	8 7 3	8 7 4	8 7 5	8 7 6	8 7 7	8 7 8	8 7 9	8 8 0	8 8 1	8 8 2	8 8 3	884	8 8 5	886	8 8 7	8 8 8	8 8 9	8 9 0	8 9 1	8 9 2	8 9 3	89 4	8 9 5
WEEKS ON STUDY	0 9 3	1 1 0	0 9 2	1 3 4	1 1 1	1 3 0	1 0 1	1 4 1	1 0 0	$\frac{1}{2}$ 6	1 0 1	1 4 5	1 3 3	1 2 8	1 3 6	1 4 1	1 1 7	1 4 0	1 4 6	1 3 7	0 9 7	1 1 2	1 0 7	1 3 2	1 3 3
INTEGUMENTARY SYSTEM	<u> </u>	<u> </u>				·											+		+	+	+	4		+	<u>ــــــــــــــــــــــــــــــــــــ</u>
Skin Squamous cell papilloma Squamous cell carcinoma Basal cell tumor Basal cell carcinoma Trichoepithelioma	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	Ŧ	+
Kerstoscanthoma Subcutaneous tissue Squamous cell carcinoma, invasive Sarcoma, NOS Fibroma	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+ X	+ X	X +	х +	X +	+	+	+	+	+	+
Fibrosarcoma Myxosarcoma Neurofibroma	6																								
RESPIRATORY SYSTEM Lungs and bronchi Squamous cell carcinoma Squamous cell carcinoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Alveolar/bronchiolar adenoma Alveolar/bronchiolar carcinoma Follicular cell carcinoma, metastatic C-cell carcinoma, metastatic	ļ															x			_						
Pheochromocytoma, metastatic Mesothelioma, metastatic Osteosarcoma, metastatic Trachea																			x	x					
Follicular cell carcinoma, invasive	+	+	+	÷	+	+	+	+	+	+	+	+	Ŧ	+	+	+	Ŧ	+	Ŧ	Ŧ	+	+	Ŧ	Ŧ	T
HEMATOPOIETIC SYSTEM Bone marrow Spleen Hemangioma	++++	+++	++++	++++	+++++	+	++++++	+	+++++++++++++++++++++++++++++++++++++++	+ +	++++	++++	++++	++++	+++++	+++++	+++	++++	++++	++++	+ +	++++	++++	++++	+ +
Hemangiosarcoma Malignant lymphoma, histiocytic type Lymph nodes	+ x	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Х +	+
Carcinoma, NOS, metastatic Mesothelioma, metastatic Hemangiosarcoma Thymus	x	+	+	+	+	~	_	±	+	+	_	+	+	+	+	+	+	+	+	X +	+	+	+	_	+
Squamous cell carcinoma, metastatic		,	Г	ľ	г			т		r					,	,						·			É I
CIRCULATORY SYSTEM Heart Mesothelioma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	* X	+	+	+	+	+
DIGESTIVE SYSTEM Oral cavity Squamous cell papilloma Squamous cell carcinoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Squamous cell carcinoma, invasive Salivary gland Fibrosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Liver Neoplastic nodule Hepatocellular carcinoma	+	+	+	* X	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	*
Bile duct Galibladder & common bile duct Pancreas Carcinoma, NOS	+ N + X	+ X +	+ N +	+ N +	+ Z +	+ N +	+ + +	+ N +	+ N +	+ N +	+ N +	+ Z +	+ N +	+ N +	+ Z +	+ Z +	+ N +	+ N +	+ N +	+ Z +	+ N +	+ N +	+ 1 +	+ N +	+ Z +
Acinar cell adenoma Mixed tumor, benign Esophagus Stomach	+++++	+ +	++++	+ +	+ +	++++	+ +	+ +	+ +	+ +	+ +	X + +	+ +	+ +	++++	+++++	+ +	X + +	+ +	+ +	+ +	+ +	+++	+ +	+ +
Squamous cell papilloma Squamous cell carcinoma Small intestine Large intestine Carcinoma, NOS, invasive Adenomatous polyp, NOS	+ + X	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+	+ +	+ +	+++	+ +	+ +
URINARY SYSTEM Kidney Tubular cell adenocarcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+
Lipoma Urin ary bladder Transitional cell carcinoma	+	+	+	+	+	+	+	+	X +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

ANIMAL NUMBER	8 9 6	8 9 7	8 9 8	8 9 9	9 0 0	9 0 1	9 0 2	9 0 3	9 0 4	9 0 5	9 0 6	9 0 7	9 0 8	9 0 9	9 1 0	9 1 1	9 1 2	9 1 3	Τ					
WEEKS ON STUDY	1 2 5	1 3 0	1 1 9	1 4 3	1 4 4	1 4 5	1 2 5	1 3 1	1 4 2	1 2 7	1 4 5	1 3 6	$\frac{1}{2}$	0 9 2	$1 \\ 1 \\ 2$	$\frac{1}{1}$	1 1 2	1 0 5	T					TOTAL: TISSUES TUMORS
INTEGUMENTARY SYSTEM																			 	 				*110
Skin Squamous cell papilloma Squamous cell carcinoma Basal cell tumor Basal cell carcinoma Trichoepithelioma Keratoacanthoma Subcutaneous tissue Squamous cell carcinoma, invasive Sarooma, NOS Fibroma Fibrosarcoma Myxosarcoma Neurofibroma	+ + x	+	+	+	+	+ x + x	+	+	+ x +	+	+ X + X	+	+ + X	+	+ + X	+ + x	+ + X	+						*118 2 2 4 1 6 *118 1 1 14 3 1 2
RESPIRATORY SYSTEM																			 	 		_		
Lungs and bronchi Squamous cell carcinoma Squamous cell carcinoma, metastatic Alveolar/bronchiolar carcinoma Folicular cell carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Mesothelioma, metastatic Osteosarcoma, metastatic Trachea Folicular cell carcinoma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+						118 1 2 1 2 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1
HEMATOPOIETIC SYSTEM																					•••			-
Bone marrow Spleen Hemangioma Hemangiosarcoma Malignant lymphoma, histiocytic type	+++	+ +	+ +	+ +	÷ x	+ +	+ +	++	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +						$ \begin{array}{c} 117 \\ 118 \\ 1 \\ 1 \\ 2 \end{array} $
Lymph nodes Carcinoma, NOS, metastatic Mesothelioma, metastatic Hemangiosarcoma	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+						118 1 2 1
Thymus Squamous cell carcinoma, metastatic	+	-	+	+	+	+	+	-	+	+	x+	+	-	-	-		+	-						89 1
CIRCULATORY SYSTEM																			 	 				
Heart Mesothelioma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+						118 1
DIGESTIVE SYSTEM Oral cavity Squamous cell papilloma Squamous cell carcinoma Squamous cell carcinoma, invasive	И	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		 				*118 1 2 1
Salivary gland Fibrosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+						116 1
Liver Neoplastic nodule	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+						118 10
Hepatocellular carcinoma Bile duct Gallbladder & common bile duct	+ N	X + N	+ N	+ N	+ N	X + N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N						6 118 *118
Pancreas Carcinoma, NOS Acinar cell adenoma Mixed tumor, benign	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+						118 1 10 3
Esophagus Stomach Squamous cell papilloma	+++	+ +	+ +	+ +	+ +	+ +	+ + X	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +						116 118 2
Squamous cell carcinoma Small intestine Large intestine Carcinoma, NOS, invasive Adenomatous polyp, NOS	+++	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	X + +	+ +	+ +	+ +	+ +	+ +	+ +	+ +						
URINARY SYSTEM Kidney Tubular cell adenocarcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	 	 			<u> </u>	- 118 1 1
Lipoma Urinary bladder Transitional cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+						118

* Animals necropsied

								ucu	/																
ANIMAL NUMBER	7 9 6	7 9 7	7 9 8	7 9 9	8 0 0	8 0 1	8 0 2	8 0 3	8 0 4	8 0 5	8 0 6	8 0 7	808	8 0 9	8 1 0	8 1 1	$\frac{8}{2}$	8 1 3	8 1 4	8 1 5	8 1 6	8 1 7	8 1 8	8 1 9	8 2 0
WEEKS ON STUDY	1 0 4	1 3 0	1 3 7	1 4 3	1 4 1	1 4 6	1 3 9	1 4 6	1 4 6	1 3 7	1 0 5	1 3 4	1 4 0	$\frac{1}{1}$	1 3 0	0 3 8	1 3 4	1 4 6	$\frac{1}{2}$	1 3 9	1 2 7	1 1 5	1 0 8	$1 \\ 2 \\ 0$	1 1 0
ENDOCRINE SYSTEM																									
Pituitary Carcinoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	. +	+	+	+	+	+	+
Adenoma, NOS			X										X				X		r		,	,	X	X +	X +
Adrenal Cortical adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	Ŧ	+	т	* X		Ŧ	
Pheochromocytoma Pheochromocytoma, malignant			Х		х	Х	х		х				X		х			х		х			x		X
Thyroid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+
Follicular cell adenoma Follicular cell carcinoma												х													
C-cell adenoma C-cell carcinoma			x		x	х	x	x					X					X	Х				X		
Parathyroid	- 1	+	4 +	+	+		+	÷	+	+	+	+	+	-	+	~	+	+	+	+	+	+	+	+	+
Adenoma, NOS Pancreatic islets	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Islet cell adenoma Islet cell carcinoma										X X			X					X						х	
REPRODUCTIVE SYSTEM																									
Mammary gland Adenoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	* X	+	+	+	+	+	+	+
Adenocarcinoma, NOS Papillary cystadenocarcinoma, NOS									x																
Fibroadenoma													X	X									L	L	
Testis Carcinoma, NOS, metastatic	+	+	+	+	+	+	+	+	+	+	+	Ŧ	+		+	÷	+	+	+	+	τ.				-
Interstitial cell tumor Prostate	X	X	X	X	X	X	X	X	X	X	X	X	X	X +	X +	+	X +	X	X +	X +	X +	X +	X +	X +	X +
Leiomvosarcoma					+																	N		N	
Preputial/clitoral gland Carcinoma, NOS	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	IN .	Ν
Squamous cell carcinoma Keratoacanthoma							х									•									
NERVOUS SYSTEM					_																				
Brain	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcínoma, NOS, invasive Glioma, NOS																									
Astrocytoma								х																X	
SPECIAL SENSE ORGANS Zymbal gland	[-	+	+	+	+		+	+	N	+	+	+	+	+	+	+	+	+
Carcinoma, NOS	x	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	т	т	Ŧ	*	-	,	,	14									
Squamous cell carcinoma	Í																							_	X
MUSCULOSKELETAL SYSTEM Bone	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Fibroma	1	14	14	14	74	1.	1.4	11	1.			1.	1.	•••					•	•	•	•	• ·	-	-
Fibrosarcoma, invasive Osteosarcoma																									
Muscle	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	+	Ν	Ν	Ν	Ν
Fibrosarcoma, invasive							**																		
BODY CAVITIES Mediastinum	N	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Squamous cell carcinoma, metastatic																									
Mesothelioma, malignant _Mesothelioma, metastatic																						N	NT		N
Pericardium Osteosarcoma, metastatic	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	N	Ν	Ν	Ν	N	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	N
Peritoneum Pheochromocytoma, invasive	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	N	Ν	Ν	N	Ν	Ν	N
Liposarcoma														+	1			,	.1	J.	L	.بر	Ł		+
Tunica vaginalis Mesothelioma, malignant	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Ŧ	Ŧ	x	-		т 	т 	T
Mesentery Fibrosarcoma	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν
Lipoma																									
ALL OTHER SYSTEMS		**							27	NT.	N.T	N	NT	NT	N	NT	N	N	N	N	N	N	N	N	N
Multiple organs, NOS Squamous cell carcinoma, invasive	N	N	N	N	N	N	N	IN	IN	IN	TN.	T.A	IN	14	N X	T.N	7.4	14	19	14	14	14	14	74	14
Fibrosarcoma, invasive Fibrous histiocytoma																									
Mesothelioma, invasive																				х					
Malignant lymphoma, lymphocytic type Malignant lymphoma, histiocytic type]																								
Monocytic leukemia		х		X		х		х	х		x						_	X			X		X		
	'															~				_					

TABLE A2. INDIVIDUAL ANIMAL TUMOR PATHOLOGY OF MALE RATS: CONTROL (Continued)

NUMBER 2 3 <th></th>																										
STUDY 9 0 3 0 4 0 1 1 1 0 1 0 <td>ANIMAL NUMBER</td> <td>8 2 1</td> <td>8 2 2</td> <td>8 2 3</td> <td>8 2 4</td> <td></td> <td></td> <td>8 2 7</td> <td>8 2 8</td> <td></td> <td>3</td> <td>8 3 1</td> <td>8 3 2</td> <td></td> <td>8 3 4</td> <td>8 3 5</td> <td>8 3 6</td> <td>8 3 7</td> <td></td> <td></td> <td>8 4 0</td> <td>8 4 1</td> <td>8 4 2</td> <td>8 4 3</td> <td>8 4 4</td> <td></td>	ANIMAL NUMBER	8 2 1	8 2 2	8 2 3	8 2 4			8 2 7	8 2 8		3	8 3 1	8 3 2		8 3 4	8 3 5	8 3 6	8 3 7			8 4 0	8 4 1	8 4 2	8 4 3	8 4 4	
Plutary mode + <t< td=""><td>WEEKS ON STUDY</td><td>0 9 1</td><td></td><td></td><td></td><td>1 0 4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>9</td><td>1 2 8</td><td></td><td>1 1 1</td><td>1 3 4</td><td>0 7 7</td><td>1 4 2</td><td>1 1 1</td><td>1 1 9</td><td>$1\\2\\1$</td><td>-</td><td></td></t<>	WEEKS ON STUDY	0 9 1				1 0 4									9	1 2 8		1 1 1	1 3 4	0 7 7	1 4 2	1 1 1	1 1 9	$1\\2\\1$	-	
Caracitan NOS x <	ENDOCRINE SYSTEM													•						_						
Advanal + + + + + + + + + + + + + + + + + + +	Pituitary Carcinoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*
Corrical defeorma X	Adenoma, NOS		-	+	+	т	X	т	т	X	X	т	т.	+	Ŧ	т	-	Ŧ	+	+	Ŧ	+	+	+	+	+
Phechomocytome, maignant x <td>Cortical adenoma</td> <td>1</td> <td>т v</td> <td>+</td> <td>т</td> <td>т 17</td> <td>т</td> <td>т</td> <td>т 17</td> <td>Ŧ</td> <td>т</td> <td>т</td> <td>т</td> <td>т</td> <td>Ŧ</td> <td>T</td> <td>ŗ</td> <td>,</td> <td>,</td> <td>,</td> <td>v</td> <td></td> <td></td> <td></td> <td></td> <td>•</td>	Cortical adenoma	1	т v	+	т	т 17	т	т	т 17	Ŧ	т	т	т	т	Ŧ	T	ŗ	,	,	,	v					•
Fölscharseil adenoma X Fölscharseil adenoma X C-seil acarnoma X Paradyroid Adenora, NOS Adenora, NOS Biste seil adenoma Lied seil acarnoma Paradyroid Adenora, NOS Papilaria/reil adenoma Lied seil acrinoma REPRODUCTIVES SYSTEM Papilaria/reil adenoma Testa Papilaria/reil adenoma Summus eli acrinoma V +	Pheochromocytoma, malignant		х	х		х			X							л					л					
Follouize selicationan X <td></td> <td>+</td> <td>* x</td> <td>+</td>		+	+	+	+	+	+	+	+	+	+	+	* x	+	+	+	+	+	+	+	+	+	+	+	+	+
C-cell cardinoma X	Follicular cell carcinoma				v			v						v		Х										
Adealona, NOS Expresset: sists Idencess: sists Idencess: sists EXPRODUCTIVE SYSTEM Adealona, NOS Adealona,	C-cell carcinoma	x			л		х	л						л		х		x								
Partreatingless Lase cell adecoma Lase cell adeco		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+
List cell carcinoma Mammary Jand Mammary Jand Adeaona, NOS Adeaona, NOS Adeaona, NOS, metastatic Carcinoma, NOS, metastatic Testia Carcinoma, NOS, metastatic Carcinoma, NOS Carcinoma, NOS Bailary otxastra V + + + + + + + + + + + + + + + + + + +	Pancreatic islets	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mammary glad + <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>																										
Mammary glad+++ <th< td=""><td>REPRODUCTIVE SYSTEM</td><td></td><td></td><td></td><td>~</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>• • •</td><td></td></th<>	REPRODUCTIVE SYSTEM				~																				• • •	
Adenozarcinoma, NOS Papilary cystatenocarcinoma, NOS Totarionna, NOS, metastatic X	Mammary gland	+	+	+	+	+	+	+	+	+	+	Ν	+	+	+	+	+	Ν	+	+	+	+	+	+	+	+
Fibroadenoma Y X <t< td=""><td>Adenocarcinoma, NOS</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Adenocarcinoma, NOS																									
Carcinora, NOS, metastatic Literstitia (strinora), NOS, intestatic Literstitia (strinora), NOS, intestatic Proputational (startiona) Squanous cell carcinoma MUSCULOSKELETAL SYSTEM Bone Fibroara (strinora), invasive MUSCULOSKELETAL SYSTEM Bone Fibroara (strinora), invasive Fibroara (strinora), invasive MUSCULOSKELETAL SYSTEM BONE MUSCULOSKELETAL SYSTEM MUSCULOSKELETAL	Fibroadenoma								X																	
Interstitule cell tumor X <td></td> <td>+</td>		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Leiongroaarooma Pepetutakilikosi Jaratiooma Karatooseil Jaratiooma NOS Squamous cell Joratiooma NOS Squamous cell Joratiooma NOS NOS NOS NOS NOS NOS NOS NOS	Interstitial cell tumor	x	x	x	X	X	X	X	X	х	X		X	X	X	X	х	X	X	X	X	X	X	X	X	X
Carinoma, NOS X X X X NERVOUS SYSTEM Fain X X X X MERVOUS SYSTEM Fain X X X X Separous cell carrinoma, NOS X X X X X Sepecial Sense ORGANS X X X X X Squamous cell carrinoma X X X X X Bore Carrinoma, NOS X X X X X Bore Carrinoma, NOS X X X X X X Bore Fibrosarcoma, invasive Obteosarcoma, invasive N	Leiomyosarcoma	1	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+			-	-				-
Squamous cell carcinoma X X MERVOUS SYSTEM T X Brain Carcinoma, NOS, invasive X Glioma, NOS X X Squamous cell carcinoma, NOS, invasive X X SpreLIAL SENSE ORGANS X X Squamous cell carcinoma X X MUSCULOSKELETAL SYSTEM N	Preputial/clitoral gland Carcinoma, NOS	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	N
NERVOUS SYSTEM Brain Carcinone, NOS, invasive Glioma, NOS Systematic and controls Systematic and controls MUSCULOSKELETAL SYSTEM Bone Fibrosarcoma, invasive MUSCULOSKELETAL SYSTEM Bone Fibrosarcoma, invasive Objectorem MUSCULOSKELETAL SYSTEM Bone Fibrosarcoma, invasive Objectorem Multia Pibrosarcoma, metastatic Pertoneum Mediastinum Squanous cell carcinoma, metastatic Pertoneum Protosarcoma, metastatic Pertoneum Pertoneum Mediastinum Squanous cell carcinoma, metastatic Pertoneum Pertoneum N N N N N N N N N N N N N N N N N N N	Squamous cell carcinoma		х	х																			х			
Brain Carcinoma, NOS, invasive Glioma, NOS Astrocytoma + + + + + + + + + + + + + + + + + + +																										
Carcinoma, NOS X X SPECIAL SENSE ORGANS X SPECIAL SENSE ORGANS X Carcinoma, NOS X Squamous cell carcinoma X MUSCUCOSKELETAL SYSTEM Bone Fibrosarcoma, invasive OSteosarcoma Muscle Fibrosarcoma, invasive BODY CAVITIES Mediaatinut Mediaatinut Mesothelioma, matastatic Pertoneum Prince vaginalis N <n< td=""> N N<n< td=""> N N<n< td=""> N N<n< td=""> N N N N N N N N N Noscie N N N N N N N N Mediaatinut Mesothelioma, metastatic Peritonau N N N N N N N N N N N N N N N N N N N N N N<td>NERVOUS SYSTEM Brain</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td></n<></n<></n<></n<>	NERVOUS SYSTEM Brain	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Astrocytoma X X SPECIAL SENSE ORGANS Zymbai glad Garanous OKS Squamous cell carcinoma + N + <	Carcinoma, NOS, invasive																									
Zymbai gland Garcinoma, NOS Squamous cell carcinoma + N + + + + + + + + + + + + + + + + + +												х								Х						
Carcinoma, NOS Squamous cell carcinoma X MUSCULOSKELETAL SYSTEM N<	SPECIAL SENSE ORGANS																									
MUSCULOSKELETAL SYSTEM Bone Fibroma Fibrosarcoma, invasive Osteosarcoma, invasive BODY CAVITIES Bothediastinum Squamous cell carcinoma, metastatic Mesothelioma, metastatic Periconarcoma, invasive Doty CAVITIES Mediastinum Squamous cell carcinoma, metastatic Pericona, metastatic Pericona, metastatic Periconarcoma, invasive Liposarcoma Mesentelioma, metastatic Preschromocytoma, invasive Lipoma ALL OTHER SYSTEMS Multiple organs, NOS Squamous cell carcinoma, invasive Fibrosarcoma Multiple organs, NOS Squamous cell carcinoma, invasive Multiple organs, NOS Squamous cell carcinoma, invasive Fibrosarcoma Multiple organs, NOS Squamous cell carcinoma, invasive Fibrosarcoma, invasive N N N N Multiple organs, NOS Squamous cell carcinoma, invasive Fibrosarcoma, in	Carcinoma, NOS	+	N	+	+	+	+	+	+	+	+	+	N	+	+	+	+	N	+	IN	+	+	+	+	÷	+
Bone N	Squamous cell carcinoma																х									
Fibroma Fibroma, invasive Osteosarcoma, invasive N Muscle N Fibrosarcoma, invasive N BODY CAVITIES N Mediastinum N Squamous cell carcinoma, metastatic Pericardium Pericardium N Mesothelioma, metastatic Pericardium Pericardium N Osteosarcoma, invasive N Liposarcoma, invasive N Liposarcoma, invasive N Liposarcoma N Mesothelioma, malignant N Mesothelioma, metastatic N Periconcum N Prictoneum N Protoneum N Protoneum N Priposarcoma N Mesothelioma, malignant N Mesothelioma, malignant N Mesothelioma, invasive N Fibrosarcoma N N N Multiple organs, NOS NOS Squamous cell carcinoma, invasive X Fibrosarcoma, invasive X <td>MUSCULOSKELETAL SYSTEM</td> <td>N</td>	MUSCULOSKELETAL SYSTEM	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Octeosarcoma N <t< td=""><td>Fibroma</td><td>1</td><td>14</td><td>14</td><td>14</td><td>14</td><td>14</td><td>14</td><td>14</td><td>14</td><td>14</td><td>14</td><td>14</td><td>14</td><td>14</td><td>14</td><td></td><td>14</td><td>11</td><td>14</td><td></td><td></td><td>• •</td><td>••</td><td>.,</td><td></td></t<>	Fibroma	1	14	14	14	14	14	14	14	14	14	14	14	14	14	14		14	11	14			• •	••	.,	
Fibrosarcoma, invasive BODY CAVITIES Mediastinum Squamous cell carcinoma, metastatic Mesothelioma, malignant Mesothelioma, metastatic Pericardium Osteosarcoma, metastatic Pericardium Osteosarcoma, invasive Liposarcoma Fibrosarcoma Multiple organs, NOS Squamous cell carcinoma, invasive Fibrosarcoma N N Multiple organs, NOS Squamous cell carcinoma, invasive Fibrosarcoma X N N N N Squamous cell carcinoma, invasive Fibrosarcoma X N N Multiple organs, NOS Squamous cell carcinoma, invasive Fibrosarcoma X N Mesothelioma, invasive Fibrosarcoma, invasive Fibrosarcoma, invasive N N N N N <td>Fibrosarcoma, invasive Osteosarcoma</td> <td></td>	Fibrosarcoma, invasive Osteosarcoma																									
BODY CAVITIES Mediastinum Squamous cell carcinoma, metastatic Mesothelioma, malignant Mesothelioma, metastatic Pericardium Osteosarcoma, metastatic Periconum Pricochromocytoma, invasive Liposarcoma Lipoma ALL OTHER SYSTEMS Multiple organs, NOS Squamous cell carcinoma, invasive Fibrosarcoma, invasive Fibrosa	Muscle	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν
Mediastinum NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN																										
Mesothelioma, malignant X Mesothelioma, metastatic N Pericardium N	Mediastinum	N	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	N	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Mesothelioma, metastatic N </td <td>Squamous cell carcinoma, metastatic Mesothelioma, malignant</td> <td></td>	Squamous cell carcinoma, metastatic Mesothelioma, malignant																									
Octeosarcoma, metastatic X Peritoneum N Pheochromocytoma, invasive N Liposarcoma N Mesentery N Fibrosarcoma X Multiple organs, NOS X Squamous cell carcinoma, invasive N Fibrosarcoma, musaive N Fibrosarcoma, and invasive N No N N N No N No N No N No N No	Mesothelioma, metastatic	NT	NT	N	N	X	N	N	NT	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Peritoneum Pheochromocytoma, invasive Liposarcoma Tunica vaginalis Mesothelioma, malignant Mesothelioma, malignant ALL OTHER SYSTEMS Multiple organs, NOS Squamous cell carcinoma, invasive Fibrosarcoma Lipoma MNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN	Osteosarcoma, metastatic	_			Х		-	-	-	•	• ·					•	-	-								
Liposarcoma Yesothelioma, malignant Mesothelioma, malignant Multiple organs, NOS Squamous cell carcinoma, invasive Fibrosarcoma Fibrosarcoma, invasive Fibrosarcoma, invasive Fibrosarcoma, invasive Malignant lymphoma, histiocytic type Malignant lymphoma, histocytic type	Peritoneum	N	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	N	Ν	N	N	N	N	N	N	N	N
Mesothelioma, malignant X X Mesothery N <td>Liposarcoma</td> <td>+</td>	Liposarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibrosarcoma Lipoma X ALL OTHER SYSTEMS NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN	Mesothelioma, malignant	NT	N	N	N	X	N	N	N	N	N	N	N	X	N	N	N	N	N	N	N	N	N	N	N	N
ALL OTHER SYSTEMS NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN	Fibrosarcoma	11	TA .	ΤN	TN	τN	TM	ΤN	T.N	74	14	1.4	7.4	14		1,	1.4	74	74	14		1.4	14	11	.,	
Multiple organs, NOS NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN															x											
Squāmous cell carcinoma, invasive Fibrosarcoma, invasive Fibrosa histiocytoma Mesothelioma, invasive X X Malignant lymphoma, histiocytic type Malignant lymphoma, histiocytic type	ALL OTHER SYSTEMS Multiple organs NOS		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Fibrous histiocytoma Mesothelioma, invasive X X Malignant lymphoma, histiocytic type Malignant lymphoma, histiocytic type	Squamous cell carcinoma, invasive		14		.,	.,			.,	- 1	.,	.,	.,	.,	- •	- '		• •	••		•	• ·	•	• •		
Mesothelioma, invasive X X Malignant lymphoma, histiocytic type Malignant lymphoma, histiocytic type	r ibrosarcoma, invasive Fibrous histiocytoma																									
Malignant lymphoma, histiocytic type	Mesothelioma, invasive					х								х												
Monocytic leukemia X X X X X X X X X X X X X	Malignant lymphoma, histiocytic type	1												••					v			v	v	v		v
	Monocytic leukemia		х				X	X			X			х		х			х			л	л			•

ANIMAL NUMBER	8 4 6	8 4 7	8 4 8	8 4 9	8 5 0	8 5 1	8 5 2	8 5 3	8 5 4	8 5 5	8 5 6	8 5 7	8 5 8	8 5 9	8 6 0	8 6 1	8 6 2	8 6 3	8 6 4	8 6 5	8 6 6	8 6 7	8 6 8	8 6 9	8 7 0
WEEKS ON STUDY	1 1 9	1 3 0	1 3 4	1 0 8	0 7 6	1 2 9	1 1 1	1 4 4	1 2 0	1 0 5	1 4 1	1 2 6	1 3 4	$\frac{1}{2}$	123	1 2 0	1 0 2	1 0 5	1 1 5	1 3 1	1 4 0	1 2 2	0 8 5	0 8 5	1 2 0
ENDOCRINE SYSTEM																									
Pituitary	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*	+	+	+	+
Carcinoma, NOS Adenoma, NOS			х			x			х	х		х									л				
Adrenal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cortical adenoma Pheochromocytoma	x			х				х							х							х			
Pheochromocytoma, malignant		Х																							
Thyroid Follicular cell adenoma	+	*	+	+	+	*	+	+	+	+	+	+	+	+	+	+	+	x ⁺	+	+	+	+	+	+	+
Follicular cell carcinoma			x										х								х				
C-cell adenoma C-cell carcinoma				Х		х			X					x											
Parathyroid	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+
Adenoma, NOS Pancreatic islets		+	-	+	L.	+		+	_		-	L.	-	-	<u>ـ</u> ـ	+	4	4	+	+	+	+	+	+	+
Islet cell adenoma	1	Ŧ	Ŧ	Ŧ	Ŧ	x	-	Ŧ	Ŧ	Ŧ	Ŧ	۴	т	,	Ŧ	Ţ	'	'			x				Ċ
Islet cell carcinoma													Х							Х					
REPRODUCTIVE SYSTEM Mammary gland Adenoma, NOS Adenocarcinoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	+	+	+	+	+	+	+	+
Papillary cystadenocarcinoma, NOS								v			v								х	х		х			
Fibroadenoma Testis	+	+	+	+	+	+	+	X +	+	+	X +	+	+	+	+	+	+	+	^ +	4 +	+	+	+	+	+
Carcinoma, NOS, metastatic						v	v	v	v		v	v	v	v	v	v	v	v	v	v	v	v	х	х	х
Interstitial cell tumor Prostate	X	X +	X +	X +	X +	х +	X +	х +	X +	+	X +	X +	X +	X +	X +	X +	X +	X +	X +	X +	X +	X +	- A +	^ +	л +
Leiomyosarcoma																	N	NT	NT	3.7	N	N	N	N	N
Preputial/clitoral gland Carcinoma, NOS	N	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	N	Ν	Ν	Ν	Ν		N X	Ν	14
Squamous cell carcinoma Keratoacanthoma									x													x			
NERVOUS SYSTEM Brain Carcinoma, NOS, invasive Glioma, NOS Astrocytoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	@X	+	+	+	+
SPECIAL SENSE ORGANS Zymbal gland	- +	+	+	+	N	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Squamous cell carcinoma		X																							
MUSCULOSKELETAL SYSTEM					·																				
Bone	N	Ν	N	N	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Fibroma Fibrosarcoma, invasive																				х					
Osteosarcoma	N	NT	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Ν	N	N	Ν	N	N
Muscle Fibrosarcoma, invasive	N	Ν	Ν	Ν	Ν	N	14	14	14	14		14	N	14	14	14	14	7.4	1,	x		• •			
BODY CAVITIES																									
Mediastinum	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Squamous cell carcinoma, metastatic																									
Mesothelioma, malignant Mesothelioma, metastatic																									
Pericardium	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Osteosarcoma, metastatic	N	Ν	N	N	Ν	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Ν	N	Ν	Ν	N	N
Peritoneum Pheochromocytoma, invasive	1	14	14	14	14	14	14	14	14	14		14		1.	11		1.			.,	•	•	•••	•	•••
Liposarcoma Tunica vaginalis		1		т.	+			+		<u>т</u>	т		+	+	+	+	+	+	+	+	+	+	. +	+	+
Mesothelioma, malignant		Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ		Ŧ	Ŧ	T	F	'	,										
Mesentery	N	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	N
Fibrosarcoma Lipoma			Λ																						
ALL OTHER SYSTEMS																									
Multiple organs, NOS	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	N	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	N	Ν	N
Squamous cell carcinoma, invasive Fibrosarcoma, invasive			x																						
Fibrous histiocytoma	l															х									
Mesothelioma, invasive Malignant lymphoma, lymphocytic type																									
Malignant lymphoma, histiocytic type					Х				-										•-						
Monocytic leukemia	X			Х		х		Х	Х		X							X	х						

@ Multiple occurrence of morphology

									<u> </u>																
ANIMAL NUMBER	8 7 1	8 7 2	8 7 3	8 7 4	8 7 5	8 7 6	8 7 7	8 7 8	8 7 9	8 8 0	8 8 1	8 8 2	8 8 3	8 8 4	8 8 5	886	8 8 7	888	8 8 9	8 9 0	8 9 1	8 9 2	8 9 3	8 9 4	8 9 5
WEEKS ON STUDY	0 9 3	1 1 0	0 9 2	1 3 4	1 1 1	1 3 0	1 0 1	1 4 1	1 0 0	1 2 6	1 0 1	1 4 5	1 3 3	1 2 8	1 3 6	1 4 1	1 1 7	1 4 0	1 4 6	1 3 7	0 9 7	1 1 2	1 0 7	$1\\3\\2$	1 3 3
ENDOCRINE SYSTEM																									
Pituitary	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Adenoma, NOS													х							Х					
Adrenal Cortical adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pheochromocytoma				X				X		Х		X		Х		х						X		X	
Pheochromocytoma, malignant Thyroid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	X +	+	+	+	+	+	+
Follicular cell adenoma																									
Follicular cell carcinoma C-cell adenoma																								X	
C-cell carcinoma Parathyroid	_	7	_	L.	1	-	1	1	÷	+	+	X +	+	X	+	+	X +	÷	+	+	+	-	+	+	+
Adenoma, NOS		Ŧ		Ŧ	Ŧ	т	+	Ŧ	x	T						,			,						
Pancreatic islets Islet cell adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Islet cell carcinoma																		X		х					
REPRODUCTIVE SYSTEM																									
Mammary gland	N	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	Ν	+	+
Adenoma, NOS Adenocarcinoma, NOS													х												
Papillary cystadenocarcinoma, NOS								.,							v		v		v						
Fibroadenoma Testis	+	+	+	X +	+	+	+	X +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷
Carcinoma, NOS, metastatic	XX	x	v	х	v	v	v	v	v	v	v	v	x	x	x	x	v	х	v	х	х	х	x	х	х
Interstitial cell tumor Prostate	+	+	х +	+	х +	х +	x +	X +	х +	+	х +	X +	+	÷	+	+	+	+	+	+	+	÷	+	+	+
Leiomyosarcoma Preputial/clitoral gland	N	N	Ν	N	N	N	N	N	N	Ν	N	Ν	Ν	Ν	N	Ν	N	Ν	Ν	Ν	Ν	N	N	Ν	Ν
Carcinoma, NOS	1	.,	.,		.,	• •		••	.,	•	•	1.	1.		•			• •			-	-	-	-	
Squamous cell carcinoma Keratoacanthoma																х									
NERVOUS SYSTEM Brain	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS, invasive																							х		
Glioma, NOS Astrocytoma									х												х		л		
SPECIAL SENSE ORGANS																									
Zymbal gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Squamous cell carcinoma	ļ																								
MUSCULOSKELETAL SYSTEM Bone	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	+	N	N	Ν	N	N	N	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν
Fibroma				•								•													
Fibrosarcoma, invasive Osteosarcoma										х															
Muscle	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Fibrosarcoma, invasive																									
BODY CAVITIES Mediastinum	N	N	N	N	N	N	N	N	N	N	N	N	N	Ν	N	N	N	N	N	N	N	N	Ν	Ν	N
Squamous cell carcinoma, metastatic	14	14	14	14	14	14	14	14		14	14	11	1	14			.,	1,		-	1.	1,		•••	
Mesothelioma, malignant Mesothelioma, metastatic																				х					
Pericardium	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N
Osteosarcoma, metastatic Peritoneum	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Ν	N
Pheochromocytoma, invasive		14	11		••					1,				•		•	•		X	•	•			•	
Liposarcoma Tunica vaginalis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mesothelioma, malignant	X		X			X	X						N	NT				N	N	N	N	N	N	N	X
Mesentery Fibrosarcoma	N	Ν	Ν	Ν	Ν	Ν	Ν	N	IN	N	IN	IN	IN	ŢN.	IN	19	IN	IN	IN	IN	IN	14	Ν	14	14
Lipoma																									
ALL OTHER SYSTEMS																									
Multiple organs, NOS Squamous cell carcinoma, invasive	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	N	N	N	N	N	Ν	N	IN
Fibrosarcoma, invasive																									
Fibrous histiocytoma Mesothelioma, invasive	x		x			х	x																		х
Malignant lymphoma, lymphocytic type					Х																				
Malignant lymphoma, histiocytic type Monocytic leukemia		х				х		х					х	X	х			х	х			х		X	
•	. I																								

TABLE A2. INDIVIDUAL ANIMAL TUMOR PATHOLOGY OF MALE RATS: CONTROL (Continued)

TABLE A2. INDIVIDUAL ANIMAL TUMOR PATHOLOGY OF MALE RATS: CONTROL (Continued)

WEEKS ON STUDY 1 <th1< th=""> <th1< th=""> <th1< th=""> <th1< th=""> <th< th=""><th>TOTAL: TISSUES TUMORS 118 2 20 118 1 38 3 117 5 6 6 11 18 109 2 118 5 7</th></th<></th1<></th1<></th1<></th1<>	TOTAL: TISSUES TUMORS 118 2 20 118 1 38 3 117 5 6 6 11 18 109 2 118 5 7
Pituitary Carcinoma, NOS Adeenal $+$	2 20 118 1 38 3 117 5 6 11 16 109 2 118 5
Carcinioma, NOS X X X X Adrenal + + + + + + + + + + + + + + + + + + +	2 20 118 1 38 3 117 5 6 11 16 109 2 118 5
Adrenal+ + + + + + + + + + + + + + + + + + +	118 1 38 3 117 5 6 11 16 109 2 118 5
Pheochromocytoma X <td>38 3 117 5 6 11 16 109 2 118 5</td>	38 3 117 5 6 11 16 109 2 118 5
Thyroid + + + + + + + + + + + + + + + + + + +	$ \begin{array}{c} 117 \\ 5 \\ 6 \\ 11 \\ 109 \\ 2 \\ 118 \\ 5 \end{array} $
Folicular cell adenoma X X Folicular cell carcinoma X X C-cell adenoma X X C-cell carcinoma X X Parathyroid + + + + + + + + + + + + + + + + + + +	6 11 16 109 2 118 5
Parathyroid + + + + + + + + + + + + + + + + + + +	109 2 118 5
Pancreatic islets + + + + + + + + + + + + + + + + + + +	118 5
Islet cell carcinoma X REPRODUCTIVE SYSTEM Mammary gland + + + + + + + + + N + N + + + + A Adenoma, NOS	
Mammary gland + + + + + + + + + + N + N + + + + + +	1
Mammary gland + + + + + + + + + + N + N + + + + + +	
	*118
Adenocarcinoma, NOS X Papillary cystadenocarcinoma, NOS	2
Fibroadenoma X X X X	17 118
Testis $+ + + + + + + + + + + + + + + + + + +$	1
Interstitial cell tumor X	114 118
Leiomyosarcoma X Preputial/clitoral gland N N N N N N N N N N N N N N N N N N	*118
Carcinoma, NOS Squamous cell carcinoma Keratoacanthoma	1 6 1
NERVOUS SYSTEM	
Brain $+ + + + + + + + + + + + + + + + + + +$	118
Carcinoma, NOS, invasive Glioma, NOS Astrocytoma X	1 7
SPECIAL SENSE ORGANS Zymbal gland + + + + + + + + + + + + + + + + + + +	*118
Squamous cell carcinoma	3
MUSCULOSKELETAL SYSTEM Bone NNNNNNNNNNNNNNNNNN	*118
Fibroma X	
Fibrosarcoma, invasive Osteosarcoma	1 *118
Muscle NNNNNNNNNNNNNNNNN Fibrosarcoma, invasive	1
BODY CAVITIES	*110
Mediastinum NNNNNNNNNNNNNNNNNNNN Squamous cell carcinoma, metastatic X	*118
Mesothelioma, malignant Mesothelioma, metastatic	
Pericardium NNNNNNNNNNNNNNNNNNN Osteosarcoma, metastatic	*118
Peritoneum N N N N N N N N N N N N N N N N N N N	*118
Liposarcoma	1 *118
Tunica vaginalis $+ + + + + + + + + + + + + + + + + + + $	9 *118
Mesentery Fibrosarcoma Lipoma	1 1
ALL OTHER SYSTEMS Multiple organs, NOS NNNNNNNNNNNNNNNNN	*118
Squamous cell carcinoma, invasive Fibrosarcoma, invasive	
Fibrous histiocytoma Mesothelioma, invasive X	1 9
Malignant lymphoma, lymphocytic type X Malignant lymphoma, histiocytic type	2
Monocytic leukemia X X X X X X	43

* Animals necropsied

ANIMAL NUMBER	0 3 2	0 3 3	0 3 4	0 3 5	0 3 6	0 3 7	0 3 8	0 3 9	0 4 0	0 4 1	0 4 2	0 4 3	0 4 4	0 4 5	046	0 4 7	0 4 8	0 4 9	0 5 0	0 5 1	0 5 2	0 5 3	0 5 4	0 5 5	0 5 6
WEEKS ON STUDY	1 2 6	1 4 6	1 4 4	1 0 3	1 3 9	1 1 9	1 4 6	1 1 3	1 4 6	1 4 6	1 4 0	1 3 8	1 2 3	1 1 5	1 4 6	1 3 4	1 2 8	1 4 6	1 2 5	1 1 9	1 0 0	1 2 6	1 2 3	1 4 6	$\frac{1}{2}$
NTEGUMENTARY SYSTEM kin Squamous cell papilloma Squamous cell carcinoma Basal cell tumor Basal cell carcinoma	+	*	+	+	+ x	+	+	N	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Trichoepithelioma Keratoacanthoma Fibrosarcoma ubcutaneous tissue Squamous cell carcinoma, invasive Sarcoma, NOS	: +	+	+	+	+	+	+	N	+	x +	X +	+	+	+	+	x +	* X	+	+	+	+	+	+	+	+
Fibroma Fibrosarcoma Myxosarcoma Liposarcoma Hemangiosarcoma Neurofibrosarcoma Neurofibrosarcoma							x					X						x	х	х					
ESPIRATORY SYSTEM ungs and bronchi Squamous cell carcinoma, metastatic Alveolar/bronchiolar carcinoma Cortical carcinoma, metastatic C-ell carcinoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibrosarcoma, metastatic Liposarcoma, metastatic rachea	+	+	+	+	+	+	х +	X +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	х +	+
EMATOPOIETIC SYSTEM one marrow oleen Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibroma	+++	++++	+ +	+ +	+	+ +	+	+ +	++++	+++++	++++	+ +	++++	+ +	+ +	+ +	+ +	+ +							
Fibrosarcoma Hemangiosarcoma Imph nodes C-cell carcinoma, metastatic Pheochromocytoma, metastatic Sarcoma, NOS, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibrosarcoma, metastatic hymus Carcinoma, NOS Squamous cell carcinoma	+	+	+	+	-	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	-	-	+
IRCULATORY SYSTEM eart Liposarcoma, metastatic	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+

+: Tissue examined microscopically
 -: Required tissue not examined microscopically
 X: Tumor incidence
 N: Necropsy, no autolysis, no microscopic examination
 S: Animal missexed

No tissue information submitted
 Necropsy, no histology due to protocol
 Autolysis
 Animal missing
 No necropsy performed

					• -																				
ANIMAL NUMBER	0 5 7	0 5 8	0 5 9	0 6 0	0 6 1	0 6 2	0 6 3	0 6 4	0 6 5	0 6 6	0 6 7	0 6 8	0 6 9	0 7 0	0 7 1	0 7 2	0 7 3	0 7 4	0 7 5	0 7 6	0 7 7	0 7 8	0 7 9	0 8 0	0 8 1
WEEKS ON STUDY	1 4 6	1 4 0	1 3 2	1 1 0	1 3 6	1 4 6	1 4 6	1 1 5	1 2 8	1 2 6	1 4 6	1 4 6	1 3 2	0 8 7	1 4 6	1 3 3	1 0 6	1 3 0	1 3 7	0 9 1	1 1 3	1 3 2	1 0 6	1 4 6	1 2 8
INTEGUMENTARY SYSTEM Skin Squamous cell papilioma Squamous cell carcinoma Basal cell tumor Basal cell carcinoma Trichoepithelioma Keratoacanthoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*	+	+	+ x	+	+	+	+	.+	+	+
Fibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Sarcoma, NOS Fibrosa Fibrosarcoma	+	+ X	+	+	+	+	+	+ X	+	+	+ X	+ x	+	+ X	+ X	+	+	+	+	+	+	+	+	+	+
Nytosarooma Liposarooma Hemangiosarcoma Neurofibroma Neurofibrosarcoma		Λ										Λ			л										
RESPIRATORY SYSTEM Lungs and bronchi Squamous cell carcinoma, metastatic Alveolar/bronchiolar carcinoma Cortical carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic	+	+ x	+	+	+	+	+ x	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+
Sarcoma, NOŠ, metastatic Fibrosarcoma, metastatic Liposarcoma, metastatic Trachea	+	x +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
HEMATOPOIETIC SYSTEM Bone marrow Spleen Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibroma	+++	++++	++++	+++	++++	++++	+ +	+++	++	++++	+++	+ +	++++	++++	+++	+ +	+++	+ +	+ +	++++	+ +	+ +	+++++	+++	+++
Fibrosarcoma Hemangiosarcoma Lymph nodes C-cell carcinoma, metastatic Pheochromocytoma, metastatic Sarcoma, NOS, invasive	X +	+	+	÷	+	+	+ X	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibrosarcoma, metastatic Thymus Carcinoma, NOS Squamous cell carcinoma	-	Х +	-	+	-	-	÷	+	Ť	+	+	+	+	+	-	-	+	+	+	+	+	-	+	+	~
CIRCULATORY SYSTEM Heart Liposarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

(Continued)
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ANIMAL NUMBER	0 8 2	0 8 3	0 8 4	0 8 5	0 8 6	0 8 7	0 8 8	0 8 9	0 9 0	0 9 1	0 9 2	0 9 3	0 9 4	0 9 5	0 9 6	0 9 7	0 9 8	0 9 9	1 0 0	1 0 1	1 0 2	1 0 3	1 0 4	1 0 5	1 0 6
WEEKS ON STUDY	1 4 6	1 3 8	1 3 6	1 4 6	1 2 9	1 4 1	1 2 9	1 3 3	1 3 9	1 4 6	0 9 0	1 3 4	1 3 7	0 8 4	1 2 2	1 0 3	0 4 8	1 1 8	1 0 9	0 9 6	1 1 1	1 0 3	1 3 3	1 2 8	1 3 4
INTEGUMENTARY SYSTEM Skin Squamous cell papilloma Squamous cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Basal cell tumor Basal cell carcinoma Trichoepithelioma Keratoacanthoma Fibroarcoma						x	X			x															
Subcutaneous tissue Squamous cell carcinoma, invasive Sarcoma, NOS Fibroma	+	+	+ x	+	+ x	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibrosarcoma Myxosarcoma Liposarcoma Hemangiosarcoma											x														
Neurofibroma Neurofibrosarcoma					x							X													
RESPIRATORY SYSTEM Lungs and bronchi Squamous cell carcinoma, metastatic Alveolar/bronchiolar carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cortical carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibrosarcoma, metastatic																						X			
Liposarcoma, metastatic Trachea	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
HEMATOPOIETIC SYSTEM Bone marrow Spleen Pheochromocytoma, metastatic Sarcoma, NOS, metastatic	++++	+++	+ +	++++	+++	+ +	+++	+ +	+ +	+++	+++	+ +	+ +	++	+ +	+ +	+ +	+ +							
Fibroma Fibrosarcoma Hemangiosarcoma Lymph nodes	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
C-cell carcinoma, metastatic Pheochromocytoma, metastatic Sarcoma, NOS, invasive Fibrosarcoma, metastatic Thymus	+	-	+	+	+	+	+	_	_	+	+	+	+	_	+	+	+	+	+		+	+	+	+	+
Carcinoma, NOS Squamous cell carcinoma																									
CIRCULATORY SYSTEM Heart Liposarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

TABLE A2.	INDIVIDUAL	ANIMAL TUMOR	R PATHOLOGY	OF	MALE	RATS:	1% TREMOLITE	
			(Continued					

ANIMAL NUMBER	1 0 7	1 0 8	1 0 9	1 1 0	1 1 1	1 1 2	1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8	1 1 9	1 2 0	1 2 1	1 2 2	1 2 3	1 2 4	1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 3 0	1 3 1
WEEKS ON STUDY	1 4 6,	1 2 6	1 3 2	1 4 6	1 2 7	1 2 5	0 9 8	1 0 3	1 2 2	1 1 4	1 1 7	1 2 2	1 0 9	1 3 0	1 1 5	1 1 1	1 4 6	1 4 1	0 9 7	1 0 5	1 1 5	1 3 1	$\frac{1}{2}$ 7	1 1 0	1 4 6
INTEGUMENTARY SYSTEM Skin Souamous cell papilloma	+	+	*	+	+	+	+	+	+	+	+	+	+ x	+	+	*	+	+	+	. +	+	+	+	+	+
Squamous cell papilloma Squamous cell carcinoma Basal cell tumor Basal cell carcinoma Trichospithelioma Keratoacanthoma Fibrosarcoma				x													x								
Subcutaneous tissue Squamous cell carcinoma, invasive Sarcoma, NOS Fibroma Fibrosarcoma	+	+	+	+ x	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Myxosarcoma Liposarcoma Hemangiosarcoma Neurofibroma Neurofibrosarcoma												x										_			
RESPIRATORY SYSTEM Lungs and bronchi Squamous cell carcinoma, metastatic Alveolar/bronchiolar carcinoma Cortical carcinoma, metastatic C-ceil carcinoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+
Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibrosarcoma, metastatic Liposarcoma, metastatic Trachea	+	+	+	+	+	+	+	+	+	+	+	+	X +	+	х +	+	+	+	+	+	+	+	+	+	+
HEMATOPOIETIC SYSTEM																									
Bone marrow Spieen Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibrosarcoma	++	+ +	+++	+ +	+ +	+ +	+ +	++++	+ +	+ +															
Hemangiosarcoma Lymph nodes C-cell carcinoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pheochromocytoma, metastatic Sarcoma, NOS, invasive Fibrosarcoma, metastatic Thymus	+	÷	+	-	+	+		+	+	+	х +	+	+	+	-	+	+	+	-	+	+	+	+	+	+
Carcinoma, NOS Squamous cell carcinoma	l																								
CIRCULATORY SYSTEM Heart Liposarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	* X	+	+	+	+	+	+	+	+	+	+	+	+

ANIMAL NUMBER	1 3 2	1 3 3	1 3 4	1 3 5	1 3 6	1 3 7	1 3 8	1 3 9	1 4 0	1 4 1	1 4 2	1 4 3	1 4 4	1 4 5	1 4 6	1 4 7	1 4 8	1 4 9	1 5 0	1 5 1	1 5 2	1 5 3	1 5 4	1 5 5	1 5 6
WEEKS ON STUDY	1 0 9	0 9 4	1 4 6	1 4 6	1 2 8	1 1 6	1 2 5	1 0 0	1 4 6	1 1 1	1 0 3	1 0 4	1 4 6	1 0 9	1 1 8	1 1 1	1 1 1	0 8 7	$\frac{1}{1}$ 2	1 4 1	1 2 6	1 2 6	0 8 9	1 2 2	0 4 6
INTEGUMENTARY SYSTEM Skin Squamous cell papilloma Squamous cell carcinoma Basal cell tumor Basal cell carcinoma Trichoepithelioma Keratoacanthoma	+	+	+	+	+	+	+	+	+ x	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Sarcoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ i
Fibroma Fibrosarcoma Myxosarcoma			x							x				x	X X		X								
Liposarcoma Hemangiosarcoma Neurofibroma Neurofibrosarcoma						x					x														
RESPIRATORY SYSTEM Lungs and bronchi Squamous cell carcinoma, metastatic Alveolarforonchiolar carcinoma Cortical carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibrosarcoma, metastatic Liposarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Trachea HEMATOPOIETIC SYSTEM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bone marrow Spleen Pheochromocytoma, metastatic Sarcoma, NOS, metastatic	+ +	+ +	+ +	+ +	+ +	+ +	+ +																		
Fibroma Fibrosarcoma Hemangiosarcoma Lymph nodes C-cell carcinoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	х +	+	+	+	+	+	+	+	X +	+	+	+	+
Pheochromocytoma, metastatic Sarcoma, NOS, invasive Fibrosarcoma, metastatic Thymus Carcinoma, NOS Squamous cell carcinoma	+	+		-	+	+	+	+	+	+	+	+	+	-	+	+ X	+	+	_	+	+	_	_	-	+
CIRCULATORY SYSTEM Heart Liposarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+

ANIMAL NUMBER	1 5 7	1 5 8	1 5 9	1 6 0	1 6 1	1 6 2	1 6 3	1 6 4	1 6 5	1 6 6	1 6 7	1 6 8	1 6 9	1 7 0	1 7 1	1 7 2	1 7 3	1 7 4	1 7 5	1 7 6	1 7 7	1 7 8	1 7 9	1 8 0	1 8 1
WEEKS ON STUDY	1 4 1	$1 \\ 2 \\ 2$	1 0 8	1 1 6	1 3 5	1 3 8	1 2 3	1 2 8	1 1 5	1 2 3	1 1 1	1 1 6	1 0 3	1 0 1	1 1 5	1 0 3	$\frac{1}{2}$	1 3 8	0 9 8	1 4 6	1 1 0	$\frac{1}{2}$	1 1 5	1 1 1	1 4 6
INTEGUMENTARY SYSTEM Skin Squamous cell papilloma Squamous cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	*	+	+	+	+	+
Basal cell tumor Basal cell carcinoma Trichoepithelioma Keratoacanthoma	x	x		X																		x	x		
Fibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Sarcoma, NOS Fibroma	+	+ X	+	X +	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+
Fibrosarcoma Myxosarcoma Liposarcoma Hemangiosarcoma Neurofibrosarcoma Neurofibrosarcoma		л				л																x x	л		
RESPIRATORY SYSTEM Lungs and bronchi Squamous cell carcinoma, metastatic Aiveolar/bronchiolar carcinoma Cortical carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibrosarcoma, metastatic Liposarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	. +	+
Trachea	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+
HEMATOPOIETIC SYSTEM Bone marrow Spieen Pheochromocytoma, metastatic Sarcoma, NOS, metastatic	+ +	+ +	+ +	+++	+++	+++	++	+ +	+ +	+++++	+ +	+ +	+ +	++++	+ +	+ +	+ +	+ +	++++	+ +	+ +	++	+ +	+++	+++
Fibroma Fibrosarcoma Hemangiosarcoma Lymph nodes C-ceil carcinoma, metastatic	+	+	+	х +	+	+	+	+	+	+	+	+	+	+	+	+	X +	+	+	+	+	+	+	+	+
Pheochromocytoma, metastatic Sarcoma, NOS, invasive Fibrosarcoma, metastatic																				x					
Thymus Carcinoma, NOS Squamous cell carcinoma	-	~	+	+	+	+	+	-	+	+	+	+	+	-		+	-	-	+	+	+	-	+	+	+
CIRCULATORY SYSTEM Heart Liposarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

ANIMAL NUMBER	1 8 2	1 8 3	1 8 4	1 8 5	1 8 6	1 8 7	1 8 8	1 8 9	1 9 0	1 9 1	1 9 2	1 9 3	1 9 4	1 9 5	1 9 6	1 9 7	1 9 8	1 9 9	2 0 0	2 0 1	2 0 2	2 0 3	2 0 4	2 0 5	2 0 6
WEEKS ON STUDY	1 2 9	1 1 1	1 0 0	1 2 9	1 2 8	1 3 8	0 8 1	1 2 5	1 3 7	0 8 5	1 4 6	1 1 4	1 2 9	1 3 8	0 8 4	0 7 6	1 1 3	1 2 3	1 2 5	1 0 9	0 9 8	0 8 5	1 3 7	1 1 1	
INTEGUMENTARY SYSTEM Skin Squamous cell papilloma Squamous cell carcinoma Basai cell tumor Basal cell carcinoma Trichoepithelioma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	÷	+	N
Keratoácanthoma Fibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Sarcoma, NOS Fibrosarcoma Myxosarcoma	+	+	+ X	+	+	+ X	+	+	+	+	+ x	+	+ X	+	+	+	+ X	+	+	+ X	+	+ X	+	+	N
Liposarcoma Hemangiosarcoma Neurofibrosarcoma Neurofibrosarcoma														x				x							
RESPIRATORY SYSTEM Lungs and bronchi Squamous cell carcinoma, metastatic Alveolar/bronchiolar carcinoma Cortical carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibrosarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*	+	+ X	+	+	+
Liposarcoma, metastatic Trachea	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+
HEMATOPOIETIC SYSTEM Bone marrow Spleen Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibroma Fibrosarcoma	++++	+ +	+ +	+ +	+++	++++	 +	++++	+++	+ +	+ +	+ +	+ +	+ +	+++	+++	++++	+ +	+ +	+++	+++	+ +	+ +	+++	+++
Hemangiosarcoma Lymph nodes C-cell carcinoma, metastatic Pheochromocytoma, metastatic Sarcoma, NOS, invasive Fibrosarcoma, metastatic	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	÷	+	+	+
Thymus Carcinoma, NOS Squamous cell carcinoma	+	+	+	+	+	+	+	+	+	-	-	+	+	-	+	+	+	-	+	+	-	-	+	-	+
CIRCULATORY SYSTEM Heart Liposarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

TABLE A2.	INDIVIDUAL	ANIMAL	TUMOR	PATHOLOGY	OF	MALE	RATS:	1% TRE	MOLITE
				(Continued	l)				

ANIMAL NUMBER	2 0 7	2 0 8	2 0 9	2 1 0	2 1 1		2 1 3	2 1 4	$^2_{1}_{5}$	2 1 6	2 1 7	2 1 8	2 1 9	2 2 0	$\frac{2}{2}{1}$	2 2 2	2 2 3	2 2 4	2 2 5	2 2 6	2 2 7	2 2 8	2 2 9	2 3 0	2 3 1
WEEKS ON STUDY	1 1 3	0 8 5	1 2 8	0 9 1	1 1 0	1 1 4	1 2 7	1 2 7	$\frac{1}{2}$	1 2 4	1 3 5	1 2 0	1 3 4	1 2 0	1 3 5	1 2 0	0 5 5	0 8 3	1 2 8	1 4 5	1 0 9	1 4 2	1 1 2	1 4 0	1 3 9
INTEGUMENTARY SYSTEM Skin Squamous cell papilloma Squamous cell carcinoma Basal cell tumor Basal cell carcinoma Trichoepithelioma	N	+	+	+	+	+	+	+	+ X	x *	+	+	+	+ X	+	+	+	+	+	+	+	*	+	+ x	+
Keratoacanthoma Fibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Sarcoma, NOS Fibroma Fibrosarcoma	N	+	+ X	+ X	+	+ X	+ X	+	+	+	+	+	+	+ X	+ X	+ X	+	+	+	+ X	+	+	+	+	+
Myxosarcoma Liposarcoma Hemangiosarcoma Neurofibrosarcoma Neurofibrosarcoma RESPIRATORY SYSTEM																									
RESPIRATORY SYSTEM Lungs and bronchi Squamous cell carcinoma, metastatic Alveolar/bronchiolar carcinoma Cortical carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibrosarcoma, metastatic Liposarcoma, metastatic Trachea	+	+	+	+	+	+	+	+	+	+	+	+ +	++	++	+	+	+	+	+	++	+	+	+	+	+
HEMATOPOIETIC SYSTEM Bone marrow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Spleen Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibroma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+
Fibrosarcoma Hemangiosarcoma Lymph nodes C-cell carcinoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	X +	+	+	+	+	+	+	+	+	+	+	+	+
Pheochromocytoma, metastatic Sarcoma, NOS, invasive Fibrosarcoma, metastatic Thymus Carcinoma, NOS Squamous cell carcinoma	+	+		+	+	+	+	+	+	+	+	÷	+	_	+	+	+	+	+	+	+	X +	+	-	+
CIRCULATORY SYSTEM Heart Liposarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

ANIMAL NUMBER	2 3 2	2 3 3	2 3 4	2 3 5	2 3 6	2 3 7	2 3 8	2 3 9	2 4 0	2 4 1	2 4 2	2 4 3	2 4 4	2 4 5	2 4 6	2 4 7	2 4 8	2 4 9
WEEKS ON STUDY	1 4 0	1 4 6	1 4 5	0 8 5	1 4 6	1 3 2	1 4 6	1 4 6	1 0 7	1 3 6	1 1 8	1 0 3	1 1 0	0 1 4	0 1 4	0 1 4	1 4 6	1 1 7
FARY SYSTEM l papilloma l carcinoma tor cinoma ioma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
oma issue l carcinoma, invasive	+	+	+	+	+	+	+	+	+	+	х +	+	+	+	+	+	+	+

ANIMAL NUMBER	2 3 2	2 3 3	2 3 4	2 3 5	2 3 6	2 3 7	2 3 8	2 3 9	2 4 0	2 4 1	2 4 2	2 4 3	2 4 4	2 4 5	2 4 6	2 4 7	2 4 8	2 4 9	2 5 0	2 5 1	2 5 2	2 5 3	2 5 4	2 5 5	2 5 6
WEEKS ON STUDY	1 4 0	1 4 6	1 4 5	0 8 5	1 4 6	1 3 2	1 4 6	1 4 6	1 0 7	1 3 6	1 1 8	1 0 3	1 1 0	0 1 4	0 1 4	0 1 4	1 4 6	1 1 7	1 4 0	1 4 0	1 4 4	1 2 8	1 4 2	1 4 3	1 3 5
INTEGUMENTARY SYSTEM Skin Squamous cell papilloma Squamous cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Squamous ceil carcinoma Basal cell tumor Trichoepithelioma Keratoacanhoma											x									x	x			x	
Fibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Sarcoma, NOS	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibroma Fibrosarcoma Myxosarcoma	x						Λ	x			x										x		x		
Liposarcoma Hemangiosarcoma Neurofibrosarcoma Neurofibrosarcoma								x																	
RESPIRATORY SYSTEM Lungs and bronchi Squamous cell carcinoma, metastatic Alveolar/bronchiolar carcinoma Cortical carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Sarcoma, NOS, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+
Fibrosarcoma, metastatic Liposarcoma, metastatic Trachea	+	+	+	+	÷	+	+	+	÷	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
HEMATOPOIETIC SYSTEM Bone marrow Spleen Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibroma	+++	+ +	+ +	+ +	+ +	+ + X	+ +	+ +	+ +	+ +	+++	+ +	+ +	+ +	+ +	+ +	++++	++++	+ +	+ +	+++	+ +	+ +	+ +	+++
Fibrosarcoma Hemangiosarcoma Lymph nodes C-ceil carcinoma, metastatic Pheochromocytoma, metastatic Sarcoma, NOS, invasive	+	+	+	+	+	+	+.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibrosarcoma, metastatic Thymus Carcinoma, NOS Squamous cell carcinoma	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-	-	+	+
CIRCULATORY SYSTEM Heart Liposarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

																	_							_		
NUMBER	5 7	5 8	5 9	6 0	6 1	6 2	6 3	6 4	6 5	6 6	6 7	6 8	6 9	7 0	7 1	7 2	7 3	7 4	7 5	7 6	7 7	7 8	7 9	8 0	8 1	TOTAL
WEEKS ON STUDY	1 1 5	1 4 6	$\frac{1}{2}$ 5	1 4 4	1 4 0	1 1 0	1 2 9	1 4 3	0 1 4	1 1 9	1 3 9	1 4 5	1 2 3	1 4 0	1 3 4	1 4 6	1 2 7	0 8 6	1 1 6	0 9 5	1 4 5	1 4 5	1 3 3	1 2 8	0 8 5	TOTAL: TISSUES TUMORS
INTEGUMENTARY SYSTEM Skin Squamous cell papilloma Squamous cell carcinoma Basal cell tumor Basal cell carcinoma Trichoepithelioma Keratoacanthoma	+	+ X	+	+	+	+	+	+	+	*	+	+ x	+	+	+	+	+	+	+	+	+	+	+	+	+	*250 9 4 2 8 1 13
Fibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Sarcoma, NOS Fibrosar Fibrosarcoma Myxosarcoma Liposarcoma Hemangiosarcoma Neurofibroma Neurofibrosarcoma	+ X	+ X	+	+ X	+ X	+	+ X	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	*250 1 3 36 11
RESPIRATORY SYSTEM Jungs and bronchi Squamous cell carcinoma, metastatic Alveolar/bronchiolar carcinoma Cortical carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250 1 2 1 5 3
Sarcoma, NOŠ, metastatic Fibrosarcoma, metastatic Liposarcoma, metastatic Trachea	Х +	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	1 1 2 250
HEMATOPOIETIC SYSTEM Jone marrow Spleen Pheochromocytoma, metastatic Sarcoma, NOS, metastatic Fibroma	++	++++	+ +	++++	++++	+++	+++	+++	+++	+++++++++++++++++++++++++++++++++++++++	+++	++++	+++	+++	++++	+++	+++	+++	+++	+++	++++	++++	+ +	+++	+++	248 250 1 1 1
Fibrosarcoma Hemangiosarcoma yymph nodes C-cell carcinoma, metastatic Pheochromocytoma, metastatic Sarcoma, NOS, invasive	+	+	+	-	+	+	+	+	+	+	+	+	+	+	*	+	+	+	+	+	+	+	+	+	+	$ \begin{array}{c} 1 \\ 4 \\ 250 \\ 2 \\ 1 \\ 2 \\ 1 \end{array} $
Fibrosarcoma, metastatic Phymus Carcinoma, NOS Squamous cell carcinoma	+	+	+	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	196 1 1
CIRCULATORY SYSTEM Heart Liposarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250

* Animals necropsied

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ANIMAL NUMBER	0 3 2	0 3 3	0 3 4	0 3 5	0 3 6	0 3 7	0 3 8	0 3 9	0 4 0	0 4 1	0 4 2	0 4 3	0 4 4	0 4 5	0 4 6	0 4 7	0 4 8	0 4 9	0 5 0	0 5 1	0 5 2	0 5 3	0 5 4	0 5 5	0 5 6
WEEKS ON STUDY	1 2 6	1 4 6	1 4 4	1 0 3	1 3 9	1 1 9	1 4 6	1 1 3	1 4 6	1 4 6	1 4 0	1 3 8	1 2 3	1 1 5	1 4 6	1 3 4	1 2 8	1 4 6	1 2 5	1 1 9	1 0 0	1 2 6	1 2 3	1 4 6	$1 \\ 2 \\ 1$
DIGESTIVE SYSTEM	-									·															
Oral cavity	N	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Squamous cell carcinoma									1.	L.	1.	1.		-		+	X	<u>т</u>	ъ	-	Ŧ	-	±.	<u>ь</u>	+
Salivary gland Sarcoma, NOS	+	+	+	+	+	÷	+	+	+	Ŧ	Ŧ	+	+	+	+	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	x	т
Fibrosarcoma																									
Liver Bile duct consistence	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bile duct carcinoma Neoplastic nodule																									
Hepatocellular carcinoma																									
Monocytic leukemia Bile duct																								-	1
Gallbladder & common bile duct	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň
Pancreas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS	Ì																								
Transitional cell carcinoma, invasive Acinar cell adenoma															х	x						X			
Acinar cell carcinoma																									
Mixed tumor, benign Esophagus																	+	+	+	-	-	-		X +	+
Stomach	ļ.	+	-	÷	÷	+	+	+	÷	+	+	÷	+	+	+	+	÷	+	+	+	+	+	+	+	+
Squamous cell papilloma	1																								
Squamous cell carcinoma Sarcoma, NOS																									
Small intestine	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenomatous polyp, NOS																									
Mucinous cystadenocarcinoma Sarcoma, NOS, metastatic						Х																			
Fibroma																									
Leiomyoma																									
Leiomyosarcoma Large intestine	1				4	4	4		-		4		1	+	4	4	+	+	1	-	+	+	+	<u>ـــ</u>	
Adenomatous polyp, NOS	1	т	-	Ŧ	Ŧ	Τ.	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	т	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	
Mucinous cystadenocarcinoma																									
URINARY SYSTEM	-																								
Kidney	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Transitional cell carcinoma Tubular cell adenoma																									
Tubular cell adenocarcinoma	+											х													
Sarcoma, NOS																									
Urinary bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ENDOCRINE SYSTEM	-																-	• •							
Pituitary	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Adenoma, NOS	x	X		х	X	x													x			х			
Adrenal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cortical adenoma																							Х		
Cortical carcinoma Pheochromocytoma		х		х						х	X		X					х							х
Pheochromocytoma, malignant							х				**		48					•••						Х	
Ganglioneuroma																									
Thyroid Follicular cell adenoma	+	+	+	+	+	+	+	+	+	x x	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Follicular cell carcinoma			х							A	X X														
C-cell adenoma					X						X														х
C-cell carcinoma Parathyroid	+	X +	+	+	+	+	+	+	+	+	+	+	X +	+	+	+	+	+	+	+	+	+	+	+	+
Adenoma, NOS					'				1.	1		'			1		т.	17	1.						
Pancreatic islets Islet cell adenoma	+	+	+	+	+	÷	+	+	+	÷	+	+	+	*	+	+	+	+	+	+	+	+	+	+	+
Islet cell adenoma Islet cell carcinoma										х				л											
					(U	on		400	.,																
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ANIMAL NUMBER	0 5 7	0 5 8	0 5 9	0 6 0	0 6 1	0 6 2	0 6 3	0 6 4	0 6 5	0 6 6	0 6 7	0 6 8	0 6 9	0 7 0	0 7 1	0 7 2	0 7 3	0 7 4	0 7 5	0 7 6	0 7 7	0 7 8	0 7 9	0 8 0	0 8 1
WEEKS ON STUDY	1 4 6	1 4 0	1 3 2	1 1 0	1 3 6	1 4 6	1 4 6	1 1 5	1 2 8	1 2 6	1 4 6	1 4 6	1 3 2	0 8 7	1 4 6	1 3 3	1 0 6	1 3 0	1 3 7	0 9 1	1 1 3	1 3 2	1 0 6	1 4 6	1 2 8
DIGESTIVE SYSTEM												·····													
Oral cavity Squamous cell carcinoma	N	Ν	N	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	N	N	Ν	Ν	Ν	N	N	N	Ν	Ν	Ν	Ν	Ν	Ν
Salivary gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sarcoma, NOS																									
Fibrosarcoma Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bile duct carcinoma																									
Neoplastic nodule Hepatocellular carcinoma	x																								
Monocytic leukemia																								L	
Bile duct Gallbladder & common bile duct	N N	Ň	, N	-+ N	, N	- N	- N	+ N	_N^+	-+ N	N N	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň	Ň
Pancreas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Transitional cell carcinoma, invasive Acinar cell adenoma																								x	
Acinar cell carcinoma																			x						
Mixed tumor, benign Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Stomach	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Squamous cell papilloma Squamous cell carcinoma																									
Sarcoma, NOS																						X			
Small intestine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenomatous polyp, NOS Mucinous cystadenocarcinoma																									
Sarcoma, NOS, metastatic																						х			
Fibroma Leiomyoma																									
Leiomyosarcoma	1.															+	1	-		Ŧ	Ŧ	+	1	+	+
Large intestine Adenomatous polyp, NOS	+	+	÷	+	+	+	+	+	Ŧ	+	+	+	Ŧ	-	Ŧ	Ŧ	Ŧ	-		T	т	r	-		
Mucinous cystadenocarcinoma																									
URINARY SYSTEM								·				·····													
Kidney Transitional cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Ŧ	+	Ŧ	• •	-	Ŧ	Ŧ	т	Ŧ	т
Tubular cell adenoma																17									
Tubular cell adenocarcinoma Sarcoma, NOS																X									
Urinary bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+
ENDOCRINE SYSTEM																			~						
Pituitary	4	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	· +	+	+	+	+	+	+
Carcinoma, NOS				х																		x			
Adenoma, NOS Adrenal	+	+	+	+	+	X	+	+	X +	+	+	+	+	+	+	+	+	+	- +	+	+	+	+	+	+
Cortical adenoma		x																							
Cortical carcinoma	X		х				x			х			x			х	х							х	
Pheochromocytoma Pheochromocytoma, malignant	1		л				л			л			~												
Ganglioneuroma																1	+	+			1	+	+	+	+
Thyroid Follicular cell adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Ŧ	Ŧ	x		· •	Ŧ	-	Ŧ	Ŧ	1
Follicular cell carcinoma		Х														X									
C-cell adenoma C-cell carcinoma	X	x					x										х							х	
Parathyroid	1		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	- 1	- +	+	+	+	+	+	+
Adenoma, NOS			Ŀ	L	4	4	+	ــ	+	+	÷	÷	+	+	+	+	+		+	. +	+	+	+	+	+
Pancreatic islets Islet cell adenoma	1	+	+	Ŧ	+	Ŧ	7		r	F	F		-	F	F		ī					X			
Islet cell carcinoma																									
	!																							<u> </u>	

						• •																				
ANIMAL NUMBER		0 8 2	0 8 3	0 8 4	0 8 5	0 8 6	0 8 7	0 8 8	0 8 9	0 9 0	0 9 1	0 9 2	0 9 3	0 9 4	0 9 5	0 9 6	0 9 7	0 9 8	0 9 9	1 0 0	1 0 1	1 0 2	1 0 3	1 0 4	1 0 5	1 0 6
WEEKS ON STUDY	-	1 4 6	1 3 8	1 3 6	1 4 6	1 2 9	1 4 1	1 2 9	1 3 3	1 3 9	1 4 6	0 9 0	1 3 4	1 3 7	0 8 4	$1 \\ 2 \\ 2$	1 0 3	0 4 8	1 1 8	1 0 9	0 9 6	1 1 1	1 0 3	1 3 3	$1 \\ 2 \\ 8$	1 3 4
DIGESTIVE SYSTEM	!																									
Oral cavity Squamous cell carcinoma		Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Salivary gland	ł	+	+	+	+	+	+	+	+	+	+	+	_	+	+	+	+	+	+	+	+	+	+	+	+	+
Sarcoma, NOS																										
Fibrosarcoma Liver		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bile duct carcinoma Neoplastic nodule Hepatocellular carcinoma Monocytic leukemia																										
Bile duct Gallbladder & common bile duct		+ N	+ N	+ N	- N	+ N	+ N	, N	+ N	+ N	Ň	, N	, N	, N	+ N	+ N	+ N	+ N	+ N	+ N	-+ N	-+ N	-+ N	Ň	+ N	+ N
Pancreas		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Transitional cell carcinoma, invasive Acinar cell adenoma Acinar cell carcinoma														x										x		
Mixed tumor, benign																										
Esophagus		+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+
Stomach Squamous cell papilloma		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	×	+	+	+	+	+	+
Squamous cell carcinoma																										
Sarcoma, NOS Small intestine		÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenomatous polyp, NOS Mucinous cystadenocarcinoma Sarcoma, NOS, metastatic Fibroma												,		•					,	,						
Leiomyoma Leiomyosarcoma Large intestine		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenomatous polyp, NOS Mucinous cystadenocarcinoma																										
URINARY SYSTEM	í																									
Kidney Transitional cell carcinoma Tubular cell adenoma		+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Tubular cell adenocarcinoma																										
Sarcoma, NOS Urinary bladder	ţ	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ENDOCRINE SYSTEM	—— Í-																									
Pituitarv	ſ	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS																										
Adenoma, NOS Adrenal		+	+	+	+	÷	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	X
Cortical adenoma							,														•					
Cortical carcinoma Pheochromocytoma				х				x						х												
Pheochromocytoma, malignant	1							Λ						л												
Ganglioneuroma																										
Thyroid Follicular cell adenoma Follicular cell carcinoma		+	+	+	*	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*
C-cell adenoma C-cell carcinoma							v		v										X	v			v		v	
Parathyroid		+	+	+	+	+	X +	÷	X	+	+	+	÷	+	+	+	+	+	+	X +	_	+	X +	+	X +	+
Adenoma, NOS							,	x				,	,		,	x		'	r	r.						
Pancreatic islets Islet cell adenoma	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Islet cell adenoma Islet cell carcinoma		х																								
	_																									

						••••			.,																
ANIMAL NUMBER	1 0 7	1 0 8	1 0 9	1 1 0	1 1 1	1 1 2	1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8	1 1 9	1 2 0	1 2 1	1 2 2	1 2 3	1 2 4	1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 3 0	1 3 1
WEEKS ON STUDY	1 4 6	1 2 6	1 3 2	1 4 6	$\frac{1}{2}$	1 2 5	0 9 8	1 0 3	1 2 2	1 1 4	1 1 7	1 2 2	1 0 9	1 3 0	1 1 5	1 1 1	1 4 6	1 4 1	0 9 7	1 0 5	1 1 5	1 3 1	$\frac{1}{2}$	1 1 0	1 4 6
DIGESTIVE SYSTEM																									
Oral cavity Squamous cell carcinoma	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	N	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ņ	Ν	N	Ν
Salivary gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sarcoma, NOS Fibrosarcoma																									
Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bile duct carcinoma									х																
Neoplastic nodule Hepatocellular carcinoma				х					х																
Monocytic leukemia											X														
Bile duct Gallbladder & common bile duct	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	Ň	+ N
Pancreas	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Transitional cell carcinoma, invasive																				х					
Acinar cell adenoma				х										х				х							x
Acinar cell carcinoma																									
Mixed tumor, benign Esophagus	+	+	+	+	+	Ŧ	+	+	+	Ŧ	+	+	+	+	+	+	+	+	+	+	+	4	+	+	+
Stomach	+	+	÷	+	+	÷	+	+	+	+	+	+	+	+	+	+	÷	+	+	÷	÷	÷	÷	÷	÷
Squamous cell papilloma																									x
Squamous cell carcinoma Sarcoma, NOS																									л
Small intestine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	÷	+
Adenomatous polyp, NOS Mucinous cystadenocarcinoma														х											
Sarcoma, NOS, metastatic Fibroma														л											
Leiomyoma Leiomyosarcoma										х						х									
Large intestine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	÷	+
Adenomatous polyp, NOS Mucinous cystadenocarcinoma																									
URINARY SYSTEM	-																								
Kidney Transitional cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Tubular cell adenoma																									
Tubular cell adenocarcinoma Sarcoma, NOS			X																			х			
Urinary bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ENDOCRINE SYSTEM																						-			
Pituitary	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Adenoma, NOS		x			х	v													х						
Adrenal	+	- ^ +	+	+	÷.	X +	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+
Cortical adenoma																v									
Cortical carcinoma Pheochromocytoma	x	х											х			X X		х							
Pheochromocytoma, malignant											Х				Х										
Ganglioneuroma Thyroid	-	<u>ـ</u>	+	<u>ـ</u> د	-	-		+	+	1	+	±.	1	ъ	Ŧ	*	+	+	+	+	+	+	+	+	+
Follicular cell adenoma	+	Ŧ	Ŧ	Ŧ	T	Ŧ	٣	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	т	Ŧ		Ŧ	7	Ŧ	Ŧ	1	т	'		
Follicular cell carcinoma					v		v	v					v					X	v						х
C-cell adenoma C-cell carcinoma		X		x	X		х	X			х	х	х				х		x						
Parathyroid	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
arathyrotd	1																х								
Adenoma, NOS		4		+	+	1.	+	÷.	+	-	+	1	-	-											
Adenoma, NOS Pancreatic islets Islet cell adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Ŧ	+

ANIMAL NUMBER	1 3 2	1 3 3	1 3 4	1 3 5	1 3 6	1 3 7	1 3 8	1 3 9	1 4 0	1 4 1	$\frac{1}{4}$	1 4 3	1 4 4	1 4 5	1 4 6	1 4 7	1 4 8	1 4 9	1 5 0	1 5 1	1 5 2	1 5 3	1 5 4	1 5 5	1 5 6
WEEKS ON STUDY	1 0 9	0 9 4	1 4 6	1 4 6	1 2 8	1 1 6	1 2 5	1 0 0	1 4 6	1 1 1	1 0 3	1 0 4	1 4 6	1 0 9	1 1 8	1 1 1	1 1 1	0 8 7	$1\\1\\2$	1 4 1	1 2 6	1 2 6	0 8 9	1 2 2	0 4 6
DIGESTIVE SYSTEM	_				_					_								_							
Oral cavity Squamous cell carcinoma	N	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	N	Ν	Ν	N	Ν	Ν	N	Ν	Ν	Ν	N	N	N
Salivary gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	_	+	+	+	+	+	+
Sarcoma, NOS	1																								
Fibrosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	X +	+	+	+	+	+	+	+	+	+	-
Bile duct carcinoma																									
Neoplastic nodule Hepatocellular carcinoma																									
Monocytic leukemia																									
Bile duct Fallbladder & common bile duct	, t N	+ N	+ N	+ N	+ N	+ N	n+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	$_{\rm N}^+$	+ N	, N	i						
ancreas		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-
Carcinoma, NOS Transitional cell carcinoma, invasive	Í																								
Acinar cell adenoma									х				х							х					
Acinar cell carcinoma																									
Mixed tumor, benign sophagus	İ +	+	+	+	+	+	+	+	+	+	+	+	+	+	_	+	+	+	+	+	+	+	+	+	
tomach	- I ÷	+	+	÷	÷	+	÷	+	+	÷	+	÷	÷	+	+	+	+	÷	+	÷	+	+	÷	+	
Squamous cell papilloma																									
Squamous cell carcinoma Sarcoma, NOS																									
mall intestine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Adenomatous polyp, NOS Mucinous cystadenocarcinoma																									
Sarcoma, NOS, metastatic																									
Fibroma																									
Leiomyoma Leiomyosarcoma																									
Large intestine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Adenomatous polyp, NOS Mucinous cystadenocarcinoma																									
·	_ L										_														
JRINARY SYSTEM Kidney																	_								
Transitional cell carcinoma	+	+	-	+	Ŧ	+	+	+	Ŧ	+	+	+	+	Ŧ	÷	Ŧ	+	+	Ŧ	+	Ŧ	Ŧ	Ŧ	Ŧ	
Tubular cell adenoma																									
Tubular cell adenocarcinoma Sarcoma, NOS																									
Jrinary bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
NDOCRINE SYSTEM											_														
Pituitary	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Carcinoma, NOS																						X			
Adenoma, NOS drenal	+	+	+		4		-	-	-	+	-	+	-	-	+	+	X	+	+	+	+	1	+	X	
Cortical adenoma	Ŧ	Ŧ	Ŧ	+	+	Ŧ	Ŧ	Ŧ	+	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	7	
Cortical carcinoma			v	v															x			x			
Pheochromocytoma Pheochromocytoma, malignant			х	х		х			х				х		х				л			л		х	
Ganglioneuroma																									
hyroïd Follicular cell adenoma	+	+	+	+	+	+	+	+	+	+	+	+	x x	+	+	+	+	+	-	+	+	+	+	+	
Follicular cell carcinoma												Х	A												
C-cell adenoma						х				х				Х			х			Х				v	
C-cell carcinoma arathyroid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	~	+	_	+	-	X +	
Adenoma, NOS	1																			X					
Ancreatic islets Islet cell adenoma	ı +	+	+	+	+	+	+	+	+	+	+	+	*	+	+	+	+	+	+	+	+	+	+	*	
Islet cell carcinoma													•		х					х				A	

						••••			.,																
ANIMAL NUMBER	1 5 7	1 5 8	1 5 9	1 6 0	1 6 1	1 6 2	1 6 3	1 6 4	1 6 5	1 6 6	1 6 7	1 6 8	1 6 9	1 7 0	1 7 1	1 7 2	1 7 3	1 7 4	1 7 5	1 7 6	1 7 7	1 7 8	1 7 9	1 8 0	1 8 1
WEEKS ON STUDY	1 4 1	1 2 2	1 0 8	1 1 6	1 3 5	1 3 8	$1 \\ 2 \\ 3$	1 2 8	1 1 5	1 2 3	1 1 1	1 1 6	1 0 3	1 0 1	1 1 5	1 0 3	$\frac{1}{2}$	1 3 8	0 9 8	1 4 6	1 1 0	1 2 1	1 1 5	1 1 1	1 4 6
DIGESTIVE SYSTEM																									
Oral cavity	N	N	N	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν
Squamous cell carcinoma Salivary gland	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sarcoma, NOS																				Х					
Fibrosarcoma Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+
Bile duct carcinoma																									
Neoplastic nodule Hepatocellular carcinoma		х					х																		
Monocytic leukemia																							х		
Bile duct Gallbladder & common bile duct	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	, N	+ N						
Pancreas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Transitional cell carcinoma, invasive																					х				
Acinar cell adenoma	x																	х			A				х
Acinar cell carcinoma Mixed tumor, benign	1																								
Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+
Stomach	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Squamous cell papilloma Squamous cell carcinoma	1																								
Sarcoma, NOS Small intestine	1.		,			1	L			1	+		+	т	4	1	+	-	-		÷	+		+	+
Adenomatous polyp, NOS	1 +	÷	+	+	+	÷	Ŧ	+	+	Ŧ	Ŧ	+	+	Ŧ	Ŧ	+	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	τ.	Ŧ	+	Ŧ
Mucinous cystadenocarcinoma																									
Sarcoma, NOS, metastatic Fibroma																									
Leiomyoma																									
Leiomyosarcoma			-		1	-	+	1	<u>т</u>	т.	+	Ŧ	1	<u>ــــ</u>	1	1	+	+	±	+	+	+	+	+	+
Large intestine Adenomatous polyp, NOS	1	Ŧ	Ŧ	т	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	т	Ŧ	Ŧ	r	1	+	,	x+	,				1		,
Mucinous cystadenocarcinoma																					х				
URINARY SYSTEM																									
Kidney Transitional cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	x+	+	+	+	+
Tubular cell adenoma																									
Tubular cell adenocarcinoma	1													х											
Sarcoma, NOS Urinary bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+
																		_							
ENDOCRINE SYSTEM Pituitary	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+
Carcinoma, NOS																									x
Adenoma, NOS Adrenal	1 +	+	+	+	+	+	+	+	+	+	X +	+	+	+	+	X +	+	+	+	+	+	+	+	+	^ +
Cortical adenoma	1	1	,						,																
Cortical carcinoma						x		v	х		х									x	x	v		х	
Pheochromocytoma Pheochromocytoma, malignant						л		л	л		Λ									Λ	A	4		~	
Ganglioneuroma	1																								
Thyroid Follicular cell adenoma	+	+	+	+	_	+	+	+	x+	+	+	+	+	+	+	+	+	+	+	x +	+	+	+	+	+
Follicular cell carcinoma								Х										х							
C-cell adenoma		х					х						х		х										
C-call carcinoma	1	<u></u>	4	+	_	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+
C-cell carcinoma Parathyroid	+																								
Parathyroid Adenoma, NOS	+	+	- -	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Parathyroid	+++	+	+ x	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+

						••••			~																
ANIMAL NUMBER	1 8 2	1 8 3	1 8 4	1 8 5	1 8 6	1 8 7	1 8 8	1 8 9	1 9 0	1 9 1	1 9 2	1 9 3	1 9 4	1 9 5	1 9 6	1 9 7	1 9 8	1 9 9	2 0 0	2 0 1	2 0 2	2 0 3	2 0 4	2 0 5	2 0 6
WEEKS ON STUDY	1 2 9	1 1 1	1 0 0	1 2 9	1 2 8	1 3 8	0 8 1	1 2 5	1 3 7	0 8 5	1 4 6	1 1 4	1 2 9	1 3 8	0 8 4	0 7 6	1 1 3	1 2 3	1 2 5	1 0 9	0 9 8	0 8 5	1 3 7	1 1 1	1 2 0
DIGESTIVE SYSTEM																									
Oral cavity Squamous cell carcinoma	N	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ŋ	Ν	N	Ν	Ν	Ν	N	Ν	N
Salivary gland Sarcoma, NOS Fibrosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ v	+	+	+	+	+	+	+
Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	, +	+	+	+	+	+	+	+
Bile duct carcinoma Neoplastic nodule Hepatocellular carcinoma					x	x			х			X													
Monocytic leukemia Bile duct	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gallbladder & common bile duct Pancreas Carcinoma, NOS	N +																								
Transitional cell carcinoma, invasive Acinar cell adenoma Acinar cell carcinoma		x																							
Mixed tumor, benign Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Stomach Squamous cell papilloma Squamous cell carcinoma	+	+	÷	÷	÷	÷	+	+	÷	+	÷	+	+	+	+	÷	÷	+	+	+	+	+	÷	+	+
Sarcoma, NOS Small intestine Adenomatous polyp, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+
Mucinous cystadenocarcinoma Sarcoma, NOS, metastatic Fibroma																									x
Leiomyoma Leiomyosarcoma																									
Large intestine Adenomatous polyp, NOS Mucinous cystadenocarcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
URINARY SYSTEM																									
Kidney Transitional cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Tubular cell adenoma Tubular cell adenocarcinoma Sarcoma, NOS											х														
Urinary bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ENDOCRINE SYSTEM Pituitary	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Adenoma, NOS					x				x		x						x	-		+		+	т.	+	X +
Adrenal Cortical adenoma Cortical carcinoma	+	+	+	+	+	+	+	+	+	+	٠	+	+	+	+	+	+	Ŧ	+	+	+	Ŧ	Ŧ	Ŧ	Ŧ
Pheochromocytoma Pheochromocytoma, malignant Ganglioneuroma	X													X			x		X						
Thyroid Follicular cell adenoma Follicular cell carcinoma	+	+	+	+	, x	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*	+
C-cell adenoma C-cell carcinoma				х		х		x				x	x	x					x			x	X		
Parathyroid Adenoma, NOS	-	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+
Pancreatic islets Islet cell adenoma Islet cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*	+
																			_			_			

TABLE A2.	INDIVIDUAL	ANIMAL	TUMOR	PATHOLOGY	OF MALE	RATS:	1% 7	FREMOLITE	
				(Continued	1)				

ANIMAL NUMBER	2 0 7	2 0 8	2 0 9	2 1 0	2 1 1	$ \frac{2}{1} 2 $	2 1 3	2 1 4	2 1 5	2 1 6	2 1 7	2 1 8	2 1 9	2 2 0	$\frac{2}{2}$	2 2 2	2 2 3	2 2 4	2 2 5	2 2 6	$\frac{2}{2}$	2 2 8	229	2 3 0	2 3 1
WEEKS ON STUDY	1 1 3	0 8 5	1 2 8	0 9 1	1 1 0	1 1 4	1 2 7	1 2 7	1 2 2	1 2 4	1 3 5	1 2 0	1 3 4	1 2 0	1 3 5	1 2 0	0 5 5	0 8 3	1 2 8	1 4 5	1 0 9	1 4 2	$1\\1\\2$	1 4 0	1 3 9
DIGESTIVE SYSTEM							N	N	NT	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Dral cavity Squamous cell carcinoma	N	Ν	Ν	N	Ν	Ν	IN	IN	Ν	Ν	IN	Ν	ţ.	IN	T.	14	IN	14	14	14	14	14	19		
alivary giand Sarcoma, NOS	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibrosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bile duct carcinoma		,	1		r	,							'			,				Ċ					
Neoplastic nodule Hepatocellular carcinoma	X																								
Monocytic leukemia Bile duct	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
allbladder & common bile duct ancreas	N +	N	Ň	N	N	N	Ň	Ň	Ň	N	N	Ň	N	N +	N	N	Ň	N +	N +	N +	N +	N	N +	N +	N +
Carcinoma, NOS	1	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	7	т	Ŧ	Ŧ	Ŧ		-	т
Transitional cell carcinoma, invasive Acinar cell adenoma															х									х	
Acinar cell carcinoma Mixed tumor, benign																							х		
Isophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+++	+	+
stomach Squamous cell papilloma	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Squamous cell carcinoma																									
Sarcoma, NOS mall intestine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenomatous polyp, NOS Mucinous cystadenocarcinoma																									
Sarcoma, NOS, metastatic																									
Fibroma Leiomyoma	Ì																								
Leiomyosarcoma arge intestine			+	+	Ŧ	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+
Adenomatous polyp, NOS	1	Ŧ	x+	Ŧ	Ŧ	т	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ		Ŧ	1	,	1	Ť	,						
Mucinous cystadenocarcinoma													_	_											
JRINARY SYSTEM Sidney		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Transitional cell carcinoma	i																								
Tubular cell adenoma Tubular cell adenocarcinoma	!																								
Sarcoma, NOS Jrinary bladder	+	+	+	+	+	+	+	.+.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
•	. !						<u> </u>																		
ENDOCRINE SYSTEM	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+
Carcinoma, NOS Adenoma, NOS										х	х									X			х		
Adrenal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cortical adenoma Cortical carcinoma																									
Pheochromocytoma Pheochromocytoma, malignant					Х								х							X			х	х	х
Ganglioneuroma																		x							+
'hyroid Follicular cell adenoma	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Ŧ	+	-	+	T	x	Ŧ	Ŧ
Follicular cell carcinoma C-cell adenoma	x																						x		
C-cell carcinoma	Ì						х	х		х	Х		х							X				х	X
'arathyroid Adenoma, NOS	+	-	+	+	+	+	+	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+	+		+
Pancreatic islets	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	* X	* X	+	+	+	+
Islet cell adenoma Islet cell carcinoma	X														х					л	л				х

(Co	nti	inı	Je	d)

ANIMAL NUMBER	2 3 2	2 3 3	2 3 4	2 3 5	2 3 6	2 3 7	2 3 8	2 3 9	2 4 0	2 4 1	2 4 2	2 4 3	2 4 4	2 4 5	2 4 6	2 4 7	2 4 8	2 4 9	2 5 0	2 5 1	2 5 2	2 5 3	2 5 4	2 5 5	2 5 6
WEEKS ON STUDY	1 4 0	1 4 6	1 4 5	0 8 5	1 4 6	1 3 2	1 4 6	1 4 6	1 0 7	1 3 6	1 1 8	1 0 3	1 1 0	0 1 4	0 1 4	0 1 4	1 4 6	1 1 7	1 4 0	1 4 0	1 4 4	1 2 8	1 4 2	1 4 3	1 3 5
DIGESTIVE SYSTEM	27		N	27	N	NT	N	N	NT		N	AT.	N	NT	NT	N	N	N	N	N	N	N	N	N	N
Oral cavity Squamous cell carcinoma	N	Ν	Ν	N	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ņ	Ν	IN	14	Ν	14	14	IN	T.	14	T.	14
Salivary gland	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sarcoma, NOS Fibrosarcoma																									
Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bile duct carcinoma Neoplastic nodule Hepatocellular carcinoma Monocytic leukemia		X																				x		x	
Bile duct Gallbladder & common bile duct	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N										
Pancreas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Transitional cell carcinoma, invasive Acinar cell adenoma Acinar cell carcinoma			x																						
Mixed tumor, benign	1																Х								
Esophagus Stomach	+	+	+	+	+	+	+	+	+	+	+++++++++++++++++++++++++++++++++++++++	+++	+++	+	+	++	+++++++++++++++++++++++++++++++++++++++	+	+	+++++++++++++++++++++++++++++++++++++++	+	+	+	+++	+++++++++++++++++++++++++++++++++++++++
Squamous cell papilloma		'										,							,						
Squamous cell carcinoma Sarcoma, NOS																									
Small intestine	+	+	+	+	+	+	+	÷	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+
Adenomatous polyp, NOS Mucinous cystadenocarcinoma Sarcoma, NOS, metastatic Fibroma																									
Leiomyoma Leiomyosarcoma																									
Large intestine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenomatous polyp, NOS Mucinous cystadenocarcinoma																									
URINARY SYSTEM																									
Kidney Transitional cell carcinoma Tubular cell adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Ŧ	+
Tubular cell adenocarcinoma Sarcoma, NOS																									X
Urinary bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ENDOCRINE SYSTEM																									
Pituitary	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Adenoma, NOS	x												х						x	X		х			
Adrenal	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+
Cortical adenoma Cortical carcinoma																									
Pheochromocytoma		х	х			х	X										X			X			х		
Pheochromocytoma, malignant Ganglioneuroma						х																		Х	
Thyroid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	* X	+	+	+	+	+
Follicular cell adenoma Follicular cell adenoma						x	x													Х					
Follicular cell carcinoma C-cell adenoma			x			л	л															х			
C-cell carcinoma		X	-														X				X				
Parathyroid Adenoma, NOS	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pancreatic islets	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Islet cell adenoma											x	Х					x								

ANIMAL NUMBER	2 5 7	2 5 8	2 5 9	2 6 0	2 6 1	2 6 2	2 6 3	2 6 4	2 6 5	2 6 6	2 6 7	2 6 8	2 6 9	2 7 0	2 7 1	2 7 2	2 7 3	2 7 4	2 7 5	2 7 6	2 7 7	2 7 8	2 7 9	2 8 0	2 8 1	TOTAL
WEEKS ON STUDY	1 1 5	1 4 6	1 2 5	1 4 4	1 4 0	1 1 0	1 2 9	1 4 3	0 1 4	1 1 9	1 3 9	1 4 5	1 2 3	1 4 0	1 3 4	1 4 6	1 2 7	0 8 6	1 1 6	0 9 5	1 4 5	1 4 5	1 3 3	1 2 8	0 8 5	TOTAL: TISSUES TUMORS
DIGESTIVE SYSTEM																										
Oral cavity	N	Ν	Ν	Ν	N	N	Ν	Ν	N	Ν	Ν	Ν	N	Ν	N,	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	*250
Squamous cell carcinoma Salivary gland	+	+	+	+	+	X +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	245
Sarcoma, NOS																							X			3
Fibrosarcoma										L		+	1		ъ	+	-	-	<u>ـ</u>	ъ	.	+	÷	+	÷	2 250
Liver Bile duct carcinoma	+	+	+	+	+	+	+	+	+	Ŧ	+	+	+	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	т	Ŧ	,	1
Neoplastic nodule	1												х													8
Hepatocellular carcinoma																										6 2
Monocytic leukemia Bile duct	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250
Gallbladder & common bile duct	Ň	N	Ň	Ň	Ň	Ń	Ň	Ň	Ň	N	N	Ň	Ň	Ň	Ň	N	N	N	N	Ν	N	Ν	Ν	Ν	Ν	*250
Pancreas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250 1
Carcinoma, NOS Transitional cell carcinoma, invasive																										1 1
Acinar cell adenoma											х						х									22
Acinar cell carcinoma																										1
Mixed tumor, benign	Ι.						,								1		-	-	+	-	т.	_	Ŧ	+	+	$3 \\ 249$
Esophagus Stomach	1 +	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	÷	+	250
Squamous cell papilloma	·																									1
Squamous cell carcinoma	(1
Sarcoma, NOS Small intestine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250
Adenomatous polyp, NOS	1						,		,																	1
Mucinous cystadenocarcinoma																										2
Sarcoma, NOS, metastatic Fibroma	[i
Leiomyoma																										1
Leiomyosarcoma																										1 250
Large intestine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250
Adenomatous polyp, NOS Mucinous cystadenocarcinoma																		X								2
URINARY SYSTEM							·		-			-														050
Kidney	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250 1
Transitional cell carcinoma Tubular cell adenoma	1																									1 ī
Tubular cell adenocarcinoma																										5
Sarcoma, NOS																	+	4.	+		+	<u>т</u>	<u>ـ</u>		+	250
Urinary bladder	+	+	+	+	+	+	+	+	+	+	+	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	-	Ŧ	Ŧ	Ŧ	Τ.	Ŧ	т	,	200
ENDOCRINE SYSTEM													-				_									
Pituitary	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	247
Carcinoma, NOS Adenoma, NOS					х										л	х	х							х		37
Adrenal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250
Cortical adenoma																										2
Cortical carcinoma		х				х							х			х					X		х			62
Pheochromocytoma Pheochromocytoma, malignant		Λ				л							Λ			A					~					7
Ganglioneuroma																										1
Thyroid	+	+	+	+	× x	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	247 12
Follicular cell adenoma Follicular cell carcinoma					X																			x		13
C-cell adenoma							х																	••		22
C-cell carcinoma	1	X		Х	Х			Х			Х		Х		х				Х		Х					48
Parathyroid	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	236
Adenoma, NOS		يل	د	4	Ł	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250
Do nomo atia in lata			+		+	-	-	-	-	-	T			-		T	T		T		· · ·	1.1	,-	· · ·		
Pancreatic islets Islet cell adenoma	T																Х							X		12

* Animals necropsied

ANIMAL NUMBER	0 3 2	0 3 3	0 3 4	0 3 5	0 3 6	0 3 7	0 3 8	0 3 9	0 4 0	0 4 1	0 4 2	0 4 3	0 4 4	0 4 5	0 4 6	0 4 7	0 4 8	0 4 9	0 5 0	0 5 1	0 5 2	0 5 3	0 5 4	0 5 5	0 5 6
WEEKS ON STUDY	1 2 6	1 4 6	1 4 4	1 0 3	1 3 9	1 1 9	1 4 6	1 1 3	1 4 6	1 4 6	1 4 0	1 3 8	1 2 3	1 1 5	1 4 6	1 3 4	1 2 8	1 4 6	1 2 5	1 1 9	1 0 0	1 2 6	1 2 3	1 4 6	1 2 1
REPRODUCTIVE SYSTEM Mammary gland Adenoma, NOS Adenocarcinoma, NOS Papillary adenocarcinoma Fibroadenoma	+	+	+	N	+	+	+	N	+	+	.+	+	+	+	+ x	+	+	+	+	+	+	+	+	+	+
Testis Interstitial cell tumor Prostate Penis Keratoacanthoma	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N																			
Preputal/citoral gland Squamous cell carcinoma Epididymis Lipoma Mesothelioma, invasive	N N	N X N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N X N	N N												
NERVOUS SYSTEM Brain Carcinoma, NOS, invasive Astrocytoma Spinal cord	+ +	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ X N	+ N	+ N	+ N	+ N	+ N
Astrocytoma SPECIAL SENSE ORGANS Zymbai gland Squamous ceil carcinoma Keratoacanthoma	+	+	+ X	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	* x	+	+ x	+	+
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Fibrosarcoma, invasive Liposarcoma, invasive Osteosarcoma	N	N	N	N	N	N		N	N	N	N	N	N	N	N	N	N X	N	N	N	N	N	N	N	N
BODY CAVITIES Mediastinum Fibrosarcoma, invasive Peritoneum Fibrosarcoma	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N
Liposarcoma Tunica vaginalis Mesothelioma, malignant Mesentery Pheochromocytoma, metastatic Sarcoma, NOS	+ N	+ N	+ N	+ N	+ N	+ N	+ N	X + N	+ N																
Fibrosarcoma Hemangiosarcoma ALL OTHER SYSTEMS Multiple organs, NOS Carcinoma, NOS, invasive	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Squamous cell carcinoma, invasive Transitional cell carcinoma, metastatic Sarcoma, NOS, invasive Fibrous histiocytoma, malignant Mesothelioma, invasive Mesothelioma, metastatic																			x					x	
Malignant lymphoma, histiocytic type Myelomonocytic leukemia Monocytic leukemia Megakaryocytic leukemia Cranial cavity Osteoma Sacral region Hemangiopericytoma, NOS Scrotum, NOS		x			x						x	x		x	x	x					x	x			x
Mesothelioma, invasive																									

ANIMAL NUMBER	0 5 7	0 5 8	0 5 9	0 6 0	0 6 1	0 6 2	0 6 3	0 6 4	0 6 5	0 6 6	0 6 7	0 6 8	0 6 9	0 7 0	0 7 1	0 7 2	0 7 3	0 7 4	0 7 5	0 7 6	0 7 7	0 7 8	0 7 9	0 8 0	0 8 1
WEEKS ON STUDY	1 4 6	1 4 0	1 3 2	1 1 0	1 3 6	1 4 6	1 4 6	1 1 5	1 2 8	1 2 6	1 4 6	1 4 6	1 3 2	0 8 7	1 4 6	1 3 3	1 0 6	1 3 0	1 3 7	0 9 1	1 1 3	1 3 2	1 0 6	1 4 6	1 2 8
REPRODUCTIVE SYSTEM Mammary gland Adenoma, NOS Adenocarcinoma, NOS	+	+	+	+	+	+	+ x	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	N	+	+
Papillary adenocarcinoma Fibroadenoma Testis Interstitial cell tumor Prostate Penis	+ X + N	+ X + N	X + X + N	+ X + N	+ X + X N	X + X + N	+ X + N	+ X + X N	+ X + N	+ X + X + N	+ X + N	X + X + N	+ X + X N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	X + X + N	+ X + N	+ X + N	+ X + N	+ X + N	X + X + N	+ X + N
Keratoacanthoma Preputial/clitoral gland Squamous cell carcinoma Epididymis Lipoma Mesothelioma, invasive	N N	N N	N N	N N	N X N	N N	N N	N N X	N N	N N	N N	N X N	N X N	N N											
NERVOUS SYSTEM							·			+															
Brain Carcinoma, NOS, invasive Astrocytoma Spinal cord Astrocytoma	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	* X N	+ N	+ N	+ N	ň	+ N	+ N	+ N	+ N	+ N	+ * X	T N	N
SPECIAL SENSE ORGANS Zymbal giand Squamous cell carcinoma Keratoacanthoma	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Fibrosarcoma, invasive Liposarcoma, invasive Osteosarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	+	N
BODY CAVITIES Mediastinum Fibrosarcoma, invasive Peritoneum Fibrosarcoma	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N
Liposarcoma Tunica vaginalis Mesothelioma, malignant Mesentery Pheochromocytoma, metastatic	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ X N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N
Sarcoma, NOS Fibrosarcoma Hemangiosarcoma																			x						
ALL OTHER SYSTEMS Multiple organs, NOS Carcinoma, NOS, invasive Squamous cell carcinoma, matastatic Sarcoma, NOS, invasive Fibrosarcoma, invasive Fibrous histlocytoma, malignant Mesothelioma, invasive Mesothelioma, metastatic	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Malignant lymphoma, histiocytic type Myelomoneytic leukemia Monocytic leukemia Megakaryocytic leukemia Cranial cavity Osteoma Sacral region					x	x	x			x	x	x	x		x		x	x	x	x	x				
Hemangropericytoma, NOS Scrotum, NOS Mesothelioma, invasive								x																	

(Cont	inued)
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					(U	•		ueo	.,																
ANIMAL NUMBER	0 8 2	0 8 3	0 8 4	0 8 5	0 8 6	0 8 7	0 8 8	0 8 9	0 9 0	0 9 1	0 9 2	0 9 3	0 9 4	0 9 5	0 9 6	0 9 7	0 9 8	0 9 9	1 0 0	1 0 1	1 0 2	1 0 3	1 0 4	1 0 5	1 0 6
WEEKS ON STUDY	1 4 6	1 3 8	1 3 6	1 4 6	1 2 9	1 4 1	1 2 9	1 3 3	1 3 9	1 4 6	0 9 0	1 3 4	1 3 7	0 8 4	1 2 2	1 0 3	0 4 8	1 1 8	1 0 9	0 9 6	1 1 1	1 0 3	1 3 3	1 2 8	1 3 4
REPRODUCTIVE SYSTEM Mammary gland Adenoma, NOS Adenocarinoma, NOS	+	+	+	+	+	+	+	. +	+	+	+	+	+	+	+	+	+	+	+	+	+	N	+	+	+
Papillary adenocarcinoma Fibroadenoma Testis Interstitial cell tumor Prostate Penis Keratoacanthoma	X + X + N	+ x + + N	X + X + N X	X + X + N	X + X + N	X + X + N	X + X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ + X	+ x + N	+ x + N	+ x + N	+ x + N	+ X + N	X + X + N	+ X + N	+ X + N
Preputial/clitoral gland Squamous cell carcinoma Epididymis Lipoma Mesothelioma, invasive	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N X	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N
NERVOUS SYSTEM Brain Carcinoma, NOS, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Astrocytoma Spinal cord Astrocytoma	N	N	N	N	N	N	N	N	X N	N	N	N	N	+	N	N	X N	N	N	X N	N	N	N	N	N
SPECIAL SENSE ORGANS Zymbal gland Squamous cell carcinoma Keratoacanthoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Fibrosarcoma, invasive Liposarcoma, invasive Osteosarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
BODY CAVITIES Mediastinum Fibrosarcoma, invasive	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Peritoneum Fibrosarcoma Liposarcoma	N	N	Ν	Ν	Ν	Ν	N	N	N	Ν	Ν	Ν	N	N	N	N	N	Ν	N	N	N	N	Ν	N	N
Tunica vaginalis Mesothelioma, malignant Mesontery Pheochromocytoma, metastatic	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N
Sarcoma, NOŜ Fibrosarcoma Hemangiosarcoma																									
ALL OTHER SYSTEMS Multiple organs, NOS Carcinoma, NOS, invasive Squamous cell carcinoma, invasive Transitional cell carcinoma, metastatic Sarcoma, NOS, invasive Fibrosarcoma, invasive Fibrous histocytoma, malignant Mesothelioma, invasive Mesothelioma, metastatic Malignant lymphoma, histiccytic type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	И
Myelomonocytic leukemia Monocytic leukemia Megakaryocytic leukemia Cranial cavity Osteoma Sacrai region Hemangiopericytoma, NOS Scrotum, NOS Mesothelioma, invasive		x	x	x		x					x	x			x			x				x	_		

ANIMAL NUMBER	1 0 7	1 0 8	1 0 9	1 1 0	1 1 1	1 1 2	1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8	1 1 9	$1 \\ 2 \\ 0$	$\frac{1}{2}$	1 2 2	1 2 3	1 2 4	1 2 5	1 2 6	$\frac{1}{2}$ 7	1 2 8	1 2 9	1 3 0	$\frac{1}{3}$
WEEKS ON STUDY	1 4 6	1 2 6	1 3 2	1 4 6	1 2 7	1 2 5	0 9 8	1 0 3	$\frac{1}{2}$	1 1 4	1 1 7	1 2 2	1 0 9	1 3 0	1 1 5	1 1 1	1 4 6	1 4 1	0 9 7	1 0 5	1 1 5	1 3 1	1 2 7	1 1 0	1 4 6
REPRODUCTIVE SYSTEM Mammary gland Adenoma, NOS Adenocarcinoma, NOS Papillary adenocarcinoma	+	+	+ x	+	+	<u>.</u> +	+	+	+	+	+	N	N	+	+	+	+	+	N	+	+	+	+	+	+
Fibroadénoma Testis Interstitial cell tumor Prostate Penis Keratoacanthoma Preputial/clitoral gland Squamous cell carcinoma Epididymis Lipoma Mesothelioma, invasive	+ X + N N N	+ X + N N N	+ X + N N N	+x+n n n	+x+z z z	+x+z z z	+ + N N N	+X+N N N	X+X+N N N	+X+N N N	X Z X	X X X+X+	+X+N NXN	+XIN NN	+X+N N N	+x+z z z	+x+z z z	X+X+Z Z Z	+X+N N N	+X+N N N	+x+n N N	+x+x z z	+X+NNNN	+X+N N N	+x+ x r x
NERVOUS SYSTEM Brain Carcinoma, NOS, invasive Astrocytoma Spinal cord Astrocytoma	+ N	+ N	+ N	+ N	+ X N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N
SPECIAL SENSE ORGANS Zymbalgland Squamous cell carcinoma Keratoacanthoma	+	+	+	+	+	+	+	+	* x	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Fibrosarcoma, invasive Liposarcoma, invasive Osteosarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
BODY CAVITIES Mediastinum Fibrosarcoma, invasive Peritoneum Fibrosarcoma Libosarcoma	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N
Tunica vaginalis Mesothelioma, malignant Mesentery Pheochromocytoma, metastatic Sarcoma, NOS Fibrosarcoma Hemangiosarcoma	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ X N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+x N	+ N	+ N	+ N	+ N	+ N
ALL OTHER SYSTEMS Multiple organs, NOS Carcinoma, NOS, invasive Squamous cell carcinoma, invasive Transitional cell carcinoma, metastatic Sarcoma, NOS, invasive Fibrosarcoma, invasive Fibrous histiocytoma, malignant Mesothelioma, invasive	N	N	N	N	N	N	N		N	N	N	N	N	N	N	N	N	N	N	N X X	N	N	N	N	N
Mesothelioma, metastatic Maignant lymphoma, histiocytic type Myelomonocytic leukemia Monocytic leukemia Cranial cavity Osteoma Sacral region Hemangiopericytoma, NOS Scrotum, NOS Mesothelioma, invasive			x	x		x		x	x						x	x							x	x	

ANIMAL NUMBER	1	1	1	1	1	1	1 3 8	1	1	1	1	14	1	1	1	1	1	1 4	1 5 0	15	15	15	15	1 5 5	1 5
WEEKS ON	2	3	4	5	6 -11-	7	8 	9 	0	1	2	3	4	5	6 -1 -	7 -11-	8	9	0	1	2	3	4	5	6
STUDY	0 9	9 4	4 6	4	28	1 6	2 5	Ō 0	4 6	1 1	0 3	0 4	4 6	0 9	1	1 1	1 1	8 7	1 2	4 1	2 6	2 6	8 9	2 2	4 6
REPRODUCTIVE SYSTEM Mammary gland Adenoma, NOS Adenocarcinoma, NOS	+	+	+	+	+	+	÷	+	+	+	+	+	+	N	+	+	+	+	+	+	+	+	+	+	+
Papillary adenocarcinoma Fibroadenoma Testis Interstitial cell tumor Prostate	* *	+ X +	X + X +	+ X +	+ X +	+ X +	+ X +	+ x +	X + X + N	X + X +	+ X +	+	+ X +	+ X +	* X +	+ X +	+	* *	+ +						
Penis Keratoacanthoma Preputial/clitorai gland	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N
Squamous cell carcinoma Epididymis Lipoma Mesothelioma, invasive	N	N	X N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N
NERVOUS SYSTEM Brain Carcinoma, NOS, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Astrocytoma Spinal cord Astrocytoma	N	N	N	N	N	Ν	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
SPECIAL SENSE ORGANS Zymbal gland Squamous cell carcinoma Keratoacanthoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Fibrosarcoma, invasive Liposarcoma, invasive Osteosarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
BODY CAVITIES Mediastinum	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Fibrosarcoma, invasive Peritoneum Fibrosarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Ν	N	N	N	Ν	Ν	N	Ν	N	Ν
Liposarcoma Tunica vaginalis	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mesothelioma, malignant Mesontery Pheochromocytoma, metastatic Sarcoma, NOS Fibrosarcoma Hemangiosarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Ν	N	N	N	Ν	Ν	Ν	N
ALL OTHER SYSTEMS Multiple organs, NOS Carcinoma, NOS, invasive Squamous cell carcinoma, invasive Transitional cell carcinoma, metastatic Sarcoma, NOS, invasive	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Fibrosarcoma, invasive Fibrous histiocytoma, malignant Mesothelioma, invasive Mesothelioma, metastatic Malignant lymphoma, histiocytic type Myelomonocytic leukemia Monocytic leukemia Megakaryocytic leukemia Cranial cavity	x	X		x	x	x	x	x				x	x		x	x							x	x	
Osteoma Sacrai region Hemangiopericytoma, NOS Scrotum, NOS Mesothelioma, invasive																		x							

ANIMAL NUMBER	1 5 7	1 5 8	1 5 9	1 6 0	1 6 1	1 6 2	1 6 3	1 6 4	1 6 5	1 6 6	1 6 7	1 6 8	1 6 9	1 7 0	1 7 1	1 7 2	1 7 3	1 7 4	1 7 5	1 7 6	1 7 7	1 7 8	1 7 9	1 8 0	1 8 1
WEEKS ON STUDY	1 4 1	$1 \\ 2 \\ 2$	1 0 8	1 1 6	1 3 5	1 3 8	1 2 3	1 2 8	1 1 5	1 2 3	1 1 1	1 1 6	1 0 3	1 0 1	1 1 5	1 0 3	1 1 2	1 3 8	0 9 8	1 4 6	1 1 0	1 2 1	1 1 5	1 1 1	1 4 6
REPRODUCTIVE SYSTEM Mammary gland Adenoma, NOS Adenocarcinoma, NOS Papillary adenocarcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibroadenoma Testis Interstitial cell tumor Prostate Penis	+ X + N	X + X + N	+ X + N	+ X + N	X + X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + X N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + X N	+ X + X + N	+ X + N	+ X + N	+ x + N
Keratoacanthoma Preputial/clitoral gland Squamous cell carcinoma Epididymis Lipoma Mesothelioma, invasive	N N	N N	N N	N N	N N	N N	N N	N X N	N N	N N	N N	N N	N X N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N
NERVOUS SYSTEM Brain Carcinoma, NOS, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Astrocytoma Spinal cord Astrocytoma	N	N	+	N	N	N	N	N	N	N	N	Ν	N	N	N	N	N	Ν	N	Ν	N	+	N	N	N
SPECIAL SENSE ORGANS Zymbal gland Squamous cell carcinoma Keratoacanthoma	+	+	+	+	+	+	+	* X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	* X	+	+
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Fibrosarcoma, invasive Liposarcoma, invasive Osteosarcoma																						x			
BODY CAVITIES Mediastinum Fibrosarcoma, invasive	-	N		N				N	N				N					N		N N	N N	N N	N N	N N	
Peritoneum Fibrosarcoma Liposarcoma Tunica vaginalis	N	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	и +	N +	и +	+	+	+	+	+	+
Mesotheilioma, malignant Mesotheilioma, malignant Pheochromocytoma, metastatic Sarcoma, NOS Fibrosarcoma Hemangiosarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	X N	N
ALL OTHER SYSTEMS Multiple organs, NOS Carcinoma, NOS, invasive	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Squamous cell carcinoma, invasive Transitional cell carcinoma, metastatic Sarcoma, NOS, invasive Fibrosarcoma, invasive Fibrous histiocytoma, malignant Mesothelioma, invasive	:																				X			x	x
Mesothelioma, metastatic Malignant lymphoma, histiocytic type Myelomonocytic leukemia Mogakaryocytic leukemia Cranial cavity Osteoma Sacral region Hemangiopericytoma, NOS	5			x		x	x	x	x	x		x										x			
Scrotum, NOS Mesothelioma, invasive																. <u>-</u>									

ANIMAL NUMBER	1 8 2	1 8 3	1 8 4	1 8 5	1 8 6	1 8 7	1 8 8	1 8 9	1 9 0	1 9 1	1 9 2	1 9 3	1 9 4	1 9 5	1 9 6	1 9 7	1 9 8	1 9 9	2 0 0	2 0 1	2 0 2	2 0 3	2 0 4	2 0 5	2 0 6
WEEKS ON STUDY	1 2 9	1 1 1	1 0 0	1 2 9	1 2 8	1 3 8	0 8 1	1 2 5	1 3 7	0 8 5	1 4 6	1 1 4	1 2 9	1 3 8	0 8 4	0 7 6	1 1 3	$\frac{1}{2}$	1 2 5	1 0 9	0 9 8	0 8 5	1 3 7	1 1 1	
REPRODUCTIVE SYSTEM Mammary gland Adenoma, NOS Adenocarcinoma, NOS Papillary adenocarcinoma Fibroadenoma	+	+	+	+	+	+	N	+	+	N	+	+	N	+	N	+	+	+	+	+	+	N	+	+	N
Testis Interstitial cell tumor Prostate	x +	+ X +	+ X + N	+ X + N	+ X + N	+ X + N	+	* * *	+ X +	* *	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N
Penis Keratoacanthoma Preputial/clitoral gland Squamous cell carcinoma Epididymis Lipoma Mesothelioma, invasive	N N N	N N N	N N N	N N N	N N N	N N N	N N N	N N N	N N N	N N N	N N	N N N	N N N	N N N	N N N	N	N N	N N	N N N	N X N	N N	N N	N N	N	N N N
NERVOUS SYSTEM Brain Carcinoma, NOS, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Astrocytoma Spinal cord Astrocytoma	N	N	N	N	N	N	N	N	N	N	Ν	N	N	N	N	N	N	N	N	N	N	N	N	Ν	N
SPECIAL SENSE ORGANS Zymbal gland Squamous cell carcinoma Keratoacanthoma	+	+	+	+	+	+	N	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	N	+	+	+
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Fibrosarcoma, invasive Liposarcoma, invasive Osteosarcoma	N	N	N	N	N	N	N	N	N	N	+	N	N	N	N	N	N	N	N	N	N	N	N	N	N
BODY CAVITIES Mediastinum	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Fibrosarcoma, invasive Peritoneum Fibrosarcoma	N	N	Ν	N	N	N	N	Ν	Ν	N	N	N	N	Ν	N	Ν	Ν	N	N	N	N	N	N	N	N
Liposarcoma Tunica vaginalis Mesothelioma, malignant Mesentery Decebergy	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ X N	+ N	* X N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N
Pheochromocytoma, metastatic Sarcoma, NOS Fibrosarcoma Hemangiosarcoma																							x		
ALL OTHER SYSTEMS Multiple organs, NOS Carcinoma, NOS, invasive Squamous cell carcinoma, invasive Transitional cell carcinoma, metastatic	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N X	N	N	N	N	N	N
Sarcoma, NOS, invasive Fibrosarcoma, invasive Fibrous histiocytoma, malignant Mesothelioma, invasive Mesothelioma, metastatic									x									x					X		
Malignant lymphoma, histiocytic type Myelomonocytic leukemia Monocytic leukemia Megakaryocytic leukemia Cranial cavity	x	X		x	X	X									x					x	x		X	x	x
Osteoma Sacrai region Hemangiopericytoma, NOS Scrotum, NOS Mesothelioma, invasive										_						x									

ANIMAL NUMBER	2 0 7	2 0 8	2 0 9		2 1 1	$\frac{2}{1}{2}$	2 1 3	2 1 4	2 1 5	2 1 6	$\frac{2}{1}$	2 1 8	2 1 9	2 2 0	2 2 1	2 2 2	2 2 3	2 2 4	2 2 5	226	2 2 7	2 2 8	2 2 9	2 3 0	2 3 1
WEEKS ON STUDY	1 1 3	0 8 5	1 2 8	0 9 1	1 1 0	1 1 4	1 2 7	1 2 7	1 2 2	1 2 4	1 3 5	1 2 0	1 3 4	1 2 0	1 3 5	120	0 5 5	0 8 3	1 2 8	1 4 5	1 0 9	1 4 2	1 1 2	1 4 0	1 3 9
REPRODUCTIVE SYSTEM Mammary gland Adenocarcinoma, NOS Adenocarcinoma, NOS	N	+	+	+	+	+ X	+	N	+	+	+	+	+	+	+	+	+	+	+	* x	+	+	+	+	+
Papillary adenocarcinoma Fibroadenoma Testis Interstitial cell tumor Prostate Penis Keratoacanthoma Preputial/clitoral gland Squamous cell carcinoma Epididymis Lipoma	+ x + N N N	+ + N N	+X+N N N	+X+N N N	X+X+Z Z Z	+x+n N N	+ x + N N N	XXZ ZXX	X+X X Z Z	+x+n n N	+X+N N N	+ X + N N N	+x+n n N	+X+N N N	+X+N NXN	+X+N N N	+ + N N	+X+N N N	X+X+N N N	+x+z z z	+X+N N N	+ X + N N N	+ X + N N N	+X+N NXN	+ X + N N N
Mesothelioma, invasive NERVOUS SYSTEM Brain Carcinoma, NOS, invasive Astrocytoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Spinal cord Astrocytoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N 	N	N	N	N	N	N	N	N	N
SPECIAL SENSE ORGANS Zymbal gland Squamous cell carcinoma Keratoacanthoma	+	Ν	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Ν	+	+	*	+	+	+	x ⁺
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Fibrosarcoma, invasive Liposarcoma, invasive Osteosarcoma	N X	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
BODY CAVITIES Mediastinum Fibrosarcoma, invasive Pertoneum Tibrosarcoma Liposarcoma Tunica vaginalis Mesothelioma, malignant Mesothelioma, malignant Mesothery Pheochromocytoma, metastatic Sarcoma, NOS Fibrosarcoma	N N + N	N N + N	N N + N	N N + N	N N + N	N N + N	NXN + N	И +	N +	N N + N	N +	N +	N N + N	N +	N +	N N + N	N +	N +	N N + N	N N + N	N N + N	N N + N X	N N + N	N N + N	N +
Hemangiosarcoma ALL OTHER SYSTEMS Multiple organs, NOS Carcinoma, NOS, invasive Squamous cell carcinoma, nivasive Transitional cell carcinoma, metastatuc Sarcoma, NOS, invasive Fibrosarcoma, invasive Fibrous histiocytoma, malignant Mesothelioma, invasive Mesothelioma, metastatic	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Malignant lymphoma, histiocytic type Myelomonocytic leukemia Menocytic leukemia Cranial cavity Osteoma Sacral region Hemangiopericytoma, NOS Scrotum, NOS Mesothelioma, invasive			x	x	x		x				x	x	x			x									x

ANIMAL NUMBER	2 3 2	2 3 3	2 3 4	2 3 5	2 3 6	2 3 7	2 3 8	2 3 9	2 4 0	2 4 1	2 4 2	2 4 3	2 4 4	2 4 5	2 4 6	2 4 7	2 4 8	2 4 9	2 5 0	2 5 1	2 5 2	2 5 3	2 5 4	2 5 5	2 5 6
WEEKS ON STUDY	1 4 0	1 4 6	1 4 5	0 8 5	1 4 6	$1\\3\\2$	1 4 6	1 4 6	1 0 7	1 3 6	1 1 8	1 0 3	1 1 0	0 1 4	0 1 4	0 1 4	1 4 6	1 1 7	1 4 0	1 4 0	1 4 4	1 2 8	$\frac{1}{4}$	1 4 3	1 3 5
REPRODUCTIVE SYSTEM Mammary gland Adenoma, NOS Adenocarcinoma, NOS	+	+	+	+	+	+	+	+	+	+	+	N	+	+	+	N	+	+	+	+ X	+	+	+	+	+
Papillary adenocarinoma Fibroadenoma Testis Interstitial cell tumor Prostate Penis Keratoacanthoma Preputial/clitoral gland Squamous cell carcinoma Epididymis Lipoma Mesothelioma, invasive	X + X + N N N	+x+n n n	X+X+N N N	+ X + N N N	X+X+Z Z Z	+X+N N N	X+X+N N N	X+X+N N N	+X+N N N	+X+N N N	+x+n N N	+X+N N N	X+X+Z Z Z	+ +z z z	+ +Z Z Z	+ +Z Z Z	+X+N N N	+X+N N N	X+X+N N N	4 + X + N N N	X+X+N NXN	+ X + N N N	+X+Z Z Z	X+X+N N N	
NERVOUS SYSTEM Brain Carcinoma, NOS, invasive Astrocytoma Spinal cord	@X N		+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N
Astrocytoma SPECIAL SENSE ORGANS Zymbal gland Squamous cell carcinoma Keratoacanthoma	+	+	+	N	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Fibrosarcoma, invasive Liposarcoma, invasive Osteosarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	+	N	N
BODY CAVITIES Mediastinum	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Fibrosarcoma, invasive Peritoneum Fibrosarcoma	N	N	N	N X	N	N	N	N	Ν	N	N	N	N	N	N	Ν	Ν	N	Ν	N	Ν	N	N	N	N
Liposarcoma Tunica vaginalis Mesothelioma, malignant	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+
Mesentery Pheochromocytoma, metastatic Sarcoma, NOS Fibrosarcoma Hemangiosarcoma	N	N	N	N	N	N	N	Ν	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Ν	N X	N
ALL OTHER SYSTEMS Multiple organs, NOS Carcinoma, NOS, invasive Squamous cell carcinoma, invasive Transitional cell carcinoma, metastatic Sarcoma, NOS, invasive Fibrosarcoma, invasive Fibrous histiocytoma, malignant Mesothelioma, invasive Mesothelioma, metastatic	N	N	N	N	N	N	N	N		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Malignant lymphoma, histiocytic type Myelomonocytic leukemia Monocytic leukemia Cranial cavity Osteoma Sacral region Hemangiopericytoma, NOS Scrotum, NOS Mesothelioma, invasive		x	x				x	x	х	x	x	x					x					x		x	

@ Multiple occurrence of morphology

ANIMAL NUMBER	2 5 7	2 5	2 5 9	26	2 6 1	2 6 2	2 6 3	264	26	2 6 6	2 6 7	2 6 8	2 6 9	2 7 0	2 7 1	2 7 2	2 7 3	2	2 7 5	2 7 6	2 7 7	2 7 8	2 7 9	2 8 0	2 8 1	
WEEKS ON STUDY	1 1 5	1 4 6	9 1 2 5	1 4 4	1 4 0	2 1 1 0	3 1 2 9	4	0	1	1 3 9	1 4 5	9 1 2 3	1 4 0	1 3 4	2 1 4 6	1 2 7	9 0 8 6	1 1 6	0	1 4 5	145	1 3 3	1 2 8	0 8 5	TOTAL: TISSUES TUMORS
REPRODUCTIVE SYSTEM Mammary gland	יי +	+	اد +	4 +	+	+	+	3 +	4 +	+	+	اد +	3 +	+	4† +	+		• +	+	5 +	ગ +	이 +	31 +	ە +	5 N	*250
Adenoma, NOS Adenocarcinoma, NOS Papillary adenocarcinoma Fibroadenoma		x				x								x		x	x									1 3 1 32
Testis Interstitial cell tumor Prostate Penis	+ X + N	+ X + X N	+ X + X + N	+ X + N	+ X + + N	+ X + N	+ X + N	+ X + N	+ + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + + N	+ x + N	+ x + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ X + N	+ + N	250 237 249 *250
Keratoacanthoma Preputial/citoral gland Squamous cell carcinoma Epididymis	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	N N	1 *250 14 *250
Lipoma Mesothelioma, invasive																										1 1 1
NERVOUS SYSTEM Brain Carcinoma, NOS, invasive Astrocytoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250 1 6
Spinal cord Astrocytoma SPECIAL SENSE ORGANS	N	N 	N	N	N	N	N	N 	N	N 	N	N 	N	N	N	N	+	N	N 	N	N	N 	N	N	N	*250
Zymbal gland Squamous cell carcinoma Keratoacanthoma	+	+	+	+	+	+	+	+	+	*	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*250 9 1
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Fibrosarcoma, invasive Liposarcoma, invasive Osteosarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N X	N	N	*250 1 1 1 1
BODY CAVITIES Mediastinum Fibrosarcoma, invasive	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	*250
Peritoneum Fibrosarcoma Liposarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	*250 1 1
Tunica vaginalis Mesothelioma, malignant Mesentery Pheochromocytoma, metastatic Sarcoma, NOS	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ א	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ X N	+ N	+ N	+ N	+ N	+ N	*250 8 *250 1 1
Fibrosarcoma Hemangiosarcoma																										1
ALL OTHER SYSTEMS Multiple organs, NOS Carcinoma, NOS, invasive Squamous cell carcinoma, invasive Transitional cell carcinoma, metastatic Sarcoma, NOS, invasive Fibrosarcoma, invasive	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	*250 1 1 1 1 2
Fibrous histiccytoma, malignant Mesothelioma, invasive Mesothelioma, metastatic Malignant lymphoma, histiccytic type Myelomonocytic leukemia					x														_	x						2 5 1 4
Mônocytic leùkemia Megakaryocytic leukemia Cranial cavity Osteoma Sacral region	x	x	x				x			X			X				x		X		X					95 1 1
Hemangiopericytoma, NOS Scrotum, NOS Mesothelioma, invasive																										1

* Animals necropsied

in: Keratoacanthoma	<u></u>	
Overall Rates (a)	6/118 (5%)	13/250 (5%)
Adjusted Rates (b)	44.4%	23.6%
Terminal Rates (c)	1/5 (20%)	5/35 (14%)
Week of First Observation	114	118
Life Table Test (d)	114	P = 0.221 N
Incidental Tumor Test (d)		P = 0.565N
Fisher Exact Test (d)		P = 0.591
in: Basal Cell Carcinoma		
Overall Rates (a)	4/118 (3%)	8/250 (3%)
Adjusted Rates (b)	18.8%	11.5%
Terminal Rates (c)	0/5 (0%)	0/35 (0%)
Week of First Observation	121	116
Life Table Tests (d)		P = 0.416N
Incidental Tumor Tests (d)		P = 0.541 N
Fisher Exact Test (d)		P = 0.572N
in: Basal Cell Tumor or Carcinoma	$C(1,1,0) \in C(1,1)$	9/250 (4%)
Overall Rates (a)	6/118 (5%)	9/250 (4%) 12.1%
Adjusted Rates (b)	36.8%	0/35 (0%)
Terminal Rates (c)	1/5 (20%)	0/35(0%)
Week of First Observation	121	P = 0.171N
Life Table Tests (d)		P = 0.171N P = 0.296N
Incidental Tumor Tests (d) Fisher Exact Test (d)		P = 0.339N
n: Basal Cell Tumor, Basal Cell Carcino	oma, or Trichoepithelioma	
Overall Rates (a)	6/118 (5%)	10/250 (4%)
Adjusted Rates (b)	36.8%	12.6%
Terminal Rates (c)	1/5 (20%)	0/35 (0%)
Week of First Observation	121	115
Life Table Tests (d)		P = 0.230N
Incidental Tumor Tests (d)		P = 0.359 N
Fisher Exact Test (d)		P = 0.409 N
in: Squamous Cell Papilloma		
Overall Rates (a)	3/118 (3%)	9/250 (4%)
Adjusted Rates (b)	6.0%	13.6%
Terminal Rates (c)	0/5 (0%)	3/35 (9%)
Week of First Observation	114	109
Life Table Test (d)		P = 0.607
Incidental Tumor Test (d)		P = 0.421
Fisher Exact Test (d)		P = 0.428
in: Squamous Cell Papilloma or Carcino		13/250 (5%)
Overall Rates (a)	5/118 (4%)	
Adjusted Rates (b)	8.3%	17.9%
Terminal Rates (c)	0/5 (0%)	4/35(11%)
Week of First Observation	105	98 P = 0.567N
Life Table Test (d)		P = 0.567 N P = 0.447
Incidental Tumor Test (d)		P = 0.447 P = 0.456
Fisher Exact Test (d)		r - 0.400
egumentary System: Fibroma Overall Rates (a)	14/118 (12%)	36/250 (14%)
Adjusted Rates (b)	36.1%	38.2%
	0/5 (0%)	6/35 (17%)
Terminal Rates (c) Week of First Observation	112	87
Life Table Tests (d)	112	P = 0.507 N
Incidental Tumor Tests (d)		P = 0.325
		L -0.040

TABLE A3. ANALYSIS OF PRIMARY TUMORS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE

	Untreated Control	1% Tremolite
ntegumentary System: Neurofibroma		<u> </u>
Overall Rates (a)	2/118 (2%)	6/250 (2%)
Adjusted Rates (b)	3.9%	5.6%
Terminal Rates (c)	0/5 (0%)	0/35 (0%)
Week of First Observation	111	121
Life Table Tests (d)		P = 0.534
Incidental Tumor Tests (d)		P = 0.503
Fisher Exact Test (d)		P=0.499
ntegumentary System: Fibroma or Neuro		
Overall Rates (a)	15/118 (13%)	41/250 (16%)
Adjusted Rates (b)	36.8%	41.1%
Terminal Rates (c)	0/5 (0%)	6/35 (17%)
Week of First Observation	111	87
Life Table Tests (d)		P = 0.521
Incidental Tumor Tests (d)		P = 0.240
Fisher Exact Test (d)		P = 0.224
ntegumentary System: Fibrosarcoma	0.4.4.007.	
Overall Rates (a)	3/118(3%)	12/250 (5%)
Adjusted Rates (b)	5.8%	17.4%
Terminal Rates (c)	0/5 (0%)	3/35 (9%)
Week of First Observation	85	85
Life Table Tests (d)		P = 0.407
Incidental Tumor Tests (d) Fisher Exact Test (d)		P = 0.246 P = 0.235
ntegumentary System: Sarcoma, Fibrosar Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d)	5/118 (4%) 18.3% 0/5 (0%) 85	$\begin{array}{c} 17/250 \ (7\%) \\ 27.4\% \\ 5/35 \ (14\%) \\ 85 \\ P = 0.553 \\ P = 0.247 \\ P = 0.236 \end{array}$
ntegumentary System: Neurofibroma or 1	Neurofibrosarcoma	
Overall Rates (a)	2/118 (2%)	7/250 (3%)
Adjusted Rates (b)	3.9%	6.2%
	0/5(0%)	
Terminal Rates (c) Week of First Observation	0/5 (0%) 111	0/35 (0%) 116
Terminal Rates (c) Week of First Observation	0/5 (0%) 111	0/35 (0%)
Terminal Rates (c)	-	0/35 (0%) 116
Terminal Rates (c) Week of First Observation Life Table Tests (d)	-	0/35(0%) 116 P=0.442
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d)	111	0/35(0%) 116 P=0.442 P=0.421
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma or Fibros Overall Rates (a)	111	0/35(0%) 116 P=0.442 P=0.421
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ategumentary System: Fibroma or Fibros	111 sarcoma	0/35 (0%) 116 P=0.442 P=0.421 P=0.407
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Ategumentary System: Fibroma or Fibros Overall Rates (a) Adjusted Rates (b) Terminal Rates (c)	111 sarcoma 17/118 (14%) 39.9% 0/5 (0%)	0/35 (0%) 116 P = 0.442 P = 0.421 P = 0.407 47/250 (19%) 49.6% 9/35 (26%)
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma or Fibros Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation	111 sarcoma 17/118 (14%) 39.9%	0/35 (0%) 116 $P = 0.442$ $P = 0.421$ $P = 0.407$ $47/250 (19%)$ $49.6%$ $9/35 (26%)$ 85
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma or Fibros Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d)	111 sarcoma 17/118 (14%) 39.9% 0/5 (0%)	0/35 (0%) 116 $P = 0.442$ $P = 0.421$ $P = 0.407$ $47/250 (19%)$ $49.6%$ $9/35 (26%)$ 85 $P = 0.542$
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma or Fibros Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d)	111 sarcoma 17/118 (14%) 39.9% 0/5 (0%)	0/35 (0%) 116 $P = 0.442$ $P = 0.421$ $P = 0.407$ $47/250 (19%)$ $49.6%$ $9/35 (26%)$ 85 $P = 0.542$ $P = 0.203$
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma or Fibros Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d)	111 sarcoma 17/118 (14%) 39.9% 0/5 (0%)	0/35 (0%) 116 $P = 0.442$ $P = 0.421$ $P = 0.407$ $47/250 (19%)$ $49.6%$ $9/35 (26%)$ 85 $P = 0.542$
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma or Fibros Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma, Neurofit	111 sarcoma 17/118 (14%) 39.9% 0/5 (0%) 85 oroma, Sarcoma, Fibrosarcoma, N	0/35 (0%) 116 P = 0.442 P = 0.421 P = 0.407 47/250 (19%) 49.6% 9/35 (26%) 85 P = 0.542 P = 0.203 P = 0.187 eurofibrosarcoma, or Myxosarcom
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma or Fibros Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma, Neurofik Overall Rates (a)	111 5arcoma 17/118 (14%) 39.9% 0/5 (0%) 85 5 5 5 5 6 7 7 7 7 8 7 1 1 1 1 1 1 1 1	0/35 (0%) 116 P = 0.442 P = 0.421 P = 0.407 47/250 (19%) 49.6% 9/35 (26%) 85 P = 0.542 P = 0.203 P = 0.187 eurofibrosarcoma, or Myxosarcom 57/250 (23%)
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma or Fibros Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma, Neurofik Overall Rates (a) Adjusted Rates (b)	111 sarcoma 17/118 (14%) 39.9% 0/5 (0%) 85 proma, Sarcoma, Fibrosarcoma, No 20/118 (17%) 49.5%	0/35 (0%) 116 P = 0.442 P = 0.421 P = 0.407 47/250 (19%) 49.6% 9/35 (26%) 85 P = 0.542 P = 0.203 P = 0.187 eurofibrosarcoma, or Myxosarcom 57/250 (23%) 57.3%
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma or Fibros Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma, Neurofik Overall Rates (a) Adjusted Rates (b) Terminal Rates (c)	111 sarcoma 17/118 (14%) 39.9% 0/5 (0%) 85 oroma, Sarcoma, Fibrosarcoma, No 20/118 (17%) 49.5% 0/5 (0%)	0/35 (0%) 116 $P = 0.442$ $P = 0.421$ $P = 0.407$ $47/250 (19%)$ $49.6%$ $9/35 (26%)$ 85 $P = 0.542$ $P = 0.203$ $P = 0.187$ eurofibrosarcoma, or Myxosarcom $57/250 (23%)$ $57.3%$ $11/35 (31%)$
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Adjusted Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Adjusted Rates (b) Terminal Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation	111 sarcoma 17/118 (14%) 39.9% 0/5 (0%) 85 proma, Sarcoma, Fibrosarcoma, No 20/118 (17%) 49.5%	0/35 (0%) 116 $P = 0.442$ $P = 0.421$ $P = 0.407$ $47/250 (19%)$ $49.6%$ $9/35 (26%)$ 85 $P = 0.542$ $P = 0.203$ $P = 0.187$ eurofibrosarcoma, or Myxosarcom $57/250 (23%)$ $57.3%$ $11/35 (31%)$ 85
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma or Fibros Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma, Neurofib Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d)	111 sarcoma 17/118 (14%) 39.9% 0/5 (0%) 85 oroma, Sarcoma, Fibrosarcoma, No 20/118 (17%) 49.5% 0/5 (0%)	0/35 (0%) 116 $P = 0.442$ $P = 0.421$ $P = 0.407$ $47/250 (19%)$ $49.6%$ $9/35 (26%)$ 85 $P = 0.542$ $P = 0.203$ $P = 0.187$ eurofibrosarcoma, or Myxosarcom $57/250 (23%)$ $57.3%$ $11/35 (31%)$ 85 $P = 0.507$
Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma or Fibros Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) ntegumentary System: Fibroma, Neurofib Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation	111 sarcoma 17/118 (14%) 39.9% 0/5 (0%) 85 oroma, Sarcoma, Fibrosarcoma, No 20/118 (17%) 49.5% 0/5 (0%)	0/35 (0%) 116 $P = 0.442$ $P = 0.421$ $P = 0.407$ $47/250 (19%)$ $49.6%$ $9/35 (26%)$ 85 $P = 0.542$ $P = 0.203$ $P = 0.187$ eurofibrosarcoma, or Myxosarcom $57/250 (23%)$ $57.3%$ $11/35 (31%)$ 85

TABLE A3. ANALYSIS OF PRIMARY TUMORS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

TABLE A3. ANALYSIS OF PRIMARY TUMORS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

	Untreated Control	1% Tremolite
ntegumentary System or Salivary Gland	Sarcoma, Fibrosarcoma, Neurofi	brosarcoma, or Myxosarcoma
Overall Rates (a)	6/118 (5%)	20/250 (8%)
Adjusted Rates (b)	20.3%	30.9%
Terminal Rates (c)	0/5 (0%)	7/35 (20%)
Week of First Observation	85	85
Life Table Tests (d)		P = 0.540
Incidental Tumor Tests (d)		P = 0.236
Fisher Exact Test (d)		P = 0.214
ntegumentary System or Salivary Gland	Fibroma, Neurofibroma, Sarcoma	a, Fibrosarcoma,
eurofibrosarcoma, or Myxosarcoma		50/050 (04/2)
Overall Rates (a)	21/118 (18%)	59/250 (24%)
Adjusted Rates (b)	50.7%	60.8%
Terminal Rates (c)	0/5 (0%)	13/35 (37%)
Week of First Observation	85	85
Life Table Tests (d)		P = 0.551N
Incidental Tumor Tests (d)		P = 0.149
Fisher Exact Test (d)		P = 0.130
ung: Alveolar/Bronchiolar Adenoma or		0/0×0 /1 // >
Overall Rates (e)	3/118 (3%)	2/250 (1%)
Adjusted Rates (b)	9.1%	3.9%
Terminal Rates (c)	0/5 (0%)	1/35 (3%)
Week of First Observation	127	132
Life Table Test (d)		P = 0.109N
Incidental Tumor Test (d)		P = 0.179N
Fisher Exact Test (d)		P = 0.190 N
lematopoietic System: Leukemia		
Overall Rates (a)	43/118 (36%)	102/250 (41%)
Adjusted Rates (b)	100.0%	75.0%
Terminal Rates (c)	5/5 (100%)	16/35 (46%)
Week of First Observation	105	84
Life Table Test (d)		P = 0.289N
Incidental Tumor Test (d)		P = 0.257
Fisher Exact Test (d)		P = 0.247
ematopoietic System: Lymphoma		
Overall Rates (a)	5/118 (4%)	1/250 (<1%)
Adjusted Rates (b)	9.2%	0.5%
Terminal Rates (c)	0/5 (0%)	0/35 (0%)
Week of First Observation	76	107
Life Table Test (d)		P = 0.009 N
Incidental Tumor Test (d)		P = 0.019N
Fisher Exact Test (d)		P = 0.014N
rculatory System: Hemangiosarcoma		
Overall Rates (a)	2/118 (2%)	8/250 (3%)
Adjusted Rates (b)	9.5%	10.2%
Terminal Rates (c)	0/5 (0%)	2/35 (6%)
Week of First Observation	132	90
Life Table Test (d)		P = 0.465
Incidental Tumor Test (d)		P = 0.287
Fisher Exact Test (d)		P = 0.327
irculatory System: Hemangioma or Hen	nangiosarcoma	
Overall Rates (a)	3/118 (3%)	8/250 (3%)
Adjusted Rates (b)	18.5%	10.2%
Terminal Rates (c)	0/5 (0%)	2/35 (6%)
Week of First Observation	132	90
Life Table Test (d)		P = 0.586N
Incidental Tumor Test (d)		P = 0.465
		P = 0.508

	Untreated Control	1% Tremolite
Liver: Neoplastic Nodule		
Overall Rates (e)	10/118 (8%)	8/250 (3%)
Adjusted Rates (b)	28.4%	9.4%
Terminal Rates (c)	0/5 (0%)	1/35 (3%)
Week of First Observation	105	113
Life Table Test (d)		P = 0.009 N
Incidental Tumor Test (d)		P = 0.018N
Fisher Exact Test (d)		P = 0.030 N
Liver: Hepatocellular Carcinoma		
Overall Rates (e)	6/118 (5%)	6/250 (2%)
Adjusted Rates (b)	27.0%	9.3%
Terminal Rates (c)	0/5 (0%)	2/35 (6%)
Week of First Observation	127	122
Life Table Test (d)		P = 0.048N
Incidental Tumor Test (d)		P = 0.126N
Fisher Exact Test (d)		P = 0.150N
Liver: Neoplastic Nodule or Hepatocel		
Overall Rates (e)	16/118 (14%)	14/250 (6%)
Adjusted Rates (b)	48.0%	18.0%
Terminal Rates (c)	0/5 (0%)	3/35 (9%)
Week of First Observation	105	113 D = 0.001 M
Life Table Test (d)		P<0.001N
Incidental Tumor Test (d)		P = 0.004N
Fisher Exact Test (d)		P = 0.010N
Pancreas: Acinar Cell Adenoma		
Overall Rates (e)	10/118 (8%)	22/250 (9%)
Adjusted Rates (b)	50.8%	35.5%
Terminal Rates (c)	1/5 (20%)	7/35 (20%)
Week of First Observation	120	111 P = 0.199N
Life Table Tests (d)		P = 0.195N P = 0.578N
Incidental Tumor Tests (d) Fisher Exact Test (d)		P = 0.57819 P = 0.545
Pancreas: Acinar Cell Adenoma or Ca Overall Rates (e)	rcinoma 10/118 (8%)	(f) 24/250 (10%)
Adjusted Rates (b)	50.8%	36.2%
Terminal Rates (c)	1/5 (20%)	7/35 (20%)
Week of First Observation	120	105
Life Table Tests (d)	120	P = 0.292N
Incidental Tumor Tests (d)		P = 0.459
Fisher Exact Test (d)		P = 0.446
Pancreas: Benign Mixed Tumor		
Overall Rates (e)	3/118 (3%)	3/250 (1%)
Adjusted Rates (b)	27.3%	7.0%
Terminal Rates (c)	1/5 (20%)	2/35 (6%)
Week of First Observation	130	137
Life Table Test (d)		P = 0.085N
Incidental Tumor Test (d)		P = 0.287 N
Fisher Exact Test (d)		P = 0.294N
Stomach: Squamous Cell Papilloma or	Carcinoma	
Overall Rates (e)	3/118 (3%)	2/250(1%)
Adjusted Rates (b)	21.2%	3.3%
Terminal Rates (c)	0/5 (0%)	1/35 (3%)
Week of First Observation	125	109
Life Table Test (d)		P = 0.067 N
Incidental Tumor Test (d)		P = 0.195N
Fisher Exact Test (d)		P = 0.190N

TABLE A3. ANALYSIS OF PRIMARY TUMORS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

	Untreated Control	1% Tremolite
		<u></u>
Overall Rates (e)	1/118(1%)	5/250 (2%)
Adjusted Rates (b)	1.9%	5.8%
Terminal Rates (c)	0/5 (0%)	0/35 (0%)
Week of First Observation	127	131
Life Table Test (d)		P = 0.417
Incidental Tumor Test (d)		P = 0.369
Fisher Exact Test (d)		P = 0.375
idney: Tubular Cell Adenoma or Aden	ocarcinoma 1/118 (1%)	6/250 (2%)
Overall Rates (e)	1.9%	8.5%
Adjusted Rates (b)	0/5 (0%)	1/35 (3%)
Terminal Rates (c)	127	131
Week of First Observation	127	P = 0.379
Life Table Test (d)		P = 0.285
Incidental Tumor Test (d) Fisher Exact Test (d)		P = 0.285
'ituitary Gland: Adenoma Overall Rates (e)	20/118 (17%)	37/247 (15%)
Adjusted Rates (b)	44.1%	36.7%
Terminal Rates (c)	0/5 (0%)	5/35 (14%)
Week of First Observation	105	97
Life Table Test (d)		P = 0.150 N
Incidental Tumor Test (d)		P = 0.351 N
Fisher Exact Test (d)		P = 0.366N
ituitary Gland: Adenoma or Carcinom	a	
Overall Rates (e)	22/118 (19%)	41/247 (17%)
Adjusted Rates (b)	47.9%	39.4%
Terminal Rates (c)	0/5 (0%)	5/35 (14%)
Week of First Observation	105	97
Life Table Test (d)		P = 0.147 N
Incidental Tumor Test (d)		P = 0.345 N
Fisher Exact Test (d)		P = 0.365N
Adrenal Medulla: Pheochromocytoma		
Overall Rates (e)	38/118 (32%)	62/250 (25%)
Adjusted Rates (b)	91.0%	68.3%
Terminal Rates (c)	3/5 (60%)	17/35 (49%)
Week of First Observation	104	103
Life Table Test (d)		P = 0.002N
Incidental Tumor Test (d)		P = 0.082N
Fisher Exact Test (d)		P = 0.087 N
Adrenal Medulla: Malignant Pheochron	nocytoma	
Overall Rates (e)	3/118 (3%)	7/250 (3%)
Adjusted Rates (b)	23.8%	10.4%
Terminal Rates (c)	1/5 (20%)	2/35 (6%)
Week of First Observation	130	113 D = 0.482N
Life Table Test (d)		P = 0.482N P = 0.627
Incidental Tumor Test (d)		P = 0.627 P = 0.594
Fisher Exact Test (d)		1
Adrenal Medulla: Pheochromocytoma o		68/250 (27%)
Overall Rates (e)	41/118 (35%)	72.9%
Adjusted Rates (b)	95.7%	12.5% 19/35 (54%)
Terminal Rates (c)	4/5 (80%)	103
Week of First Observation	104	P = 0.001 N
Life Table Test (d)		P = 0.001N P = 0.075N
Incidental Tumor Test (d)		P = 0.073 N P = 0.088 N
Fisher Exact Test (d)		1 -0.0001

TABLE A3. ANALYSIS OF PRIMARY TUMORS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

	Untreated Control	1% Tremolite
Fhyroid Gland: Follicular Cell Adenoma		
Overall Rates (e)	5/117 (4%)	12/247 (5%)
Adjusted Rates (b)	8.8%	18.4%
Terminal Rates (c)	0/5 (0%)	4/35 (11%)
Week of First Observation	105	111
Life Table Test (d)		P = 0.501N P = 0.474
Incidental Tumor Test (d)		P = 0.519
Fisher Exact Test (d)		1 = 0.015
hyroid Gland: Follicular Cell Carcinoma	C(110/E0)	13/247 (5%)
Overall Rates (e)	6/117 (5%) 24.7%	18.4%
Adjusted Rates (b) Terminal Rates (c)	24.7% 0/5 (0%)	2/35 (6%)
Week of First Observation	128	104
Life Table Test (d)		P = 0.391 N
Incidental Tumor Test (d)		P = 0.599
Fisher Exact Test (d)		P=0.589
'hyroid Gland: Follicular Cell Adenoma o	r Carcinoma	
Overall Rates (e)	11/117 (9%)	25/247 (10%)
Adjusted Rates (b)	31.4%	34.1%
Terminal Rates (c)	0/5 (0%)	6/35 (17%)
Week of First Observation	105	104 D 0 846N
Life Table Test (d)		P = 0.346N P = 0.479
Incidental Tumor Test (d) Fisher Exact Test (d)		P = 0.475 P = 0.497
Fisher Exact rest(d)		
Thyroid Gland: C-Cell Adenoma		22/247 (9%)
Overall Rates (e)	11/117(9%)	17.8%
Adjusted Rates (b)	35.9% 1/5 (20%)	0/35(0%)
Terminal Rates (c)	108	97
Week of First Observation	108	P = 0.386N
Life Table Test (d) Incidental Tumor Test (d)		P = 0.572N
Fisher Exact Test (d)		P = 0.509 N
Thyroid Gland: C-Cell Carcinoma		
Overall Rates (e)	16/117 (14%)	48/247 (19%)
Adjusted Rates (b)	62.4%	53.0%
Terminal Rates (c)	2/5 (40%)	9/35 (26%)
Week of First Observation	91	85
Life Table Test (d)		P = 0.505
Incidental Tumor Test (d)		P = 0.130 P = 0.114
Fisher Exact Test (d)		P = 0.114
Thyroid Gland: C-Cell Adenoma or Carcin	ioma	70/047 (990)
Overall Rates (e)	27/117 (23%)	70/247 (28%) 61.5%
Adjusted Rates (b)	79.9% 2/5 (60%)	9/35 (26%)
Terminal Rates (c)	3/5 (60%) 91	85
Week of First Observation Life Table Test (d)	71	P = 0.473N
Incidental Tumor Test (d)		P = 0.170
Fisher Exact Test (d)		P = 0.175
Pancreatic Islets: Islet Cell Adenoma		
Overall Rates (e)	5/118 (4%)	12/250 (5%)
Adjusted Rates (b)	31.8%	11.4%
Terminal Rates (c)	1/5 (20%)	1/35 (3%)
Week of First Observation	129	103
Life Table Test (d)		P = 0.529N
Incidental Tumor Test (d)		P = 0.494
Fisher Exact Test (d)		P = 0.522

TABLE A3. ANALYSIS OF PRIMARY TUMORS IN MALE RATS IN THE LIFETIME FEED STUDYOF TREMOLITE (Continued)

	Untreated Control	1% Tremolite	
Pancreatic Islets: Islet Cell Carcinoma			
Overall Rates (e)	7/118 (6%)	11/250 (4%)	
Adjusted Rates (b)	19.5%	16.1%	
Terminal Rates (c)	0/5 (0%)	3/35 (9%)	
Week of First Observation	120	108	
Life Table Test (d)		P = 0.173N	
Incidental Tumor Test (d)		P = 0.320N	
Fisher Exact Test (d)		P = 0.345N	
Pancreatic Islets: Islet Cell Adenoma or		00/050 (00)	
Overall Rates (e)	11/118 (9%)	22/250 (9%)	
Adjusted Rates (b)	43.2%	25.3%	
Terminal Rates (c)	1/5(20%)	4/35(11%)	
Week of First Observation	120	103 D. 0.050N	
Life Table Test (d)		P = 0.250N	
Incidental Tumor Test (d)		P = 0.502N	
Fisher Exact Test (d)		P = 0.505 N	
Mammary Gland: Fibroadenoma	17/110/11/2	32/250 (13%)	
Overall Rates (a)	17/118(14%)		
Adjusted Rates (b)	59.4%	49.6%	
Terminal Rates (c)	1/5 (20%)	12/35 (34%)	
Week of First Observation	112	110 D. 0.041N	
Life Table Tests (d)		$P = 0.041 \mathrm{N}$	
Incidental Tumor Tests (d)		P = 0.347 N	
Fisher Exact Test (d)		P = 0.393 N	
Preputial Gland: Squamous Cell Carcino	ma 6/118 (5%)	14/250 (6%)	
Overall Rates (e)		19.2%	
Adjusted Rates (b)	13.2% 0/5 (0%)	3/35 (9%)	
Terminal Rates (c)	110	103	
Week of First Observation	110	P = 0.456N	
Life Table Tests (d)		P = 0.507	
Incidental Tumor Tests (d)		P = 0.528	
Fisher Exact Test (d)		r = 0.028	
Preputial Gland: Carcinoma or Squamou		14/250 (6%)	
Overall Rates (e)	7/118(6%) 14.0%	19.2%	
Adjusted Rates (b)	0/5 (0%)	3/35(9%)	
Terminal Rates (c) Week of First Observation	85	103	
Life Table Tests (d)	00	P = 0.328N	
Life Table Tests (d) Incidental Tumor Tests (d)		P = 0.553N	
Fisher Exact Test (d)		P = 0.534N	
Testis: Interstitial Cell Tumor			
Overall Rates (e)	114/118 (97%)	237/250 (95%)	
Adjusted Rates (b)	100.0%	100.0%	
Terminal Rates (c)	5/5 (100%)	35/35 (100%)	
Week of First Observation	76	76	
Life Table Test (d)		P = 0.022N	
Incidental Tumor Test (d)		P = 0.590 N	
Fisher Exact Test (d)		P = 0.315N	
Brain: Astrocytoma			
Overall Rates (e)	7/118 (6%)	6/250 (2%)	
Adjusted Rates (b)	30.3%	4.9%	
Terminal Rates (c)	1/5 (20%)	0/35(0%)	
Week of First Observation	61	48 B - 0.047 N	
Life Table Tests (d)		P = 0.047 N P = 0.066 N	
Incidental Tumor Tests (d) Fisher Exact Test (d)		P = 0.066 N P = 0.082 N	

TABLE A3. ANALYSIS OF PRIMARY TUMORS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

	Untreated Control	1% Tremolite	
Brain: Glioma or Astrocytoma			
Overall Rates (e)	8/118 (7%)	6/250 (2%)	
Adjusted Rates (b)	31.0%	4.9%	
Terminal Rates (c)	1/5 (20%)	0/35 (0%)	
Week of First Observation	61	48	
Life Table Tests (d)		P = 0.022N	
Incidental Tumor Tests (d)		P = 0.035 N	
Fisher Exact Test (d)		P = 0.043 N	
All Sites: Malignant Mesothelioma			
Overall Rates (a)	10/118 (8%)	8/250 (3 %)	
Adjusted Rates (b)	18.0%	7.0%	
Terminal Rates (c)	0/5 (0%)	1/35 (3%)	
Week of First Observation	92	94	
Life Table Test (d)		P = 0.017 N	
Incidental Tumor Test (d)		P = 0.046N	
Fisher Exact Test (d)		P = 0.030 N	
All Sites: Benign Tumors			
Overall Rates (a)	115/118 (97%)	238/250 (95%)	
Adjusted Rates (b)	100.0%	100.0%	
Terminal Rates (c)	5/5 (100%)	35/35 (100%)	
Week of First Observation	76	76	
Life Table Test (d)		P = 0.021 N	
Incidental Tumor Test (d)		P = 0.528N	
Fisher Exact Test (d)		P = 0.235N	
All Sites: Malignant Tumors			
Overall Rates (a)	96/118 (81%)	199/250 (80%)	
Adjusted Rates (b)	100.0%	96.5%	
Terminal Rates (c)	5/5(100%)	29/35 (83%)	
Week of First Observation	61	48	
Life Table Test (d)	•-	P = 0.032N	
Incidental Tumor Test (d)		P = 0.428N	
Fisher Exact Test (d)		P = 0.403 N	
All Sites: All Tumors			
Overall Rates (a)	117/118 (99%)	241/250 (96%)	
Adjusted Rates (b)	100.0%	100.0%	
Terminal Rates (c)	5/5 (100%)	35/35 (100%)	
Week of First Observation	61	48	
Life Table Test (d)	.	P = 0.019N	
Incidental Tumor Test (d)		P = 0.351N	
Fisher Exact Test (d)		P = 0.116N	

TABLE A3. ANALYSIS OF PRIMARY TUMORS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

(a) Number of tumor-bearing animals/number of animals examined grossly at the site

(b) Kaplan-Meier estimated tumor incidences at the end of the study after adjusting for intercurrent mortality

(c) Observed tumor incidence in animals killed at the end of the study

(d) Beneath the dosed group incidence are the P values corresponding to pairwise comparisons between the dosed group and the controls. The life table analysis regards tumors in animals dying prior to terminal kill as being (directly or indirectly) the cause of death. The incidental tumor test regards these lesions as nonfatal. The Fisher exact test compares directly the overall incidence rates. A lower incidence in the dosed group than in controls is indicated by (N).

(e) Number of tumor-bearing animals/number of animals examined microscopically at the site

(f) Includes one carcinoma, NOS

TABLE A4a. INCIDENCE OF EPITHELIAL TUMORS OF THE LARGE INTESTINE IN MALE F344/N RATSRECEIVING NO TREATMENT IN LIFETIME STUDIES

Asbestos Studies	Incidence	Diagnosis
SR Chrysotile	0/87 (0.0%)	
IR Chrysotile	0/85 (0.0%)	
Tremolite	1/118 (0.8%)	Adenomatous polyp, NOS
Crocidolite (a)	1/117 (0.8%)	Adenomatous polyp, NOS
•	1/117 (0.8%)	Carcinoma, NOS
Amosite	0/117 (0.0%)	
TOTAL	2/524 (0.4%)	
SD (b)	0.47%	

(a) Both tumors occured in the same animal

(b) Standard deviation

TABLE A4b. INCIDENCE OF EPITHELIAL TUMORS OF THE SMALL INTESTINE IN MALE F344/N RATS RECEIVING NO TREATMENT IN LIFETIME STUDIES

Asbestos Studies	Incidence	Diagnosis
SR Chrysotile	1/88(0.6%)	Mucinous cystadenocarcinoma
IR Chrysotile	0/85 (0.0%)	·
Tremolite	0/118(0.0%)	
Crocidolite	1/117 (0.9%)	Adenocarcinoma, NOS
Amosite	1/117(0.9%)	Adenomatous polyp
	2/117(1.7%)	Mucinous cystadenocarcinoma
TOTAL	5/524(1.0%)	
SD(a)	1.05%	

(a) Standard deviation

TABLE A5. S	SUMMARY OF THE	INCIDENCE OF N	NONNEOPLASTIC	CLESIONS IN MALE RATS IN 7	гне
		LIFETIME FEED	STUDY OF TREM	IOLITE	

	Untreated Control		1% Tremolite 250	
Animals initially in study				
Animals necropsied	18		250	
Animals examined histopathologically	18		250	
NTEGUMENTARY SYSTEM				
*Skin	(118)		(250)	(1 m)
Epidermal inclusion cyst		(3%)		(1%)
Abscess, NOS	2	(2%)		(1%) (0.4%)
Inflammation, chronic focal				(0.4%) (0.4%)
Granuloma, NOS				(1%)
Fibrosis, focal Necrosis, focal				(0.4%)
Hyperplasia, basal cell	1	(1%)		(0.4%)
Hyperkeratosis		(2%)		(4%)
Acanthosis		(4%)	6	(2%)
*Subcutaneous tissue	(118)		(250)	
Edema, NOS			-	(0.4%)
Hemorrhage				(1%)
Steatitis	-			(0.4%)
Abscess, NOS		(1%)	3	(1%)
Inflammation, chronic focal	1	(1%)		
RESPIRATORY SYSTEM	· · · · · · · · · · · · · · · · · · ·			
*Nasal turbinate	(118)		(250)	
Inflammation, acute diffuse				(0.4%)
Necrosis, focal	(110)			(0.4%)
#Lung/bronchus	(118)		(250)	(0.4%)
Fibrosis, focal	(118)		(250)	(0.4%)
#Lung		(6%)		(4%)
Congestion, NOS Hemorrhage		(7%)		(5%)
Inflammation, interstitial		(7%)		(4%)
Pneumonia, aspiration		(1%)		(0.4%)
Inflammation, fibrinous	-	(1	(0.4%)
Inflammation, acute focal	2	(2%)		(0.4%)
Inflammation, chronic	89	(75%)	230	(92%)
Inflammation, chronic focal	1	(1%)		
Fibrosis, diffuse				(1%)
Pigmentation, NOS				(1%)
Hyperplasia, alveolar epithelium	7	(6%)		(3%)
Metaplasia, osseous	(110)			(0.4%)
#Lung/alveoli Edema, NOS	(118)	(1%)	(250)	(0.4%)
Edema, NOS Histiocytosis		(5%)		(5%)
HEMATOPOIETIC SYSTEM	<u></u>	······································		
#Bone marrow	(117)		(248)	
Hemorrhage		(1%)		(0.4%)
Hypoplasia, NOS		(4%)		(4%)
Hyperplasia, NOS		(6%)	9	(4%)
#Spleen	(118)		(250)	
Congestion, NOS				(0.4%)
Hemorrhage				(1 %)
Fibrosis, focal	11	(9%)		(7%)
Fibrosis, multifocal	C	(5%)		(1%) (3%)
Fibrosis, diffuse	6	(070)		(0.4%)
Necrosis, NOS	1	(1%)		(4%)
Necrosis, focal Amyloidosis	1	- 101		(0.4%)
5 ULV 10 U U SIS			•	

	Untreated	l Control	1% Tr	emolite
MATODOIETIC SVSTEM			<u></u>	
MATOPOIETIC SYSTEM #Spleen (Continued)	(118)		(250)	
	(110)			(1%)
Pigmentation, NOS	10	(16%)		(20%)
Hemosiderosis	19	(10%)		(0.4%)
Hyperplasia, nodular				(0.4%)
Hyperplasia, stromal				(0.4%) (1%)
Hyperplasia, reticulum cell				(1%)
Hyperplasia, lymphoid	25	(30%)		(1%)
Hematopoiesis		(30%)	(250)	
#Splenic capsule	(118)	(19)	(250)	
Cyst, NOS	(118)	(1%)	(250)	
#Splenic follicles		(2%)		(4%)
Atrophy, NOS		(1%)	0	(4/0)
Atrophy, focal #Mandibular lymph node	(118)	(10)	(250)	
#Mandibular lymph node Congestion, NOS		(1%)		(0.4%)
0,		(1%) (1%)		(0.4%)
Hemorrhage	1	(170)		(0.4%)
Abscess, NOS			-	(0.4%)
Pigmentation, NOS	•	(10)	1	(0.470)
Hyperplasia, NOS	1	(1%)	1	(1 10)
Hyperplasia, reticulum cell		(050)		(0.4%)
Hyperplasia, lymphoid		(25%)		(15%)
#Cervical lymph node	(118)		(250)	
Erythrophagocytosis				(0.4%)
Hyperplasia, lymphoid				(0.4%)
#Mediastinal lymph node	(118)		(250)	
Congestion, NOS		(4%)	-	(1%)
Hemorrhage	6	(5%)		(5%)
Inflammation, acute				(0.4%)
Inflammation, chronic				(0.4%)
Necrosis, NOS			1	(0.4%)
Pigmentation, NOS	20	(17%)	22	(9%)
Atrophy, NOS	1	(1%)	1	(0.4%)
Erythrophagocytosis	6	(5%)	6	(2%)
Hyperplasia, reticulum cell		(5%)	5	(2%)
Hyperplasia, lymphoid		(7%)	3	(1%)
Hematopoiesis	•	(1	(0.4%)
#Pancreatic lymph node	(118)		(250)	
Pigmentation, NOS		(4%)		(2%)
Hyperplasia, reticulum cell		(3%)		(2%)
Hyperplasia, lymphoid		(1%)		(1%)
#Mesenteric lymph node	(118)	/	(250)	
Hemorrhage		(2%)		(0.4%)
Pigmentation, NOS		(1%)		(1%)
Atrophy, NOS		(1%)	-	
Erythrophagocytosis		(2%)	7	(3%)
Hyperplasia, reticulum cell		(25%)		(26%)
Hyperplasia, lymphoid		(5%)		(5%)
	(118)		(250)	
#Ileocolic lymph node	(110)			(0.4%)
Hemorrhage				(0.4%)
Inflammation, chronic	1	(1%)	1	(0170)
Fibrosis Fibrosis	1	(170)	1	(0.4%)
Fibrosis, focal	4	(10%)	1	(0.4170)
Hyperplasia, reticulum cell		(1%)	(250)	
#Renal lymph node	(118)			
Pigmentation, NOS		(1%)		(2%)
Hyperplasia, reticulum cell	1	(1%)		(1%)
Hyperplasia, lymphoid				(1%)
#Iliac lymph node	(118)		(250)	
Inflammation, acute				(0.4%)
Erythrophagocytosis				(0.4%)
#Lung	(118)		(250)	1
Leukocytosis, NOS	1	(1%)		

TABLE A5. SUMMARY OF THE INCIDENCE OF NONNEOPLASTIC LESIONS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

Tremolite, NTP TR 277

	Untreated Control	1% Tremolite	
EMATOPOIETIC SYSTEM (Continued)	<u></u>		<u> </u>
#Liver	(118)	(250)	
Leukocytosis, NOS	2 (2%)	((2%)
Hematopoiesis	$\frac{1}{1}$ (1%)		(1%)
#Thymus	(89)	(196)	(1,0)
Cystic ducts	1 (1%)	(100)	
Congestion, NOS	1 (1,0)	2	(1%)
Hyperplasia, epithelial	2 (2%)	-	(1,0)
	2 (270)		
RCULATORY SYSTEM			
#Cerebrum	(118)	(250)	
Thrombosis, NOS	1 (1%)		
*Mediastinum	(118)	(250)	
Thrombosis, NOS	1 (1%)	(200)	
Periarteritis		1	(0.4%)
#Spleen	(118)	(250)	
Thrombosis, NOS		3	(1%)
#Mandibular lymph node	(118)	(250)	
Lymphangiectasis	4 (3%)	11	(4%)
#Mediastinal lymph node	(118)	(250)	
Lymphangiectasis	5 (4%)		(2%)
Thrombosis, NOS	- \/		(0.4%)
#Pancreatic lymph node	(118)	(250)	
Lymphangiectasis	1 (1%)		(0.4%)
#Mesenteric lymph node	(118)	(250)	
Lymphangiectasis	6 (5%)		(4%)
#Ileocolic lymph node	(118)	(250)	
Lymphangiectasis	3 (3%)	2	(1%)
#Iliac lymph node	(118)	(250)	
Lymphangiectasis		2	(1%)
#Lung	(118)	(250)	
Thrombosis, NOS		3	(1%)
#Heart	(118)	(250)	
Inflammation, chronic		1	(0.4%)
Inflammation, chronic focal	1 (1%)		
Inflammation, chronic diffuse		1	(0.4%)
#Heart/atrium	(118)	(250)	
Thrombosis, NOS	5 (4%)		(1%)
#Myocardium	(118)	(250)	
Mineralization	2 (2%)		(0.4%)
Inflammation, acute focal		-	(0.4%)
Inflammation, chronic focal	35 (30%)		(35%)
Inflammation, chronic diffuse	35 (30%)	100	(40%)
Fibrosis, focal	2 (2%)		
Fibrosis, multifocal		1	(0.4%)
Degeneration, NOS			(0.4%)
#Cardiac valve	(118)	(250)	
Inflammation, chronic			(0.4%)
Inflammation, chronic focal	1 (1%)		(0.4%)
*Aorta	(118)	(250)	
Mineralization	1 (1%)		(1%)
*Mesenteric artery	(118)	(250)	
Mineralization	4 (3%)		(0.4%)
#Liver	(118)	(250)	
Embolus, septic			(0.4%)
#Pancreas	(118)	(250)	
Periarteritis	2 (2%)		(2%)
*Mesentery	(118)	(250)	
Periarteritis	3 (3%)		(3%)
#Kidney	(118)	(250)	
Embolus, septic		1	(0.4%)

TABLE A5. SUMMARY OF THE INCIDENCE OF NONNEOPLASTIC LESIONS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

Un	treated	l Control	1% Tre	emolite
IRCULATORY SYSTEM (Continued)				
#Testis	(118)		(250)	
Periarteritis		(2%)	1	(0.4%)
#Adrenal	(118)		(250)	
Thrombosis, NOS	3	(3%)	3	(1%)
#Adrenal cortex	(118)		(250)	
Thrombosis, NOS			1	(0.4%)
IGESTIVE SYSTEM				-
*Hard palate	(118)		(250)	
Hyperkeratosis				(0.4%)
Acanthosis				(0.4%)
*Tongue	(118)		(250)	
Acanthosis		(1%)		(1%)
#Salivary gland	(116)		(245)	(0.400)
Atrophy, NOS				(0.4%)
Atrophy, diffuse	(110)		(245)	(0.4%)
#Parotid gland	(116)			(0.4%)
Inflammation, chronic Degeneration, NOS				(0.4%)
#Liver	(118)		(250)	
Congestion, NOS	(= = + /	(1%)		(1%)
Hemorrhage		(3%)		(0.4%)
Hemorrhagic cyst			1	(0.4%)
Inflammation, acute focal			1	(0.4%)
Inflammation, acute diffuse			1	(0.4%)
Abscess, NOS			1	(0.4%)
Inflammation, chronic	1	(1%)		
Inflammation, chronic focal			1	(0.4%)
Granuloma, NOS		(10%)	15	(6%)
Fibrosis, focal		(1%)		
Fibrosis, multifocal		(1%)	20	
Hepatitis, toxic		(13%)		(11%)
Degeneration, NOS		(14%)		(7%)
Degeneration, cystic	1	(1%)		(1%) (0.4%)
Necrosis, NOS	10	(1 = 0)		(0.4%)
Necrosis, focal	18	(15%)		(3%) (0.4%)
Necrosis, diffuse	177	(1 40%)		(0.4%) (14%)
Metamorphosis fatty		(14%) (8%)		(14%) (15%)
Pigmentation, NOS Focal collular change		(33%)		(26%)
Focal cellular change Angiectasis		(3%)		(4%)
#Bile duct	(118)		(250)	. = . = /
Dilatation, NOS	((0.4%)
Inflammation, chronic	23	(19%)	24	(10%)
Fibrosis		(4%)	2	(1%)
Necrosis, focal		(1%)		
Pigmentation, NOS		(1%)		(100)
Hyperplasia, NOS		(32%)		(18%)
#Pancreas	(118)	(0~)	(250)	
Ectopia	3	(3%)		(4%)
Calculus, unknown gross or microscopic observation		(10()		(0.4%)
Inflammation, chronic focal	1	(1%)		(1%)
Fibrosis, diffuse				(0.4%) (0.4%)
Degeneration, NOS		(107.)	1	(0.4%)
Lipoidosis Pigmentation, NOS	1	(1%)	1	(0.4%)
Atrophy, NOS				(0.4%)
Atrophy, focal	18	(15%)		(11%)
Atrophy, local Atrophy, diffuse		(4%)		(2%)
Hyperplasia, focal				(1%)

TABLE A5. SUMMARY OF THE INCIDENCE OF NONNEOPLASTIC LESIONS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

	Untreated	l Control	1% Tre	emolite
GESTIVE SYSTEM (Continued)	· · · · · · · · · · · · · · · · ·			
#Pancreatic duct	(118)		(250)	
Hyperplasia, NOS	()		1	(0.4%)
#Pancreatic acinus	(118)		(250)	
Hyperplasia, focal	7	(6%)		(7%)
#Esophagus	(116)		(249)	
Inflammation, chronic diffuse		(1%)		
Necrosis, focal		(2%)		(0.4%)
Hyperkeratosis		(8%)	18	(7%)
Acanthosis		(1%)	(250)	
#Stomach	(118)			(0,4%)
Embryonal rest	10	(0 , 0)		(0.4%) (2%)
Mineralization	10	(8%)		(2.4%)
Cyst, NOS	1	(10)		(1%)
Edema, NOS		(1%) (2%)	2	(170)
Hemorrhage		(2%)	9	(1%)
Inflammation, acute focal		(1%)	2	(1/0)
Inflammation, chronic		(1%) (3%)	19	(5%)
Inflammation, chronic focal				(11%)
Inflammation, chronic diffuse		(12%) (8%)		(7%)
Ulcer, perforated	10	(0%)		(0,4%)
Fibrosis, diffuse				(0.4%)
Adhesion, NOS Necrosis, focal	19	(16%)		(18%)
Hyperplasia, epithelial		(2%)	••	(10,0)
Hyperplasia, epitienal Hyperplasia, diffuse	-	(270)	1	(0.4%)
Hyperkeratosis	17	(14%)		(14%)
Acanthosis		(22%)		(22%)
Polyp, inflammatory		(42,0)		(0.4%)
#Gastric muscularis	(118)		(250)	
Degeneration, NOS		(6%)	(200)	
Necrosis, diffuse		(0,0)	1	(0.4%)
#Gastric fundus	(118)		(250)	
Hyperplasia, epithelial		(3%)		
Hyperplasia, focal			1	(0.4%)
Hyperplasia, diffuse	4	(3%)		
#Small intestine	(118)		(250)	
Inflammation, chronic				(0.4%)
#Duodenum	(118)		(250)	
Necrosis, focal	2	(2%)		(0.4%)
#Jejunum	(118)		(250)	
Abscess, NOS		(1%)		
#Ileum	(118)		(250)	
Inflammation, chronic diffuse				(0.4%)
Granuloma, NOS				(0.4%)
Ulcer, perforated				(0.4%)
#Large intestine	(118)		(250)	(0.4%)
Parasitism	(110)		(250)	
#Colon	(118)			(0.4%)
Edema, NOS				(0.4%)
Inflammation, acute focal				(1%)
Inflammation, chronic focal				(0.4%)
Inflammation, chronic diffuse Parasitism	5	(4%)		(13%)
Parasitism Necrosis, focal	0			(1%)
,				(0.4%)
Hyperplasia, epithelial	(118)		(250)	
#Colonic muscularis propria		(1%)	(200)	
Degeneration, NOS #Cecum	(118)		(250)	
#Cecum Congestion, NOS	(110)			(0.4%)
Edema, NOS				(0.4%)
Hemorrhage	1	(1%)		(0.4%)
Inflammation, acute focal		(1%)		

TABLE A5. SUMMARY OF THE INCIDENCE OF NONNEOPLASTIC LESIONS IN MALE RATS IN THELIFETIME FEED STUDY OF TREMOLITE (Continued)

	Untreated Control	1% Tre	emolite
DIGESTIVE SYSTEM			
#Cecum (Continued)	(118)	(250)	
Inflammation, chronic diffuse	• • •	2	(1%)
Parasitism		2	(1%)
Necrosis, focal	1 (1%)		(1%)
Necrosis, diffuse			(1%)
#Descending colon	(118)	(250)	
Abscess, NOS	1 (1%)		
*Rectum	(118)	(250)	(0.40)
Necrosis, focal		1	(0.4%)
JRINARY SYSTEM			
#Kidney	(118)	(250)	
Mineralization	9 (8%)		(4%)
Hydronephrosis			(1%)
Congestion, NOS	2 (2%)		(1%)
Inflammation, acute focal			(0.4%)
Inflammation, chronic	92 (78%)		(91%)
Fibrosis, diffuse	• /• ~ `	1	(0.4%)
Infarct, NOS	1 (1%)	0	(10)
Infarct, healed			(1%) (0.4%)
Pigmentation, NOS	1 (1%)		(0.4%)
Hyperplasia, tubular cell #Kidnow/contox	(118)	(250)	
#Kidney/cortex Cyst, NOS	19 (16%)		(5%)
Multilocular cyst			(1%)
Multiple cysts	2 (2%)		(0.4%)
#Kidney/medulla	(118)	(250)	
Necrosis, focal		1	(0.4%)
#Renal papilla	(118)	(250)	
Hyperplasia, papillary		1	(0.4%)
#Kidney/tubule	(118)	(250)	
Pigmentation, NOS	29 (25%)		(22%)
#Kidney/pelvis	(118)	(250)	
Dilatation, NOS		-	(0.4%)
#Urinary bladder	(118)	(250)	
Hemorrhage	2 (2%)		(2%)
Inflammation, acute diffuse	2 (2%)		(2%)
Inflammation, chronic diffuse			(1%) (0.4%)
Necrosis, focal			(0.4%)
Necrosis, diffuse Hyperplasia, epithelial	1 (1%)	2	· • /•/
	I (170)	1	(0.4%)
Hyperplasia, diffuse Hyperplasia, papillary	2 (2%)	-	(1%)
Hyperplasia, papillary Metaplasia, squamous	2 (270)		(0.4%)
#Urinary bladder/submucosa	(118)	(250)	
Fibrosis, diffuse	1 (1%)		
*Urethra	(118)	(250)	
Inflammation, acute focal	1 (1%)		
			······································
ENDOCRINE SYSTEM #Pituitary	(118)	(247)	
Cyst, NOS	2 (2%)		(3%)
Hemorrhage	$\frac{1}{1}$ (1%)		(1%)
Hemorrhagic cyst			(1%)
Inflammation, acute	1 (1%)		
Necrosis, NOS	1 (1%)		
Pigmentation, NOS	1 (1%)		(0.4%)
Hyperplasia, focal	12 (10%)		(7%)
Angiectasis	11 (9%)	16	(6%)

TABLE A5. SUMMARY OF THE INCIDENCE OF NONNEOPLASTIC LESIONS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

	Untreated Control	1% Tre	emolite
NDOCRINE SYSTEM (Continued)	<u></u>		<u></u>
#Adrenal	(118)	(250)	
Mineralization	()	1	(0.4%)
Hemorrhage	1 (1%)	1	(0.4%)
Hemorrhagic cyst	1 (1%)		(
Inflammation, chronic focal	1 (1%)		
Inflammation, chronic diffuse	1 (170)	1	(0.4%)
	1 (1%)		(0.4%)
Necrosis, focal	1 (1%)		(0.4%)
Infarct, NOS	1 (177)		(1%)
Angiectasis	1 (1%)	(250)	(1,0)
#Adrenal/capsule	(118)		(0.4%)
Fibrosis, focal		-	(0.4%)
Fibrosis, diffuse	(110)	(250)	(0.470)
#Adrenal cortex	(118)		(1%)
Degeneration, NOS	1 (1%)		(0.4%)
Degeneration, lipoid	07 (007)		(20%)
Metamorphosis fatty	27 (23%)		(20%)
Hyperplasia, focal	12 (10%)	13	(0%)
Angiectasis	5 (4%)	(050)	
#Adrenal medulla	(118)	(250)	
Hyperplasia, NOS	1 (1%)		
Hyperplasia, focal	40 (34%)		(31%)
#Thyroid	(117)	(247)	
Cystic follicles	1 (1%)	2	(1%)
Follicular cyst, NOS	4 (3%)	14	(6%)
Hyperplasia, C-cell	25 (21%)	50	(20%)
Hyperplasia, follicular cell		1	(0.4%)
#Parathyroid	(109)	(236)	
Inflammation, chronic	1 (1%)		
Hyperplasia, NOS	26 (24%)	22	(9%)
#Pancreatic islets	(118)	(250)	
Hyperplasia, focal	4 (3%)	3	(1%)
EPRODUCTIVE SYSTEM	(118)	(250)	
*Mammary gland	1 (1%)		(0.4%)
Galactocele			(3%)
Cystic ducts	6 (5%)		(0.4%)
Hyperplasia, NOS			
Hyperplasia, focal	1 (1%)		(1%)
Hyperplasia, diffuse	9 (8%)		(5%)
*Preputial gland	(118)	(250)	
Cyst, NOS			(0.4%)
Cystic ducts	2 (2%)		(5%)
Inflammation, acute diffuse		-	(1%)
Abscess, NOS	1 (1%)		(1%)
Inflammation, chronic			(0.4%)
Inflammation, chronic diffuse			(0,4%)
Hyperplasia, diffuse		1	(0.4%)
Hyperkeratosis	1 (1%)		
#Prostate	(118)	(249)	
Cyst, NOS		4	(2%)
Hemorrhage			(1%)
Inflammation, acute focal			(0.4%)
Inflammation, acute local Inflammation, acute diffuse			(0.4%)
	9 (8%)		(11%)
Abscess, NOS	0 (0707		(0.4%)
Inflammation, acute/chronic			(0.4%)
Inflammation, chronic	36 (31%)		(27%)
Inflammation, chronic focal			(11%)
Inflammation, chronic diffuse	4 (3%)		(0.4%)
Necrosis, focal	11 (9%)		(10%)
Hyperplasia, focal			

TABLE A5. SUMMARY OF THE INCIDENCE OF NONNEOPLASTIC LESIONS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

	Untreated Control	1% Tremolite
REPRODUCTIVE SYSTEM		
#Prostate (Continued)	(118)	(249)
Hyperkeratosis		1 (0.4%)
Metaplasia, squamous		2 (1%)
*Seminal vesicle	(118)	(250)
Cyst, NOS	3 (3%)	13 (5%)
Cystic ducts		3 (1%)
Hemorrhage		1 (0.4%)
Inflammation, acute diffuse		3 (1%)
Abscess, NOS		4 (2%)
Inflammation, chronic		1 (0.4%)
Inflammation, chronic diffuse	1 (1%)	2 (1%)
Hyperplasia, epithelial	1 (1%)	1 (0.4%)
Hyperplasia, diffuse	(110) (2%)	7 (3%)
*Coagulating gland	(118)	(250)
Hyperplasia, NOS Metaplasia, squamous		1 (0.4%)
#Testis	(118)	(0.4%) (250)
Granuloma, spermatic	(118) 1 (1%)	(200)
Degeneration, NOS	10(1%)	31 (12%)
Infarct, NOS	10(1%) 1(1%)	1 (0.4%)
Hyperplasia, interstitial cell	36(31%)	89 (36%)
*Epididymis	(118)	(250)
Steatitis	(110)	(1,0,4%)
Fibrosis, focal		1 (0.4%)
Necrosis, NOS		1 (0.4%)
Necrosis, fat		4 (2%)
*Vas deferens/muscula	(118)	(250)
Degeneration, NOS	1 (1%)	
NERVOUS SYSTEM		
#Cerebrum	(118)	(250)
Hemorrhage	(110)	4 (2%)
Inflammation, chronic		1 (0.4%)
Necrosis, focal		1 (0.4%)
Necrosis, diffuse		1 (0.4%)
#Cerebellum	(118)	(250)
Hemorrhage	3 (3%)	5 (2%)
Gliosis	1 (1%)	
Necrosis, focal	_ (,	1 (0.4%)
#Medulla oblongata	(118)	(250)
Necrosis, focal	1 (1%)	
*Spinal cord	(118)	(250)
Gliosis	1 (1%)	
PECIAL SENSE ORGANS		
*Eye	(118)	(250)
Hemorrhage	7 (6%)	11 (4%)
Inflammation, chronic diffuse	1 (1%)	
Synechia, posterior	7 (6%)	8 (3%)
Cataract	21 (18%)	34 (14%)
Phthisis bulbi	2 (2%)	4 (2%)
*Eye anterior chamber	(118)	(250)
Empyema	4 (3%)	2 (1%)
*Vitreous body	(118)	(250)
Vascularization	3 (3%)	2 (1%)
*Eye/cornea	(118)	(250)
Inflammation, focal	1 (1%) 2 (2%)	
Inflammation, necrotizing	2 (2%)	1 (0.40)
Inflammation, chronic Inflammation, chronic focal	6 (5%)	1 (0.4%) 1 (0.4%)
anianimation, enfonic local	0 (0%)	1 (U.470)

TABLE A5. SUMMARY OF THE INCIDENCE OF NONNEOPLASTIC LESIONS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)
	Untreated	Control	1% Tre	molite
PECIAL SENSE ORGANS	<u></u>			
	(118)		(250)	
*Eye/cornea (Continued) Inflammation, chronic diffuse	· · · · ·	(2%)	· · · · · ·	(1%)
*Eye/retina	(118)	(270)	(250)	()
Degeneration, NOS		(30%)		(26%)
*Eye/crystalline lens	(118)		(250)	
Rupture		(5%)		(1%)
*Harderian gland	(118)	(0,0)	(250)	(
Inflammation, acute diffuse	(110)		1	(0.4%)
*Zymbal gland	(118)		(250)	
Cystic ducts	20	(17%)	36	(14%)
Hyperkeratosis			2	(1%)
Acanthosis	1	(1%)		
IUSCULOSKELETAL SYSTEM				
*Skull	(118)		(250)	
Osteopetrosis	2 (2	2%)		(2%)
Fibrous osteodystrophy	$\frac{1}{2}$ (2		1	(0.4%)
*Temporal bone	(118)		(250)	
Fibrous osteodystrophy	1 (1	(%)		
*Maxilla	(118)		(250)	
Exostosis				(0.4%)
*Sternum	(118)		(250)	
Fibrosis	1 (1	1%)		
Degeneration, NOS			1	(0.4%)
Fibrous osteodystrophy	2 (2	2%)		
Exostosis	1 (1	l%)		
*Rib	(118)		(250)	(1.01)
Degeneration, NOS			3	(1%)
Fibrous osteodystrophy	1 (3	1%)		
BODY CAVITIES				
*Mediastinum	(118)		(250)	
Ectopia	2 (2	2%)		
Inflammation, acute diffuse	1 ()	1%)	1	(0.4%)
Inflammation, chronic	1 ()	1%)		
Hemosiderosis	1 (1%)		
*Abdominal cavity	(118)		(250)	
Hemorrhage			-	(0.4%)
Abscess, NOS				(0.4%)
Inflammation, chronic diffuse				(0.4%)
Necrosis, fat	7 (6%)		(6%)
*Mesentery	(118)		(250)	
Hematoma, organized	1 ((0.49)
Inflammation, acute diffuse	1 (1%)		(0.4%)
Inflammation, chronic focal				(2%)
Inflammation, chronic diffuse			1	(0.4%)
Necrosis, fat	1 (1%)		
ALL OTHER SYSTEMS			(0=0)	
*Multiple organs	(118)		(250)	
Mineralization		4%)		
Hemorrhage		1%)		
Inflammation, acute		1%)		(40)
Inflammation, chronic	23 (19%)		(4%)
Necrosis, diffuse				(0.4%)
Metamorphosis fatty				(0.4%)
Pigmentation, NOS				(0.4%) (0.4%)
Hyperplasia, NOS		1%)		

TABLE A5. SUMMARY OF THE INCIDENCE OF NONNEOPLASTIC LESIONS IN MALE RATS IN THELIFETIME FEED STUDY OF TREMOLITE (Continued)

TABLE A5. SUMMARY OF THE INCIDENCE OF NONNEOPLASTIC LESIONS IN MALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

	Untreated Control	1% Tremolite
ALL OTHER SYSTEMS (Continued)		
Diaphragm		
Hernia, NOS		2
Mesentery of colon	<u>^</u>	
Inflammation, acute diffuse	2	
Inflammation, acute/chronic		1
Inflammation, chronic diffuse		2

None

* Number of animals receiving complete necropsy examination; all gross lesions including masses examined microscopically. # Number of animals examined microscopically at this site

APPENDIX B

SUMMARY OF LESIONS IN FEMALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE

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TABLE B1. SUMMARY OF THE INCIDENCE OF NEOPLASMS IN FEMALE RATS IN THE LIFETIMEFEED STUDY OF TREMOLITE

	Untreate	d Control	1% Tr	emolite
Animals initially in study	118		250	
Animals necropsied	118		250	
Animals examined histopathologically	118		250	
INTEGUMENTARY SYSTEM				
*Skin	(118)		(250)	
Squamous cell papilloma		(1%)		(3%)
Squamous cell carcinoma	-	(=)		(0,4%)
Keratoacanthoma				(1%)
Fibroma	1	(1%)	-	(1%)
Fibrosarcoma	-	(10)		(0.4%)
Neurofibrosarcoma	1	(1%)	•	(0.1,0)
*Subcutaneous tissue	(118)	(1)0)	(250)	
Squamous cell carcinoma, invasive	(-)	(1%)		(1%)
Fibroma		(4%)		(3%)
Fibrosarcoma		(2%)		(2%)
Fibrous histiocytoma, malignant	-			(0.4%)
Lipoma			-	(0.4%)
Neurofibroma	3	(3%)		(1%)
Neurofibrosarcoma	Ũ			(1%)
RESPIRATORY SYSTEM				
#Trachea	(118)		(250)	
Follicular cell carcinoma, invasive	(110)			(0.4%)
#Lung	(118)		(250)	(0.470)
Papillary carcinoma, metastatic	(110)			(0.4%)
Squamous cell carcinoma, metastatic				(1%)
Adenocarcinoma, NOS, metastatic	1	(1%)		(0.4%)
Alveolar/bronchiolar adenoma	-			(0.4%)
Alveolar/bronchiolar carcinoma	3	(3%)		(1%)
Follicular cell carcinoma, metastatic	Ũ			(0.4%)
C-cell carcinoma, metastatic	1	(1%)		(1%)
Pheochromocytoma, metastatic	•	(1)0)		(0.4%)
Fibrosarcoma, metastatic				(0.4%)
Osteosarcoma, metastatic	1	(1%)		(0.4%)
HEMATOPOIETIC SYSTEM				· · · - - · · ·
*Multiple organs	(118)		(250)	
Malignant lymphoma, NOS	(110)			(0.4%)
Malignant lymphoma, undifferentiated type	1	(1%)	1	
Myelomonocytic leukemia		(2%)	6	(2%)
Monocytic leukemia		(42%)		(38%)
#Spleen	(118)		(250)	
Leiomyosarcoma, invasive		(1%)	.2007	
#Mandibular lymph node	(118)	x = / • /	(250)	
Carcinoma, NOS, metastatic	(110)			(0.4%)
C-cell carcinoma, metastatic	1	(1%)	1	(******
#Cervical lymph node	(118)		(250)	
Malignant lymphoma, lymphocytic type		(1%)	(2007	
#Mediastinal lymph node	(118)	(× /U)	(250)	
Neurofibrosarcoma, metastatic	(110)			(0.4%)
#Liver	(118)		(250)	(0, 10)
Monocytic leukemia		(3%)	(200)	
			(221)	
#Thymus	(83)		(221)	

	Untreated Control	1% Tremolite
CIRCULATORY SYSTEM	<u></u>	<u> </u>
*Multiple organs	(118)	(250)
Hemangiosarcoma, invasive	()	1 (0.4%)
*Mesentery	(118)	(250)
Hemangiosarcoma	/	1 (0.4%)
#Uterus	(118)	(249)
Hemangiosarcoma	1 (1%)	
DIGESTIVE SYSTEM		
*Oral mucous membrane	(118)	(250)
Squamous cell carcinoma	1 (1%)	3 (1%)
*Palate	(118)	(250)
Squamous cell carcinoma, invasive	1 (1%)	
*Tongue	(118)	(250)
Squamous cell papilloma		1 (0.4%)
Squamous cell carcinoma		1 (0.4%)
Squamous cell carcinoma, invasive		1 (0.4%)
#Salivary gland	(118)	(249)
Sarcoma, NOS		1 (0.4%)
#Parotid gland	(118)	(249)
Squamous cell carcinoma, invasive		1 (0.4%)
Fibrosarcoma	1 (1%)	
#Liver	(118)	(250)
Neoplastic nodule	2 (2%)	10 (4%)
#Pancreas	(118)	(250)
Acinar cell adenoma		3 (1%)
Fibrosarcoma	1 (1%)	(0.10)
#Esophagus	(118)	(248)
Follicular cell carcinoma, invasive	(110)	2(1%)
#Duodenum Fibroma	(118)	(250) 1 (0.4%)
Leiomyosarcoma	1 (1%)	1 (0.4%) 1 (0.4%)
#Jejunum	(118)	(250)
Adenomatous polyp, NOS	(118) 1 (1%)	(250)
#Ileum	(118)	(250)
Leiomyoma	(113) 1 (1%)	(200)
#Colon	(118)	(250)
Leiomyosarcoma	(110) 1 (1%)	(200)
#Cecum	(118)	(250)
Fibroma	1 (1%)	
#Descending colon	(118)	(250)
Adenocarcinoma in adenomatous polyp		1 (0.4%)
URINARY SYSTEM	****	
#Kidney	(118)	(250)
Tubular cell adenoma		2 (1%)
Tubular cell adenocarcinoma		2 (1%)
Mixed tumor, malignant		2 (1%)
#Urinary bladder	(118)	(246)
Transitional cell papilloma		1 (0.4%)
ENDOCRINE SYSTEM		
#Pituitary	(117)	(248)
Carcinoma, NOS	5 (4%)	11 (4%)
Adenoma, NOS	51 (44%)	93 (38%)
#Adrenal	(118)	(250)
Cortical adenoma	9 (8%)	13 (5%)
Pheochromocytoma	22 (19%)	32 (13%)
Pheochromocytoma, malignant	1 (1%)	4 (2%)
Ganglioneuroma	1 (170)	1 (0.4%)

TABLE B1. SUMMARY OF THE INCIDENCE OF NEOPLASMS IN FEMALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

	Untreate	d Control	1% Tr	emolite
ENDOCRINE SYSTEM (Continued)	<u></u>	·····		
#Thyroid	(118)		(250)	
Follicular cell adenoma		(3%)		(3%)
Follicular cell carcinoma		(4%)		(6%)
C-cell adenoma		(6%)		(3%)
C-cell carcinoma		(15%)		(16%)
#Parathyroid	(113)	(10%)	(238)	
Adenoma, NOS	· ·	(1%)	(200)	
#Pancreatic islets	(118)	(1/0)	(250)	
Islet cell adenoma		(4%)		(3%)
Islet cell carcinoma		(3%)		(2%)
REPRODUCTIVE SYSTEM			· · · · ·	
*Mammary gland	(118)		(250)	
Carcinoma, NOS			1	(0.4%)
Adenoma, NOS	2	(2%)		(2%)
Adenocarcinoma, NOS		(20%)		(8%)
Papillary adenocarcinoma				(0.4%)
Papillary cystadenoma, NOS	1	(1%)		
Fibroadenoma	62	(53%)	127	(51%)
Neurofibroma			1	(0.4%)
*Preputial gland	(118)		(250)	
Carcinoma, NOS			1	(0.4%)
Squamous cell papilloma			1	(0.4%)
Squamous cell carcinoma	6	(5%)	15	(6%)
Keratoacanthoma			1	(0.4%)
*Vagina	(118)		(250)	
Squamous cell carcinoma		(1%)	,	
#Uterus	(118)		(249)	
Carcinoma, NOS		(1%)	(= 10)	
Papillary carcinoma	-		1	(0.4%)
Adenocarcinoma, NOS	1	(1%)	•	
Papillary adenocarcinoma		(1%)	3	(1%)
Papillary cystadenocarcinoma, NOS		(1%)	Ŭ	
Leiomyosarcoma		(1%)		
Endometrial stromal polyp		(13%)	28	(11%)
Endometrial stromal sarcoma		(1%)		(1%)
#Cervix uteri	(118)	• .	(249)	
Fibrosarcoma	(**0)			(0.4%)
Endometrial stromal sarcoma, invasive	1	(1%)		(0.4%)
#Uterus/endometrium	(118)		(249)	
Papillary adenocarcinoma	(110)			(0.4%)
#Ovarv	(118)		(249)	
Papillary cystadenocarcinoma, NOS		(1%)	(2-10)	
Granulosa cell tumor		(3%)	3	(1%)
Granulosa cell carcinoma	-			(0.4%)
NERVOUS SYSTEM				
#Cerebrum	(118)		(250)	
Carcinoma, NOS, invasive	3	(3%)	3	(1%)
Glioma, NOS			1	(0.4%)
Astrocytoma	1	(1%)	2	(1%)
#Cerebellum	(118)		(250)	
Carcinoma, NOS, invasive	1	(1%)	5	(2%)
*Spinal cord	(118)		(250)	
Osteosarcoma, invasive			1	(0.4%)

TABLE B1. SUMMARY OF THE INCIDENCE OF NEOPLASMS IN FEMALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

	Untreated Control	1% Tremolite
SPECIAL SENSE ORGANS	(110)	(950)
*Zymbal gland	(118)	(250) 1 (0.4%)
Carcinoma in-situ, NOS Squamous cell papilloma		1 (0.4%)
Squamous cell carcinoma	3 (3%)	6 (2%)
Keratoacanthoma	1 (1%)	
MUSCULOSKELETAL SYSTEM	<u></u>	
*Maxilla	(118)	(250)
Squamous cell carcinoma, invasive	(118) (1%)	(250)
*Mandible Squamous cell carcinoma, invasive	(118) 1 (1%)	(230) 2 (1%)
*Vertebra	(118)	(250)
Osteosarcoma	1 (1%)	1 (0.4%)
BODY CAVITIES None		
ALL OTHER SYSTEMS		
*Multiple organs	(118)	(250) 1 (0.4%)
Carcinoma, NOS, invasive Adenocarcinoma, NOS, invasive	1 (1%)	1 (0.4%)
Adenocarcinoma, NOS, mvasive Adenocarcinoma, NOS, metastatic	1 (1707	1 (0.4%)
C-cell carcinoma, metastatic		1 (0.4%)
Granulosa cell carcinoma, metastatic		1 (0.4%)
Fibrosarcoma, invasive	1 (1%)	
Fibrosarcoma, metastatic	1 (1%)	
Pituitary fossa		1
Carcinoma, NOS, invasive		I
ANIMAL DISPOSITION SUMMARY	18	250
Animals initially in study Natural death	18	30
Moribund sacrifice	90	196
Terminal sacrifice	12	21
Accidentally killed, nda	1	3
TUMOR SUMMARY		
Total animals with primary tumors**	115	243
Total primary tumors	342	633 201
Total animals with benign tumors Total benign tumors	100 192	356
Total animals with malignant tumors	96	188
Total malignant tumors	145	264
Total animals with secondary tumors##	12	30
Total secondary tumors	17	37
Total animals with tumors uncertain benign or malignant	5	13
		10

TABLE B1. SUMMARY OF THE INCIDENCE OF NEOPLASMS IN FEMALE RATS IN THE LIFETIMEFEED STUDY OF TREMOLITE (Continued)

* Number of animals receiving complete necropsy examination; all gross lesions including masses examined microscopically.
 ** Primary tumors: all tumors except secondary tumors
 # Number of animals examined microscopically at this site
 ## Secondary tumors: metastatic tumors or tumors invasive into an adjacent organ

TABLE B2. INDIVIDUAL ANIMAL TUMOR PATHOLOGY OF FEMALE RATS IN THE LIFETIME FEEDSTUDY OF TREMOLITE: CONTROL

ANIMAL NUMBER	0 0 A	0 0 1	0 0 2	0 0 3	0 0 4	0 0 5	0 0 6	0 0 7	0 0 8	0 0 9	0 1 0	0 1 1	0 1 2	0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8	0 1 9	0 2 0	0 2 1	0 2 2	0 2 3	0 2 4
WEEKS ON STUDY	1 3 8	1 1 6	0 4 8	0 8 4	0 9 6	1 4 8	1 3 3	1 3 7	1 2 9	1 3 3	0 9 3	1 4 8	1 4 8	1 4 7	1 2 1	1 2 0	1 4 4	1 1 7	1 3 5	1 3 1	1 3 8	1 4 3	1 2 7	1 1 7	1 0 3
INTEGUMENTARY SYSTEM Skin	— —								·																
Skin Squamous cell papilloma Fibroma	x x	+	+	+	+	+	+	+	+.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Neurofibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Fibroma	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	÷	+	+	+	+
Fibrosarcoma Neurofibroma	x							х							х										
RESPIRATORY SYSTEM																									
Lungs and bronchi Adenocarcinoma, NOS, metastatic Alveolar/bronchiolar carcinoma C-cell carcinoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+
Osteosarcoma, metastatic Trachea	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
HEMATOPOIETIC SYSTEM Bone marrow	-																								<u> </u>
Bone marrow Spleen Leiomyosarcoma, invasive	+	++	++	++	++	+ +	+ +	+ +	++	+ +	+ +	++	+ +	+++	+++	+++									
Lymph nodes C-cell carcinoma, metastatic	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Malignant lymphoma, lymphocytic type Thymus	+	-	+	+	+	+	+	+	-	+	+	+	+	+	-	+	+	+	-	+	+	+	+	+	-
CIRCULATORY SYSTEM Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DIGESTIVE SYSTEM										-															
Oral cavity Squamous cell carcinoma _Squamous cell carcinoma, invasive	N	N	N	Ν	N	Ν	N	Ν	Ν	Ν	N	N	N	Ν	Ν	N	Ν	Ν	N	N	Ν	N	N	N	N
Salivary gland Fibrosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Liver Neoplastic nodule Monocytic leukemia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+
Bile duct Gallbladder & common bile duct	+ N	, N	$_{\rm N}^+$	+ N																					
Pancreas _Fibrosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Esophagus Stomach	++++	+++	+++	++	+++	+++	+++	+ +	+ +	++	+ +	++	+ +	+++	+++++++++++++++++++++++++++++++++++++++	++++	+++	+++	++	++++	+ +	++++	++++	+ +	++
Small intestine Adenomatous polyp, NOS Leiomyoma	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	÷	+	+	+	+
Leiomyosarcoma Large intestine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibroma Leiomyosarcoma											x														·
URINARY SYSTEM																									
Kidney Urinary bladder	++	+ +	+++	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	++++	+ +	+ +	+ +	+ +								
ENDOCRINE SYSTEM Pituitary																						<u> </u>			
Carcinoma, NOS	+	+	+	+	+	+	+	+	+	x X	+	+	+	÷	+	+	x	+	+	+	+	+	+	+	+
Adenoma, NOS Adrenal	X +	X +	+	+	X +	x + X	+	X + X	+	+	X +	+	X +	X +	+	X +	+	+	+	+	+	X +	X +	X +	X +
Cortical adenoma Pheochromocytoma		*				X X		х		х		*	x						х		х				
Pheochromocytoma, malignant Thyroid																									
Follicular cell adenoma Follicular cell carcinoma	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	x X	+	x,	+	+	+	+	÷
C-ceil adenoma C-ceil carcinoma									х								x			x					
Parathyroid Adenoma, NOS	+	+	+	+	+	+	+	* X	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pancreatic islets Islet cell adenoma Islet cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	* x	+	+	+	+	+	+	+	+ X	+	+	+

+: Tissue examined microscopically
 -: Required tissue not examined microscopically
 X: Tumor incidence
 N: Necropsy, no autolysis, no microscopic examination

: No tissue information submitted C: Necropsy, no histology due to protocol A: Autolysis M: Animal missing

TABLE B2. INDIVIDUAL ANIMAL TUMOR PATHOLOGY OF FEMALE RATS: CONTROL (Continued)

ANIMAL NUMBER	0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 3 0	0 3 1	9 1 4	9 1 5	9 1 6	9 1 7	9 1 8	9 1 9	9 2 0	9 2 1	9 2 2	9 2 3	9 2 4	9 2 5	9 2 6	9 2 7	9 2 8	9 2 9	9 3 0	9 3 1
WEEKS ON STUDY	1 2 4	1 3 6	1 4 8	1 2 7	1 2 6	$\frac{1}{2}$	1 2 7	$1 \\ 1 \\ 2$	1 3 7	1 4 8	$\frac{1}{3}$ 7	1 4 3	1 4 8	1 0 8	1 1 5	0 7 9	1 2 1	$\frac{1}{2}$	1 1 7	4	1 4 6	1 2 7	1 3 5	1 3 8	1 1 1
INTEGUMENTARY SYSTEM Skin Squamous cell papilloma Fibroma Neurofibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Fibroma Fibroma Fibrosarcoma Neurofibroma	+	+	+	+	+	+	+	.+ +	+	+	+	+	+	+	+	+	+	+	+ + X	+	+	+ X +	++	+	+
RESPIRATORY SYSTEM Lungs and bronchi Adenocarcinoma, NOS, metastatic Alveolar/bronchiolar carcinoma C-cell carcinoma, metastatic Osteosarcoma, metastatic Trachea	+	+++++	+	++	++	+ x +	+++	+	+	+	+	+	+	+	+++	+ +	+	+ +	+ +	+	+++	+	+	+	+ +
HEMATOPOIETIC SYSTEM Bone marrow Spleen Leiomyosarcoma, invasive Lymph nodes C-cell carcinoma, metastatic	+++++++++++++++++++++++++++++++++++++++	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+++++	+ + +	+ + +	+ + X +	+ + +	+++++	+ + +	+ + +	+ + +	+ + +	+ + +
Malignant lymphoma, lymphocytic type Thymus CIRCULATORY SYSTEM Heart	+	+	-	+	-	+	+	-	-	+	+		+	+	+		+	+	-	+	+	+	+	-	+
DIGESTIVE SYSTEM Oral cavity Squamous cell carcinoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N X	N	N	N	N	N	N
Squamous cell carcinoma, invasive Salivary gland Fibrosarcoma Liver Neoplastic nodule	+	+ X +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +
Moñocytic leukemia Bile duct Galibiadder & common bile duct Pancreas Fibrosarcoma	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ X +	+ N +	X + N +	+ N +	+ N +	+ X +	+ X +	+ N +	+ Z +	+ Z +	+ Z +	+ N +	+ N +	+ Z +	+ Z +
Esophagus Stomach Small intestine Adenomatous polyp, NOS Leiomvoma	+ + + +	+ + +	+ + +	+++	+ + + X	+ + +	+++	++++	+ + +	++++	++++	+ + +	+ + +	+ + +	+ + +	+++	++++	+++	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +
Leiomýosarcoma Large intestine Fibroma Leiomyosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
URINARY SYSTEM Kidney Urinary biadder	+++++++++++++++++++++++++++++++++++++++	+ +	+++++	++++	++++++	+ +	++++	+++	++++	+++	+ +	+++++	+ +	+ +	+ +	++++	+ +	+++	+ +	+++++	+ +	+ +	+ +	+ +	+ +
ENDOCRINE SYSTEM Pituitary Carcinoma, NOS Adenoma, NOS Adrenai Cortical adenoma Pheochromocytoma Pheochromocytoma Pheochromocytoma, malignant Thyroid	+ X +	+ X + X +	+ X + +	++++	+++++	+++++	+ X +	+++++	+ X +	+ X +	+ X + +	+ X +	+ X +	+ + +	+ + X +	+++++	* * +	+ X + X +	+++	+ X + +	+ + X +	+ + +	+ + X +	+ + +	+ + +
Follicular cell adenoma Follicular cell carcinoma C-ceil adenoma C-ceil carcinoma Parathyroid Adenoma, NOS Pancreatic islets Islet cell adenoma Islet cell carcinoma	++	X + +	+ +	X + +	+ +	+ +	+ +	X + +	+ +	+ +	X + +	X X + +	X + +	+ +	+ +	+ +	X + +	X + +	X + +	+ +	X + + X	X + +	+ +	x + +	+ +

ANIMAL NUMBER	9 3 2	9 3 3	9 3 4	9 3 5	9 3 6	9 3 7	9 3 8	9 3 9	9 4 0	9 4 1	9 4 2	9 4 3	9 4 4	9 4 5	9 4 6	9 4 7	9 4 8	9 4 9	9 5 0	9 5 1	9 5 2	9 5 3	9 5 4	9 5 5	9 5 6
WEEKS ON STUDY	102	1 2 6	1 1 6	1 3 4	1 1 7	1 2 2	1 0 5	0 2 2	1 1 6	1 1 3	1 0 3	1 1 3	1 1 2	0 8 7	0 7 4	1 0 5	1 4 7	1 4 8	1 4 6	1 1 2	1 4 3	1 1 6	1 4 8	1 4 8	1 1 4
INTEGUMENTARY SYSTEM																									
Skin Squamous cell papilloma	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Squamous cell papilloma Fibroma																						T			
Neurofibrosarcoma Subcutaneous tissue	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+
Squamous cell carcinoma, invasive Fibroma																				х			v	x	
Fibrosarcoma														х						A			a.	~	
Neurofibroma																		x							
RESPIRATORY SYSTEM	-						-																		
Lungs and bronchi	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenocarcinoma, NOS, metastatic Alveolar/bronchiolar carcinoma																						Х			
C-cell carcinoma, metastatic																									
Osteosarcoma, metastatic Trachea	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
										·															
HEMATOPOIETIC SYSTEM Bone marrow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Spleen	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+
Leiomyosarcoma, invasive Lymph nodes	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
C-cell carcinoma, metastatic																									
Malignant lymphoma, lymphocytic type Thymus	-	+	+	-	+	+	+	+	+				+	+		-	+	-	+	_	-	+	+		+
CIRCULATORY SYSTEM																									
Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DIGESTIVE SYSTEM																									
Oral cavity	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Squamous cell carcinoma Squamous cell carcinoma, invasive										х															
Salivary gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibrosarcoma Liver	_	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Neoplastic nodule			x	,																					
Monocytic leukemia Bile duct	1	+	+	+	+	+	Ŧ	+	<u>т</u>	+	4	Ŧ	+	<u>т</u>	+	+	+	+	+	+	+	+	+	+	+
Gallbladder & common bile duct	Ń	Ń	Ň	Ň	Ň	N	Ň	Ň	Ń	Ň	Ň	N	Ň	Ň	Ň	Ň	Ň	Ň	Ń	Ň	N	Ń	Ň	Ň	Ň
Pancreas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibrosarcoma Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Stomach	+	+	+	+	+	+	+	+	+	+	+	+	+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	++++	+	+	+	+	+	+	+	+	+	+
Small intestine Adenomatous polyp, NOS	1	Ŧ	Ŧ	Ŧ	Ŧ	т	Ŧ	Ŧ	т	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	+	+	Ŧ	т	Ŧ	r	
Leiomyoma	v																								
Leiomyosarcoma Large intestine	X +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibroma	1																								
Leiomyosarcoma																				_					
URINARY SYSTEM Kidney				<u>ь</u>	±		<u> </u>		1	-	<u>ب</u> د	1	-	+	1	+	+	+	+	+	+	+	+	+	+
Urinary bladder	+	+	÷	+	+	+	+	+	+	+	+	+	÷	÷	+	÷	÷	+	÷	÷	+	+	÷	÷	÷
ENDOCRINE SYSTEM																									
Pituitary	+	+	+	+	+	+	+	+	* X	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Adenoma, NOS			x				x		X			х							х		x			х	х
Adrenal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*	+	+	+	+	+	+	+	+
Cortical adenoma Pheochromocytoma										X							х	х	х		х				
Pheochromocytoma, malignant																									
Thyroid Follicular cell adenoma	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	Ŧ	Ŧ
Follicular cell carcinoma	-	••							X									х							
C-cell adenoma C-cell carcinoma	X	x								X														х	
Parathyroid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenoma, NOS Pancreatic islets	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Isiet cell adenoma					x				•						·									X	
Islet cell carcinoma	1																						х		

ANIMAL NUMBER	9 5 7	9 5 8	9 5 9	9 6 0	9 6 1	9 6 2	9 6 3	9 6 4	9 6 5	9 6 6	9 6 7	9 6 8	9 6 9	9 7 0	9 7 1	9 7 2	9 7 3	9 7 4	9 7 5	9 7 6	9 7 7	9 7 8	9 7 9	9 8 0	9 8 1
WEEKS ON STUDY	0 9 8	1 1 7	1 2 6	0 9 2	1 4 7	1 1 0	1 4 8	1 2 0	1 3 2	1 0 7	1 3 7	1 2 6	1 2 1	1 4 6	0 8 5	1 2 8	1 4 8	1 0 2	1 0 4	0 8 0	1 0 2	0 9 6	1 0 9	1 4 2	1 4 2
INTEGUMENTARY SYSTEM																									
Skin Squamous cell papilloma	+	+	+	+	. +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibroma Neurofibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Fibroma Fibrosarcoma Neurofibroma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
RESPIRATORY SYSTEM Lungs and bronchi Adenocarcinoma, NOS, metastatic Alveolar/bronchiolar carcinoma C-cell carcinoma, metastatic Osteosarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+
Trachea	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
HEMATOPOIETIC SYSTEM Bone marrow Spleen	++++	++++	+ +	+++++	++++	++++	+ +	+++++++++++++++++++++++++++++++++++++++	++++	+++	+ +	++++	++++	+ +	++++	+ +	++++	++++	++++	+ +	++++	++++	+ +	++++	+ +
Leiomyosarcoma, invasive Lymph nodes C-cell carcinoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Malignant lymphoma, lymphocytic type Thymus	-	+	+	-	+	+	~	+	+	-	+	+	+	-	+	+	+	+	+	-	+	-	+	-	+
CIRCULATORY SYSTEM Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DIGESTIVE SYSTEM Oral cavity Squamous cell carcinoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Squamous cell carcinoma, invasive Salivary gland Fibrosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Liver Neoplastic nodule	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Monocytic leukemia Bile duct	+	+	+	+	+	X +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gallbladder & common bile duct Pancreas	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +						
Fibrosarcoma												,		X	+										
Esophagus Stomach	+	+	+	+	+	+	+	+	+	+	++	+	+	++	+	÷	÷	+	+	+	+	÷	+	+	+
Small intestine Adenomatous polyp, NOS Leiomyoma	+	+	+	+	+	+	+	+	+	+	+	+	*	+	+	+	+	+	+	+	+	+	+	+	+
Leiomyosarcoma Large intestine Fibroma	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Leiomyosarcoma																									
URINARY SYSTEM Kidney Urinary bladder	++++	+++	+	 + +	+	+	+	+	+	+	+++++	+	+	+	+	+	+	+	+	+++++	++++	+	+	+	+
				····-						· ·															
ENDOCRINE SYSTEM Pituitary	+	+	+	÷	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Adenoma, NOS	x	x	x	х	x	x		х			х	x		х	х	х	x		х					x	
Adrenal	+	+	+	+	+	+	+	+	+	+	x x	+	+	+	+	+	+	+	+	+	+	*	+	+	+
Cortical adenoma Pheochromocytoma					х					х	л			х	х		х	х				Λ		х	
Pheochromocytoma, malignant Thyroid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Follicular cell adenoma Follicular cell carcinoma C-cell adenoma																									
C-cell carcinoma Parathyroid		Ŧ	Ŧ	_	-	ـ	*	4	+		X	<u>ــ</u>	1	X	<u>ـــ</u>	-	-	4	<u>ـ</u> ـ	<u>ــ</u>	ـ	_	4	*	<u>ـ</u>
Adenoma, NOS	+	Ŧ	Ŧ	-	+	Ŧ	+	+	+	+	Ŧ	Ŧ	+	+	Ŧ	+	+	Ŧ	+	Ŧ	Ŧ	_	Ŧ	+	+
Pancreatic islets Islet cell adenoma Islet cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*	+	+	+	+	+	+	+	+

ANIMAL NUMBER	9 8 2	9 8 3	9 8 4	9 8 5	9 8 6	9 8 7	9 8 8	9 8 9	9 9 0	9 9 1	9 9 2	9 9 3	9 9 4	9 9 5	9 9 6	9 9 7	9 9 8	9 9 9				TOTA	
WEEKS ON STUDY	1 3 9	1 0 2	1 0 9	1 3 3	1 3 8	1 2 6	0 9 9	1 3 1	1 1 1		1 4 3	1 1 7	1 4 7	1 4 8	1 2 8	1 4 8	1 3 8	1 3 0					JES ORS
INTEGUMENTARY SYSTEM	<u> </u>																+		 		 	 *118	_
Skin Squamous cell papilloma Fibroma Neurofibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Fibroma Fibrosarcoma Neurofibroma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ + X	+	+	+				*118 1 1 *118 1 5 2 3	
RESPIRATORY SYSTEM Lungs and bronchi Adenocarcinoma, NOS, metastatic Alveolar/bronchiolar carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ x	+	+			 	 118 1 3 1	
C-cell carcinoma, metastatic Osteosarcoma, metastatic Trachea	+	+	X +	+	+	+	+	+	+	+	+	+	+	+	+	л +	+	+				118	
HEMATOPOIETIC SYSTEM Bone marrow Spleen	++++	++++	+++	+	++++	++++	+++	+ + +	+++++	+++	++	+ +	++++	+++	+++++	++++	++++	+++		 	 	 118 118	
Leiomyosarcoma, invasive Lymph nodes C-cell carcinoma, metastatic	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	* x	+	+				1 118 1	
Malinant. lymphoma, lymphocytic type Thymus	-	+	+	+	+	+		+	X +	+	-	+	+	+	+	+	+	+		 	 	 83	
CIRCULATORY SYSTEM Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				118	
DIGESTIVE SYSTEM Oral cavity Squamous cell carcinoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	 			*118	
Squamous cell carcinoma, invasive Salivary gland Fibrosarcoma Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				118 118 118	
Neoplastic nodule Monocytic leukemia Bile duct	+	+	x +	+	+	+	+	+	+	+	x +	+	+	+	+	+	+	+				110 2 4 118	
Galibladder & common bile duct Pancreas Fibrosarcoma	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +				*118 118 1	
Esophagus Stomach Small intestine Adenomatous polyp, NOS Leiomyoma	+++++++++++++++++++++++++++++++++++++++	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+++	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+++	+ + +	+ + +				118 118 118 118 1	
Leiomyosarcoma Large intestine Fibroma Leiomyosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				118 118 1 1	
URINARY SYSTEM Kidney Urinary bladder	+++	+ +	+ +	+ +	+ +	+ +	+ +	++++	++++	+ +	+++	++++	+++	+ +	+ +	+ +	++++	+ +				118 118	
ENDOCRINE SYSTEM Pituitary Carcinoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	 	 	 	 117	
Adenoma, NOS Adrenal Cortical adenoma Pheochromocytoma	X +	+	+ X	X +	X +	+	+	X +	+ X	X +	+	+	X + X	+	+	+	+	+				51 118 9 22	
Pheochromocytoma, maiignant Thyroid Follicular cell adenoma	+	+	л +	+	+	+	+	+	а +	+	+	+	+	+	+	X +	+	+				118 3	
Follicular cell carcinoma C-cell adenoma C-cell carcinoma Parathyroid	 	-	-	1	x	Ŧ	-	X +	_	+	+	+	X +	+	x +	X +	÷	+				5 7 18 113	
Adenoma, NOS Pancreatic islets Islet cell adenoma Islet cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	י +	+	, +	, +				113 118 5 3	

* Animals necropsied

ANIMAL NUMBER	0 0 A	0 0 1	0 0 2	0 0 3	0 0 4	0 0 5	0 0 6	0 0 7	0 0 8	0 0 9	0 1 0	0 1 1	0 1 2	0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8	0 1 9	0 2 0	0 2 1	0 2 2	0 2 3	0 2 4
WEEKS ON STUDY	1 3 8	1 1 6	0 4 8	0 8 4	0 9 6	1 4 8	1 3 3	1 3 7	1 2 9	1 3 3	0 9 3	1 4 8	1 4 8	1 4 7	$\frac{1}{2}$	1 2 0	1 4 4	1 1 7	1 3 5	1 3 1	1 3 8	1 4 3	$1 \\ 2 \\ 7$	1 1 7	1 0 3
REPRODUCTIVE SYSTEM Mammary gland Adenoma, NOS Adenocarcinoma, NOS	+	+ X	+	+	+	+	+	+ X	+	+	+	+	+ x	+ x	* x	+ x	+	+ X	+	+ x	+	+ X	+	+	+
Papillary cystadenoma, NOS Fibroadenoma Preputial/clitoral gland Squamous cell carcinoma	X N	XN	N	N	N	N	N	X N	X N	N	N	N	X N	X N	X N	X N	X N	N	X N	X N	X N	N	X X N	N	X N
Vagina Squamous cell carcinoma Uterus Carcinoma, NOS Adenocarcinoma, NOS	N +	и +	N +	и +	N +	N +	N +	N +	N +	и +	N +	N +	N +	N +	И +	и +	и +	N +	N + X						
Papillary adenocarcinoma Papillary cystadenocarcinoma, NOS Leiomyosarcoma Endometrial stromal polyp Endometrial stromal sarcoma Endometrial stromal sarcoma, invasive Hemangiosarcoma	x		X X				x						x	x						x					
Ovary Papillary cystadenocarcinoma, NOS Granulosa cell tumor	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
NERVOUS SYSTEM Brain Carcinoma, NOS, invasive Astrocytoma	+	+	+	+	+	+	+	+	+	* X	+	+	+	+	+	+	* X	+	+	+	+	+	+	+ X	+
SPECIAL SENSE ORGANS Zymbal giand Squamous cell carcinoma Keratoacanthoma	+	+	+	+	+	+	* X	* X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Osteosarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
ALL OTHER SYSTEMS Multiple organs, NOS Adenocarcinoma, NOS, invasive Fibrosarcoma, invasive Fibrosarcoma, metastatic Malignant lymphoma, undifferentiated type	N	N	N	N X	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Myelomonocytic leukemia Monocytic leukemia	x					x	x				_			x				x	x				x		

TABLE B2. INDIVIDUAL ANIMAL TUMOR PATHOLOGY OF FEMALE RATS: CONTROL

(Continue	ed)
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ANIMAL NUMBER	0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 3 0	0 3 1	9 1 4	9 1 5	9 1 6	9 1 7	9 1 8	9 1 9	9 2 0	9 2 1	9 2 2	9 2 3	9 2 4	9 2 5	926	927	9 2 8	9 2 9	9 3 0	9 3 1
WEEKS ON STUDY	1 2 4	1 3 6	1 4 8	$1 \\ 2 \\ 7$	1 2 6	$\frac{1}{2}$	1 2 7	$egin{array}{c} 1 \\ 1 \\ 2 \end{array}$	1 3 7	1 4 8	1 3 7	1 4 3	1 4 8	1 0 8	1 1 5	0 7 9	1 2 1	1 2 1	1 1 7	1 4 4	1 4 6	1 2 7	1 3 5	1 3 8	1 1 1
REPRODUCTIVE SYSTEM Mammary gland Adenoma, NOS Adenocarcinoma, NOS Papillary cystadenoma, NOS	+	+	+	+	+	+	+	+	+ x	+	+ X	+	+	+	÷	+ X	+ X	+	+	+	+	*	+ X	+	+
Fibroadenoma Preputia/clitoral gland Squamous cell carcinoma Vagina	X N N	X N N	X N N	X N N	N X N	N N	X N N	X N N	X N N	X N N	X N N	X N N	X N N	N N	X N N	N N	X N N	N N	X N N	N N	N N	X N N	X N N	X N N	N N
Squamous cell carcinoma Uterus Carcinoma, NOS Adenocarcinoma, NOS Papillary adenocarcinoma Papillary cystadenocarcinoma, NOS	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Leiomyosarcoma Endometrial stromal polyp Endometrial stromal sarcoma Endometrial stromal sarcoma, invasive Hemangiosarcoma	x											x						X X			x				
Ovary Papillary cystadenocarcinoma, NOS Granulosa cell tumor	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*	+	+	+	+	+	+	+	+
NERVOUS SYSTEM Brain Carcinoma, NOS, invasive Astrocytoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	* x	+	+	+	+	+	+	+	+
SPECIAL SENSE ORGANS Zymbal gland Squamous cell carcinoma Keratoacanthoma	-	+	+	+	+	+	+	+	+	÷	+	+	+	N	+	+	+	+	+	+	+	+	+	+	+
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Osteosarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N X	N	N	N	N	N	N
ALL OTHER SYSTEMS Multiple organs, NOS Adenocarrinoma, NOS, invasive Fibrosarcoma, invasive Fibrosarcoma, metastatic Malignant lymphoma, undifferentiated type	N	N X X	N	N	N	N X	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Myelomonocytic leukemia Monocytic leukemia			x	x	x	X	x		x			x				х	x			x				x	x

ANIMAL NUMBER 9 3 2 9 3 5 9 3 6 9 3 7 9 4 1 9 4 2 9 4 3 944 9 4 5 9 4 6 947 948 9 4 9 9 5 0 9 5 2 9 5 3 9 5 4 9 9 938 9 5 5 3 34 39 4 5 5 WEEKS ON STUDY T Т 0 7 4 105 Т 26 3 4 0 3 87 0 2 1 17 $\hat{2}$ 0 5 22 1 6 1 1 3 $\overline{1}$ 47 4 4 12 43 16 4 8 4 1 4 REPRODUCTIVE SYSTEM Mammary giand Adenoma, NOS Adenocarcinoma, NOS Papillary cystadenoma, NOS Pribroadenoma Preputial/clitoral gland Squamous cell carcinoma Vagina Squamous cell carcinoma Uterus Carcinoma, NOS Adenocarcinoma, NOS Adenocarcinoma, NOS Papillary cystadenocarcinoma Papillary cystadenocarcinoma Endometrial stromal sarcoma Endometrial stromal sarcoma Endometrial stromal sarcoma Memory Adenocarcinoma Superior Sarcoma Endometrial stromal sarcoma Mometrial stromal sarcoma Memory Papillary cystadenocarcinoma Ovary Papillary cystadenocarcinoma NOS + + + + + + + + + + + ÷ + 4 + 4 + + + 4 + + + X X x X X X N N N X X X X N N N N N X N X X N N N N N N X N N N X N N NNNNNN N N N N N N N N Ν N N N N Ν Ν NNN NNNN N N + X х X + Ovary Papillary cystadenocarcinoma, NOS Granulosa cell tumor + + + + + + NERVOUS SYSTEM Brain Carcinoma, NOS, invasive Astrocytoma + + + + + X + + + + + + + + + + SPECIAL SENSE ORGANS Zymbal gland Squamous cell carcinoma Keratoacanthoma + + + + + N + + * + + + + + + + + + + + + Х MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Osteosarcoma ALL OTHER SYSTEMS Multiple organs, NOS Adenocarcinoma, NOS, invasive Fibrosarcoma, invasive Fibrosarcoma, metastatic Malignant lymphoma, undifferentiated type Myelomonocytic leukemia Monocytic leukemia

х

х х

x x ^x x x

х

х

ANIMAL NUMBER	9 5 7	9 5 8	9 5 9	9 6 0	9 6 1	9 6 2	9 6 3	9 6 4	9 6 5	9 6 6	9 6 7	9 6 8	9 6 9	9 7 0	9 7 1	9 7 2	9 7 3	9 7 4	9 7 5	9 7 6	9 7 7	9 7 8	9 7 9	9 8 0	9 8 1
WEEKS ON STUDY	0 9 8	1 1 7	1 2 6	0 9 2	1 4 7	1 1 0	1 4 8	$1 \\ 2 \\ 0$	1 3 2	1 0 7	1 3 7	1 2 6	1 2 1	1 4 6	0 8 5	1 2 8	1 4 8	1 0 2	1 0 4	0 8 0	1 0 2	0 9 6	1 0 9	1 4 2	1 4 2
REPRODUCTIVE SYSTEM Mammary gland Adenoma, NOS	- +	+	+	+	+ x	+ X	+	+	+	+	+	+ X	+ X	+	+	+ x	+	+	+	+	+	+	+	+ X	+
Adenocarcinoma, NOS Papillary cystadenoma, NOS Fibroadenoma Preputial/clitoral gland	N	N	N	N	X N	N	X N	N	N	N	X N	X N	X N	N	N		N	N	X N	N	N	N	N	X N	N
Squamous cell carcinoma Vagina Squamous cell carcinoma	N	N	N	N	Ν	X N	N	N	N	Ν	N	N	N	N	N	N	Ν	N	Ν	Ν	N	N	N	N	Ν
Squamous centrarcinoma Uterus Carcinoma, NOS Adenocarcinoma, NOS Papillary adenocarcinoma Papillary cystadenocarcinoma, NOS Leiomyosarcoma Endometrial stromal polyp Endometrial stromal sarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+ X
Endometrial stromal sarcoma, invasive Hemangiosarcoma Ovary Papillary cystadenocarcinoma, NOS Granulosa cell tumor	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+
NERVOUS SYSTEM Brain Carcinoma, NOS, invasive Astrocytoma	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
SPECIAL SENSE ORGANS Zymbal gland Squamous cell carcinoma Keratoacanthoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Osteosarcoma	- N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
ALL OTHER SYSTEMS Multiple organs, NOS Adenocarcinoma, NOS, invasive Fibrosarcoma, invasive Fibrosarcoma, metastatic Malignant lymphoma, undifferentiated type Myelomonocytic leukemia	- N	N	N	N	И	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Myelomonocytic leukemia Monocytic leukemia		X	x		x		x		X	X								X		X	X		X		X

ANIMAL NUMBER	9 8 2	9 8 3	9 8 4	9 8 5	9 8 6	9 8 7	9 8 8	9 8 9	9 9 0	9 9 1	9 9 2	9 9 3	9 9 4	9 9 5	9 9 6	9 9 7	9 9 8	9 9 9				Ī	TOTAL:
WEEKS ON STUDY	1 3 9	1 0 2	1 0 9	1 3 3	1 3 8	1 2 6	0 9 9	1 3 1	1 1 1	1 2 6	1 4 3	1 1 7	1 4 7	1 4 8	1 2 8	1 4 8	1 3 8	1 3 0					TISSUE TUMOR
REPRODUCTIVE SYSTEM Mammary gland Adenoma, NOS Adenocarcinoma, NOS	+	+	+	+	+	+	N	+	+	+	+	+	+ X	+	+	+	+	+	 	 	 		*118 2 24
Papillary cystadenoma, NOS Fibroadenoma Preputial/clitoral gland Squamous cell carcinoma Vagina	X N N	N N	N N	N N	X N N	N N	N N	X N N	X N N	X N N	X N N	X N X N	X N N	X N X N	X N N	X N N	X N N	X N N					1 62 *118 6 *118
Squamous cell carcinoma Uterus Carcinoma, NOS Adenocarcinoma, NOS Papillary adenocarcinoma Papillary cystadenocarcinoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	X +	+					
Leiomyosarcoma Endometrial stromal polyp Endometrial stromal sarcoma Endometrial stromal sarcoma, invasive Hemangiosarcoma Ovary Papillary cystadenocarcinoma. NOS	+	+	х +	+	x +	+	х +	+	+	+	+	+	+	+	+	+	x +	+					1 15 1 1 1 118 1
Granulosa cell tumor NERVOUS SYSTEM Brain Carcinoma, NOS, invasive	 +	+	+	+	+	+	+	+	+	+	+	+	x +	+	+	+	+	+	 	 			
Astrocycoma SPECIAL SENSE ORGANS Zymbal gland Squamous cell carcinoma Keratoacanthoma	+	+	+	+	+	N	+	+	+	+	+	+	+	+	+	+	+	+	 	 	 		*118
NUS avacanchoma MUSCULOSKELETAL SYSTEM Sone Squamous cell carcinoma, invasive Osteosarcoma	N	N	N X	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	 	 	 	. —	*118 2 1
ALL OTHER SYSTEMS Multiple organs, NOS Adenocarcinoma, NOS, invasive Fibrosarcoma, netastatic Fibrosarcoma, netastatic	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		 			*118 1 1 1 1 1
Malignant lymphoma, undiffer type Myelomonocytic leukemia Monocytic leukemia	x			x	x	X				X	x		x	x	x	x	x	х					1 2 50

* Animals necropsied

ANIMAL NUMBER		2	2 8 3	2 8 4	$\frac{2}{5}$	2 8 6	2 8 7	2 8 8	2 8 9	2 9 0	2 9 1	2 9 2	2 9 3	2 9 4	2 9 5	2 9 6	2 9 7	2 9 8	2 9 9	3 0 0	3 0 1	3 0 2	3 0 3	3 0 4	3 0 5	3 0 6
WEEKS ON STUDY			1 1 8	0 6 9	1 4 8	1 3 7	1 2 8	$\frac{1}{2}$	1 1 6	1 1 0	1 2 0	1 2 9	1 4 8	1 1 3	1 3 0	1 4 2	1 3 4	1 3 8	1 0 6	0 8 8	1 3 9	1 0 0	1 0 9	1 1 9	1 3 7	0 8 9
INTEGUMENTARY SYSTEM Skin Squamous cell papilloma Squamous cell carcinoma Keratoacanthoma Fibroma Fibroma Fibrosarcoma		+	+	+	+	+	+	+	+	+	+	+	*	+	+	+	+	+	+	+	+	+	+	+	+	+
																					x					
RESPIRATORY SYSTEM Lungs and bronchi Papiliary carcinoma, metastatic Squamous cell carcinoma, metastatic Adenocarcinoma, NOS, metastatic Alveolar/bronchiolar adenoma Alveolar/bronchiolar carcinoma Follicular cell carcinoma, metastatic		+ x	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
		÷	+	+	+	+	÷	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
HEMATOPOIETIC SYSTEM Bone marrow Spleen Lymph nodes Carcinoma, NOS, metastatic		+ + +	+++++	+ + +	+++++	+++++	+++++	+ + +	++++	++++	+++++	++++	+ + +	++++	++++	+ + +	+ + +	+ + +	++++	+ + +	++++	++++	+ + +	++++	++++	++++
Neurofibrosarcoma, metastatic T hymus Carcinoma, NOS		ł	+	+	-	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	х +	+	+	+	+	+
CIRCULATORY SYSTEM Heart		÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DIGESTIVE SYSTEM Oral cavity Squamous cell papilloma Squamous cell carcinoma Suamous cell carcinoma, invasive Salivary gland Squamous cell carcinoma, invasive Sarcoma, NOS Liver	1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Neoplastic nodule Bile duct Gallbladder & common bile duct Pancreas Acinar cell adenoma Esophagus Follicular cell carcinoma, invasivew	1.	+ X	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Stomach Small intestine Fibroma Leiomyosarcoma		- + +	+++	++++	++	+++++	+++	++++	^ + +	+++++++++++++++++++++++++++++++++++++++	++	++++	++++	+ +	+ +	+++	+ +	+++++++++++++++++++++++++++++++++++++++	++++	+++++++++++++++++++++++++++++++++++++++	+ +	+++	++++	+++	+ +	+++++
Large intestine Adenocarcinoma in adenomatous polyp URINARY SYSTEM		r	+	+	+	+	+	+		+	+	+	Ŧ	T	T	+	+ 	т	<i>τ</i>	Ŧ	τ	Ŧ		T		т
URINARY SISIEM Tubular cell adenoma Tubular cell adenocarcinoma Mixed tumor, malignant		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Urinary bladder Transitional cell papilloma		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+

TABLE B2. INDIVIDUAL ANIMAL TUMOR PATHOLOGY OF FEMALE RATS IN THE LIFETIME FEEDSTUDY OF TREMOLITE:1% TREMOLITE

ANIMAL NUMBER	3 0 7	3 0 8	3 0 9	3 1 0	3 1 1	3 1 2	3 1 3	3 1 4	3 1 5	3 1 6	3 1 7	3 1 8	3 1 9	3 2 0	3 2 1	3 2 2	3 2 3	3 2 4	3 2 5	3 2 6	3 2 7	3 2 8	3 2 9	3 3 0	$3 \\ 3 \\ 1$
WEEKS ON STUDY	1 1 3	1 2 3	1 1 2	1 4 5	1 2 9	1 1 4	1 4 8	0 9 1	1 4 8	1 3 3	1 4 8	1 3 7	1 1 9	1 2 8	1 3 6	1 0 0	1 2 8	1 1 4	1 3 2	1 1 1	1 0 5	0 9 5	1 4 8	1 1 3	1 3 3
INTEGUMENTARY SYSTEM	—- i—																								
Skin Squamous cell papilloma Squamous cell carcinoma Keratoacanthoma Fibroma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	* X
Fibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Fibrosarcoma Fibrosarcoma Fibrous histiocytoma, malignant Lipoma Neurofibroma Neurofibrosarcoma	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
RESPIRATORY SYSTEM Lungs and bronchi Papillary carcinoma, metastatic Squamous cell carcinoma, metastatic Adenocarcinoma, NOS, metastatic Alveolar/bronchiolar adenoma Alveolar/bronchiolar carcinoma Follicular cell carcinoma, metastatic C-cell carcinoma, metastatic Fibrosarcoma, metastatic Fibrosarcoma, metastatic Osteosarcoma, metastatic	+	+	+	+	+	+	*	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Trachea Follicular cell carcinoma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
HEMATOPOIETIC SYSTEM Bone marrow Spieen Lymph nodes Carcinoma, NOS, metastatic Neurofibrosarcoma, metastatic Thymus Carcinoma, NOS	 + + + +	++++++++	+++++++++++++++++++++++++++++++++++++++	++++++	+++++++	+ + + +	+ + + +	+++++++	++++++++++++++++++++++++++++++++++++++	+ + + +	++++++	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+++++++	+ + + +	+ + + +	+ + +	+ + + + -	+ + +	++++++++	+ + + +	+ + + +
CIRCULATORY SYSTEM Heart		+	+	+	+	+	+	 +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DIGESTIVE SYSTEM Oral cavity Squamous cell papilloma Squamous cell carcinoma Squamous cell carcinoma, invasive Salivary gland	N	N +	 N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N X +	N +	N +	N +	N +	N +	N +
Squamous cell carcinoma, invasive Sarcoma, NOS Liver			, L					-			+		Ļ	·	1		, T					1			
Neoplastic nodule Bile duct	+	+	+	+	X +	+	+	+	+	+	X +	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gallbladder & common bile duct Pancreas Acinar cell adenoma	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +
Esophagus Follicular cell carcinoma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Stomach Small intestine Fibroma	++++	+ + X	+++	++	+	+ +	+ +	+	+ +	+ +	+	++	++	++	+ +	++	+	++	+ +	+ +	+ +	+ +	+ +	+	+ +
Leiomyosarcoma Large intestine Adenocarcinoma in adenomatous polyp	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	* x	+	÷	+	+	+
URINARY SYSTEM Kidney Tubular cell adenoma Tubular cell adenocarcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mixed tumor, malignant Urinary bladder Transitional cell papilloma	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

ANIMAL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3 5	3 5	3	3
NUMBER	32	3 3	3	3 3 5	3 6	3 7	3 8	39	4 0	4	42	4 3	4	4 5	4 6	4	4 8	4 9	5 0	5	5 2	3	5 4	5 5	5 6
WEEKS ON STUDY	1 4 8	1 1 7	1 1 7	1 0 5	1 4 8	1 3 6	1 3 4	0 8 1	1 3 8	1 4 5	$\frac{1}{2}$ 7	0 9 8	1 2 7	0 6 5	1 1 7	1 1 1	1 2 6	1 1 0	1 2 8	1 2 6	1 1 1	1 0 9	$\frac{1}{2}$	1 3 1	1 4 8
INTEGUMENTARY SYSTEM Skin Squamous cell papilloma Squamous cell carcinoma Keratoacanthoma Fibroma	+	+	+	+	+	+	+	+	* X	*	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Fibrosarcoma Fibrosarcoma Fibrous histiocytoma, malignant Lipoma Neurofibroma Neurofibrosarcoma	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	•	+	+	+	+
RESPIRATORY SYSTEM Lungs and bronchi Papillary carcinoma, metastatic Squamous cell carcinoma, metastatic Adenocarcinoma, NOS, metastatic Alveolar/bronchiolar carcinoma Follicular cell carcinoma, metastatic C.cell carcinoma, metastatic Pheochromocytoma, metastatic Fibrosarcoma, metastatic Osteosarcoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Trachea Follicular cell carcinoma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+
HEMATOPOIETIC SYSTEM Bone marrow Spieen Lymph nodes Carcinoma, NOS, metastatic Neurofibrosarcoma, metastatic Thymus Carcinoma, NOS	+ + + +	++++++	++++++	++++++	++++	++++	+ + + +	+ + + +	+ + +	+ + +	+++++++	+++++++	++++++	++++++++	+ + + +	-+++++	+++++++	+ + + +	+ + + +	++++	+ + +	+++++	+ + +	+ + 	+ + + +
CIRCULATORY SYSTEM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DIGESTIVE SYSTEM Orai cavity Squamous cell papilloma Squamous cell carcinoma Squamous cell carcinoma, invasive	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Salivary gland Squamous cell carcinoma, invasive Sarcoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Liver Neoplastic nodule Bile duct	+	++	++	++	+	++	+	+	+	+	+	++	++	++	+	++	++	+	+	+	++	+	+	+	++
Gailbladder & common bile duct Pancreas Acinar cell adenoma Esophagus Follicular cell carcinoma, invasive	N + +	N + +	N + +	N + +	N + +	N + +	N + +	N + 	N + +	N + +	N + +	N + +	N + +	N + +	N + +	N + +	N + +	N + +	N + +	N + +	N + +	N + +	N + +	N + +	N + +
Stomach Small intestine Fibroma	+++++	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+++	+ +	+ +	+ +
Leiomyosarcoma Large intestine Adenocarcinoma in adenomatous polyp	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
URINARY SYSTEM Kidney Tubular cell adenoma Tubular cell adenocarcinoma Mixed tumor, malignant Urinary bladder Transitional cell papilloma	+	+	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	+	+	++	++	+ X + +	+	+

ANIMAL 3 3 3 3 3 3 NUMBER 5 5 5 6 6 7 8 9 0 1	3 3 3 3 6 6 6 6 2 3 4 5	3 3 3 3 3 3 6 6 6 6 5 6 7 8 9	3 3 3 7 7 7 0 1 2	3 3 7 7 3 4	3 3 7 7 5 6	3 3 7 7 7 8	3 3 7 8 9 0	3 8 1
WEEKS ON 1 1 1 1 1 1 1 1 1 1 1 2 2 4 4 1 9 6 6 8 8 1 9 6 6 8 1 9 6 6 8 1 9 6 6 8 1 9 6 6 8 1 9 6 6 8 1 9 6 6 8 1<		$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1 0 1 0 8 4 5 1 7		1 1 3 4 9 4	$ \begin{array}{ccc} 1 & 1 \\ 2 & 0 \\ 7 & 9 \end{array} $	0 1 9 0 5 5	1 2 1
INTEGUMENTARY SYSTEM Skin + + + + + Squamous cell papilloma Squamous cell carcinoma Koratoacanthoma X	+ + + + +	+ + + + + X	+ + +	- + +	+ +	+ +	+ +	+
Fibroma Fibrosarcoma Subcutaneous tissue Fibroma Fibrosarcoma Fibrosantoma, malignant Lipoma Neurofibroma	+ + + +	+ + + + + X	+ + + X	- + +	+ + X	+ +	+ + X	+
Neurofibrosarcoma RESPIRATORY SYSTEM Lungs and bronchi + + + + +				- + +	× 		+ +	
Papillary carcinoma, metastatic Squamous cell carcinoma, metastatic Adenocarcinoma, NOS, metastatic Alveolar/bronchiolar adenoma Alveolar/bronchiolar carcinoma Follicular cell carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Fibrosarcoma, metastatic	x				1 1		x	,
Osteosarcoma, metastatic Trachea + + + + + Follicular cell carcinoma, invasive	+ + + + +	+ + + + +	+ + +	+ + +	+ +	+ +	+ +	+
HEMATOPOIETIC SYSTEM Bone marrow Poien Lymph nodes Carcinoma, NOS, metastatic Neurofibrosarcoma, metastatic Thymus Carcinoma, NOS	$\begin{array}{c} + & + & + & + & + & + & + & + & + & + $	+ +		• + + • + + • + +	+ + + + + +	+ + + + + +	+ + + + + +	+ + +
CIRCULATORY SYSTEM Heart + + + + +	+ + + + +	+ + + + +		+ + +	+ +	+ +	+ +	+
DIGESTIVE SYSTEM Oral cavity N N N N N Squamous cell papilloma Squamous cell carcinoma	NNNN	N N N N N	ומא	N N	N N	N N	N N	N
Squamous cell carcinoma, invasive Salivary gland + + + + + Squamous cell carcinoma, invasive Sarcoma, NOS	+ + + + +	+ + ~ + +	• + + -	+ + +	+ +	+ +	+ +	+
Liver + + + + + Neoplastic nodule Bile duct + + + + + Gallbladder & common bile duct N N N N		+ + + + + + X X + + + + + + + N N N N N	· + + -		+ + + + N N	+ + + + N N	+ + + + N N	+ + N
Pancreas Acinar celladenoma Esophagus + + + + +		+ + + + + +	· + + ·	+ + +	+ + +	+ + +	+ + +	+++++++++++++++++++++++++++++++++++++++
Follicular cell carcinoma, invasive Stomach + + + + + small intestine + + + + +	+ + + + + + + + + +	+ + + + + + + + + + + + + + + + + + + +	· + + ·	+ + +	+ + + +	+ + + +	+ + + +	+ +
Fibroma Leiomyosarcoma Large intestine + + + + + Adenocarcinoma in adenomatous polyp	+ + + + 4	+ + + + +	. + + -	+ + +	+ +	+ +	+ +	+
URINARY SYSTEM Kidney + + + + + Tubular cell adenoma Tubular cell adenocarcinoma Mixed tumor, malignant	+ + + + +	+ + + + +	- + + -	+ + +	+ +	+ +	+ +	+
Urinary bladder + + - + + Transitional cell papilloma	+ + + + +	+ + + + +	• + + •	+ + +	+ +	+ +	+ +	+

ANIMAL NUMBER	3 8 2	3	3 8 4	3 8 5	3 8 6	3 8 7	3 8 8	3 8 9	3 9	3 9 1	392	393	3 9	3 9 5	3 9 6	3 9 7	39	3 9 9	4 0	4 0 1	4 0 2	403	404	4 0 5	4 0 6
WEEKS ON STUDY	0 8 8	1 4 8	1	1 3 6	1 4 8	127	0 8 8	1 1 7	0 9 2	1 4 6	1	1 3 6	1 1 3	1 4 5	1 1 0	1 1 8	1 1 4	1 4 3	1 4 7	1 4 7	1 0 0	0 8 1	1 0 6	0 9 4	0 9 2
INTEGUMENTARY SYSTEM Skin Squamous cell papilloma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Squamous cell carcinoma Keratoacanthoma Fibroma Fibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Fibroma Fibrosarcoma Fibrosa histiocytoma, malignant	+	+	+	+	+ X	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	X +	+	+	+	+
Lipoma Neurofibroma Neurofibrosarcoma																									
RESPIRATORY SYSTEM Lungs and bronchi Papillary carcinoma, metastatic Squamous cell carcinoma, metastatic Adenocarcinoma, NOS, metastatic Alveolar/bronchiolar adenoma Alveolar/bronchiolar carcinoma Follicul/arcell carcinoma, metastatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
C-cell carcinoma, metastatic Pheochromocytoma, metastatic Fibrosarcoma, metastatic Osteosarcoma, metastatic			+	1		+	T	T	T	Ŧ		т	L	L.		L	±	X	-	1	_	+	+	+	+
Trachea Follicular cell carcinoma, invasive		+	+	Ŧ	Ŧ	+	Ŧ	+	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	T	Ŧ	-	Ŧ	Ŧ	-	Ŧ	+	Ŧ	+
HEMATOPOIETIC SYSTEM Bone marrow Spieen Lymph nodes Carcinoma, NOS, metastatic	+ + +	+++++	+ + +	+ + +	++++	+ + +	+ + +	+ + +	+ + X	+ + +	+ + +	+ + +													
Neurofibrosarcoma, metastatic Thymus Carcinoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+
CIRCULATORY SYSTEM Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DIGESTIVE SYSTEM Oral cavity Squamous cell papilloma Squamous cell carcinoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N X	N	N	N	N	N	N	N	N	N
Squamous cell carcinoma, invasive Salivary gland Squamous cell carcinoma, invasive Sarcoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Х +	+	+	+	+	÷	+	+	+	÷
Liver Neoplastic nodule Bile duct	+++++++++++++++++++++++++++++++++++++++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	* X	+	+	+	++	+	+	+	+	+ +
Gallbladder & common bile duct Pancreas Acinar cell adenoma	N +	N +	N +	N +	Ń +	N +	Ń +	N +	+ N +	N +															
Esophagus Follicular cell carcinoma, invasive Stomach	+++++++++++++++++++++++++++++++++++++++	++	+	+	+	+	++	++	++	+	++	++	++	++	+	++	++	+	++	++	++	++	++	++	+ +
Small intestine Fibroma Leiomyosarcoma Large intestine	+	+	+	+	+	+	+	+	+	+	+	+ +	+	+	+	+	+ +	+	+	+	+	+	+	+	+ +
Adenocarcinoma in adenomatous polyp URINARY SYSTEM		;																							
Kidney Tubular cell adenoma Tubular cell adenocarcinoma Mixed tumor, malignant Urinary biadder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Transitional cell papilloma		Ŧ	-	ŗ	τ.	r	r	,	ť	T	,	r	,				1	,							

					(0	on	int	ued)																
ANIMAL NUMBER	4 0 7	4 0 8	4 0 9	4 1 0	4 1 1	4 1 2	4 1 3	4 1 4	4 1 5	4 1 6	4 1 7	4 1 8	4 1 9	4 2 0	4 2 1	4 2 2	4 2 3	4 2 4	4 2 5	4 2 6	4 2 7	4 2 8	4 2 9	4 3 0	4 3 1
WEEKS ON STUDY	1 4 8	1 1 0	1 4 3	1 2 8	1 4 6	1 4 1	0 4 9	$\frac{1}{3}$	1 2 1	1 3 4	1 4 8	0 8 3	0 9 7	1 2 4	1 4 8	1 1 0	1 2 0	1 3 0	1 3 1	1 4 6	1 0 5	1 4 3	1 3 8	1 2 8	1 0 3
INTEGUMENTARY SYSTEM Skin Squamous cell papilloma Squamous cell carcinoma Keratoacanthoma Fibroma	+	+	+	+	+	+	+	+	+	+	*	+	+	+	+ x	+	+	+	+	+	÷	+	+	+	,+ ,
Fibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Fibroma Fibrosarcoma Fibrosa histiocytoma, malignant Lipoma	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+ X	+	+ X
Neurofibroma Neurofibrosarcoma												X						X							
RESPIRATORY SYSTEM Lungs and bronchi Papillary carcinoma, metastatic Squamous cell carcinoma, metastatic Adenocarcinoma, NOS, metastatic Aiveolar/bronchiolar adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Alveolar/bronchiolar carcinoma Foliicular cell carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Fibrosarcoma, metastatic Osteosarcoma, metastatic																		x							
Trachea Follicular cell carcinoma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Ŧ	+
HEMATOPOIETIC SYSTEM Bone marrow Spleen Lymph nodes Carcinoma, NOS, metastatic	+++++++++++++++++++++++++++++++++++++++	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+++++	+ + +	+ + +	+ + +	++++	+++++	+++++	+ + +	+ + +	+ + +	+ + +	++++	+ + +	++++	++++	+++++	+ + +
Neurofibrosarcoma, metastatic Thymus Carcinoma, NOS	+	+	+	+	+	+	+ X	÷	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	-
CIRCULATORY SYSTEM Heart		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DIGESTIVE SYSTEM Oral cavity Squamous cell papilloma Squamous cell carcinoma Squamous cell carcinoma, invasive	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Salivary gland Squamous cell carcinoma, invasive Sarcoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Liver Neoplastic nodule Bile duct Gallbladder & common bile duct	+ + N	+ + N	+ + N	+ + N	+ + N	+ + N	+ + N	+ + N	+ + N	+ + N	+ + + N	+ + N	+ + N	+ + N	+ N	+ N	+ + N	+ + N	+ N						
Pancreas Acinar cell adenoma Esophagus	+++	+++	+++	+++	++++	+++++++++++++++++++++++++++++++++++++++	++++	+++	+++	+++	+++	+	+++	+++++++++++++++++++++++++++++++++++++++	++	++	+	+++	+++	+	++	++	+	++	++
Follicular cell carcinoma, invasive Stomach Small intestine	+++	+ +	+ +	++++	+ +	+ +	+ +	+ +	+ +	+ +	+ +	++	++	+ +	+ +	+ +	+ +	+ +							
Fibroma Leiomyosarcoma Large intestine Adenocarcinoma in adenomatous polyp	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
URINARY SYSTEM Kidney Tubular cell adenoma Tubular cell adenocarcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mixed tumor, malignant Urinary bladder Transitional cell papilloma	+	+	+	+	+	+	+	X +	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+
		_			_						-						_	_		_					

ANIMAL NUMBER	4 3 2	4 3 3	4 3 4	4 3 5	4 3 6	4 3 7	4 3 8	4 3 9	4 4 0	4 4 1	4 4 2	4 4 3	4 4 4	4 4 5	4 6	4 4 7	4 8	4 9	4 5 0	4 5 1	4 5 2	4 5 3	4 5 4	4 5 5	4 5 6
WEEKS ON STUDY	1 2 9	1 2 3	1 2 9	$\frac{1}{2}$	1 2 8	0 9 1	1 0 9	1 01 91	1 3 7	1 2 8	1 3 8	1 0	0 9 8	1 3 6	1 2 9	1 2 9	1 1 6	$\frac{1}{2}$	1 1 1	1 0 6	1 2 9	1 3 0	1 1 7	1 1 3	1 3 8
INTEGUMENTARY SYSTEM				•																					
Skin Squamous cell papilloma Squamous cell carcinoma Keratoacanthoma Fibroma Fibrosarcoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Subsarouna Squamous cell carcinoma, invasive Fibroma Fibrosarooma Fibrosa histiocytoma, malignant Lipoma Neurofibroma Neurofibroma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
RESPIRATORY SYSTEM Lungs and bronchi Papillary carcinoma, metastatic Squamous cell carcinoma, metastatic Adenocarcinoma, NOS, metastatic Alveolar/bronchiolar adenoma Alveolar/bronchiolar carcinoma	+	+	+	+ x	+	+	+ x	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Follicular cell carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Fibrosarcoma, metastatic Osteosarcoma, metastatic Trachea Follicular cell carcinoma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
HEMATOPOIETIC SYSTEM Bone marrow Spleen Lymph nodes Carcinoma, NOS, metastatic	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +	+ + +
Neurofibrosarcoma, metastatic Thymus Carcinoma, NOS	+	+	+	+	+	+	+	-	+	+	+	+	+	-	+	+	+	+	+	+	+	÷	-	+	+
CIRCULATORY SYSTEM Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DIGESTIVE SYSTEM Oral cavity Squamous cell papilloma Squamous cell carcinoma	N	N	N	N	N	N	N	Ν	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Squamous cell carcinoma, invasive Salivary gland Squamous cell carcinoma, invasive Sarcoma, NOS	+	+	+	+	+	$\overset{+}{\mathbf{X}}$	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Liver Neoplastic nodule Bile duct	+	+	+	+	+	+	+	+	+	+	+ +	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gallbladder & common bile duct Pancreas	* N +	+ N +	+ N +	+ N +	n +	ň +	N +	+ N +	+ N +	ň +	N +	N +	+ N +	+ N +	+ N +	+ N +	+ N +	N +	ň +	N +	т N +	Ň +	+ N +	N +	т N +
Acinar cell adenoma E sophagus Follicular cell carcinoma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Stomach Small intestine Fibroma	++++	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +
Leiomyosarco ma L arge intestine Adenocarcinoma in adenomatous polyp	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
URINARY SYSTEM Kidney Tubular ceil adenoma Tubular ceil adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	*	+	+	+	+	+	+	+	+	+	+	+
Tubular cell adenocarcinoma Mixed tumor, malignant Urinary bladder Transitional cell papilloma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	÷	+

																- 7		~ .7							-
ANIMAL NUMBER	4 5 7	4 5 8	4 5 9	4 6 0	4 6 1	4 6 2	4 6 3	4 6 4	4 6 5	4 6 6	4 6 7	4 6 8	4 6 9	4 7 0	4 7 1	4 7 2	4 7 3	4 7 4	4 7 5	4 7 6	4 7 7	4 7 8	4 7 9	4 8 0	4 8 1
WEEKS ON STUDY	1 3 7	1 4 2	1 4 5	1 1 9	0 9 0	1 2 2	0 9 2	1 4 1	1 0 3	1 4 0	1 4 8	1 4 8	1 2 8	1 4 7	1 3 3	1 2 0	1 2 6	1 3 8	1 3 0	1 2 6	1 2 9	1 3 8	1 1 6	$\frac{1}{3}$	1 0 9
INTEGUMENTARY SYSTEM						<u> </u>																			
Skin Squamous cell papilloma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Squamous cell carcinoma Keratoacanthoma Fibroma																									
Fibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Fibroma	+	+	+	+	+	+	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibroarcoma Fibrous histiocytoma, malignant Lipoma Neurofibroma										л					x										x
Neurofibrosarcoma	1																								
RESPIRATORY SYSTEM Lungs and bronchi Papillary carcinoma, metastatic Squamous cell carcinoma, metastatic Adenocarcinoma, NOS, metastatic Alveolar/bronchiolar adenoma Alveolar/bronchiolar carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Follicular cell carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Fibrosarcoma, metastatic Osteosarcoma. metastatic Trachea Follicular cell carcinoma, invasive	+	x +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+
,						_																			
HEMATOPOIETIC SYSTEM Bone marrow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Spleen Lymph nodes	++++	+++++++++++++++++++++++++++++++++++++++	++	++	+ +	++	+++	++	++++	+	+	+++++++++++++++++++++++++++++++++++++++	++	++	+++	+++	+++	+ +	+ +	+ +	+ +	++++	+++	+++	+++
Carcinoma, NOS, metastatic Neurofibrosarcoma, metastatic																									
Thymus Carcinoma, NOS	+	-	+	+	+	+	+	_	-	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	-
CIRCULATORY SYSTEM Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DIGESTIVE SYSTEM Oral cavity Squamous cell papilloma Squamous cell carcinoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Squamous cell carcinoma, invasive Salivary gland Squamous cell carcinoma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sarcoma, NOS Liver	+	+	+	+	+	+	+	+	+	+	+	X +	+	+	+	+	+	÷	+	4	+	+	+	+	+
Neoplastic nodule Bile duct	+	+	+	+	+	+	+	+	+	+	+	+	+	X + N	+	+	+	+	+	+	+	+	+	+	+
Gallbladder & common bile duct Pancreas	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +	N +
Acinar cell adenoma Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	X +	+	+	+
Follicular cell carcinoma, invasive Stomach	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Small intestine Fibroma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Leiomyosarcoma Large intestine Adenocarcinoma in adenomatous polyp	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
URINARY SYSTEM Kidney Tubular cell adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Tubular cell adenoma Mixed tumor, malignant Urinary bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	÷	+	+

ANIMAL NUMBER	4 8 2	4 8 3	4 8 4	4 8 5	4 8 6	4 8 7	4 8 8	4 8 9	4 9 0	4 9 1	4 9 2	4 9 3	4 9 4	4 9 5	4 9 6	4 9 7	4 9 8	4 9 9	5 0 0	5 0 1	5 0 2	5 0 3	5 0 4	5 0 5	5 0 6
WEEKS ON STUDY	1 3 2	1 4 8	1 2 0	1 3 1	1 0 4	0 9 5	0 8 6	1 2 7	1 0 1	1 0 7	0 9 1	1 1 3	$\frac{1}{3}$ 2	1 1 6	1 1 9	1 3 0	1 4 7	1 2 8	1 3 7	1 4 8	1 3 9	1 4 8	1 2 3	1 0 7	1 4 0
INTEGUMENTARY SYSTEM Skin			+	*	+		+	+	+	+	+	4	+	+	+	+	+	+	+	+	+	+	+	+	+
Squamous cell papilloma Squamous cell carcinoma Keratoacanthoma Fibroma Fibrosarcoma		Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	x	Ŧ	Ŧ	т	т	Ŧ	Ŧ
Subcutaneous tissue Squamous cell carcinoma, invasive Fibroma Fibrosarcoma Fibrous histicocytoma, malignant Lipoma Neurofibroma Neurofibrosarcoma	+	+ x	+	+	+	+	+	+	+	* X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
RESPIRATORY SYSTEM Lungs and bronchi Papillary carcinoma, metastatic Squamous cell carcinoma, metastatic Alveolar/bronchiolar adenoma Alveolar/bronchiolar carcinoma Follicular cell carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Fibrosarcoma, metastatic Osteosarcoma, metastatic	+	+ X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Follicular cell carcinoma, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+
HEMATOPOIETIC SYSTEM Bone marrow				-			+												-	+	-	+			
Spleen Lymph nodes Carcinoma, NOS, metastatic	+++++++++++++++++++++++++++++++++++++++	++	++	+ +	++	++	+++	+++	++	+++	+ +	+++	+ +	+ +	++++	+ + +	+++	+ +							
Neurofibrosarcoma, metastatic Thymus Carcinoma, NOS	+	-	+	+	+	+	+	+	-	+	+	-	+	+	+	+	-	+	+	+	+	+	-	+	-
CIRCULATORY SYSTEM Heart	- +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DIGESTIVE SYSTEM Oral cavity Squamous cell papilloma Squamous cell carcinoma	N	N	N	N	N	N	N	N	N	N X	N	N X	N	N	N	N	N	N X	N	N	N	N	N	N	N
Squamous cell carcinoma, invasive Salivary gland Squamous cell carcinoma, invasive Sarcoma, NOS	+	+	+	+	+	+	+	+	+	л +	+	л +	+	+	+	+	+	+	+	+	+	+	+	+	+
Liver Neoplastic nodule	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*	+	+	+	+
Bile duct Gallbladder & common bile duct Pancreas	+ N +	+ N +	+ N +	+ N +	н н +	+ N +	+ N +	+ N +	+ N +	+ N +	н н +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +						
Acinar cell adenoma Esophagus Follicular cell carcinoma, invasive	+	X +	+	+	+	+	+	+	+	+	+	+	Х +	+	+	+	+	+	+	+	+	+	+	+	+
Stomach Small intestine	+++	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +								
Fibroma Leiomyosarcoma Large intestine Adenocarcinoma in adenomatous polyp	+	+	X +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
URINARY SYSTEM Kidney		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Tubular ceil adenoma Tubular ceil adenocarcinoma Mixed tumor, malignant Urinary bladder Transitional ceil papilloma	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	x -	+	х +	+	+	+	+	+	+	+

								(U	on		400	9														
ANIMAL NUMBER	5 0 7	5 0 8	5 0 9	5 1 0	5 1 1	5 1 2	5 1 3	5 1 4	5 1 5	5 1 6	5 1 7	5 1 8	5 1 9	5 2 0	5 2 1	5 2 2	5 2 3	5 2 4	5 2 5	5 2 6	5 2 7	5 2 8	5 2 9	5 3 0	5 3 1	TOTAL
WEEKS ON STUDY	1 2 9	0 8 4	1 3 0	1 1 6	1 3 2	1 3 2	0 3 3	0 3 3	0 3 3	1 1 1	1 2 3	1 4 8	1 2 2	1 2 0	1 1 6	1 1 1	0 8 1	1 1 1	1 2 2	1 4 8	1 3 5	1 1 6	0 9 3	0 7 6	$\frac{1}{3}$	TOTAL: TISSUES TUMORS
INTEGUMENTARY SYSTEM					•																					
Skin Squamous cell papilloma Squamous cell carcinoma Keratoacanthoma Fibrosarcoma Subcutaneous tissue Squamous cell carcinoma, invasive Fibroma Fibrous histicytoma, malignant Lipoma Neurofibroma Neurofibroma Neurofibrosarcoma	+	+	+	+	+ X +	* +	+	+	+	+	+	+	+	+	+	+	+	* +	+	+	+	+	+	+	+	*250 7 1 2 2 1 *250 2 8 4 1 1 2 3
RESPIRATORY SYSTEM Lungs and bronchi Papillary carcinoma, metastatic Squamous cell carcinoma, metastatic Adenocarcinoma, NOS, metastatic Alveolar/bronchiolar adenoma Alveolar/bronchiolar carcinoma Folicular cell carcinoma, metastatic C-cell carcinoma, metastatic Pheochromocytoma, metastatic Fibrosarcoma, metastatic Osteosarcoma, metastatic Trachea Follicular cell carcinoma, invasive	+	+	+	+	+ X +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250 1 2 1 1 2 1 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2
HEMATOPOIETIC SYSTEM Bone marrow Spleen	+++	+	+ + +	+++	+++	++++	++++	++++	+++	+++++	+++	+++++	++++	++++++	+++	++++	+++	++++	+++	++	 + +	+++++	+++	++	+ + +	248 250
Lymph nodes Carcinoma, NOS, metastatic Neurofibrosarcoma, metastatic	+	+	+	÷	+	÷	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	250 250 1 1
Thymus Carcinoma, NOS	+	-	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	221 1
CIRCULATORY SYSTEM Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250
DIGESTIVE SYSTEM Oral cavity Squamous cell papilloma Squamous cell carcinoma Squamous cell carcinoma, invasive	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	*250 1 4
Salivary gland Squamous cell carcinoma, invasive Sarcoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	249 1 1
Liver Neoplastic nodule	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250 10
Bile duct Gallbladder & common bile duct Pancreas	+ N +	+ N +	+ X +	+ N +	+ N +	+ N +	+ N +	+ N +	+ N +	250 *250 250																
Acinar cell adenoma Esophagus Follouis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	248
Follicular cell carcinoma, invasive Stomach Small intestine Fibroma	+++	+ +	2 250 250 1																							
Leionnyosarcoma Large intestine Adenocarcinoma in adenomatous polyp	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250 1
URINARY SYSTEM Kidney Tubular cell adenoma Tubular cell adenocarcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	250 2 2
Mixed tumor, malignant Urinary bladder Transitional cell papilloma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+	246 1

* Animals necropsied

ANIMAL NUMBER	2 8 2	2 8 3	2 8 4	2 8 5	2 8 6	2 8 7	2 8 8	2 8 9	2 9 0	2 9 1	2 9 2	2 9 3	2 9 4	2 9 5	2 9 6	2 9 7	2 9 8	2 9 9	3 0 0	3 0 1	3 0 2	3 0 3	3 0 4	3 0 5	3 0 6
WEEKS ON STUDY	1 0 9	1 1 8	0 6 9	1 4 8	1 3 7	1 2 8	1 2 7	1 1 6	1 1 0	$1 \\ 2 \\ 0$	1 2 9	1 4 8	1 1 3	1 3 0	1 4 2	1 3 4	1 3 8	1 0 6	0 8 8	1 3 9	1 0 0	1 0 9	1 1 9	1 3 7	0 8 9
ENDOCRINE SYSTEM Pituitary Carcinoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	*	+	+	+	+	+	+	+	+	+	+	+	+
Adenoma, NOS Adrenal Cortical adenoma Pheochromocytoma Pheochromocytoma, malignant	+	+ X	+	+	x + x	+	X +	Х +	X +	+ X	+	+	+	Х +	+	X +	* x	+	+	X +	+	÷	+	X +	+
Ganglioneuroma Thyroid Follicular cell adenoma Follicular cell carcinoma	+ x	+	+	÷	+	+ X	+	+ X	+	+	+	+ X	+	+	+	+	+	+	+	+	+	+ x	+	+	+
C-cell adenoma C-cell carcinoma Parathyroid Pancreatic islets Islet cell adenoma	+++	+ +	+ +	X + +	+ +	++	++	++	+ +	X + +	+ +	+++	+ +	- +	++	+ +	+ +	+ +	x + +	- +	+ +	- +	+ +	++	+ +
Islet cell carcinoma REPRODUCTIVE SYSTEM Mammary gland		 +	 +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Adenoma, NOS Adenocarcinoma, NOS Papillary adenocarcinoma Fibroadenoma				v	X	v					x		x	x	v	v	x			x		x	x	x x	
Neurofibroma Preputial/clitoral.gland Carcinoma, NOS Squamous cell papilloma	N	N	N	N	N N		N	N	N	N		N		N	X N	X N	N	N	N	л N	N	N	N	N	N
Squamous cell carcinoma Keratoacanthoma Uterus Papillary carcinoma Papillary adenocarcinoma	÷	+	+	+	+	+	+	+	+	+	+	X +	+	+	+	+	+	+ X	+	+	+	Х +	+	+	+
Fibrosarcoma Endometrial stromal polyp Endometrial stromal sarcoma Endometrial stromal sarcoma, invasive Ovary	x			x		x			x						x										x
Granulosa cell tumor Granulosa cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
NERVOUS SYSTEM Brain Carcinoma, NOS, invasive Glioma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	* x	+	+	+	+	+	+	+	+	+	+	÷	+
Astrocytoma Spinal cord Osteosarcoma, invasive	N	Ν	N	N	Ν	N	N	N	Ν	* x	Ν	N	Ν	N	Ν	N	Ν	N	N	Ν	N	N	N	N	N
SPECIAL SENSE ORGANS Zymbal gland Carcinoma in-situ, NOS Squamous cell papilloma Squamous cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	*	+	N	+	+	+	+	+	+	+	+	+	+	+
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Osteosarcoma	N	N	N	N	N	N	N	N	N	N X	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
BODY CAVITIES Mesentery Hemangiosarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
ALL OTHER SYSTEMS Multiple organs, NOS Carcinoma, NOS, invasive Adenocarcinoma, NOS, metastatic C-cell carcinoma, metastatic Granulosa cell carcinoma, metastatic Hemangiosarcoma, invasive Malignant lymphoma, NOS	N	N	N	N	N	N		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Myelomonocytic leukemia Monocytic leukemia Pituitary fossa Carcinoma, NOS, invasive		x					х							x	x		x		x		x			x	x

					(U	0111		ieu	<i>.</i>																
ANIMAL NUMBER	3 0 7	3 0 8	3 0 9	3 1 0	3 1 1	$\frac{3}{1}{2}$	3 1 3	3 1 4	3 1 5	3 1 6	3 1 7	3 1 8	3 1 9	3 2 0	$\frac{3}{2}{1}$	3 2 2	3 2 3	3 2 4	3 2 5	3 2 6	3 2 7	3 2 8	3 2 9	3 3 0	3 3 1
WEEKS ON STUDY	1 1 3	1 2 3	$1 \\ 1 \\ 2$	1 4 5	1 2 9	1 1 4	1 4 8	0 9 1	1 4 8	1 3 3	1 4 8	1 3 7	1 1 9	1 2 8	1 3 6	1 0 0	1 2 8	1 1 4	1 3 2	1 1 1	1 0 5	0 9 5	1 4 8	1 1 3	1 3 3
ENDOCRINE SYSTEM	-																								
Pituitary Carcinoma, NOS	+	+	x x	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	x+	+	+	+	+	+	+
Adenoma, NOS	x		л		х			х	х		X	X		Х	X		х			х	Х	х		Х	
Adrenal Cortical adenoma	+	+	+	x X	+	+	+	+	+	x+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pheochromocytoma Pheochromocytoma, malignant Ganglioneuroma				X					X						х										
Thyroid	+	+	+	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	÷	+	+	+	+	+
Follicular cell adenoma Follicular cell carcinoma C-cell adenoma				х																X					
C-cell carcinoma Parathyroid	+	X		X	+	+	+	+	L.	+	X	+	+	+	+	+	+	+	+	Ŧ	+	+	+	+	+
Pancreatic islets	+	÷	+	÷	+	+	+	÷	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷
Islet cell adenoma Islet cell carcinoma										x	х														
REPRODUCTIVE SYSTEM Mammary gland	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Adenoma, NOS Adenocarcinoma, NOS									X																
Papillary adenocarcinoma									A																
Fibroadenoma Neurofibroma			х		х		х			X	х	х		х	х		х					х			X
Preputial/clitoral gland	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	N
Carcinoma, NOS Squamous cell papilloma Squamous cell carcinoma																									x
Keratoacanthoma Uterus Papillary carcinoma	+	+	+	+	+	+	* X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Papillary adenocarcinoma Fibrosarcoma Endometrial stromal polyp						x							x						x				x		
Endometrial stromal sarcoma Endometrial stromal sarcoma, invasive																									
Ovary Granulosa cell tumor Granulosa cell carcinoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
NERVOUS SYSTEM	-																								
Brain Carcinoma, NOS, invasive Glioma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	* x	+	+	+	+	+	+
Astrocytoma																					NT				
Spinal cord Osteosarcoma, invasive	N	Ν	Ν	Ν	Ν	Ν	N	Ν	N	N	N	N	Ν	Ν	IN	N	N	N	Ν	N	N	Ν	IN	N	14
SPECIAL SENSE ORGANS Zymbal gland	~	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma in-situ, NOS Squamous cell papilloma Squamous cell carcinoma																									
MUSCULOSKELETAL SYSTEM	-		•																						
Bone Squamous cell carcinoma, invasive Osteosarcoma	N	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	N	N	N	Ν	Ν	N	Ν	N	N	N	Ν	N	N
BODY CAVITIES	-		N	N	 N	N		N		N	N	N	N	N	N			N	N	N	N	N			
Mesentery Hemangiosarcoma		N	IN	N	IN	IN	IN	IN	IN	IN	ĮN.	IN	IN	LN.	IN	TN.	ţN.	IN	IN	19	LN	IN	N	IN	14
ALL OTHER SYSTEMS Multiple organs, NOS	- N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Carcinoma, NOS, invasive Adenocarcinoma, NOS, metastatic C-cell carcinoma, metastatic																									
Granulosa cell carcinoma, metastatic Hemangiosarcoma, invasive Malignant lymphoma, NOS																									
Myelomonocytic leukemia Monocytic leukemia	x			x		x	x			x	x	x				x		x					x		x
Pituitary fossa Carcinoma, NOS, invasive																									

ANIMAL NUMBER	3 3 2	3 3 3	3 3 4	3 3 5	3 3 6	3 3 7	338	339	3 4 0	3 4 1	3 4 2	3 4 3	3 4 4	3 4 5	3 4 6	3 4 7	3 4 8	3 4 9	3 5 0	3 5 1	3 5 2	3 5 3	3 5 4	3 5 5	3 5 6
WEEKS ON STUDY	1 4 8	1 1 7	1 1 7	1 0 5	1 4 8	1 3 6	1 3 4	0 8 1	1 3 8	1 4 5	$\frac{1}{2}$ 7	0 9 8	$\frac{1}{2}$	0 6 5	1 1 7	1 1 1	1 2 6	1 1 0	1 2 8	1 2 6	1 1 1	1 0 9	$\frac{1}{2}$	1 3 1	1 4 8
ENDOCRINE SYSTEM																						·			
Pituitary Carcinoma, NOS	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenoma, NOS	x		х	х		х	x		х									X		х					
Adrenal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cortical adenoma Pheochromocytoma																				х		х			x
Pheochromocytoma, malignant																									
Ganglioneuroma Thyroid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Follicular cell adenoma												·	Ċ												
Follicular cell carcinoma C-cell adenoma																x			х						
C-cell carcinoma			х							х						л			~			х		х	Х
Parathyroid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	-	+	+	+	+
Pancreatic islets Islet cell adenoma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Islet cell carcinoma																									
REPRODUCTIVE SYSTEM																									
Mammary gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Adenoma, NOS	ĺ								х																
Adenocarcinoma, NOS	x					х			л	Х										х					
Papillary adenocarcinoma																									
Fibroadenoma Neurofibroma	X	х			х	х			х		х		х		х		х		х	х	Х		х	х	X
Preputial/clitoral gland	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Carcinoma, NOS Squamous cell papilloma																									
Squamous cell carcinoma																			х			х		х	
Keratoacanthoma Uterus																									
Papillary carcinoma	- T	. *	-	+	+	+	+	+	+	+	+	+	÷	+	+	÷	+	+	+	+	+	+	+	+	Ŧ
Papillary adenocarcinoma																									
Fibrosarcoma Endometrial stromal polyp					х															v	х				
Endometrial stromal sarcoma								Х												21	~				
Endometrial stromal sarcoma, invasive Ovary																									
Granulosa cell tumor	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Granulosa cell carcinoma																									
NERVOUS SYSTEM						···																			
Brain	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS, invasive Glioma, NOS														х											
Astrocytoma							_										Х								
Spinal cord Osteosarcoma, invasive	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
SPECIAL SENSE ORGANS Zymbal gland	-	-	1		-		_	+	+	+		_	-	L.		_	L	L.			+	+			+
Carcinoma in-situ, NOS	Ŧ	Ŧ		Ŧ	Ŧ	Ŧ	т	Ŧ	Ŧ	т	Ŧ	Ŧ	Ŧ	т	7	Ŧ	Ŧ	T	Ŧ	Ŧ	-	Ŧ	Ŧ	Ŧ	т
Squamous cell papilloma Squamous cell carcinoma																									
MUSCULOSKELETAL SYSTEM Bone			N T	NT.								NT													
Squamous cell carcinoma, invasive	N	Ν	Ν	Ν	Ν	Ν	Ν	IN	IN	IN	Ν	IN	Ν	Ν	IN	+	Ν	N	Ν	N	Ν	Ν	Ν	IN	Ν
Osteosarcoma																									
BODY CAVITIES																									
Mesentery Hemangiosarcoma	N	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
nemangiosarcoma																									
ALL OTHER SYSTEMS				N																					
Multiple organs, NOS Carcinoma, NOS, invasive	14	Ν	Ν	IN	11	IN	IN	7.1	14	14	11	IN	Ν	IN	IN	IN	IN	TN	IN	14	14	ΤN	Ν	IN	IN
Adenocarcinoma, NOS, metastatic																									
C-cell carcinoma, metastatic Granulosa cell carcinoma, metastatic																									
Hemangiosarcoma, invasive																									
Malignant lymphoma, NOS Myelomonocytic leukemia	{									x															
Monocytic leukemia			X		х	X	х		х	4		х				х				х	х	х	X		
Pituitary fossa Carcinoma, NOS, invasive																									

TABLE B2.	INDIVIDUAL ANIMAI	L TUMOR PATHOLOGY OF	FEMALE RATS:	1% TREMOLITE
		(Continued)		

ANIMAL NUMBER	3 5 7	3 5 8	3 5 9	3 6 0	3 6 1	3 6 2	3 6 3	3 6 4	3 6 5	3 6 6	3 6 7	3 6 8	3 6 9	3 7 0	3 7 1	3 7 2	3 7 3	3 7 4	3 7 5	3 7 6	3 7 7	3 7 8	3 7 9	3 8 0	3 8 1
WEEKS ON STUDY		1 2 9	1 2 6	1 4 6	1 4 8	1 2 5	1 4 5	1 0 1	0 9 9	1 4 7	1 1 7	1 3 1	1 2 9	1 0 5	0 8 1	1 4 7	1 1 1	1 1 9	1 3 9	1 4 4	1 2 7	1 0 9	0 9 5	1 0 5	1 2 1
ENDOCRINE SYSTEM			~ <u> </u>																						
Pituitary Carcinoma, NOS	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenoma, NOS Adrenal	+	X +	X +	+	+	+	X +	+	+	х +	+	+	X +	+	+	X +	X +	X +	+	+	X +	+	+	+	X +
Cortical adenoma Pheochromocytoma										x		x			*									X	
Pheochromocytoma, malignant										Λ		^													
Ganglioneuroma Thyroid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Follicular cell adenoma Follicular cell carcinoma	X				x					x		х													
C-cell adenoma					~					Λ															
C-cell carcinoma Parathyroid	+	+	+	X +	+	+	X +	+	+	+	+	_	+	+	+	+	+	+	X +	+		+	+	+	+
Pancreatic islets	+	÷	+	÷	+	÷	÷	+	÷	÷	+	+	÷	÷	÷	÷	÷	÷	+	÷	+	+	+	+	+
Islet cell adenoma Islet cell carcinoma																				х					
REPRODUCTIVE SYSTEM																									
Mammary gland Carcinoma, NOS	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenoma, NOS				х						х													x		
Adenocarcinoma, NOS Papillary adenocarcinoma																							л		
Fibroadenoma Neurofibroma		х	х	х	х		х				х		X	x		х		х	х		х				x
Preputial/clitoral gland	N	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	N	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	N
Carcinoma, NOS Squamous cell papilloma																				х					
Squamous cell carcinoma					Х												Х								
Keratoacanthoma Uterus	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Papillary carcinoma Papillary adenocarcinoma																									
Fibrosarcoma																									
Endometrial stromal polyp Endometrial stromal sarcoma		X												X					х					X	х
Endometrial stromal sarcoma, invasive																						+		+	L
Ovary Granulosa cell tumor	+	+	-	+	+	+	+	+	+	+	+	+	÷	+	Ŧ	Ŧ	+	+	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ
Granulosa cell carcinoma	ļ																								
NERVOUS SYSTEM Brain										-		-	4	4		+		+		+	+	+	+	+	+
Carcinoma, NOS, invasive	1	т	т	Ŧ	т.	Ŧ	+	T.	· •	Ŧ	т	-	1	Ŧ	Ŧ	,	Ŧ	,				,			,
Glioma, NOS Astrocytoma				х																					
Spinal cord	N	Ν	Ν	Ν	Ν	Ν	N	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν
Osteosarcoma, invasive																									
SPECIAL SENSE ORGANS Zymbal gland	+	+	+	+	+	+	+	+	N	+	+	+	+	+	+	N	+	+	+	+	+	+	+	+	+
Carcinoma in-situ, NOS	1	,		,												•				·					
Squamous cell papilloma Squamous cell carcinoma								х																	
MUSCULOSKELETAL SYSTEM																									
Bone	N	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν
Squamous cell carcinoma, invasive Osteosarcoma																									
BODY CAVITIES									• • • • •															_	
Mesentery	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Hemangiosarcoma																									
ALL OTHER SYSTEMS Multiple organs, NOS	N	N	N	Ν	Ν	N	Ν	N	Ν	N	N	N	N	N	N	N	N	N	N	Ν	Ν	N	N	Ν	Ν
Carcinoma, NOS, invasive																									
Adenocarcinoma, NOS, metastatic C-cell carcinoma, metastatic																									
Granulosa cell carcinoma, metastatic Hemangiosarcoma, invasive																									
Malignant lymphoma, NOS																									
Myelomonocytic leukemia	x	х		х	х	х	х			х	х		x		x					х		x			
				-																					
Monocytic leukemia Pituitary fossa Carcinoma, NOS, invasive																									

148 + X + X + X + X + + + + + + + + + + +	1 1 9 + x + + + x ++ + N x + +	1 3 6 + X + + + + + + + + + + +	1 4 8 + + + + + + X N + +	1 2 7 + x + x + x + + + + + + + + + + + + + + + + + +	0 8 4 + + + + + + + + + + + + + + + + + +	1 1 7 + X + + + + + N +	0 992 + + + + + + + + + + + N +	146 + x + x x + + + + x x N +	1 1 1 + + + + + + + + X N +	1 3 6 + x + x + + + + + + + + + + + + + + + +	1 1 3 + + + + + + + + + + +	1 4 5 + + + + + + + + X N +	1 1 0 + + + + + X + N +	1 1 8 + + + + + N + +	11 14 + + + + + + + + + +	1 4 3 + x + + + + x + + + X N + +	1 4 7 + X + + + + + N X + +	1 4 7 + X + + + + + + X N + + + +	1 0 0 0 + + + + + + + + X N +	0 8 1 + X + + + + + + X N +	1 0 6 + + + + + + + + + X N +	0 9 4 + + + + x N X + X N X +	0 9 2 + + + + + + + + N + N +
+ x + x + x + + +	+ + x + + + N x + +	+ + + + + X	+ + + x	+ x + x + + + + +	+ + + + + + × × × × × × × × × × × × × ×	+ + X + +	+ + + + +	+ X X + + + + + X X X	+ + + X	+ x + + + + x	+ + + + + + + + NN + +		+	+	+++++++++++++++++++++++++++++++++++++++	+ + X + + X	+ + * + +	+ + X + + + X		+ + + X		+ X N	+ + + + + + + + + + + + + + + + + + +
+ x + x + x + + +	+ + x + + + N x + +	+ + + + + X	+ + + x	+ x + x + + + + +	+ + + + + N +	+ + + + +	+ + + + +	+ X X + + + + + X X X	+ + + X	+ x + + + + x	+ + + + + + +		+	+	+++++++++++++++++++++++++++++++++++++++	+ + X + + X	+ + * + +	+ + X + + + X		+ + + X		+ X N	+ + + + + + + + + + + + + + + + + + +
+ x + x + x + + +	+ + x + + + N x + +	+ + + + + X	+ + + x	+ x + x + + + + +	+ + + + + +	+ + + + +	+ + + + +	+ X X + + + + + X X X	+ + + X	+ x + + + + x	+ + + + N +		+	+	+++++++++++++++++++++++++++++++++++++++	+ + X + + X	+ + * + +	+ + X + + + X		+ + + X		+ X N	+ + + + + + + + + + + + + + + + + + +
+ X X ++++ +	+++ + N X + +		+ + + x	+ x + + +	+ +++ + N +	+++	+ ++ + NN +	+ x + + + x x		+ + + + X	+ + + + N +		+	+	+++++++++++++++++++++++++++++++++++++++		+ + + N					+ X N	+ Z + + +
x + + + + + + x	+++ + N X + +		+ + + x	+ + x	+ ++ + + +	+++	+ + + + + +	+ + x x			+ + + N +		+	+	+++++++++++++++++++++++++++++++++++++++		+ + + N					+ X N	+ ++ + ++ + N +
+ + + x	+++ + N X + +		+ + + x	+ + x	+ + + + N + +	+++	+ + + N +	+ + x x			+ + + N +		+	+ + N +	+++++++++++++++++++++++++++++++++++++++		+ + + N					+ X N	+++ + N +
+ + + x	+++ + N X + +		+ + + x		++ + + *	+++	+++ + N +	x			+++ + N +		+	+ + N +	+++++++++++++++++++++++++++++++++++++++		+ + + N					+ X N	++ + N +
	x +				+ + N +	+ + N +	+ + N +	x			+ + N +		+	+ + N +	+ + N +							+ X N	+ + N +
	x +				+ N +	+ N +	+ N +	x			+ N +		+ N +	+ N +	+ N +							N	+ N +
	x +				N +	N +	N +	x			N +		N +	N +	N +							N	N +
	x +				N +	N +	N +				N +		N +	N +	N +					N +		N	N +
и + +	x +	N + +	N +	N +	N +	N +	N +	N +		N +	N +	N +	N +	N +	N +	N +		N +	N +	N +	N +	N	N +
+	x +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+		+
+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	x +	+	+	+	÷	X +	+
+	+ + X	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+	+
+	+ X	+																					
+	x	-																					
			÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
-							+		 +	+													
,	,	,	I	'	,	,	T	F		1	F	1	F	T	,		F	,	T	F	1	T	r
N	N	Ν	N	N	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	N	Ν	Ν	N	Ν	Ν	N
+	÷	÷	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+
N	N	N	N	N	N	N	Ν	N	Ν	N	N	Ν	Ν	N X	N	Ν	N	N	Ν	N	N	N	Ν
N	N	N	N	N X	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
				x																			
	x				х		v					x			x		x						x
N	T	I N	I N N	I N N N I N N N	T N N N N X	INNNNNN INNNNN X X	I N N N N N N N X I N N N N N N N X X	X X X X X X X X X X X X X X X X X X X	X N N N N N N N N N N N N X N N N N N N	I N N N N N N N N N N N N N N N N N N N	X X X X X X X X X X X X X X X X X X X	X X X X X	X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	X I N N N N N N N N N N N N N N N N I N N N N	X I N N N N N N N N N N N N N N N N I N N N N	X I N N N N N N N N N N N N N N N N N N N	X I N N N N N N N N N N N N N N N N N N N	X N N N N N N N N N N N N N N N N N N N	X N N N N N N N N N N N N N N N N N N N	X I N N N N N N N N N N N N N N N N N N N	X I N N N N N N N N N N N N N N N N N N N	X I N N N N N N N N N N N N N N N N N N N

TABLE B2.	INDIVIDUAL	ANIMAL '	TUMOR	PATHOLOGY	OF	' FEMALE	RATS:	1%	TREMOLITE
				(Continue	d)				

ANIMAL NUMBER	4 0 7	4 0 8	4 0 9	4 1 0	4 1 1	4 1 2	4 1 3	4 1 4	4 1 5	4 1 6	4 1 7	4 1 8	4 1 9	4 2 0	4 2 1	4 2 2	4 2 3	4 2 4	4 2 5	4 2 6	4 2 7	4 2 8	4 2 9	4 3 0	4 3 1
WEEKS ON STUDY	1 4 8	1 1 0	1 4 3	1 2 8	1 4 6	1 4 1	0 4 9	1 3 2	1 2 1	1 3 4	1 4 8	0 8 3	0 9 7	1 2 4	1 4 8	1 1 0	1 2 0	1 3 0	1 3 1	1 4 6	1 0 5	1 4 3	1 3 8	1 2 8	1 0 3
ENDOCRINE SYSTEM Pituitary Carcinoma, NOS Adenoma, NOS Adrenal Cortical adenoma Pheochromocytoma Pheochromocytoma, malignant	+++	+ X +	++	+ +	+ X +	+	+	+ +	* * +	+ X +	+ *	+ +	+	+ X +	+ X + X	+ + X	+	+ X +	+ X +	+ + X	+ x +	+	+	+ X +	+ X +
Ganglioneuroma Thyroid Follicular cell adenoma Follicular cell carcinoma C-cell adenoma C-ceil carcinoma Parathyroid Pancreatic islets Isiet cell adenoma	+ X + +	+ + +	+++	+ ++	+ X + +	+ + + + X X	+ ++	++++	+ X + +	+ x + +	++++	++++	+ + +	++++	+ X + +	+ + +	+ + +	+ ++	+ + +	++++	+ X + +	++++	+ + +	+ + +	+ + +
Islet cell carcinoma REPRODUCTIVE SYSTEM Mammary gland Carcinoma, NOS	+	+	+	+	+	x +	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenoma, NOS Adenocarcinoma, NOS Papillary adenocarcinoma Fibroadenoma Neurofibroma Preputial/clitoral gland Carcinoma, NOS Squamous cell papilloma Squamous cell carcinoma Keratoacanthoma	X N	N	N	X N	X N	X N	N	X N	X X N	X N	X X N	N	N	X N	X N	X N	N	X X N	N	X N	X N	N	X N X	X N	X N
Vierus Papillary carcinoma Papillary adenocarcinoma Fibrosarcoma Endometrial stromal polyp Endometrial stromal sarcoma Endometrial stromal sarcoma, invasive Ovary Granulosa cell tumor	+	+	+	+	+	+	+	+ X +	+ X +	+	+	+	+	+	+	+	+	+	+	+	+	+ + X	+	+	+
Granulosa cell carcinoma NERVOUS SYSTEM Brain Carcinoma, NOS, invasive Glioma, NOS Astrocytoma Spinal cord	+	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ X N	+	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N	+ N
Osteosarcoma, invasive SPECIAL SENSE ORGANS Zymbal gland Carcinoma in-situ, NOS Squamous cell papilloma Squamous cell carcinoma	+ X	+	+	+	+	+	+	+	+	+ x	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
MUSCULOSKELETAL SYSTEM Bone Squamous cell carcinoma, invasive Osteosarcoma	N	N	N	N	N	N	N	N	N		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
BODY CAVITIES Mesentery Hemangiosarcoma	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
ALL OTHER SYSTEMS Multiple organs, NOS Carcinoma, NOS, invasive Adenocarcinoma, NOS, metastatic C-cell carcinoma, metastatic Granulosa cell carcinoma, metastatic Hemangiosarcoma, invasive Maligmant lymphoma, NOS Myelomonocytic leukemia Monocytic leukemia Pituitary fosaa	N	N	N	N X	N	N	N X	N		N X	N	N	N X	N	N	N		N X		N	N		N X		N

ANIMAL NUMBER	4 3 2	4 3 3	4 3 4	4 3 5	4 3 6	4 3 7	4 3 8	4 3 9	4 4 0	4 4 1	4 4 2	4 4 3	4 4 4	4 4 5	4 4 6	4 4 7	4 4 8	4 4 9	4 5 0	4 5 1	4 5 2	4 5 3	4 5 4	4 5 5	4 5 6
WEEKS ON STUDY	1 2 9	1 2 3	1 2 9	1 2 3	1 2 8	0 9 1	1 0 9	1 0 9	1 3 7	1 2 8	1 3 8	1 0 0	0 9 8	1 3 6	1 2 9	1 2 9	1 1 6	1 3 2	1 1 1	1 0 6	1 2 9	1 3 0	1 1 7	1 1 3	1 3 8
ENDOCRINE SYSTEM														-											
Pituitary Carcinoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ ¥	+	+	+
Adenoma, NOS			X +		х						X	х										ñ			х
Adrenal Cortical adenoma	+	+	+	+	+	+	+	*	+	+	+	+	+	*	+	+	+	+	+	+	+	+	+	+	+
Pheochromocytoma								л			х			л				х							
Pheochromocytoma, malignant Ganglioneuroma																									
Thyroid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Follicular cell adenoma Follicular cell carcinoma		Х					v			v															
C-cell adenoma							х			х				х											
C-cell carcinoma																	Х				х				
Parathyroid Pancreatic islets	+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	+	+++	+++++	+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	++	+	++++	+++	+++	+	+++	++++	+	+++++++++++++++++++++++++++++++++++++++	++++	+++	+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	+	+++
Islet cell adenoma					Ċ			,	x						•	·									·
Islet cell carcinoma																х									
REPRODUCTIVE SYSTEM												· · · ·													
Mammary gland Carcinoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenoma, NOS																									
Adenocarcinoma, NOS Papillary adenocarcinoma			х							х		х													х
Fibroadenoma	X	х			х		Х		Х	х		Х		Х	х	х				Х	X	х			
Neurofibroma Preputial/clitoral gland	Ν	N	Ν	Ν	Ν	N	Ν	Ν	N	N	N	Ν	Ν	N	N	Ν	N	Ν	N	Ν	N	Ν	N	N	Ν
Carcinoma, NOS	•	•	•		•					•	••			•		••	•••	•	•	•	•	•	•	•	
Squamous cell papilloma Squamous cell carcinoma																			х		х				
Keratoacanthoma																			л		A				
Uterus Panillami consistente	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Papillary carcinoma Papillary adenocarcinoma	х																								
Fibrosarcoma																									
Endometrial stromal polyp Endometrial stromal sarcoma												Х													
Endometrial stromal sarcoma, invasive																									
Ovary Granulosa cell tumor	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Granulosa cell carcinoma																									
NERVOUS SYSTEM															-										
Brain Carcinoma, NOS, invasive	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ v	+	+	+
Glioma, NOS																						^			
Astrocytoma Spinal cord	Ν	N	N	М	NT	N	N	N	N	N	N	N	N	N	NT	N	N	N	м	N	N	N	N	N	N
Osteosarcoma, invasive	14	IN	14	N	Ν	Ν	14	Ν	14	IN	IN	14	Ν	Ν	14	14	IN	T.	14	TA	14	TA	14	10	14
SPECIAL SENSE ORGANS																									
Zymbal gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma in-situ, NOS																									
Squamous cell papilloma Squamous cell carcinoma				X		х																			
MUSCULOSKELETAL SYSTEM Bone	Ν	N	N	Ν	N	N	Ν	Ν	N	N	Ν	N	Ν	Ν	N	N	N	N	N	N	N	N	N	N	N
Squamous cell carcinoma, invasive		•	•	••	•	• •		•	•		•		•	•		•	•	• •	•	• •	•		•		•
Osteosarcoma																									
BODY CAVITIES Mesentery		N	N	N	NT	N7	N	N	NT	NT	N7	N	N	N	NT		NT	N.T.	M	NT	NT	NT	N	N	NT
Hemangiosarcoma	14	TA	14	Ν	T.	14	14	IN	IN	IN	IN	14	14	14	14	IN	14	14	14	14	14	1	14	14	14
ALL OTHER SYSTEMS																									
Multiple organs, NOS	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Carcinoma, NOS, invasive																									
Adenocarcinoma NOS metastatic																									
Adenocarcinoma, NOS, metastatic C-cell carcinoma, metastatic																									
C-cell carcinoma, metastatic Granulosa cell carcinoma, metastatic																									
C-cell carcinoma, metastatic Granulosa cell carcinoma, metastatic Hemangiosarcoma, invasive Malignant lymphoma, NOS																									
C-cell carcinoma, metastatic Granulosa cell carcinoma, metastatic Hemangiosarcoma, invasive Malignant lymphoma, NOS Myelomonocytic leukemia		v						v					P	v	v		v	Ŧ	v			v	v	v	
C-cell carcinoma, metastatic Granulosa cell carcinoma, metastatic Hemangiosarcoma, invasive Malignant lymphoma, NOS		x						x					x	x	x		x	x	x			x	x	x	

ANIMAL NUMBER	4 5 7	4 5 8	4 5 9	4 6 0	4 6 1	4 6 2	4 6 3	4 6 4	4 6 5	4 6 6	4 6 7	4 6 8	4 6 9	4 7 0	4 7 1	4 7 2	4 7 3	4 7 4	4 7 5	4 7 6	4 7 7	4 7 8	4 7 9	4 8 0	4 8 1
WEEKS ON STUDY	1 3 7	$1\\4\\2$	1 4 5	1 1 9	0 9 0	$1 \\ 2 \\ 2$	0 9 2	1 4 1	1 0 3	1 4 0	1 4 8	1 4 8	1 2 8	1 4 7	1 3 3	1 2 0	1 2 6	1 3 8	1 3 0	1 2 6	1 2 9	1 3 8	1 1 6	1 3 2	1 0 9
ENDOCRINE SYSTEM	-																								
Pituitary Carcinoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*	+	+
Adenoma, NOS Adrenal				X	X	X		X +		X				X					x	X	X	+		Ŧ	X +
Cortical adenoma		Ŧ		Ŧ	7	Ŧ	+		Ŧ	+	Ŧ	x	Ŧ	* X	Ŧ	Ŧ	Ŧ	Ŧ	-	т	Ŧ	-	T	,	۲
Pheochromocytoma Pheochromocytoma, malignant		х	х					х		х	х							х	х			х			
Ganglionsuroma Thyroid	+	+	+	+	+	+	-	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Follicular cell adenoma		,			,		,	,					'	,				•		,					
Follicular cell carcinoma C-cell adenoma	1							х		X															
C-cell carcinoma Parathyroid	+	1	X +	X	ىد	+	X +	4	+	<u>ـ</u>	÷	+	X	+	+	+	+	+	+	+	+	X +	+	+	X +
Pancreatic islets	+	+	+	+	+	÷	+	÷	÷	+	÷	÷	÷	+	÷	+	+	÷	+	+	÷	÷	÷	+	÷
Islet cell adenoma Islet cell carcinoma	ļ		Х																						
REPRODUCTIVE SYSTEM	-									_						··									
Mammary gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS Adenoma, NOS	ì																								
Adenocarcinoma, NOS Papillary adenocarcinoma								х													х				
Fibroadenoma Neurofibroma	X	х				х		Х			х	Х			х	х	х	х	х	х	X			х	
Preputial/clitoral gland	N	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N
Carcinoma, NOS Squamous cell papilloma																									
Squamous cell carcinoma																	Х								
Keratoacanthoma Uterus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+
Papillary carcinoma Papillary adenocarcinoma	ļ										х														
Fibrosarcoma												v										x	x		
Endometrial stromal polyp Endometrial stromal sarcoma				х								А	X									л	л		
Endometrial stromal sarcoma, invasive Ova <i>r</i> y	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Granulosa cell tumor									,	•					,										
Granulosa cell carcinoma																									
NERVOUS SYSTEM Brain	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS, invasive																							х		
Glioma, NOS Astrocytoma																									
Spinal cord Osteosarcoma, invasive	+	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	N
· · · · · · · · · · · · · · · · · · ·	-																					· —			
SPECIAL SENSE ORGANS Zymbal gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma in-situ, NOS Squamous cell papilloma																									
Squamous cell carcinoma																									
MUSCULOSKELETAL SYSTEM	-											_			_										
Bone Squamous cell carcinoma, invasive	N	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	N
Osteosarcoma																									
BODY CAVITIES	-																					27		NT	NT.
Mesentery Hemangiosarcoma	N	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	N	N	Ν	N	N	N	N	N	N	N	N	N	IN	IN	IN
ALL OTHER SYSTEMS	-																								
Multiple organs, NOS Carcinoma, NOS, invasive	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N
Adenocarcinoma, NOS, metastatic																									
C-cell carcinoma, metastatic Granulosa cell carcinoma, metastatic																									
Hemangiosarcoma, invasive																									
Malignant lymphoma, NOS Myelomonocytic leukemia																									
Monocytic leukemia Pituitary fossa				х			х		х	х			х		X				x				X	x	х
Carcinoma, NOS, invasive																									

TABLE B2.	INDIVIDUAL ANIMAL TUMOR PATHOLOGY OF FEMALE RATS: 1% TREMOLITE														
	(Continued)														

ANIMAL NUMBER	4 8 2	4 8 3	4 8 4	4 8 5	4 8 6	4 8 7	4 8 8	4 8 9	4 9 0	4 9 1	4 9 2	4 9 3	4 9 4	4 9 5	4 9 6	4 9 7	4 9 8	4 9 9	5 0 0	5 0 1	5 0 2	5 0 3	5 0 4	5 0 5	5 0 6
WEEKS ON STUDY	$\begin{array}{c}1\\3\\2\end{array}$	1 4 8	1 2 0	1 3 1	1 0 4	0 9 5	0 8 6	$\frac{1}{2}$	1 0 1	1 0 7	0 9 1	1 1 3	1 3 2	1 1 6	1 1 9	1 3 0	1 4 7	1 2 8	1 3 7	1 4 8	1 3 9	1 4 8	$\frac{1}{2}$	1 0 7	1 4 0
ENDOCRINE SYSTEM Pituitary														 +	+	+	+			1	+	+	4		
Carcinoma, NOS	+	+	+	+		+	Ŧ	+	x	+	x	+	Ŧ	-	-		Ŧ	-		Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	.⊤ ₩
Adenoma, NOS Adrenal	+	х +	X +	+	х +	+	+	X +	+	+	+	+	+	X +	X +	X +	+	X +	X +	+	+	+	+	+	X +
Cortical adenoma Pheochromocytoma			х	х																			х		
Pheochromocytoma, malignant			л	A													х						••		
Ganglioneuroma Thyroid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Follicular cell adenoma Follicular cell carcinoma			х																						
C-cell adenoma C-cell carcinoma	x	X		x				х	x							v						Y	х		х
Parathyroid	+	+	+	÷	+	+	+	+	÷	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+
Pancreatic islets Islet cell adenoma	x ⁺	+	+	x +	+	+	+	x+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Islet cell carcinoma																х									
REPRODUCTIVE SYSTEM																									
Mammary gland Carcinoma, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Adenoma, NOS	X																		х						
Adenocarcinoma, NOS Papillary adenocarcinoma																			л						
Fibroadenoma Neurofibroma		X					х	X X			х		х			x		х			х	х			
Preputial/clitoral gland	N	Ν	Ν	Ν	Ν	Ν	Ν		Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Carcinoma, NOS Squamous cell papilloma																									
Squamous cell carcinoma Keratoacanthoma																				х		х			
Uterus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Papillary carcinoma Papillary adenocarcinoma																									
Fibrosarcoma Endometrial stromal polyp												x											х		х
Endometrial stromal sarcoma Endometrial stromal sarcoma, invasive																									
Ovary	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	* x	+	+	+	+	+	+	+	+
Granulosa cell tumor Granulosa cell carcinoma	1																х								
NERVOUS SYSTEM	1																								
Brain	+	+	+	+	+	+	+	+	* X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Carcinoma, NOS, invasive Glioma, NOS									х		Х														
Astrocytoma Spinal cord	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Osteosarcoma, invasive	1.	.,	••	.,			.,				••	•	•••				• •	•			•	•		-	-
SPECIAL SENSE ORGANS	¦																								
Zymbal gland Carcinoma in-situ, NOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	÷	+
Squamous cell papilloma Squamous cell carcinoma																					x				
MUSCULOSKELETAL SYSTEM Bone	N	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	N	Ν	Ν	Ν	N	N	Ν	Ν	N	Ν	Ν	N	Ν	Ν	Ν
Squamous cell carcinoma, invasive Osteosarcoma										N X															
																									_
BODY CAVITIES Mesentery	N	Ν	Ν	Ν	Ν	N	N	Ν	Ν	Ν	N	N	N	N	N	Ν	Ν	Ν	Ν	Ν	Ν	N	N	N	Ν
Hemangiosarcoma																									
ALL OTHER SYSTEMS									N	N	N	NT	N	N	N	N	N	N	N	N	N	N	N	N	N
Multiple organs, NOS Carcinoma, NOS, invasive	IN	Ν	IN	Ν	Ν	N	Ν	Ν	IN	14	Ν	IN	IA	N	Ν	14	14	14	14	14	14	14	14		
Adenocarcinoma, NOS, metastatic C-cell carcinoma, metastatic																х									
Granulosa cell carcinoma, metastatic																									
Hemangiosarcoma, invasive Malignant lymphoma, NOS																									
Myelomonocytic leukémia Monocytic leukemia	x					x													х	x	x			х	x
Pituitary fossa Carcinoma, NOS, invasive																									
	1																								

142
								(U	on	in	uea	.)														
ANIMAL NUMBER	5 0 7	5 0 8	5 0 9	5 1 0	5 1 1	5 1 2	5 1 3	5 1 4	5 1 5	5 1 6	5 1 7	5 1 8	5 1 9	5 2 0	5 2 1	5 2 2	5 2 3	5 2 4	5 2 5	5 2 6	5 2 7	5 2 8	5 2 9	5 3 0	5 3 1	TOTAL:
WEEKS ON STUDY	1 2 9	0 8 4	1 3 0	1 1 6	1 3 2	1 3 2	0 3 3	0 3 3	0 3 3	1 1 1	1 2 3	1 4 8	1 2 2	1 2 0	1 1 6	1 1 1	0 8 1	1 1 1	$\frac{1}{2}$	1 4 8	1 3 5	1 1 6	0 9 3	0 7 6	$\frac{1}{3}$ 2	TISSUES TUMORS
ENDOCRINE SYSTEM	-								······				_	~~												
Pituitary	+	+	<u>+</u>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	248
Carcinoma, NOS Adenoma, NOS	x		x	X	х					x	X		х		X					X	X				х	93
Adrenal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250
Cortical adenoma Pheochromocytoma Pheochromocytoma, malignant	x					X				x				x			v		x	x						13 32 4 1
Ganglioneuroma Thyroid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	X +	+	+	+	+	+	+	+	+	250
Follicular cell adenoma			v																							7 15
Follicular cell carcinoma C-cell adenoma C-cell carcinoma	X		X																		1	1				13 8 41 238
Parathyroid Pancreatic islets	+++++	+++++++++++++++++++++++++++++++++++++++	+	++	+	+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	+	+++	++	+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	++	++	+	++	+	++	+	+	+	+	+	+	250
Islet cell adenoma Islet cell carcinoma																										8
REPRODUCTIVE SYSTEM Mammary gland	+	+	 +	+	4		+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	*250
Carcinoma, NOS	1	Ŧ	т	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	Ŧ	r-	Ŧ	,	ŕ	,	,	,		1						1 4
Adenoma, NOS Adenocarcínoma, NOS	1																				х					21
Papillary adenocarcinoma										X																1
Fibroadenoma Neurofibroma	X		X	х	X								X	х	х			х	X	х				X		127
Preputial/clitoral gland	N	N	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	*250
Carcinoma, NOS Squamous cell papilloma)																									
Squamous cell carcinoma																										15
Keratoacanthoma Uterus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	1 249
Papillary carcinoma	1																									1
Papillary adenocarcinoma Fibrosarcoma	ł																									4
Endometrial stromal polyp	ļ	X								Х																28
Endometrial stromal sarcoma Endometrial stromal sarcoma, invasive	1	X X																								3
Ovary	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	249
Granulosa cell tumor Granulosa cell carcinoma																										3
NERVOUS SYSTEM																										
Brain	+	+	+	+	+	+	+	÷	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	250
Carcinoma, NOS, invasive Glioma, NOS													х													8
Astrocytoma																										2
Spínal cord Osteosarcoma, invasive	N	Ν	Ν	N	Ν	N	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	*250
SPECIAL SENSE ORGANS	1 +	+	+	+	+	+	+	+	Ν	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*250
Carcinoma in-situ, NOS									•																	1
Squamous cell papilloma Squamous cell carcinoma	1											х														ê
														_			·									
MUSCULOSKELETAL SYSTEM Bone	N	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	N	N	N	Ν	N	*250
Squamous cell carcinoma, invasive					•	•																				2
Osteosarcoma																										1
BODY CAVITIES	N	N		NT	NT	N	N	N		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	*250
Mesentery Hemangiosarcoma		Ţ.	IN	τı	IN	T.A	T.A	14	14	IN	Ţ.	14	14	14	14	14	1.4	14	14	1.	14	14	14			1
ALL OTHER SYSTEMS Multiple organs, NOS	N	Ν	N	N	Ν	Ν	Ν	N	N	Ν	N	Ν	N	N	N	N	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	*250
Carcinoma, NOS, invasive																										1
Adenocarcinoma, NOS, metastatic C-cell carcinoma, metastatic																					х					
Granulosa cell carcinoma, metastatic																										1
Hemangiosarcoma, invasive Malignant lymphoma, NOS																										1
Myelomonocytic leukemia											••					X				••					v	6
Monocytic leukemia Pituitary fossa	x				х					X	х				X		х	х		х		X			х	95
Carcinoma, NOS, invasive																										1
·																										· · · · · · · · · · · · · · · · · · ·

TABLE B2. INDIVIDUAL ANIMAL TUMOR PATHOLOGY OF FEMALE RATS: 1% TREMOLITE
(Continued)

* Animals necropsied

	Untreated Control	1% Tremolite
Skin: Squamous Cell Papilloma		
Overall Rates (a)	1/118(1%)	7/250 (3%)
Adjusted Rates (b)	2.9%	15.7%
Terminal Rates (c)	0/13 (0%)	2/22 (9%)
Week of First Observation	138	111
Life Table Test (d)		P = 0.151
Incidental Tumor Test (d)		P = 0.220
Fisher Exact Test (d)		P = 0.214
kin: Squamous Cell Papilloma or Carcino		
Overall Rates (a)	1/118 (1%)	8/250 (3%)
Adjusted Rates (b)	2.9%	16.8%
Terminal Rates (c)	0/13 (0%)	2/22 (9%)
Week of First Observation	138	111
Life Table Test (d)		P = 0.111
Incidental Tumor Test (d)		P = 0.168 P = 0.158
Fisher Exact Test (d)		P = 0.158
ntegumentary System: Fibroma	6/118 (592)	10/250 (4%)
Overall Rates (a)	6/118 (5%) 20.2%	24.6%
Adjusted Rates (b) Terminal Rates (c)	20.2% 2/13 (15%)	3/22(14%)
Week of First Observation	93	109
Life Table Tests (d)	55	P = 0.524N
Incidental Tumor Tests (d)		P = 0.385N
Fisher Exact Test (d)		P = 0.409N
ntegumentary System: Neurofibroma		
Overall Rates (a)	3/118(3%)	2/250 (1%)
Adjusted Rates (b)	12.8%	2.4%
Terminal Rates (c)	1/13 (8%)	0/22 (0%)
Week of First Observation	137	130
Life Table Tests (d)		P = 0.270 N
Incidental Tumor Tests (d)		P = 0.183N
Fisher Exact Test (d)		P = 0.190N
ntegumentary System: Fibroma or Neurol		
Overall Rates (a)	9/118 (8%)	12/250 (5%)
Adjusted Rates (b)	31.4%	26.4%
Terminal Rates (c)	3/13 (23%)	3/22 (14%)
Week of First Observation	93	109 D=0.212N
Life Table Tests (d)		P = 0.312N
Incidental Tumor Tests (d) Fisher Exact Test (d)		P = 0.168N $P = 0.196N$
ntegumentary System: Fibrosarcoma		
Overall Rates (a)	2/118 (2%)	5/250 (2%)
Adjusted Rates (b)	2.3%	3.8%
Terminal Rates (c)	0/13 (0%)	0/22(0%)
Week of First Observation	87	95
Life Table Tests (d)	<u>.</u> .	P = 0.553
Incidental Tumor Tests (d)		P = 0.573
Fisher Exact Test (d)		P = 0.600
ntegumentary System: Fibroma or Fibros		
Overall Rates (a)	8/118 (7%)	15/250 (6%)
Adjusted Rates (b)	22.0%	27.5%
Terminal Rates (c)	2/13 (15%)	3/22 (14%)
Week of First Observation	87	95 D-0 570N
Life Table Tests (d)		P = 0.579N
Incidental Tumor Tests (d)		P = 0.454N
Fisher Exact Test (d)		P = 0.467 N

TABLE B3. ANALYSIS OF PRIMARY TUMORS IN FEMALE RATS IN THE LIFETIME FEED STUDYOF TREMOLITE

	Untreated Control	1% Tremolite
Integumentary System: Neurofibroma of	· Neurofibrosarcoma	<u></u>
Overall Rates (a)	4/118 (3%)	5/250 (2%)
Adjusted Rates (b)	13.8%	6.7%
Terminal Rates (c)	1/13 (8%)	0/22(0%)
Week of First Observation	116	83
Life Table Tests (d)		P = 0.424N
Incidental Tumor Tests (d)		P = 0.330N
Fisher Exact Test (d)		P = 0.317N
ntegumentary System: Fibrosarcoma or		
Overall Rates (a)	3/118 (3%)	8/250 (3%)
Adjusted Rates (b)	3.5%	8.1%
Terminal Rates (c)	0/13 (0%)	0/22(0%)
Week of First Observation	87	83 D-0.445
Life Table Tests (d)		P = 0.445 P = 0.475
Incidental Tumor Tests (d) Fisher Exact Test (d)		P = 0.475 P = 0.508
ntegumentary System: Fibroma, Neuro Overall Rates (a)	fibroma, Fibrosarcoma, or Neurofib 12/118(10%)	rosarcoma 20/250 (8%)
Adjusted Rates (b)	33.8%	32.3%
Terminal Rates (c)	3/13 (23%)	3/22 (14%)
Week of First Observation	87	83
Life Table Tests (d)		P = 0.450N
Incidental Tumor Tests (d)		P = 0.295 N
Fisher Exact Test (d)		P = 0.307 N
ntegumentary System or Salivary Glan	d Sarcoma Fibrosarcoma or Neur	ofibrosarcoma
Overall Rates (a)	4/118 (3%)	9/250 (4%)
Adjusted Rates (b)	6.0%	12.2%
Terminal Rates (c)	0/13(0%)	1/22 (5%)
Week of First Observation	87	83
Life Table Tests (d)		P = 0.511
Incidental Tumor Tests (d)		P = 0.566
Fisher Exact Test (d)		P = 0.592
	d: Fibroma, Neurofibroma, Sarcoma	a, Fibrosarcoma, or
Integumentary System or Salivary Glan		
	13/118(11%)	21/250 (8%)
Neurofibrosarcoma	13/118(11%) 35.5%	35.9%
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c)	13/118 (11%) 35.5% 3/13 (23%)	35.9% 4/22 (18%)
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation	13/118(11%) 35.5%	35.9% 4/22 (18%) 83
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d)	13/118 (11%) 35.5% 3/13 (23%)	35.9%4/22 (18%)83P=0.413N
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d)	13/118 (11%) 35.5% 3/13 (23%)	35.9% 4/22 (18%) 83 P = 0.413 N P = 0.251 N
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d)	13/118 (11%) 35.5% 3/13 (23%)	35.9%4/22 (18%)83P=0.413N
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Carcinoma	13/118 (11%) 35.5% 3/13 (23%) 87	35.9% 4/22 (18%) 83 P=0.413N P=0.251N P=0.265N
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Carcinoma Overall Rates (e)	13/118 (11%) 35.5% 3/13 (23%) 87 3/118 (3%)	35.9% $4/22 (18%)$ 83 $P = 0.413N$ $P = 0.251N$ $P = 0.265N$ $2/250 (1%)$
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Cung: Alveolar/Bronchiolar Carcinoma Overall Rates (e) Adjusted Rates (b)	13/118 (11%) 35.5% 3/13 (23%) 87 3/118 (3%) 6.0%	35.9% $4/22 (18%)$ 83 $P = 0.413N$ $P = 0.251N$ $P = 0.265N$ $2/250 (1%)$ $1.6%$
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Carcinoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c)	13/118 (11%) 35.5% 3/13 (23%) 87 3/118 (3%) 6.0% 0/13 (0%)	35.9% $4/22 (18%)$ 83 $P = 0.413 N$ $P = 0.251 N$ $P = 0.265 N$ $2/250 (1%)$ $1.6%$ $0/22 (0%)$
Veurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Carcinoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation	13/118 (11%) 35.5% 3/13 (23%) 87 3/118 (3%) 6.0%	35.9% $4/22 (18%)$ 83 $P = 0.413 N$ $P = 0.251 N$ $P = 0.265 N$ $2/250 (1%)$ $1.6%$ $0/22 (0%)$ 109
Veurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Carcinoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d)	13/118 (11%) 35.5% 3/13 (23%) 87 3/118 (3%) 6.0% 0/13 (0%)	35.9% $4/22 (18%)$ 83 $P = 0.413N$ $P = 0.251N$ $P = 0.265N$ $2/250 (1%)$ $1.6%$ $0/22 (0%)$ 109 $P = 0.225N$
Veurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Carcinoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d)	13/118 (11%) 35.5% 3/13 (23%) 87 3/118 (3%) 6.0% 0/13 (0%)	35.9% $4/22 (18%)$ 83 $P = 0.413N$ $P = 0.251N$ $P = 0.265N$ $2/250 (1%)$ $1.6%$ $0/22 (0%)$ 109 $P = 0.225N$ $P = 0.186N$
Veurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Carcinoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d)	13/118 (11%) 35.5% 3/13 (23%) 87 3/118 (3%) 6.0% 0/13 (0%)	35.9% $4/22 (18%)$ 83 $P = 0.413N$ $P = 0.251N$ $P = 0.265N$ $2/250 (1%)$ $1.6%$ $0/22 (0%)$ 109 $P = 0.225N$
Veurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Carcinoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Adenoma o	13/118 (11%) 35.5% 3/13 (23%) 87 3/118 (3%) 6.0% 0/13 (0%) 104 r Carcinoma	35.9% 4/22 (18%) 83 P = 0.413N P = 0.251N P = 0.265N 2/250 (1%) 1.6% 0/22 (0%) 109 P = 0.225N P = 0.186N P = 0.190N
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Cung: Alveolar/Bronchiolar Carcinoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Adenoma o Overall Rates (e)	13/118 (11%) 35.5% 3/13 (23%) 87 3/118 (3%) 6.0% 0/13 (0%) 104 r Carcinoma 3/118 (3%)	35.9% $4/22 (18%)$ 83 $P = 0.413N$ $P = 0.251N$ $P = 0.265N$ $2/250 (1%)$ $1.6%$ $0/22 (0%)$ 109 $P = 0.225N$ $P = 0.186N$ $P = 0.190N$ $3/250 (1%)$
Veurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Carcinoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Adenoma o Overall Rates (e) Adjusted Rates (b)	13/118 (11%) 35.5% 3/13 (23%) 87 3/118 (3%) 6.0% 0/13 (0%) 104 r Carcinoma 3/118 (3%) 6.0%	35.9% $4/22 (18%)$ 83 $P = 0.413 N$ $P = 0.251 N$ $P = 0.265 N$ $2/250 (1%)$ $1.6%$ $0/22 (0%)$ 109 $P = 0.225 N$ $P = 0.186 N$ $P = 0.190 N$ $3/250 (1%)$ $4.2%$
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Carcinoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Adenoma o Overall Rates (e) Adjusted Rates (b) Terminal Rates (c)	$13/118 (11\%) \\ 35.5\% \\ 3/13 (23\%) \\ 87 \\ 3/118 (3\%) \\ 6.0\% \\ 0/13 (0\%) \\ 104 \\ r \ Carcinoma \\ 3/118 (3\%) \\ 6.0\% \\ 0/13 (0\%) \\ 0/10 (0\%)$	35.9% $4/22 (18%)$ 83 $P = 0.413 N$ $P = 0.251 N$ $P = 0.265 N$ $2/250 (1%)$ $1.6%$ $0/22 (0%)$ 109 $P = 0.225 N$ $P = 0.186 N$ $P = 0.190 N$ $3/250 (1%)$ $4.2%$ $0/22 (0%)$
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Carcinoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Adenoma o Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation	13/118 (11%) 35.5% 3/13 (23%) 87 3/118 (3%) 6.0% 0/13 (0%) 104 r Carcinoma 3/118 (3%) 6.0%	35.9% $4/22 (18%)$ 83 $P = 0.413N$ $P = 0.251N$ $P = 0.265N$ $2/250 (1%)$ $1.6%$ $0/22 (0%)$ 109 $P = 0.225N$ $P = 0.186N$ $P = 0.190N$ $3/250 (1%)$ $4.2%$ $0/22 (0%)$ 109
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Carcinoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Adenoma o Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d)	$13/118 (11\%) \\ 35.5\% \\ 3/13 (23\%) \\ 87 \\ 3/118 (3\%) \\ 6.0\% \\ 0/13 (0\%) \\ 104 \\ r \ Carcinoma \\ 3/118 (3\%) \\ 6.0\% \\ 0/13 (0\%) \\ 0/10 (0\%)$	35.9% $4/22 (18%)$ 83 $P = 0.413 N$ $P = 0.251 N$ $P = 0.265 N$ $2/250 (1%)$ $1.6%$ $0/22 (0%)$ 109 $P = 0.225 N$ $P = 0.186 N$ $P = 0.186 N$ $P = 0.190 N$ $3/250 (1%)$ $4.2%$ $0/22 (0%)$ 109 $P = 0.350 N$
Neurofibrosarcoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Tests (d) Incidental Tumor Tests (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Carcinoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Lung: Alveolar/Bronchiolar Adenoma o Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation	$13/118 (11\%) \\ 35.5\% \\ 3/13 (23\%) \\ 87 \\ 3/118 (3\%) \\ 6.0\% \\ 0/13 (0\%) \\ 104 \\ r \ Carcinoma \\ 3/118 (3\%) \\ 6.0\% \\ 0/13 (0\%) \\ 0/10 (0\%)$	35.9% $4/22 (18%)$ 83 $P = 0.413N$ $P = 0.251N$ $P = 0.265N$ $2/250 (1%)$ $1.6%$ $0/22 (0%)$ 109 $P = 0.225N$ $P = 0.186N$ $P = 0.190N$ $3/250 (1%)$ $4.2%$ $0/22 (0%)$ 109

TABLE B3. ANALYSIS OF PRIMARY TUMORS IN FEMALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

	Untreated Control	1% Tremolite
Iematopoietic System: Leukemia		
Overall Rates (a)	56/118 (47%)	101/250 (40%)
Adjusted Rates (b)	86.1%	76.5%
Terminal Rates (c)	7/13 (54%)	7/22 (32%)
Week of First Observation	79	81
Life Table Test (d)		P = 0.408N
Incidental Tumor Test (d)		P = 0.113N
Fisher Exact Test (d)		P = 0.122N
liver: Neoplastic Nodule		
Overall Rates (e)	2/118 (2%)	10/250 (4%)
Adjusted Rates (b)	5.0%	20.6%
Terminal Rates (c)	0/13 (0%)	2/22 (9%)
Week of First Observation	116	105
Life Table Test (d)		P = 0.149
Incidental Tumor Test (d)		P = 0.199
Fisher Exact Test (d)		P = 0.202
Kidney: Tubular Cell Adenoma or Adeno		A10E0 (001)
Overall Rates (e)	0/118 (0%)	4/250 (2%)
Adjusted Rates (b)	0.0%	4.2%
Terminal Rates (c)	0/13(0%)	0/22 (0%) 128
Week of First Observation		P = 0.189
Life Table Test (d)		P = 0.135 P = 0.205
Incidental Tumor Test (d)		P = 0.200 P = 0.211
Fisher Exact Test (d)		r - 0.211
Pituitary Gland: Adenoma		
Overall Rates (e)	51/117 (44%)	93/248 (38%)
Adjusted Rates (b)	82.2%	76.6%
Terminal Rates (c)	6/13 (46%)	7/22 (32%)
Week of First Observation	85	81 P=0.451N
Life Table Test (d)		P = 0.166N
Incidental Tumor Test (d)		P = 0.160 N
Fisher Exact Test (d)		F = 0.1001
Pituitary Gland: Carcinoma		
Overall Rates (e)	5/117 (4%)	11/248(4%)
Adjusted Rates (b)	16.1%	7.6%
Terminal Rates (c)	1/13 (8%)	0/22 (0%)
Week of First Observation	116	91 D=0.516
Life Table Test (d)		P = 0.516
Incidental Tumor Test (d)		P = 0.558 P = 0.592
Fisher Exact Test (d)		r = 0.002
Pituitary Gland: Adenoma or Carcinoma		104/248 (42%)
Overall Rates (e)	56/117 (48%)	104/248 (42%) 78.4%
Adjusted Rates (b)	86.2% 7/13 (54%)	78.4% 7/22 (32%)
Terminal Rates (c)		81
Week of First Observation	85	P = 0.483N
Life Table Test (d)		P = 0.183N
Incidental Tumor Test (d) Fisher Exact Test (d)		P = 0.170N
FISHER EXACT LEST(C)		
Adrenal Cortex: Cortical Adenoma	0/118 (8/2)	13/250 (5%)
Overall Rates (e)	9/118 (8%)	13/250 (5%) 24.3%
Adjusted Rates (b)	31.6%	24.3% 2/22 (9%)
	2/13 (15%)	
Terminal Rates (c)		<u>81</u>
Week of First Observation	96	81 P=0.390N
		81 P=0.390N P=0.234N

TABLE B3. ANALYSIS OF PRIMARY TUMORS IN FEMALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

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	Untreated Control	1% Tremolite
Adrenal Medulla: Pheochromocytoma		
Overall Rates (e)	22/118 (19%)	32/250 (13%)
Adjusted Rates (b)	58.2%	48.0%
Terminal Rates (c)	4/13 (31%)	5/22 (23%)
Week of First Observation	85	109
Life Table Test (d)		P = 0.249N
Incidental Tumor Test (d)		P = 0.088N
Fisher Exact Test (d)		P = 0.095 N
drenal Medulia: Pheochromocytoma or M	lalignant Pheochromocytoma	
Overall Rates (e)	23/118 (19%)	36/250 (14%)
Adjusted Rates (b)	62.9%	54.8%
Terminal Rates (c)	5/13 (38%)	6/22 (27%)
Week of First Observation	85	109
Life Table Test (d)		P = 0.343N
Incidental Tumor Test (d)		P = 0.128N
Fisher Exact Test (d)		P = 0.138N
hyroid Gland: Follicular Cell Adenoma		
Overall Rates (e)	3/118 (3%)	7/250(3%)
Adjusted Rates (b)	6.2%	11.2%
Terminal Rates (c)	0/13 (0%)	1/22 (5%)
Week of First Observation	117	111 B=0.510
Life Table Test (d)		P = 0.510 P = 0.566
Incidental Tumor Test (d) Fisher Exact Test (d)		P = 0.588 P = 0.594
Changed Claude Relition for Call Constitution		
Chyroid Gland: Follicular Cell Carcinoma	5/118 (4%)	15/250 (6%)
Overall Rates (e)		22.6%
Adjusted Rates (b)	14.3%	2/22 (9%)
Terminal Rates (c)	1/13 (8%)	109
Week of First Observation	96	P = 0.260
Life Table Test (d)		P = 0.230 P = 0.334
Incidental Tumor Test (d) Fisher Exact Test (d)		P = 0.334 P = 0.335
Thyroid Gland: Follicular Cell Adenoma of	r Carcinoma	
Overall Rates (e)	7/118 (6%)	22/250 (9%)
Adjusted Rates (b)	18.5%	31.6%
Terminal Rates (c)	1/13 (8%)	3/22(14%)
Week of First Observation	96	109
Life Table Test (d)	50	P = 0.163
Incidental Tumor Test (d)		P = 0.231
Fisher Exact Test (d)		P = 0.231
Thyroid Gland: C-Cell Adenoma		
Overall Rates (e)	7/118 (6%)	8/250 (3%)
Adjusted Rates (b)	10.3%	9.8%
Terminal Rates (c)	0/13 (0%)	0/22 (0%)
Week of First Observation	102	88
Life Table Test (d)		P = 0.211N
Incidental Tumor Test (d)		P = 0.165 N
Fisher Exact Test (d)		P = 0.169N
Thyroid Gland: C-Cell Carcinoma		
Overall Rates (e)	18/118 (15%)	41/250 (16%)
Adjusted Rates (b)	51.5%	62.7%
Terminal Rates (c)	3/13 (23%)	9/22 (41%)
Week of First Observation	113	92
Life Table Test (d)		P = 0.259
Incidental Tumor Test (d)		P = 0.440
Fisher Exact Test (d)		P = 0.454

TABLE B3. ANALYSIS OF PRIMARY TUMORS IN FEMALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

Tremolite, NTP TR 277

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	Untreated Control	1% Tremolite
Thyroid Gland: C-Cell Adenoma or Ca	rcinoma	
Overall Rates (e)	25/118 (21%)	49/250 (20%)
Adjusted Rates (b)	56.6%	66.4%
Terminal Rates (c)	3/13 (23%)	9/22 (4 1%)
Week of First Observation	102	88
Life Table Test (d)		P = 0.470
Incidental Tumor Test (d)		P = 0.417 N
Fisher Exact Test (d)		P = 0.411N
ancreatic Islets: Islet Cell Adenoma		0/050 (00)
Overall Rates (e)	5/118 (4%)	8/250 (3%)
Adjusted Rates (b)	28.5%	10.9%
Terminal Rates (c)	3/13 (23%)	0/22 (0%)
Week of First Observation	117	94
Life Table Test (d)		P = 0.535N
Incidental Tumor Test (d)		P = 0.407 N
Fisher Exact Test (d)		P = 0.408N
Pancreatic Islets: Islet Cell Carcinoma		C/0E0 (001)
Overall Rates (e)	3/118 (3%)	6/250(2%)
Adjusted Rates (b)	15.7%	11.4%
Terminal Rates (c)	1/13 (8%)	1/22 (5%)
Week of First Observation	143	110 P = 0.568
Life Table Test (d)		P = 0.568 P = 0.590N
Incidental Tumor Test (d)		P = 0.590 N P = 0.593 N
Fisher Exact Test (d)		1 - 0.00011
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma		
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e)	8/118 (7%)	13/250 (5%)
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b)	8/118 (7%) 41.3%	13/250 (5%) 19.3%
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c)	8/118 (7%) 41.3% 4/13 (31%)	13/250 (5%) 19.3% 1/22 (5%)
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation	8/118 (7%) 41.3%	13/250 (5%) 19.3% 1/22 (5%) 94
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d)	8/118 (7%) 41.3% 4/13 (31%)	13/250 (5%) 19.3% 1/22 (5%) 94 P=0.504N
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d)	8/118 (7%) 41.3% 4/13 (31%)	13/250 (5%) 19.3% 1/22 (5%) 94 P=0.504N P=0.331N
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d)	8/118 (7%) 41.3% 4/13 (31%)	13/250 (5%) 19.3% 1/22 (5%) 94 P=0.504N
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Mammary Gland: Fibroadenoma	8/118 (7%) 41.3% 4/13 (31%) 117	13/250 (5%) 19.3% 1/22 (5%) 94 P=0.504N P=0.331N P=0.348N
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Mammary Gland: Fibroadenoma Overall Rates (a)	8/118 (7%) 41.3% 4/13 (31%) 117 62/118 (53%)	13/250 (5%) 19.3% 1/22 (5%) 94 P = 0.504N P = 0.331N P = 0.348N 127/250 (51%)
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Mammary Gland: Fibroadenoma Overall Rates (a) Adjusted Rates (b)	8/118 (7%) 41.3% 4/13 (31%) 117 62/118 (53%) 90.4%	13/250 (5%) 19.3% 1/22 (5%) 94 P = 0.504N P = 0.331N P = 0.348N 127/250 (51%) 92.7%
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Mammary Gland: Fibroadenoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c)	8/118 (7%) 41.3% 4/13 (31%) 117 62/118 (53%) 90.4% 8/13 (62%)	13/250 (5%) $19.3%$ $1/22 (5%)$ 94 $P = 0.504N$ $P = 0.331N$ $P = 0.348N$ $127/250 (51%)$ $92.7%$ $16/22 (73%)$
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Mammary Gland: Fibroadenoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation	8/118 (7%) 41.3% 4/13 (31%) 117 62/118 (53%) 90.4%	13/250 (5%) $19.3%$ $1/22 (5%)$ 94 $P = 0.504N$ $P = 0.331N$ $P = 0.348N$ $127/250 (51%)$ $92.7%$ $16/22 (73%)$ 76
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Mammary Gland: Fibroadenoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d)	8/118 (7%) 41.3% 4/13 (31%) 117 62/118 (53%) 90.4% 8/13 (62%)	13/250 (5%) $19.3%$ $1/22 (5%)$ 94 $P = 0.504N$ $P = 0.331N$ $P = 0.348N$ $127/250 (51%)$ $92.7%$ $16/22 (73%)$ 76 $P = 0.310$
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Mammary Gland: Fibroadenoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d)	8/118 (7%) 41.3% 4/13 (31%) 117 62/118 (53%) 90.4% 8/13 (62%)	13/250 (5%) $19.3%$ $1/22 (5%)$ 94 $P = 0.504N$ $P = 0.331N$ $P = 0.348N$ $127/250 (51%)$ $92.7%$ $16/22 (73%)$ 76 $P = 0.310$ $P = 0.422N$
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Mammary Gland: Fibroadenoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d)	8/118 (7%) 41.3% 4/13 (31%) 117 62/118 (53%) 90.4% 8/13 (62%)	13/250 (5%) $19.3%$ $1/22 (5%)$ 94 $P = 0.504N$ $P = 0.331N$ $P = 0.348N$ $127/250 (51%)$ $92.7%$ $16/22 (73%)$ 76 $P = 0.310$
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Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Mammary Gland: Fibroadenoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Mammary Gland: Adenocarcinoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Clitoral Gland: Squamous Cell Carcin Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation	$8/118 (7\%) \\ 41.3\% \\ 4/13 (31\%) \\ 117 \\ 62/118 (53\%) \\ 90.4\% \\ 8/13 (62\%) \\ 74 \\ 24/118 (20\%) \\ 53.3\% \\ 2/13 (15\%) \\ 79 \\ oma \\ 6/118 (5\%) \\ 19.6\% \\ $	13/250 (5%) $19.3%$ $1/22 (5%)$ 94 $P = 0.504N$ $P = 0.331N$ $P = 0.348N$ $127/250 (51%)$ $92.7%$ $16/22 (73%)$ 76 $P = 0.310$ $P = 0.422N$ $P = 0.421N$ $21/250 (8%)$ $36.7%$ $4/22 (18%)$ 95 $P = 0.008N$ $P < 0.001N$ $P = 0.001N$ $15/250 (6%)$ $27.4%$ $4/22 (18%)$ 109
Fisher Exact Test (d) Pancreatic Islets: Islet Cell Adenoma Overall Rates (e) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Mammary Gland: Fibroadenoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Mammary Gland: Adenocarcinoma Overall Rates (a) Adjusted Rates (b) Terminal Rates (c) Week of First Observation Life Table Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Incidental Tumor Test (d) Fisher Exact Test (d) Clitoral Gland: Squamous Cell Carcin Overall Rates (e) Adjusted Rates (b) Terminal Rates (c)	$8/118 (7\%) \\ 41.3\% \\ 4/13 (31\%) \\ 117 $ $62/118 (53\%) \\ 90.4\% \\ 8/13 (62\%) \\ 74 $ $24/118 (20\%) \\ 53.3\% \\ 2/13 (15\%) \\ 79 $ oma $6/118 (5\%) \\ 19.6\% \\ 2/13 (15\%) $	13/250 (5%) $19.3%$ $1/22 (5%)$ 94 $P = 0.504N$ $P = 0.331N$ $P = 0.348N$ $127/250 (51%)$ $92.7%$ $16/22 (73%)$ 76 $P = 0.310$ $P = 0.422N$ $P = 0.421N$ $21/250 (8%)$ $36.7%$ $4/22 (18%)$ 95 $P = 0.008N$ $P < 0.001N$ $P = 0.001N$ $15/250 (6%)$ $27.4%$ $4/22 (18%)$

TABLE B3. ANALYSIS OF PRIMARY TUMORS IN FEMALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

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	Untreated Control	1% Tremolite
Nitonal Clands Sausana Call Bartilan	a ar Caroinama	
Clitoral Gland: Squamous Cell Papillom: Overall Rates (e)	6/118 (5%)	16/250 (6%)
Adjusted Rates (b)	19.6%	29.3%
Terminal Rates (c)	2/13 (15%)	4/22 (18%)
Week of First Observation	105	109
Life Table Tests (d)		P = 0.311
Incidental Tumor Tests (d)		P = 0.410
Fisher Exact Test (d)		P=0.407
Clitoral Gland: Carcinoma, Squamous C	ell Papilloma, or Squamous Cell Ca	ircinoma
Overall Rates (e)	6/118 (5%)	17/250 (7%)
Adjusted Rates (b)	19.6%	30.2%
Terminal Rates (c)	2/13 (15%)	4/22 (18%)
Week of First Observation	105	109
Life Table Tests (d)		P = 0.258
Incidental Tumor Tests (d)		P = 0.357
Fisher Exact Test (d)		P = 0.351
Uterus: Endometrial Stromal Polyp	1 = /1 1 0 (1 0 7)	28/249 (11%)
Overall Rates (e)	15/118 (13%)	34.1%
Adjusted Rates (b)	36.9%	34.1% 4/22 (18%)
Terminal Rates (c)	1/13 (8%)	4/22 (18%) 84
Week of First Observation	99	P = 0.551N
Life Table Test (d)		P = 0.331N P = 0.406N
Incidental Tumor Test (d)		P = 0.400 N
Fisher Exact Test (d)		L ~ 0'40714
Ovary: Granulosa Cell Tumor		2/240(1%)
Overall Rates (e)	3/118 (3%)	3/249(1%)
Adjusted Rates (b)	9.2%	6.6%
Terminal Rates (c)	0/13 (0%)	0/22 (0%)
Week of First Observation	124	119 P=0.366N
Life Table Tests (d)		P = 0.306 N P = 0.326 N
Incidental Tumor Tests (d)		P = 0.3261 P = 0.295N
Fisher Exact Test (d)		F = 0.23019
Ovary: Granulosa Cell Tumor or Carcir		4/249 (2%)
Overall Rates (e)	3/118 (3%)	
Adjusted Rates (b)	9.2%	6.9% 0/22 (0%)
Terminal Rates (c)	0/13 (0%)	0/22(0%)
Week of First Observation	124	88 P = 0.475N
Life Table Tests (d)		P = 0.475N P = 0.429N
Incidental Tumor Tests (d)		P = 0.425 N P = 0.402 N
Fisher Exact Test (d)		1 - 0.10411
Zymbal Gland: Squamous Cell Carcinor Overall Rates (e)	na 3/118 (3%)	6/250 (2%)
Adjusted Rates (b)	5.9%	9.3%
Terminal Rates (c)	0/13 (0%)	1/22(5%)
Week of First Observation	113	91
Life Table Tests (d)	110	P = 0.595
Incidental Tumor Tests (d)		P = 0.608N
Fisher Exact Test (d)		P = 0.593N
Zymbal Gland: Squamous Cell Papillon	a or Carcinoma	
Overall Rates (e)	3/118 (3%)	7/250(3%)
Adjusted Rates (b)	5.9%	13.6%
Terminal Rates (c)	0/13 (0%)	2/22 (9%)
Week of First Observation	113	91
Life Table Tests (d)		P = 0.492
Incidental Tumor Tests (d)		P = 0.583
Fisher Exact Test (d)		P = 0.594

TABLE B3. ANALYSIS OF PRIMARY TUMORS IN FEMALE RATS IN THE LIFETIME FEED STUDYOF TREMOLITE (Continued)

	Untreated Control	1% Tremolite
All Sites: Benign Tumors		
Overall Rates (a)	100/118 (85%)	201/250 (80%)
Adjusted Rates (b)	100.0%	98.9%
Terminal Rates (c)	13/13 (100%)	20/22 (91%)
Week of First Observation	74	76
Life Table Test (d)		P=0.338
Incidental Tumor Test (d)		P = 0.176N
Fisher Exact Test (d)		P = 0.195N
All Sites: Malignant Tumors		
Overall Rates (a)	96/118 (81%)	188/250 (75%)
Adjusted Rates (b)	96.6%	100.0%
Terminal Rates (c)	10/13 (77%)	22/22 (100%)
Week of First Observation	48	49
Life Table Test (d)		P = 0.442
Incidental Tumor Test (d)		P = 0.113 N
Fisher Exact Test (d)		P = 0.118N
All Sites: All Tumors		
Overall Rates (a)	115/118 (97%)	243/250 (97%)
Adjusted Rates (b)	100.0%	100.0%
Terminal Rates (c)	13/13 (100%)	22/22 (100%)
Week of First Observation	48	49
Life Table Test (d)		P = 0.201
Incidental Tumor Test (d)		P = 0.605 N
Fisher Exact Test (d)		P = 0.594N

TABLE B3. ANALYSIS OF PRIMARY TUMORS IN FEMALE RATS IN THE LIFETIME FEED STUDY OF TREMOLITE (Continued)

(a) Number of tumor-bearing animals/number of animals examined grossly at the site

(b) Kaplan-Meier estimated tumor incidences at the end of the study after adjusting for intercurrent mortality

(c) Observed tumor incidence in animals killed at the end of the study

(d) Beneath the dosed group incidence are the P values corresponding to pairwise comparisons between the dosed group and the controls. The life table analysis regards tumors in animals dying prior to terminal kill as being (directly or indirectly) the cause of death. The incidental tumor test regards these lesions as nonfatal. The Fisher exact test compares directly the overall incidence rates. A lower incidence in the dosed group than in controls is indicated by (N).

(e) Number of tumor-bearing animals/number of animals examined microscopically at the site

TABLE B4. SUMMARY OF THE INCIDENCE OF NONNEOPLASTIC LESIONS IN FEMALE RATS IN THELIFETIME FEED STUDY OF TREMOLITE

	Untreated	l Control	1% Tre	emolite
Animals initially in study	18		250	
Animals necropsied	18		250	
Animals examined histopathologically	18		250	
NTEGUMENTARY SYSTEM	· · · · · · · · · · · · · · · · · · ·			
*Skin	(118)		(250)	
Epidermal inclusion cyst			1	(0.4%)
Abscess, NOS		(1%)	9	(1%)
Inflammation, chronic focal	1	(1%)		(1%)
Necrosis, focal Alopecia				(0.4%)
Hyperkeratosis	1	(1%)		(1%)
Acanthosis			3	(1%)
*Subcutaneous tissue	(118)		(250)	
Abscess, NOS	1	(1%)		(0.4%)
Fibrosis, focal			1	(0.4%)
RESPIRATORY SYSTEM				
*Nasal turbinate	(118)		(250)	(0.40)
Abscess, NOS				(0.4%) (0.4%)
Inflammation, chronic diffuse				(0.4%) (0.4%)
Hyperkeratosis	(118)		(250)	(0.470)
#Lung Congestion, NOS		(3%)		(2%)
Hemorrhage		(7%)		(5%)
Inflammation, interstitial		(6%)	11	(4%)
Inflammation, acute focal				(0.4%)
Inflammation, chronic	105	(89%)		(88%)
Inflammation, chronic diffuse		(10)		(0.4%) (1%)
Granuloma, NOS		(1%) (1%)		(0.4%)
Fibrosis, diffuse Necrosis, focal	1	(1%)		(0.4%)
Necrosis, diffuse	1	(1%)	-	(01010)
Pigmentation, NOS		(3%)	11	(4%)
Hyperplasia, alveolar epithelium		(2%)	4	(2%)
Histiocytosis				(0.4%)
#Lung/alveoli	(118)		(250)	
Edema, NOS		(102)		(0.4%)
Histiocytosis	12	(10%)	17	(7%)
HEMATOPOIETIC SYSTEM	(110)		(950)	
*Multiple organs	(118)		(250)	(0.4%)
Erythrophagocytosis Hyperplasia, lymphoid	1	(1%)	1	(0.*/0)
*Mammary gland	(118)		(250)	
Hyperplasia, reticulum cell	(110)		1	(0.4%)
#Bone marrow	(118)		(248)	
Hypoplasia, NOS		(6%)		(2%)
Hyperplasia, NOS		(1%)		(2%)
Myelofibrosis		(1%)	2 (250)	(1%)
#Spleen	(118)	(3%)		(1%)
Hemorrhage Hematoma, NOS		(1%)	2	· · · · /
Fibrosis, focal		(5%)	6	(2%)
Fibrosis, multifocal	1	(1%)		(4.24)
Fibrosis, diffuse	1	(1%)		(1%)
Necrosis, NOS	-	(1.01)		(0.4%)
Necrosis, focal		(1%)		(1%) (17%)
Hemosiderosis		(15%)		(17%)
Hematopoiesis	38	(32%)	59	(4= N)

	Untreate	d Control	1% Tr	emolite
HEMATOPOIETIC SYSTEM (Continued)				
#Splenic capsule	(118)		(250)	
Hemorrhage		(1%)	()	
Fibrosis, focal			1	(0.4%)
Fibrosis, diffuse	1	(1%)		
#Splenic follicles	(118)		(250)	
Atrophy, NOS	2	(2%)	4	(2%)
#Mandibular lymph node	(118)		(250)	
Hemorrhage	1	(1%)		
Pigmentation, NOS	1	(1%)	-	(0.4%)
Erythrophagocytosis			4	(2%)
Hyperplasia, reticulum cell		(1%)		
Hyperplasia, lymphoid		(15%)		(14%)
#Cervical lymph node	(118)		(250)	
Hemorrhage		(1%)		
#Mediastinal lymph node	(118)		(250)	(4.~.)
Congestion, NOS		(0.07.)		(1%)
Hemorrhage	4	(3%)		(1%)
Necrosis, focal		(110)		(0.4%)
Pigmentation, NOS		(11%)	40	(16%)
Hyperplasia, NOS		(1%)		(0~)
Erythrophagocytosis		(5%)		(6%)
Hyperplasia, reticulum cell		(1%)		(2%)
Hyperplasia, lymphoid		(3%)		(2%)
#Pancreatic lymph node	(118)	(0~)	(250)	(
Pigmentation, NOS		(3%)		(5%)
Hyperplasia, reticulum cell		(2%)		(5%)
#Mesenteric lymph node Necrosis, focal	(118)		(250)	$(\mathbf{D}, \mathbf{A}, 0^{t})$
Pigmentation, NOS	0	(3%)		(0.4%) (6%)
Atrophy, NOS		(2%)		(0.4%)
Erythrophagocytosis		(1%)		(4%)
Hyperplasia, reticulum cell		(35%)		(48%)
Hyperplasia, lymphoid		(2%)		(6%)
Hematopoiesis	4	(270)		(0.4%)
#Ileocolic lymph node	(118)		(250)	(0.470)
Hyperplasia, reticulum cell	(110)			(0.4%)
Hyperplasia, lymphoid				(0.4%)
#Renal lymph node	(118)		(250)	(0.470)
Pigmentation, NOS		(1%)	(200)	
Erythrophagocytosis	1	(1)0)	1	(0.4%)
Hyperplasia, reticulum cell	3	(3%)	L	· · · · · · · · · · · · · · · · · · ·
#Iliac lymph node	(118)		(250)	
Hyperplasia, lymphoid			1	(0.4%)
*Sternum	(118)		(250)	
Myelofibrosis	2	(2%)		
#Liver	(118)		(250)	
Leukocytosis, NOS		(3%)		(2%)
Hematopoiesis		(2%)		(1%)
#Kidney	(118)		(250)	
Hematopoiesis				(0.4%)
#Thymus	(83)		(221)	
Ectopia		(1%)		
Congestion, NOS	1	(1%)	1	(0.5%)
DIRCULATORY SYSTEM				
#Spleen	(118)	(4.44)	(250)	(0.47)
Thrombosis, NOS		(1%)		(0.4%)
#Mediastinal lymph node	(118)	(4 m)	(250)	
Lymphangiectasis	1	(1%)		

	Untreated	ł Control	1% Tr	emolite
IRCULATORY SYSTEM (Continued)				
#Celiac lymph node	(118)		(250)	
Lymphangiectasis	(110)		,	$(0.4\%)^{-1}$
#Mesenteric lymph node	(118)		(250)	
Lymphangiectasis	4	(3%)	4	(2%)
#Ileocolic lymph node	(118)		(250)	
Lymphangiectasis		(3%)	-	(1%)
#Renal lymph node	(118)		(250)	
Lymphangiectasis			-	(1%)
#Iliac lymph node	(118)		(250)	(0.477)
Lymphangiectasis #Lung	(119)			(0.4%)
Thrombosis, NOS	(118)		(250)	(0.4%)
#Heart/atrium	(118)		(250)	(0.470)
Thrombosis, NOS		(3%)	(200)	
#Myocardium	(118)	(0%)	(250)	
Mineralization	(110)			(0.4%)
Inflammation, chronic				(1%)
Inflammation, chronic focal	37	(31%)		(34%)
Inflammation, chronic diffuse		(36%)		(36%)
*Aorta	(118)	(00%)	(250)	(30 %)
Mineralization	(110)		, ,	(0.4%)
*Coronary artery	(118)		(250)	
Thrombus, organized		(1%)		
*Mesenteric artery	(118)		(250)	
Inflammation, chronic			1	(0.4%)
#Liver	(118)		(250)	
Thrombosis, NOS	1	(1%)	1	(0.4%)
*Mesentery	(118)		(250)	
Periarteritis		(1%)		
#Adrenal	(118)		(250)	
Thrombosis, NOS	1	(1%)	1	(0.4%)
IGESTIVE SYSTEM				
*Oral mucous membrane	(118)		(250)	
Inflammation, chronic focal			1	(0.4%)
Necrosis, focal			1	(0.4%)
*Lip	(118)		(250)	
Abscess, NOS			1	(0.4%)
*Tongue	(118)		(250)	
Edema, NOS				(0.4%)
Inflammation, acute/chronic				(0.4%)
Inflammation, chronic focal				(0.4%)
Inflammation, chronic diffuse				(0.4%)
Hyperkeratosis		(4 a).		(1%)
Acanthosis		(1%)		(0.4%)
#Salivary gland	(118)		(249)	(0.40)
Calculus, unknown gross or microscopic observatio Cystic ducts		(10)	1	(0.4%)
Inflammation, acute focal	1	(1%)	1	(0.4%)
Inflammation, acute/chronic				(0.4%)
Inflammation, chronic				(0.4%)
Inflammation, chronic diffuse				(0.4%)
Atrophy, NOS				(1%)
Atrophy, diffuse				(0.4%)
#Parotid gland	(118)		(249)	
Atrophy, NOS		(1%)	(- 10)	
#Liver	(118)		(250)	
Hemorrhage	4	(3%)		(2%)
Inflammation, chronic		(1%)		(0.4%)
Granuloma, NOS		(25%)	61	(24%)

	Untreated	l Control	1% Tremolite		
GESTIVE SYSTEM			<u></u>		
#Liver (Continued)	(118)		(250)		
Degeneration, NOS	2	(2%)		(1%)	
Necrosis, focal	20	(17%)		(12%)	
Metamorphosis fatty	29	(25%)		(24%)	
Pigmentation, NOS	16	(14%)		(18%)	
Mitotic alteration				(0.4%)	
Focal cellular change		(58%)		(56%)	
Angiectasis	2	(2%)		(4%)	
#Bile duct	(118)		(250)		
Cyst, NOS		(1%)		(1%)	
Inflammation, chronic	5	(4%)		(7%)	
Fibrosis				(0.4%)	
Hyperplasia, NOS	2	(2%)		(6%)	
#Pancreas	(118)		(250)		
Ectopia	2	(2%)		(4%)	
Embryonal rest				(0.4%)	
Fibrosis, focal				(0.4%)	
Atrophy, focal		(6%)		(8%)	
Atrophy, diffuse	3	(3%)		(2%)	
Hyperplasia, focal				(1%)	
#Pancreatic acinus	(118)		(250)	(04)	
Hyperplasia, focal	3	(3%)	-	(2%)	
#Esophagus	(118)		(248)		
Inflammation, chronic diffuse				(0.4%)	
Hyperkeratosis	3	(3%)		(2%)	
Acanthosis			-	(0.4%)	
#Stomach	(118)		(250)		
Embryonal rest	1	(1%)			
Mineralization	4	(3%)		(1%)	
Cyst, NOS				(0.4%)	
Hemorrhage			1	(0.4%)	
Inflammation, acute focal	1	(1%)			
Inflammation, acute diffuse			1	(0.4%)	
Abscess, NOS		(1%)			
Inflammation, chronic focal	10	(8%)		(4%)	
Inflammation, chronic diffuse	15	(13%)		(11%)	
Ulcer, perforated		(8%)		(4%)	
Necrosis, focal	16	(14%)	31	(12%)	
Necrosis, fibrinoid		(1%)			
Hyperplasia, epithelial				(1%)	
Hyperkeratosis	15	(13%)		(12%)	
Acanthosis	23	(19%)		(18%)	
#Gastric submucosa	(118)		(250)		
Edema, NOS				(0.4%)	
#Gastric fundus	(118)		(250)		
Hyperplasia, focal		(2%)			
Hyperplasia, diffuse		(1%)	/A=^		
#Duodenum	(118)	1	(250)		
Diverticulum				(0.4%)	
Fibrosis, focal				(1%)	
Necrosis, focal		(1%)		(1%)	
#Jejunum	(118))	(250)		
Fibrosis, focal				(0.4%)	
#Ileum	(118))	(250)		
Inflammation, chronic focal				(0.4%)	
Necrosis, focal				(0.4%)	
#Large intestine	(118))	(250)		
Parasitism				(5%)	
#Colon	(118))	(250)		
Hemorrhage			1	(0.4%)	
Inflammation, acute focal	1	(1%)			

	Untreated	l Control	1% Tre	emolite
DIGESTIVE SYSTEM			· · · · · · · · · · · · · · · · · · ·	
#Colon (Continued)	(118)		(250)	
Inflammation, chronic focal	, -,	(1%)	,	
Inflammation, chronic diffuse		(1%)		
Fibrosis, focal	-	(2.27	1	(0.4%)
Parasitism	5	(4%)	2	(1%)
Necrosis, focal		(1%)		
Necrosis, diffuse		(,	1	(0,4%)
Hyperplasia, epithelial				(0.4%)
#Cecum	(118)		(250)	
Dilatation, NOS	(110)			(0.4%)
Hemorrhage				(0.4%)
Hematoma, NOS				(0.4%)
Inflammation, acute focal	1	(1%)	-	
Inflammation, chronic focal	1	(170)	1	(0.4%)
Inflammation, chronic diffuse	3	(3%)	-	
Ulcer, perforated	0		1	(0.4%)
Parasitism	9	(2%)		(0.4%)
Necrosis, focal		(1%)		(1%)
Necrosis, local Necrosis, diffuse	1	(= /V)		(0.4%)
Hyperplasia, epithelial				(0.4%)
				(0.470)
URINARY SYSTEM #Kidney	(118)		(250)	
# Kiney Mineralization		(91%)		(86%)
	107	(91%)		(0.4%)
Inflammation, acute focal	110	(95%)		(0.4%)
Inflammation, chronic Fibrogia diffuso		(95%) (1%)	22((01/0)
Fibrosis, diffuse Matamarphasis fattu		(1%)	1	(0.4%)
Metamorphosis fatty		(1%) (2%)	1	(0 10)
Pigmentation, NOS			1	$(0, A \sigma_{0})$
Hyperplasia, tubular cell		(1%)		(0.4%)
#Kidney/cortex	(118)		(250)	(1.01)
Cyst, NOS		(3%)	-	(1%)
#Renal papilla	(118)		(250)	
Necrosis, focal		(1%)		
#Kidney/tubule	(118)		(250)	
Pigmentation, NOS		(60%)		(70%)
#Urinary bladder	(118)		(246)	
Congestion, NOS	1	(1%)		
Inflammation, chronic focal		(1%)		
Inflammation, chronic diffuse		(1%)		
Hyperplasia, epithelial		(1%)	1	(0.4%)
Hyperplasia, diffuse	2	(2%)		
ENDOCRINE SYSTEM			(940)	
#Pituitary	(117)	(A 0 L)	(248)	(5%)
Cyst, NOS		(4%)		(5%) (2%)
Hemorrhagic cyst		(7%)		
Hyperplasia, focal		(12%)	31	(13%)
Hyperplasia, diffuse		(1%)	4.4	(170)
Angiectasis	29	(25%)		(17%)
Metaplasia, osseous				(0.4%)
#Adrenal	(118)		(250)	
Congestion, NOS	-	(1.07)		(0.4%)
Hemorrhage	1	(1%)		(0.4%)
Degeneration, hyaline				(0.4%)
Degeneration, lipoid		(1.01)	1	(0.4%)
Necrosis, focal	1	(1%)		(0.40)
Infarct, NOS				(0.4%)
A			1	(0.4%)
Amyloidosis Metamorphosis fatty		(1%)		(1%)

	Untreated	Control	1% Tremolite				
NDOCRINE SYSTEM				<u></u>			
#Adrenal (Continued)	(118)		(250)				
Metamorphosis fatty	(+/	(1%)		(1%)			
	-	(1,0)		(1%)			
Angiectasis	(118)		(250)				
#Adrenal cortex		(1%)		(0.4%)			
Congestion, NOS		(1%)	-	(012/0/			
Hemorrhage	1	(1/0)	1	(0.4%)			
Inflammation, chronic	1	(1%)		(2%)			
Degeneration, NOS	1	(1,0)		(0.4%)			
Necrosis, focal	59	(50%)		(42%)			
Metamorphosis fatty		(1%)					
Atrophy, NOS		(1))	1	(0,4%)			
Hypertrophy, NOS				(1%)			
Hypertrophy, focal				(0.4%)			
Hyperplasia, NOS	91	(18%)		(19%)			
Hyperplasia, focal	21	(10/0)		(0.4%)			
Angiectasis	(118)		(250)				
#Adrenal medulla		(25%)		(16%)			
Hyperplasia, focal	(118)	(2070)	(250)	(_0,0)			
#Thyroid		(1%)	(200)				
Cystic follicles			25	(10%)			
Follicular cyst, NOS		(5%)		(29%)			
Hyperplasia, C-cell	(113)	(15%)	(238)	(2010)			
#Parathyroid		(9%)		(8%)			
Hyperplasia, NOS	(118)	(9%)	(250)	(0,0)			
#Pancreatic islets Hyperplasia, focal	(118)			(0.4%)			
EPRODUCTIVE SYSTEM	(118)		(250)				
*Mammary gland	(118)	(1401)		(21%)			
Galactocele		(14%)		(46%)			
Cystic ducts	30	(32%)		(0.4%)			
Inflammation, acute diffuse	0	(901)		(0.4%)			
Abscess, NOS	2	(2%)		(0.4%)			
Inflammation, acute/chronic	1	(101)	1				
Inflammation, chronic focal	1	(1%)	1	(0.4%)			
Necrosis, focal	4	(3%)		(14%)			
Hyperplasia, NOS		(1%)		(0.4%)			
Hyperplasia, focal		(1%)		(1%)			
Hyperplasia, diffuse			(250)	(1,0)			
*Preputial gland	(118)	(1%)		(2%)			
Cystic ducts	I	(1/0)		(0.4%)			
Inflammation, acute diffuse	1	(1%)		(1%)			
Abscess, NOS	1	(1/0)		(0.4%)			
Inflammation, chronic diffuse				(1%)			
Necrosis, focal				(0.4%)			
Necrosis, diffuse				(0.4%)			
Hyperplasia, NOS	1	(1%)	1	(3.2.2)			
Hyperplasia, diffuse	1	(170)	3	(1%)			
Hyperkeratosis				(0.4%)			
Acanthosis	(118)		(250)				
*Vagina		(1%)	(200)				
Acanthosis	(118)		(249)				
#Uterus		(3%)		(6%)			
Hydrometra		(3%) (2%)		(0.4%)			
Hemorrhage				(0.4%)			
Inflammation, acute	1	(1%)		(1%)			
Abscess, NOS				(0.4%)			
Inflammation, chronic focal		(1 M)	1	(0.=/0)			
Inflammation, chronic diffuse Fibrosis, focal	1	(1%)	1	(0.4%)			

	Untreated	Control	1% Tre	molite
REPRODUCTIVE SYSTEM				
#Uterus (Continued)	(118)		(249)	
Hyperplasia, papillary	,	(1%)	(= -•• /	
Metaplasia, squamous			1	(0.4%)
#Cervix uteri	(118)		(249)	
Cyst, NOS	,		3	(1%)
Inflammation, acute diffuse			1	(0.4%)
Fibrosis	2	(2%)	2	(1%)
Fibrosis, diffuse	2	(2%)		
Hyperkeratosis				(0.4%)
Acanthosis				(0.4%)
#Uterus/endometrium	(118)		(249)	(00)
Cyst, NOS	6	(5%)		(2%)
Hyperplasia, NOS		(4~~)		(0.4%)
Hyperplasia, papillary	1	(1%)		(1%)
Hyperplasia, cystic				(0.4%)
#Endometrial gland	(118)	(1.07.)	(249)	
Cyst, NOS		(1%)	(0.40)	
#Ovary	(118)		(249)	(70L)
Cyst, NOS	8	(7%)		(7%)
Parovarian cyst				(0.4%)
Degeneration, hyaline		(10)		(0.4%) (0.4%)
Pigmentation, NOS		(1%)	1	(0.470)
Atrophy, NOS		(1%) (1%)		
Hyperplasia, focal	1	(1%)		
NERVOUS SYSTEM				
#Cerebrum	(118)		(250)	
Hydrocephalus, NOS	1	(1%)		
Hemorrhage	2	(2%)	3	(1%)
Abscess, NOS			1	(0.4%)
Gliosis	1	(1%)		
Necrosis, focal			1	(0.4%)
#Brain	(118)		(250)	
Hemorrhage	1	(1%)		
Necrosis, focal		(1%)		
#Cerebellum	(118)		(250)	
Hemorrhage	5	(4%)		(1%)
Abscess, NOS				(0.4%)
Necrosis, focal				(0.4%)
*Spinal cord	(118)		(250)	
Hemorrhage	1	(1%)		(0.40)
Degeneration, NOS			1	(0.4%)
SPECIAL SENSE ORGANS	······································	· · · · · · · · · · · · · · · · · · ·		
*Eye	(118)		(250)	
Hemorrhage		(3%)	8	(3%)
Inflammation, chronic				(0.4%)
Synechia, anterior				(0.4%)
Synechia, posterior		(2%)	-	(3%)
Cataract		(14%)		(17%)
*Eye anterior chamber	(118)		(250)	
Empyema				(1%)
*Vitreous body	(118)		(250)	
Vascularization				(0.4%)
*Eye/cornea	(118)		(250)	
Inflammation, necrotizing				(1%)
Inflammation, chronic focal		(7%)		(2%)
Inflammation, chronic diffuse	5	(4%)		(3%)
Inflammation, chronic necrotizing			1	(0.4%)

SPECIAL SENSE ORGANS (Continued) *Eye/retina Degeneration, NOS *Eye/crystalline lens Rupture *Eyelid Fibrosis, focal *Harderian gland Inflammation, chronic Atrophy, NOS *Zymbal gland Cystic ducts Hyperplasia, focal Hyperkeratosis MUSCULOSKELETAL SYSTEM	(118) (118) 1 (118) 1 (118) 8	 (39%) (1%) (1%) (7%) (1%) 	(250) 1 (250) (250) 1 (250) 17 1 17 1	(34%) (0.4%) (0.4%) (0.4%) (7%) (0.4%) (1%)
*Eye/retina Degeneration, NOS *Eye/crystalline lens Rupture *Eyelid Fibrosis, focal *Harderian gland Inflammation, chronic Atrophy, NOS *Zymbal gland Cystic ducts Hyperplasia, focal Hyperkeratosis	46 (118) (118) 1 (118) 1 (118) 8	(1%) (1%) (7%)	86 (250) 1 (250) (250) 1 1 (250) 17 1	(0.4%) (0.4%) (0.4%) (7%) (0.4%)
Degeneration, NOS *Eye/crystalline lens Rupture *Eyelid Fibrosis, focal *Harderian gland Inflammation, chronic Atrophy, NOS *Zymbal gland Cystic ducts Hyperplasia, focal Hyperkeratosis	46 (118) (118) 1 (118) 1 (118) 8	(1%) (1%) (7%)	86 (250) 1 (250) (250) 1 1 (250) 17 1	(0.4%) (0.4%) (0.4%) (7%) (0.4%)
Rupture *Eyelid Fibrosis, focal *Harderian gland Inflammation, chronic Atrophy, NOS *Zymbal gland Cystic ducts Hyperplasia, focal Hyperkeratosis	(118) 1 (118) 1 (118) 8	(1%)	1 (250) (250) 1 (250) 17 17 1	(0.4%) (0.4%) (7%) (0.4%)
*Eyelid Fibrosis, focal *Harderian gland Inflammation, chronic Atrophy, NOS *Zymbal gland Cystic ducts Hyperplasia, focal Hyperkeratosis	1 (118) 1 (118) 8	(1%)	(250) (250) 1 1 (250) 17 1	(0.4%) (0.4%) (7%) (0.4%)
Fibrosis, focal *Harderian gland Inflammation, chronic Atrophy, NOS *Zymbal gland Cystic ducts Hyperplasia, focal Hyperkeratosis	1 (118) 1 (118) 8	(1%)	(250) 1 1 (250) 17 1	(0.4%) (7%) (0.4%)
 *Harderian gland Inflammation, chronic Atrophy, NOS *Zymbal gland Cystic ducts Hyperplasia, focal Hyperkeratosis 	(118) 1 (118) 8	(1%)	1 (250) 17 1	(0.4%) (7%) (0.4%)
Inflammation, chronic Atrophy, NOS *Zymbal gland Cystic ducts Hyperplasia, focal Hyperkeratosis	1 (118) 8	(7%)	1 (250) 17 1	(0.4%) (7%) (0.4%)
Atrophy, NOS *Zymbal gland Cystic ducts Hyperplasia, focal Hyperkeratosis	(118) 8	(7%)	1 (250) 17 1	(0.4%) (7%) (0.4%)
*Zymbal gland Cystic ducts Hyperplasia, focal Hyperkeratosis	(118) 8	(7%)	(250) 17 1	(7%) (0.4 %)
Cystic ducts Hyperplasia, focal Hyperkeratosis	8		17 1	(0.4%)
Hyperplasia, focal Hyperkeratosis			1	(0.4%)
Hyperkeratosis	1	(1%)		
MUSCULOSKELETAL SYSTEM			·····	
	(110)		(272)	
*Skull	(118)	(70)	(250)	(COL)
Osteopetrosis *Sternum	8 (118)	(7%)	(250)	(6%)
Osteopetrosis		(7%)		(8%)
*Rib	(118)	(170)	(250)	(070)
Degeneration, NOS	(110)			(0.4%)
BODY CAVITIES	(110)		(250)	
*Mediastinum Edema, NOS	(118)	(1%)	(250)	
Inflammation, chronic		(1%) (1%)		
*Abdominal cavity	(118)	(170)	(250)	
Hemorrhage	(110)			(0.4%)
Necrosis, fat	7	(6%)	15	(6%)
*Mesentery	(118)		(250)	
Inflammation, chronic focal	2	(2%)		
ALL OTHER EVETENC				
ALL OTHER SYSTEMS *Multiple organs	(118)		(250)	
Mineralization		(1%)	(200)	
Inflammation, chronic		(3%)	6	(2%)
Degeneration, NOS	1	(1%)		
Metamorphosis fatty	1	(1%)	1	(0.4%)
Fibrous osteodystrophy	1	(1%)		(.
Pigmentation, NOS			3	(1%)
Diaphragm Hernia, NOS	1		2	
Adipose tissue	1		Z	
Hemorrhage	1			
Mesentery of colon	1			
Inflammation, chronic focal	1			
- ,. ,	-			

* Number of animals receiving complete necropsy examination; all gross lesions including masses examined microscopically. # Number of animals examined microscopically at this site

APPENDIX C

PATHOGEN BURDEN SURVEY

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TABLE C1	INITIAL MICROSCOPIC EXAMINATION FOR ENDOPARASITES AND BACTERIA IN ${\rm F}_0$ RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE	160
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TABLE C1. INITIAL MICROSCOPIC EXAMINATION FOR ENDOPARASITES AND BACTERIA IN \mathbf{F}_0 RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE

Animal/Specimen Number (a)	Micro-organisms Identified (b)	
149/3756	1 + Coliform; 1 + Proteus vulgaris	
150/3757	3 + Coliform; 1 + Proteus vulgaris	
151/3758	3 + Coliform; 1 + Proteus vulgaris	
152/3759	3 + Coliform; 1 + Proteus vulgaris	
153/3760	1 + Coliform (two types); 1 + Proteus vulgaris	
154/3761	1 + Coliform; 1 + Proteus vulgaris	
155/3762	2 + Coliform; 1 + Proteus vulgaris	
156/3763	2 + Coliform; 1 + Proteus vulgaris	
157/3764	3 + Coliform; 1 + Proteus vulgaris	
158/3765	3 + Coliform; 1 + Proteus vulgaris	
159/3766	3 + Coliform; 1 + Proteus vulgaris	
160/3767	1 + Coliform; 1 + Proteus vulgaris	
161/3768	1 + Coliform; 1 + Proteus vulgaris	
162/3769	2 + Coliform: 1 + Proteus vulgaris	
163/3770	1 + Coliform: 1 + Proteus vulgaris	
164/3771	1 + Coliform; 1 + Proteus vulgaris	

(a) Date of specimen: 11/2/77

(b) Lung, spleen, feces, and tracheal wash were examined for each specimen; no growth observed in the spleen or lungs; no mycoplasma isolated from tracheal washings.

TABLE C2. MURINE VIRUS ANTIBODY DETERMINATION IN F_0 RATS IN THE LIFETIME FEEDSTUDIES OF TREMOLITE

Sample Number	Complement Fixation Sendai LCM	
3756		
3757	_ _	
3758		
3759		
3760		
3761		
3762		
3763	_ _	
3764	<u> </u>	
3765	— —	
3766		
3768		
3769		
3770		
3771		
ignificant titer	10 10	

	Male							Female								
Animal Number: Site/Lesion	1 4 9	1 5 0	1 5 1	1 5 2	1 5 3	1 5 4	1 5 5	1 5 6	1 5 7	1 5 8	1 5 9	1 6 0	1 6 1	1 6 2	1 6 3	1 6 4
Grain	x	x	x	x	x	x	x	X	x	x	x	x	x	x	x	x
Ieart	x	х	х	X	х	X	X	х	х	x	X	X	X	X	X	x
Lung Peribronchial lymphoid hyperplasia Foci of mononuclear cells Perivascular lymphoid hyperplasia Artifactual collapse Aspirated blood	1	1	Ρ	1 1	1	2	Ρ	2 1	1 P	1	2	1 P	2	1	1 P	3
Spleen	x	x	x	x	x	x	x	x	х	x	х	r X	х	x	x	0
iver Nonsuppurative pericholangitis	x	x	x	x	x	x	X	1	x	1	x	x	1	1	1	X
Kidney Focal interstitial nephritis Regenerative tubular epithelium	x	x	X	1 P	x	Р	x	1	X	x	х	х	2	X	1 P	2
Early fibrosis Mononuclear cells				Р Р				Р					Р		Р	Р
mall intestine	x	х	х	х	x	X	X	х	х	х	X	х	Х	Х	X	x
arge intestine	X	Х	Х	Х	Х	Х	X	Х	х	X	X	х	Х	Х	Х	X
alivary gland	x	Х	Х	X	Х	X	Х	Х	Х	X	Х	х	0	Х	0	X
Jrinary bladder	X	Х	Х	Х	0	Х	Х	Х	Х	X	0	Х	Х	X	0	Х
farderian gland	x	X	X	X	X	0	0	х	X	х	Х	X	Х	Х	X	x
kin	x	X	X	X	Х	х	X	х	x	x	X	x	Х	Х	Х	х
anus	X	0	X	X	Х	Х	X	х	0	х	X	0	х	Х	Х	х
rachea	X	х	х	х	Х	х	Х	Х	х	Х	х	х	0	х	X	0
Aesenteric lymph node Lymphoid hyperplasia									Р							

TABLE C3. INITIAL INDIVIDUAL HISTOPATHOLOGIC FINDINGS IN \mathbf{F}_0 RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE

Type of Finding:

O = Tissue absent X = Tissue examined and not remarkable P = Finding present

Degree of Finding:

- Minimal Slight 1 ~
- 2 3 4 5 ×
- = Moderate
- Moderately severe
 Severe

Pathogen Burden Summary (F₀ Repeated)

Sections of brain, heart, lung, spleen, liver, kidney, small intestine, large intestine, salivary gland, urinary bladder, harderian gland, skin, anus, and cecum were examined from four male and six female rats (parental generation) killed for pathology burden. A subcutaneous tissue mass in one female was also examined.

Evidence of respiratory disease was noted in all rats. This was characterized by minimal-to-moderate peribronchial lymphoid hyperplasia in all 10 rats and a bronchial exudate in 3 males. These lesions were slightly more pronounced than those observed at a prior kill.

Minimal focal nonsuppurative myocarditis was noted in one male. Minimal-to-moderate pigment deposition of yellowish-brown granular pigment (presumably hemosiderin) was noted in sections of spleen from three male and four female rats.

In sections of liver, scattered microgranulomas were observed in one male and foci of mononuclear cells occurred in two other males.

In the kidney, minimal chronic interstitial nephritis occurred in three males and foci of intratubular mineralization was noted at the corticomedullary junction in two males and three females.

Cross-sections of a nematode parasite, presumably *Syphacea obvelata*, were noted in the colon of one male rat.

The subcutaneous tissue mass occurring in the vicinity of the salivary glands in female no. 286 was diagnosed as a mammary fibroadenoma.

The remaining tissues examined were not remarkable.

TABLE C4. REPEATED MICROSCOPIC EXAMINATION FOR ENDOPARASITES AND BACTERIA IN ${\bf F}_0$ RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE

Animal/Specimen Number (a)	Micro-organisms Identified (b)							
277/4008	4 + Group D Streptococcus; 2 + Staphylococcus epidermidis; 3 + Coliform; 2 + Pseudomonas aeruginosa; 3 + Proteus rettgeri							
278/4009	4 + Group D Streptococcus; 2 + Staphylococcus epidermidis; 2 + Coliform; 1 + Pseudomonas aeruginosa; 1 + Proteus morganii							
279/4010	4+ Group D Streptococcus; 3+ Diphtheroids; 4+ Coliform; 4+ Pseudomonas aeruginosa; 4+ Citrobacter freundii							
280/4011	3 + Group D Streptococcus							
281/4012	4 + Group D Streptococcus; 1 + Staphylococcus epidermidis; 3 + Coliform							
282/4013	4 + Group D Streptococcus; 3 + Bacillus sp.; 4 + Coliform; 1 + Pseudomonas aeruginosa							
283/4014	4 + Group D Streptococcus; 3 + Bacillus sp.; 4 + Coliform; 1 + Pseudomonas aeruginosa							
284/4015	4+ Group D Streptococcus; 4+ Micrococcus sp.; 4+ Coliform; 3+ Pseudomonas aeruginosa							
285/4016	4 + Group D Streptococcus; 3 + Micrococcus sp.; 4 + Coliform; 4 + Candida brumptii							
286/4017	4 + Group D Streptococcus; 4 + Micrococcus sp.; 4 + Coliform; 1 + Proteus vulgaris; 1 + Pseudomonas aeruginosa; 4 + Candida brumptii							

(a) Date of specimen: 5/30/78

(b) Lung, spleen, feces, and tracheal wash were examined for each specimen; no growth observed in the spleen or lung; no mycoplasma isolated from tracheal washings.

TABLE C5. REPEATED MURINE VIRUS ANTIBODY DETERMINATION IN ${\rm F_0}$ RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE

Sample Number	Complement Fixation Sendai LCM	
3934		· · · · · · · · · · · · · · · · · · ·
3935	-	
3936	~ -	
3937		
3938		
3940		
3941		
3942		
3943		
3944		
3945		
3946		
3947		
3948		
Significant titer	10 10	

			Contro			 1% Tremolite				
Animal	$\frac{\mathbf{N}}{2}$	lale 2	2	Fem 2	ale 2	$\frac{M}{2}$	<u>ale</u> 2	2	Fem 2	ale 2
Number: Site/Lesion	-7 7	7 8	-7 9	8 0	8 1	8 2	8 3	8 4	8 5	8 6
Brain	x	х	х	x	x	 x	x	x	x	0
leart Focal nonsuppurative myocarditis	х	x	X	1	Х	х	X	X	X	x
Lung Peribronchial lymphoid hyperplasia Bronchial exudate	2	3 P	2 P	2	2 P	2	3	2	1	2
Spleen Pigment deposition	2	2	X	x	2	2	3	2	1	X
iver Microgranulomas Foci of mononuclear cells	Р	P	x	х	Р	X	Х	х	х	0
idney Chronic interstitial nephritis Foci of mineralization	1 P	1	1	Р	x	Р	х	P	0	Р
mall intestine	x	x	x	x	x	x	x	0	x	r X
arge intestine Nematodiasis	x	х	x	Р	x	x	х	0	x	x
alivary gland	0	0	0	0	0	x	х	X	x	x
rinary bladder	Х	х	х	х	0	Х	х	х	0	x
arderian gland	0	0	0	X	х	х	0	х	0	x
kin	0	0	0	x	х	х	х	0	Х	0
nus	Х	x	х	х	х	х	x	0	Х	x
ecum	х	x	Х	Х	X	х	X	0	х	x
issue mass Mammary fibroadenoma										Р

TABLE C6. REPEATED INDIVIDUAL HISTOPATHOLOGIC FINDINGS IN \mathbf{F}_0 RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE

Type of Finding:

O = Tissue absent X = Tissue examined and not remarkable P = Finding present

Degree of Finding:

- 1 = Minimal
- 2 =
- Slight Moderate 3 =
- Moderately severe =
- 4 5 = Severe

Pathogen Burden Summary (F₁)

Sections of brain, heart, lung, spleen, liver, kidney, small intestine, large intestine, salivary gland, urinary bladder, harderian gland, skin, anus, and cecum were examined from eight male and eight female rats killed for pathology burden.

Evidence of early spontaneous respiratory disease was present in the lungs of all rats examined. This was characterized by minimal-to-slight peribronchial lymphoid hyperplasia.

In sections of kidney, focal intratubular mineralization was noted at the corticomedullary junction in all but one female.

In the skin section of one female, a focus of dermatitis was noted with a microabscess in the epidermis.

The remaining tissues examined were not remarkable.

Animal/Specimen Number (a)	Micro-organisms Identified (b)							
229/3933	4 + Group D Streptococcus; 3 + Staphylococcus epidermidis; 1 + Coliform; 1 + Proteus vulgaris							
230/3934	4 + Group D Streptococcus; 3 + Coliform; 3 + Micrococcus sp.; 1 + Staphylococcus epidermidis							
231/3935	4 + Group D Streptococcus; 1 + Staphylococcus epidermidis; 3 + Coliform; 2 + Bacillus sp.; 2 + Pseudomonas aeruginosa							
237/3936	4 + Group D Streptococcus; 3 + Micrococcus sp.; 3 + Coliform							
238/3937	4 + Group D Streptococcus; 3 + Micrococcus sp.; 3 + Coliform							
239/3938	4 + Group D Streptococcus; 3 + Micrococcus sp.; 3 + Gamma Streptococcus; 3 + Candida albicans; 3 + Coliform							
232/3939	 4 + Group D Streptococcus; 1 + Coliform; 2 + Micrococcus sp.; 3 + Staphylococcus epidermidis 							
233/3940	4+ Group D Streptococcus; 4+ Micrococcus sp.; 4+Diphtheroids; 1+ Pseudomonas aeruginosa							
234/3941	4 + Group D Streptococcus; 4 + Coliform; 4 + Micrococcus sp.; 4 + Diphtheroids; 3 + <i>Proteus vulgaris</i>							
235/3942	4 + Group D Streptococcus; 1 + Coliform							
236/3943	4 + Group D Streptococcus; 4 + Coliform; 1 + Micrococcus sp.; 1 + Proteus morganii							
240/3944	4 + Group D Streptococcus; 4 + Coliform; 1 + Micrococcus sp.; 1 + Proteus vulgaris							
241/3945	4 + Group D Streptococcus; 4 + Coliform; 1 + Pseudomonas aeruginosa							
242/3946	4+ Group D Streptococcus; 1+ Coliform; 1+ Micrococcus sp.; 1+ Proteus morganii							
243/3947	4 + Group D Streptococcus; 3 + Coliform; 1 + Proteus vulgaris							
244/3948	4 + Group D Streptococcus; 3 + Coliform							

TABLE C7. MICROSCOPIC EXAMINATION FOR ENDOPARASITES AND BACTERIA IN \mathbf{F}_1 RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE

(a) Date of specimen: 4/13/78

(b) Lung, spleen, feces, and tracheal wash were examined for each specimen; no growth observed in the spleen or lung; no mycoplasma isolated from tracheal washings.

Sample Number	<u>Complement Fixation</u> Sendai LCM	
4008		
4009		
4010		
4011		
4012		
4013		
4014		
4015		
4016		
4017		
Significant titer	10 10	

TABLE C8. MURINE VIRUS ANTIBODY DETERMINATION IN \mathbf{F}_1 RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE

		Control					<u> </u>									
	2	Mal			Tema				Mal					Fema		
Animal Number: Site/Lesion		2 3 0	2 3 1	2 3 7	2 3 8	2 3 9	2 3 2	2 3 3	2 3 4	2 3 5	2 3 6	2 4 0	2 4 1	2 4 2	2 4 3	4
Brain	x	x	X	X	x	x	x	х	x	х	X	х	x	X	х	Х
leart	х	Х	х	х	X	x	х	X	Х	X	х	х	X	X	X	Х
ung Peribronchial lymphoid hyperplasia	1	2	1	1	2	1	1	2	2	2	2	2	1	2	2	1
Liver	Х	х	X	х	X	х	х	х	x	х	х	Х	X	x	Х	Х
Cidney Focal mineralization	X	Х	X	Р	Р	Ρ	Х	X	X	X	x	Р	Р	Р	Р	Х
Small intestine	Х	х	Х	х	Х	х	Х	х	x	х	Х	Х	х	х	х	Х
Large intestine	X	х	х	х	Х	х	х	x	х	х	х	Х	Х	х	X	X
alivary gland	Х	x	х	х	x	х	Х	0	x	Х	x	Х	Х	х	Х	Х
Jrinary bladder	x	x	х	x	х	0	X	x	Х	х	х	0	X	X	X	C
Iarderian gland	Х	х	x	х	х	х	x	x	х	0	х	х	X	0	0	Х
škin Microabscess Focal dermatitis	x	x	x	х	0	X	X	x	x	x	Х	X	x	P P	x	X
Anus	х	x	x	х	х	0	Х	х	Х	х	х	x	X	X	Х	2
Cecum	х	х	х	Х	х	х	0	х	х	х	х	х	х	х	х	2

TABLE C9. INDIVIDUAL HISTOPATHOLOGIC FINDINGS IN \mathbf{F}_1 RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE

Type of Finding:

O = Tissue absent X = Tissue examined and not remarkable P = Finding present

Degree of Finding:

Minimal =

- 1 2 3 4 5 = Slight
- = Moderate = Moderately severe = Severe

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APPENDIX D

ANALYSIS OF BEDDING SAMPLES IN THE LIFETIME FEED STUDIES OF TREMOLITE

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TABLE D1	ANALYSIS OF BEDDING SAMPLES AT HAZLETON LABORATORIES	170
TABLE D2	ANALYSIS OF BEDDING SAMPLES AT ILLINOIS INSTITUTE OF TECHNOLOGY RESEARCH INSTITUTE	170

Collection Date	Desired Level (ppm)	Determined Level of Pentachlorophenol (ppm)	Determined Level of Polychlorinated Biphenyls (ppm)
07/78	<1.0	6.0	< 0.5
08/78	<1.0	< 0.5	< 0.5
08/79	<1.0	<0.2	< 0.5
01/80	<1.0	< 0.2	< 0.5
08/80	<1.0	< 0.2	< 0.5

TABLE D1. ANALYSIS OF BEDDING SAMPLES AT HAZLETON LABORATORIES

TABLE D2. ANALYSIS OF BEDDING SAMPLES AT ILLINOIS INSTITUTE OF TECHNOLOGY RESEARCHINSTITUTE

	Fiber C	Fiber Concentration				
Collection Date	Total (a)	Asbestos (a)				
03/77	110/g	ND				
03/79	110/g 90/g	ND				
02/80	130/g	ND				
08/80	40/g	ND				

(a) ND = less than detection limit (~ 25,000 fibers per liter or 25 fibers per gram)

APPENDIX E

WATER ANALYSIS IN THE LIFETIME FEED STUDIES OF TREMOLITE

APPENDIX E. WATER ANALYSIS

Samples of drinking water were submitted to the Water Supply Research Laboratory, U.S. Environmental Protection Agency, Cincinnati, OH, for baseline asbestos determinations. The samples were collected on November 8, 1976, and November 11, 1980.

The results of the first analysis determined the concentration of chrysotile asbestos and amphibole asbestos to be below detectable limits of 10,000 fibers per liter.

The second analysis detected one chrysotile asbestos fiber, equivalent to 50,000 fibers per liter, but a count based on a single fiber is not statistically significant. The chrysotile asbestos fiber was probably a contaminant from the study diet.

APPENDIX F

AIR ANALYSIS IN THE LIFETIME FEED STUDIES OF TREMOLITE

 PAGE
 PAGE

 TABLE F1
 RESULTS OF ANALYSES OF AIR SAMPLES IN LIFETIME FEED STUDIES OF

 TREMOLITE IN RATS
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Initially, 6-hour samplings of air were taken for baseline asbestos determinations from clean and dirty corridors and from one room. Samples were sent for analysis to the Illinois Institute of Technology Research Institute (IITRI). Additional 6-hour air samplings of rooms and corridors were taken when each asbestos diet was introduced into a room and approximately every 6 months thereafter.

Air samples were obtained with a portable pump Model G (part no. 456058) from Mining Safety Appliances Co. (Pittsburgh, PA), which was connected by Tygon tubing to a Millipore Filter Field Monitor (pore size, 5μ). Results of air sample analyses are presented in Table F1.

Date	Room No. 32 (next to return hall door)	Service Hall (outside room no. 30)	Room No. 35 (next to service hall door)	Return Hall Intersection of Nos. 45 and 44	Room No. 36 (next to return hall door)
·····		Total Fib	er Concentration (no/cc of air)	
6/78	0.06	0	0	0	0
1/79	0.17	0.04	0.04		0.30
2/80	0.095		0.048		
7/80	0.11	0.09	0.03		0
	<u> </u>	Asbestos F	iber Concentration	n (no./cc of air)	
6/78	0.06	0	0	0	0
1/79	0.13	0.04	0		0.17
2/80	0.095		0		
7/80	0.03	0.03	0.03		0
			<u>>5 μm (no./cc of </u>	air)	
6/78	0	0		0	0
1/79	Ő	Õ	0	-	0
2/80	0		0		
7/80	Ő	0	Õ		0
		<u></u>	>1 µm (no/cc of :	air)	·····
6/78	0	0		0	0
1/79	0.13	0	0	Ŭ	0.14
2/80	0.15	U	0		0.14
7/80	0	0	0.03		0
	Service Hall	Room No. 33	Return Hall		
Date	Service Hall Intersection of Nos. 29 and 55	Room No. 33 (next to return hall door)	Return Hall (No. 20) Outside Women's Locker	e of (next to return	Service Hall
Date	Intersection	(next to return hall door)	(No. 20) Outside	e of (next to return Room hall door)	Service Hall
	Intersection of Nos. 29 and 55	(next to return hall door) Total Fib	(No. 20) Outside Women's Locker er Concentration (e of (next to return Room hall door)	Service Hall
6/78	Intersection	(next to return hall door)	(No. 20) Outside Women's Locker	e of (next to return Room hall door) no./cc of air)	Service Hall
	Intersection of Nos. 29 and 55	(next to return hall door) Total Fib (b)0	(No. 20) Outside Women's Locker er Concentration (e of (next to return Room hall door) <u>no./cc of air)</u> 0	
6/78 1/79	Intersection of Nos. 29 and 55	(next to return hall door) Total Fib (b) 0 0.11	(No. 20) Outside Women's Locker er Concentration (e of (next to return Room hall door) <u>no./cc of air)</u> 0	
6/78 1/79 2/80	Intersection of Nos. 29 and 55	(next to return hall door) Total Fib (b) 0 0.11 0.00 0.11	(No. 20) Outside Women's Locker er Concentration (e of (next to return Room hall door) no./cc of air) 0 0.04 0.34	
6/78 1/79 2/80 7/80 6/78	Intersection of Nos. 29 and 55	(next to return hall door) Total Fib (b) 0 0.11 0.00 0.11 Asbestos F (b) 0	(No. 20) Outside Women's Locker er Concentration (0	e of (next to return Room hall door) no./cc of air) 0 0.04 0.34 n (no./cc of air) 0	
6/78 1/79 2/80 7/80 6/78 1/79	Intersection of Nos. 29 and 55 	(next to return hall door) Total Fib (b) 0 0.11 0.00 0.11 Asbestos F (b) 0 0.04	(No. 20) Outside Women's Locker er Concentration (0 <u>Ciber Concentration</u>	e of (next to return Room hall door) no./cc of air) 0 0.04 0.34 n (no./cc of air)	
6/78 1/79 2/80 7/80 6/78 1/79 2/80	Intersection of Nos. 29 and 55 	(next to return hall door) Total Fib (b) 0 0.11 0.00 0.11 Asbestos F (b) 0 0.04 0.00	(No. 20) Outside Women's Locker er Concentration (0 <u>Ciber Concentration</u>	e of (next to return Room hall door) no./cc of air) 0 0.04 0.34 n (no./cc of air) 0 0.04	0.04
6/78 1/79 2/80 7/80 6/78 1/79	Intersection of Nos. 29 and 55 	(next to return hall door) Total Fib (b) 0 0.11 0.00 0.11 Asbestos F (b) 0 0.04	(No. 20) Outside Women's Locker er Concentration (0 <u>Concentration</u> 0	e of (next to return Room hall door) 	0.04
6/78 1/79 2/80 7/80 6/78 1/79 2/80	Intersection of Nos. 29 and 55 0.12 0.06	(next to return hall door) Total Fib (b) 0 0.11 0.00 0.11 Asbestos F (b) 0 0.04 0.00 0.03	(No. 20) Outside Women's Locker er Concentration (0 <u>iber Concentration</u> 0 >5 μm (no./cc of s	e of (next to return Room hall door) no./cc of air) 0 0.04 0.34 n (no./cc of air) 0 0.04 0.23 air)	0.04
6/78 1/79 2/80 7/80 6/78 1/79 2/80 7/80	Intersection of Nos. 29 and 55 	(next to return hall door) Total Fib (b) 0 0.11 0.00 0.11 Asbestos F (b) 0 0.04 0.00 0.03 (b) 0	(No. 20) Outside Women's Locker er Concentration (0 <u>Concentration</u> 0	e of (next to return Room hall door) <u>no./cc of air)</u> 0 0.04 0.34 n (no./cc of air) 0 0.04 0.23 air) 0	0.04
6/78 1/79 2/80 7/80 6/78 1/79 2/80 7/80 6/78 1/79	Intersection of Nos. 29 and 55 0.12 0.06	(next to return hall door) Total Fib (b) 0 0.11 0.00 0.11 Asbestos F (b) 0 0.04 0.00 0.03 (b) 0 0 0	(No. 20) Outside Women's Locker er Concentration (0 <u>iber Concentration</u> 0 >5 μm (no./cc of s	e of (next to return Room hall door) no./cc of air) 0 0.04 0.34 n (no./cc of air) 0 0.04 0.23 air)	0.04
6/78 1/79 2/80 7/80 6/78 1/79 2/80 7/80	Intersection of Nos. 29 and 55 0.12 0.06	(next to return hall door) Total Fib (b) 0 0.11 0.00 0.11 Asbestos F (b) 0 0.04 0.00 0.03 (b) 0	(No. 20) Outside Women's Locker er Concentration (0 <u>iber Concentration</u> 0 >5 μm (no./cc of s	e of (next to return Room hall door) <u>no./cc of air)</u> 0 0.04 0.34 n (no./cc of air) 0 0.04 0.23 air) 0	0.04
6/78 1/79 2/80 7/80 6/78 1/79 2/80 7/80 6/78 1/79 2/80	Intersection of Nos. 29 and 55 0.12 0.06	(next to return hall door) Total Fib (b) 0 0.11 0.00 0.11 Asbestos F (b) 0 0.04 0.00 0.03 (b) 0 0.03	(No. 20) Outside Women's Locker er Concentration (0 <u>iber Concentration</u> 0 >5 μm (no./cc of s	e of (next to return Room hall door) no./cc of air) 0 0.04 0.34 n (no./cc of air) 0 0.04 0.23 air) 0 0 0 0 0 0 0 0 0 0 0 0 0	0.04
6/78 1/79 2/80 7/80 6/78 1/79 2/80 7/80 6/78 1/79 2/80 7/80	Intersection of Nos. 29 and 55 0.12 0.06 0	(next to return hall door) Total Fib (b) 0 0.11 0.00 0.11 Asbestos F (b) 0 0.04 0.00 0.03 (b) 0 0 0 0	(No. 20) Outside Women's Locker er Concentration (0 'iber Concentration 0 'iber Concentration 0 >5 µm (no./cc of a) 0 >1 µm (no./cc of a)	e of (next to return Room hall door) no./cc of air) 0 0.04 0.34 1 (no./cc of air) 0 0.04 0.23 air) 0 0 0 0 0 0 0 0 0 0 0 0 0	0.04
6/78 1/79 2/80 7/80 6/78 1/79 2/80 7/80 6/78 1/79 2/80 7/80	Intersection of Nos. 29 and 55 0.12 0.06	(next to return hall door) Total Fib (b) 0 0.11 0.00 0.11 Asbestos F (b) 0 0.04 0.00 0.03 (b) 0 0 0 0 0 0	(No. 20) Outside Women's Locker er Concentration (0 <u>Ciber Concentration</u> 0 <u>>5 μm (no./cc of s</u> 0	e of (next to return Room hall door) <u>no./cc of air)</u> 0 0.04 0.34 n (no./cc of air) 0 0.04 0.23 air) 0 0 0 0 0 0 0 0 0 0 0 0 0	0.04
6/78 1/79 2/80 7/80 6/78 1/79 2/80 7/80 6/78 1/79 2/80 7/80	Intersection of Nos. 29 and 55 0.12 0.06 0	(next to return hall door) Total Fib (b) 0 0.11 0.00 0.11 Asbestos F (b) 0 0.04 0.00 0.03 (b) 0 0 0 0	(No. 20) Outside Women's Locker er Concentration (0 'iber Concentration 0 'iber Concentration 0 >5 µm (no./cc of a) 0 >1 µm (no./cc of a)	e of (next to return Room hall door) no./cc of air) 0 0.04 0.34 1 (no./cc of air) 0 0.04 0.23 air) 0 0 0 0 0 0 0 0 0 0 0 0 0	0.04

TABLE F1. RESULTS OF ANALYSES OF AIR SAMPLES IN LIFETIME FEED STUDIES OF TREMOLITE IN RATS (a)

Date	Return Hall	Service Hall (halls 55 and 56)	Room 31	Room 34	Blank
		Total Fiber Conce	ntration (no./cc	of air)	
6/78 1/79 2/80	0.07 0.048	0.048	0.13 0.048	0.17 0.24	0.04
7/80		. 0.26	0.03	0.20	0.03
		Asbestos Fiber Conc	entration (no./c	c of air)	
6/78 1/79	0.04		0.04	0.04	0
2/80	0.048	0.048	0	0.14 0.09	0
7/80		0.20	0.03	0.09	U
C /7 0	<u></u>	Σο μια (I			
6/78 1/79	0		0	0	0
2/80 7/80	0	0 0.06	0	0 0	0
1100			no./cc of air)	Ŭ	Ū
6/78			······································		
1/79	0	0	0	0.04	0
2/80 7/80	0	0 0.14	0 0	0.05 0.06	0
Date	Service Hall	Wash Area Room 48		e Area	Room 56
		Total Fiber Conce	ntration (no./cc	of air)	
6/78 1/79 2/80	0				
7/80		0.06	0.3	11	0.09
		Asbestos Fiber Con	centration (no./c	c of air)	
6/78 1/79	0				
2/80	U			~~	0.00
7/80		0	0.0	03	0.09
		>5 μm ()	no./cc of air)		
6/78 1/79	0				
2/80 7/80		0	0		0
			no./cc of air)		
6/78					
1/70	0				
1/79 2/80			0.		0.0 9

TABLE F1. RESULTS OF ANALYSES OF AIR SAMPLES IN LIFETIME FEED STUDIES OF TREMOLITE IN RATS (Continued)

(a) Samples analyzed by IITRI; the computations are based on a 1 liter/min sample rate and a 6-h sample period = 360 min.
(b) Sample holder was damaged.

APPENDIX G

SUMMARY OF CLINICAL SIGNS OBSERVED PRIOR TO MORIBUND KILL IN THE LIFETIME FEED STUDIES OF TREMOLITE

 SUMMARY OF CLINICAL SIGNS OBSERVED IN RATS BEFORE MORIBUND KILL IN THE LIFETIME FEED STUDIES OF TREMOLITE: CONTROL	178
SUMMARY OF CLINICAL SIGNS OBSERVED IN RATS BEFORE MORIBUND KILL IN THE LIFETIME FEED STUDIES OF TREMOLITE: 1%	179

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		<u>cs 83-87</u> Female		<u>s 88-92</u> Female		<u>ks 93-97</u> Female	<u>Weeks</u> Male	<u>98-102</u> Female
Number of animals killed in moribund condition	2	2	1	1	4	2	2	1
Pale	2	2	1	1	1	1	4	•
Fale Fhin		2		1	1	2		1
Hunched		1			1	4		*
Bloody crust around nose		1				1		
					1	1		
Pale eyes Bloody crust around eye(s)		1			1	1		
Head tilt		1				•		
Depressed		1			2	2		1
Circling		1			-	-		-
Loss of equilibrium		•				1		
Loss of righting reflex						-		1
Ataxia		1						
Palpable mass in abdomen		1			1	1		
Tissue mass (abscessed)lower midline,					-	-		
chest, side of back, forelimb, head,								
neck, or side of body	2		1		1	1		
Abdomen distended and/or dark	2		•		2	-	1	
Abdomen firm					4		î	
Paralysis (flaccid) in hind legs							1	
		1					•	
Extremities yellow		1		1				
Discharge (red) from anus				I		1		
Urine stains						1		
			Weeks	103-107		Weeks	108-112	
			Male	Female		Male	Female	
Number of animals killed in moribund con	dition		7	7		9	4	
Pale	antion		4	4		4	3	
Thin			4	1		7	2	
Hunched				*		2	-	
nuncheu								
Pala avea						1		
						1 1		
Head tilt			9	A		1	9	
Head tilt Depressed			3	4		1 3	2	
Pale eyes Head tilt Depressed Labored respiration						1 3 1	2	
Head tilt Depressed Labored respiration Loss of equilibrium			3 1	1		1 3	2	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex						$ \begin{array}{c} 1 \\ 3 \\ 1 \\ 2 \end{array} $	2	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head			1	1 1		1 3 1 2 1		
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head Palpable mass in abdomen	1			1		$ \begin{array}{c} 1 \\ 3 \\ 1 \\ 2 \end{array} $	2	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head Palpable mass in abdomen Tissue mass (abscessed)lower midline, c	hest, side	e of back,	1 3	1 1 4		1 3 1 2 1 2	1	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head Palpable mass in abdomen Tissue mass (abscessed)lower midline, c forelimb, head, neck, or side of body	hest, side	e of back,	1	1 1		1 3 1 2 1	1	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head Palpable mass in abdomen Tissue mass (abscessed)lower midline, c forelimb, head, neck, or side of body Abscessed areaperineal region	hest, side	e of back,	1 3 2	1 1 4		1 3 1 2 1 2	1	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head Palpable mass in abdomen Tissue mass (abscessed)lower midline, c forelimb, head, neck, or side of body Abscessed areaperineal region Abdomen distended and/or dark	hest, side	e of back,	1 3	1 1 4		1 3 1 2 1 2	1 1 1	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head Palpable mass in abdomen Tissue mass (abscessed)lower midline, c forelimb, head, neck, or side of body Abscessed areaperineal region Abdomen distended and/or dark Dark wet stains entire ventral surface	hest, side	e of back,	1 3 2	1 1 4		1 3 1 2 1 2	1 1 1	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head Palpable mass in abdomen Tissue mass (abscessed)lower midline, c forelimb, head, neck, or side of body Abscessed areaperineal region Abdomen distended and/or dark Dark wet stains entire ventral surface Animal prostrate in cage	hest, side	e of back,	1 3 2	1 1 4 2		1 3 1 2 1 2	1 1 1	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head Palpable mass in abdomen Tissue mass (abscessed)lower midline, c forelimb, head, neck, or side of body Abscessed areaperineal region Abdomen distended and/or dark Dark wet stains entire ventral surface Animal prostrate in cage Swelling around neck	hest, side	e of back,	1 3 2 1	1 1 4		1 3 1 2 1 2	1 1 1	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head Palpable mass in abdomen Tissue mass (abscessed)lower midline, c forelimb, head, neck, or side of body Abscessed areaperineal region Abdomen distended and/or dark Dark wet stains entire ventral surface Animal prostrate in cage Swelling around neck Cyanotic	hest, side	e of back,	1 3 2 1	1 1 4 2		1 3 1 2 1 2 2	1 1 1 1	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head Palpable mass in abdomen Tissue mass (abscessed)lower midline, c forelimb, head, neck, or side of body Abscessed areaperineal region Abdomen distended and/or dark Dark wet stains entire ventral surface Animal prostrate in cage Swelling around neck Cyanotic Unkempt	hest, side	e of back,	1 3 2 1	1 1 4 2		1 3 1 2 1 2 2	1 1 1	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head Palpable mass in abdomen Tissue mass (abscessed)lower midline, c forelimb, head, neck, or side of body Abscessed areaperineal region Abdomen distended and/or dark Dark wet stains entire ventral surface Animal prostrate in cage Swelling around neck Cyanotic Unkempt Inactive	hest, side	e of back,	1 3 2 1	1 1 4 2		1 3 1 2 1 2 2	1 1 1 1	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head Palpable mass in abdomen Tissue mass (abscessed)lower midline, c forelimb, head, neck, or side of body Abscessed areaperineal region Abdomen distended and/or dark Dark wet stains entire ventral surface Animal prostrate in cage Swelling around neck Cyanotic Unkempt Inactive Discharge (red) from penis	hest, side	e of back,	1 3 2 1	1 4 2 1		1 3 1 2 1 2 2	1 1 1 1	
Head tilt Depressed Labored respiration Loss of equilibrium Loss of righting reflex Noduleneck, head Palpable mass in abdomen Tissue mass (abscessed)lower midline, c forelimb, head, neck, or side of body Abscessed areaperineal region Abdomen distended and/or dark Dark wet stains entire ventral surface Animal prostrate in cage Swelling around neck Cyanotic Unkempt Inactive	hest, side	e of back,	1 3 2 1	1 1 4 2		1 3 1 2 1 2 2	1 1 1 1	

TABLE G1. SUMMARY OF CLINICAL SIGNS OBSERVED IN RATS BEFORE MORIBUND KILL IN THE
LIFETIME FEED STUDIES OF TREMOLITE: CONTROL (a)

(a) The intervals were arbitrarily selected based on weeks when a large percentage of moribund kills occurred. Clinical signs observed after the last interval selected were believed not to be readily discernible from signs of aging.

	Weel	<u>ks 83-87</u>	Weel	ks 88-92	Weel	<u>cs 93-97</u>		98-102
	Male	Female	Male	Female	Male	Female	Male	Female
Number of animals killed in moribund condition	6	3	5	5	3	8	6	7
Pale			1	1	2	3	2	4 3
Thin	2	1	2	1	2	5	3	3
funched	1		1					
acrimating eyes Bloody crust or red stains around eyes	1			1				
Pale eyes	1		2	-	2	2	1	
Head tilt	-	1			1		1	2
falocclusion						1		1
Rapid respiration	1			1		1		1
Labored respiration	1 1				1	1		1
Vheezing Cyanotic	1					•		1
Depressed			1	3	3	2	2	4
nactive			-	-			1	
Abdomen distended and/or dark					2			
Palpable mass in abdomen	2	1	3	1	2	4	4	3
Fissue mass (abscessed)axilla, thoracic region,								
sacral region, hind leg, mouth, ear, chest, head,			~			=	4	2
midline, flank, or shoulder	1	2	3 1		1	5	4	4
Rough hair coat	1		1					1
Alopecia Prostrate in cage	1			2		1		-
Loss of pain perception	-			1		-		
Flaccid muscle tone	1			1		1		
Circling					1			
Ataxia				1				2
Loss of coordination or equilibrium							1	2
Paralysis (flaccid) in hind legs	1			1				
Swollen and stiff leg			2	1			1	
Yellow tinge Cold to touch	1		2	1	1	2		
Unkempt	-						1	
Aggressive behavior								1
Urine stains					1	1		
Weight loss							1	
			Weeks	103-107		Wooks	108-112	
			Male	Female		Male	Female	
Number of animals killed in moribund condition			9	10		12	15	
Pale			2	2		4	7	
Thin			4	7		4	3 1	
Hunched				1		-	1	
Bloody crust or red stains around eyes Pale eyes							1	
Dark eyes			1					
Head tilt			1	1				
Malocclusion						1		
Salivating						0	1	
Depressed			2	4		2	3	
Inactive			1	1		1	1	
Nodule(s) Protruding anal nodule				1		-	1	
Protruding anal nodule Abdomen distended or dark						1	-	
Palpable mass in abdomen			5	3		6	11	
Tissue mass (abscessed)axilla, thoracic region, sacral							~	
Tissue mass (abscessed)axilla, thoracic region, sacral region, hind leg, mouth, chest, head, midline, flank	τ,			3		3	5	
Tissue mass (abscessed)axilla, thoracic region, sacral region, hind leg, mouth, chest, head, midline, flank or shoulder	τ,		1	0				
Tissue mass (abscessed)axilla, thoracic region, sacral region, hind leg, mouth, chest, head, midline, flank or shoulder Circling	τ,		1					
Tissue mass (abscessed)axilla, thoracic region, sacral region, hind leg, mouth, chest, head, midline, flank or shoulder Circling Loss of coordination or equilibrium	ι,		1 3	2				
Tissue mass (abscessed)axilla, thoracic region, sacral region, hind leg, mouth, chest, head, midline, flank or shoulder Circling Loss of coordination or equilibrium Paralysis (flaccid) in hind legs	ι,		1 3 1			2	1	
Tissue mass (abscessed)axilla, thoracic region, sacral region, hind leg, mouth, chest, head, midline, flank or shoulder Circling Loss of coordination or equilibrium Paralysis (flaccid) in hind legs Unkempt	ι,		1 3				1	
Tissue mass (abscessed)axilla, thoracic region, sacral region, hind leg, mouth, chest, head, midline, flank or shoulder Circling Loss of coordination or equilibrium Paralysis (flaccid) in hind legs Unkempt Urine stains	τ,		1 3 1 1	2			1	
Tissue mass (abscessed)axilla, thoracic region, sacral region, hind leg, mouth, chest, head, midline, flank	τ,		1 3 1	2			1	

TABLE G2. SUMMARY OF CLINICAL SIGNS OBSERVED IN RATS BEFORE MORIBUND KILL IN THE LIFETIME FEED STUDIES OF TREMOLITE: 1% (a)

(a) The intervals were arbitrarily selected based on weeks when a large percentage of moribund kills occurred. Clinical signs observed after the last interval selected were believed not to be readily discernible from signs of aging.

APPENDIX H

FEED AND COMPOUND CONSUMPTION BY RATS IN THE LIFETIME FEED STUDIES OF TREMOLITE

PAGE

	FEED AND COMPOUND CONSUMPTION BY MALE RATS FOR REPRESENTATIVE WEEKS IN THE LIFETIME FEED STUDY OF TREMOLITE	182
TABLE H2	FEED AND COMPOUND CONSUMPTION BY FEMALE RATS FOR REPRESENTATIVE WEEKS IN THE LIFETIME FEED STUDY OF TREMOLITE	183

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TABLE H1. FEED AND COMPOUND CONSUMPTION BY MALE RATS FOR REPRESENTATIVE WEEKSIN THE LIFETIME FEED STUDY OF TREMOLITE

	Cor	itrol	1% Tremolite					
Week	Grams Feed/ Day (a)	Body Weight (grams)	Grams Feed/ Day(a)	Body Weight (grams)	Dose/Day (c)			
17	17	350	16	252	635			
27	17	348	17	307	554			
37	17	395	17	341	499			
47	17	390	17	357	476			
57	17	429	16	386	415			
67	19	463	18	416	433			
77	17	469	17	426	399			
87	17	466	15	432	347			
97	18	461	14	427	328			
107	17	444	16	418	383			
117	16	420	16	396	404			
127	15	398	16	368	435			
137	16	367	17	348	489			
ean	16.9	415	16.3	375	446			
) (d)	1.0		1.0		84.6			
/(e)	5.6		6.3		19.0			

(a) Grams of feed removed from the feeder per animal per day; not corrected for scatter.
(b) Grams of feed per day for the dosed group divided by that for the controls
(c) Estimated milligrams of tremolite consumed per day per kilogram of body weight

(d) Standard deviation

(e) Coefficient of variation = (standard deviation/mean) \times 100

TABLE H2.	FEED	AND	COMPOUN	d CO	NSUMP 1	TION 1	BY	FEMALE	RATS	FOR	REPRESENTAT	IVE
WEEKS IN THE LIFETIME FEED STUDY OF TREMOLITE												

	Con	trol	1% Tremolite					
Week	Grams Feed/ Day (a)	Body Weight (grams)	Grams Feed/ Day (a)	Body Weight (grams)	Dose/Day (c)			
17	12	182	11	166	663			
27	13	199	12	185	649			
37	12	220	12	199	603			
47	12	224	13	214	607			
57	13	251	13	233	558			
67	14	281	13	265	491			
77	14	303	14	277	505			
87	15	323	12	298	403			
97	14	323	12	295	407			
107	14	330	14	303	462			
117	13	320	14	293	478			
127	13	316	(d) 29	286	(e) 1,014			
137	14	299	14	264	530			
147	13	283	13	255	510			
lean	13.3	275	14.0	252	563			
D (f)	0.9		4.4		153.0			
V(g)	6.9		31.6		27.2			

(a) Grams of feed removed from the feeder per animal per day; not corrected for scatter.
(b) Grams of feed per day for the dosed group divided by that for the controls
(c) Estimated milligrams of tremolite consumed per day per kilogram of body weight
(d) If this value is excluded, the mean and standard deviation are 12.8 and 1.0.

(e) If this value is excluded, the mean and standard deviation are 528 and 84.2.

(f) Standard deviation

(g) Coefficient of variation = (standard deviation/mean) \times 100