

ACTIVITIES REPORT  
REGISTRY OF TUMORS IN LOWER ANIMALS

1965 - 1973 + 1977, 1978, 1979

JOHN C. HARSHBARGER, DIRECTOR

SUPPLEMENTS

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REGISTRY OF TUMORS IN LOWER ANIMALS  
NATIONAL MUSEUM OF NATURAL HISTORY  
ROOM W-216A  
SMITHSONIAN INSTITUTION  
WASHINGTON, D.C. 20560

## ESTABLISHMENT, OBJECTIVES, AND OPERATION

The Registry of Tumors in Lower Animals was begun in 1965 as a cooperative project between the National Cancer Institute (Contract No. N01-CB-33874) and the Smithsonian Institution to study tumors in invertebrate and poikilothermic vertebrate animals. Objectives are: (1) to collect, identify, characterize, and preserve specimens with neoplasms and related disorders from natural habitats, zoos, aquaria, and laboratory experiments; (2) to conduct and promote experimental studies of the nature, incidence, and etiology of these diseases; and, (3) to analyze, correlate, and disseminate pertinent published and unpublished information. As a result of such efforts, a number of benefits may accrue:

1. An improved understanding of the biology of cancer as it occurs at various levels of phylogeny.
2. Evidence concerning the question of whether certain animals may be exempt from cancer, and if so, why.
3. Evidence that may lead to discovery of new etiologic agents in cancer.
4. Evidence of carcinogens in the environment.
5. Evidence that may bear on certain theories of cancer: e.g., the oncogene theory, the clonal selection theory, the somatic mutation theory, and others.
6. Discovery of types of animals that may be useful in cancer research because of specific features such as differences in immunological complexity, unusual sensitivity or resistance to carcinogens, ability to concentrate certain elements, such as Hg, Cu, or Zn, genetic features influencing cancer rates, ability to reject tumors by autectomy, and so on.
7. Discovery of possible reservoirs or vectors of oncogenic viruses.
8. Identification and protection of populations in possible jeopardy from epizootic neoplasia.
9. Maintenance of a proper perspective among citizens concerned about the significance of reports of cancer among lower animals of economic importance.

After specimens with cryptogenic and induced lesions are received they are photographed, studied grossly and microscopically and stored for easy retrieval. An effort is made to determine the nature of the lesion or verify the diagnosis of the contributor, often after getting the opinion of one or more specialists for the type of animal or tissue involved. When specimens are received which appear to be good research models for furthering the understanding of neoplastic processes, research projects may be initiated by the Registry with the consent of the contributor.

## PHYSICAL PLANT

Laboratory, storage, and office space occupies three rooms in the National Museum of Natural History, Smithsonian Institution, Tenth and Constitution Avenue, Northwest, Washington, D.C. In addition, the Registry has use of electron microscope, darkroom, and aquarium facilities. Library and duplication services are also available.

## INFORMATION CONCERNING THIS REPORT

This report is cumulative for all accessions in the Registry's collection as of 5 December 1973. It supersedes earlier reports in that most cases previously listed as pending now have diagnoses and some cases have been reinterpreted following additional study. As a new feature, pertinent references are given for those accessions that have been specifically described in the literature or that exemplify a type of disease that has been the subject of a series of papers.

Additional information concerning selected unpublished cases can be made available on request. Persons interested in the comparative study of slides in the collection may either visit the Registry or request duplicate slides on short-term loan. Slides do not circulate from accessions that do not contain duplicate material; those that contain rare and irreplaceable material; and accessions that are being worked up for publication by the contributor. Anyone desiring to publish photographs from such comparative studies is expected to obtain permission from the contributor. Twenty sets of 20 slides each are available as instructional aides.

This report is being distributed to all contributors whose address is still known and to other persons who have expressed an interest in the work of the Registry and/or tumors in lower animals. It is also being sent to selected persons known to be studying diseases in various cold-blooded vertebrates and invertebrates for their possible interest in this peripheral field. Approximately 2,000 copies will be distributed.

## DISTRIBUTION OF SPECIMENS IN THE COLLECTION

Specimens are accessioned individually except when groups of the same species having similar pertinent parameters (collecting site; type of disease; same experimental study, etc.) are received at the same time. We have been particularly fortunate that several collections of research material have been contributed en masse: e.g., RTLA 577 by Dr. William R. Duryee; RTLA 809 by Dr. Gladys S. King; and RTLA 443 by Miss Leora Stark, Mr. Douglas A. Stark, and Dr. James C. Dahl for Dr. Mary B. Stark.

As of 5 December 1973 there were 887 accessions in the collection distributed as follows:

## DISTRIBUTION OF SPECIMENS IN THE COLLECTION (CONTD)

	<u>Neoplastic</u>	<u>Non-neoplastic</u>	<u>Indeterminant</u>	<u>Total</u>
Reptiles	38	53	0	91
Amphibians	41	36	0	77
Bony fish	252	156	22	430
Sharks	3	7	0	10
Lampreys	1	3	0	4
Tunicates	0	6	0	6
Mollusks	68	61	1	130
Echinoderms	0	5	1	6
Arthropods	6	73	3	82
Annelids	0	22	0	22
Acanthocephala	0	1	0	1
Platyhelminths	0	10	0	10
Coelenterates	0	7	7	14
Porifera	0	1	1	2
Protozoa	0	1	0	1
Fungi	0	1	0	1
	<u>409</u>	<u>443</u>	<u>35</u>	<u>887</u>

The non-neoplastic lesions include infectious and parasitic granulomas, developmental anomalies, and injury and wound repair. Indeterminant lesions either have not been fully examined or the material is inadequate for diagnosis.

Among the accessions with neoplasms, additional diseased specimens can be field collected in the following cases:

Tiger salamander	Fibroma/papilloma	Southcentral USA
Cunner	Papilloma	Northeast USA
White croaker	Papilloma	California, USA
Atlantic eel	Papilloma	Europe
Various flatfish	Papilloma	Western USA
Rock oyster	Papilloma	Australia
American oyster	Hematopoietic neoplasm	Eastern USA
Leopard frog	Renal adenocarcinoma	Northeast/Northcentral USA
Green turtle	Fibroma	Hawaii/Caribbean
Northern pike	Lymphosarcoma	Europe/North America
Various catfish	Papilloma/carcinoma	USA
Yellowfin goby	Papilloma	Japan/Korea
Goldfish	Fibroma	USA
Muskellunge	Lymphoma	North America

## SUBMITTING SPECIMENS

We invite you to help in building this collection by submitting examples of induced or naturally occurring neoplasms, pre-neoplastic conditions, or indeterminate lesions of a presumptive neoplastic nature that require confirmation. As there is an indistinct boundary between

neoplastic disease and the process of inflammation, repair, and regeneration, examples of the latter processes are also useful to establish points of reference. If we prepare the material histologically, a set of slides will be returned to the contributor with our diagnosis.

Specimens are accepted alive, fixed, in blocks, and on slides. Frozen specimens are generally unsatisfactory for preparation of good histological material, but sometimes are useful when an infectious agent must be sought.

Many specimens arrive poorly fixed for the following reasons:

1. Delay in fixation - Specimens should be fixed immediately after death or when death is imminent since degeneration in some cells begins premortem. If a delay is unavoidable, specimens should be kept cool in the interim, BUT NOT FROZEN.
2. Slow or incomplete penetration - To remedy this we recommend:
  - a. Always open body cavity or inject fixative;
  - b. Either inject the fixative or preferably, make deep transverse incisions intermittently along the length of large tumors and organs. This is especially important for fixatives that penetrate slowly (e.g., 10 percent formalin);
  - c. Use fixatives that penetrate rapidly (Bouin's works well for fish, Davidson's for marine mollusks, and Dietrich's [FAA] for insects);
  - d. Remove air from the trachae of insects by subjecting them to negative pressure (vacuum chamber) while immersed in the fixative for as long as bubbles continue to appear; and,
  - e. For electron microscopy submit bits of tissue, less than 2 mm in diameter, in glutaraldehyde.
3. Insufficient volume of fixative - A volume of chemical ten times the volume of the specimen is recommended.

#### REPRINT LIBRARY

A continuing project to assemble a complete library of reprints relating to neoplasms in invertebrates and poikilothermic vertebrate animals presently contains more than 2,500 reprints (see computer abstract form on next page) is nearing completion. Following final editing, searches will be made at a reasonable cost. WE WILL NOT HONOR REQUESTS FOR XEROX COPIES OF REPRINTS.

## COMPUTER ABSTRACT FORM FOR REPRINT FILE

001: Author:  
 002: Date:  
 003: Title:  
 004: Journal information:  
 005: Serial number:  
 006: Review Antitumor agent Research Associated material Vector  
 007: Corresponding RTLA number:  
 008: Language (if not English):  
 009: Phylum: 013: Genus:  
 010: Class: 014: Species:  
 011: Order: 015: Strain:  
 012: Family:  
 016: Continent: 019: City/County  
 017: Country: 020: Habitat:  
 018: State/Province: F M E T  
 021: Neoplastic Borderline Tumor Hyperplastic Hypertrophy  
 Mutagenic Developmental anomaly Infectious Inflammation  
 Injury and repair Toxic Normal  
 022: Epithelial Nonepithelial  
 023: System of origin: Integumentary Skeletal Nervous Circulatory  
 Endocrine Digestive Excretory Reproductive Respiratory  
 Mesenchymal Sensory Muscular Hematopoietic  
 024: Organ of origin:  
 025: Cell of origin:  
 026: Diagnosis:  
 027: Transmission: Cell free extract Tissue homogenate  
 Graft Other:  
 028: Induced?  
 029: Invasive?  
 030: Metastasis?  
 031: Physiology:  
 032: Virus, RNA, DNA 036: Bacteria:  
 033: Chemical: 037: Protozoa:  
 034: Transplant/Graft: 038: Fungus:  
 035: Physical: Radiation 039: Parasite:  
 Trauma Temperature 040: Genetics:  
 Other:

## RESEARCH

While several research projects in cooperation with contributors are in early phases, the principal study has been on the nature, incidence, and etiology of epidermal carcinomas and papillomas in several populations of fish, under the auspices of the Committee on Comparative Oncology of the Union Internationale Contre le Cancer (UICC). This Committee is composed of eight scientists each of which, with a small work group, is making an in-depth study of one or two particular populations of lower animals with a significant incidence of a neoplastic disease. The purposes and objectives of this Committee have been described in detail by its Chairman (Dawe, C. J. Comparative Oncology and Environmental Carcinogens. UICC Bull. Cancer, 8(4): 2-3; Dec. 1970).

## PAPERS WITH AVAILABLE COPIES

- Harshbarger, J. C. & R. L. Taylor. Neoplasms of Insects. Annu. Rev. Entomol., 13: 159-190. (1968).
- Cantwell, G. E., J. C. Harshbarger, R. L. Taylor, C. Kenton, M. S. Slatick, & C. J. Dawe. A Bibliography of the Literature on Neoplasms of Invertebrate Animals. GANN Monogr. 5, pp. 57-84. (1968).
- Harshbarger, J. C. The Registry of Tumors in Lower Animals. Natl. Cancer Inst. Monogr. 31, pp. XI-XVI. (1969).
- Harshbarger, J. C. & G. W. Bane. Case Report of a Fibrolipoma on a Rockfish, Sebastes diploproa. Natl. Cancer Inst. Monogr. 31, pp. 219-221. (1969).
- Dawe, C. J. & J. C. Harshbarger (ed.). Natl. Cancer Inst. Monogr. 31: Neoplasms and Related Disorders of Invertebrate and Lower Vertebrate Animals. 772 pp. (1969).
- Harshbarger, J. C., G. E. Cantwell, & M. F. Stanton. Effects of N-nitrosodimethylamine on the Crayfish, Procambarus clarkii. In: Proceedings: IVth International Colloquium on Insect Pathology [held in conjunction] with The Society for Invertebrate Pathology, 25-28 August 1970, College Park, Md., pp. 425-430. (1970).
- Cosgrove, G. E. & J. C. Harshbarger. Testicular Tumor in a Salamander. J. Amer. Vet. Med. Assoc., 159: 582. (1971).
- Zwart, P. & J. C. Harshbarger. Hematopoietic Neoplasms in Lizards: Report of a Typical Case in Hydrosaurus amboinensis and of a Probable Case in Varanus salvator. Intl. J. Cancer, 9: 548-553. (1972).
- Harshbarger, J. C. Work of the Registry of Tumours in Lower Animals with Emphasis on Fish Neoplasms. Symp. Zool. Soc. London, No. 30: 285-303. (1972).
- Harshbarger, J. C. Invertebrate Animals--What Can They Contribute to Cancer Research? Fed. Proc., 32: 2224-2227. (1973).

- RTLA 350. Fiddler crab, Uca pugilator  
 Material: Three gross specimens with darkened areas on ventral cuticle  
 Diagnosis: Thickened cuticular laminae; no explanation  
 Submitter: A. C. Smith
- RTLA 351. Turtle (Green sea?) Chelonia mydas (?)  
 Material: Two enlarged lymph pumps  
 Diagnosis: No significant histologic abnormality  
 Submitter: A. C. Smith
- RTLA 352. Hermit crab, Pagurus sp.  
 Material: Gross specimen with abdominal swellings  
 Diagnosis: Thickened irregular focus in exoskeleton  
 Submitter: A. C. Smith  
 Reprint: [see RTLA 329]
- RTLA 353. Pen shell  
 Material: Two pieces of mantle with black shiny growths  
 Diagnosis: Pearl forming cyst on mantle  
 Submitter: A. C. Smith
- RTLA 354. Worm, Nereis (?) sp.  
 Material: Gross specimen with abrupt change in pigmentation  
 Diagnosis: Normal testis  
 Submitter: A. C. Smith
- RTLA 355. Sea hare, Aplysia sp.  
 Material: Gross specimen with wound in parapodium  
 Diagnosis: Bacterial growth and necrosis under skin fold  
 Submitter: A. C. Smith
- RTLA 356. Sea hare, Aplysia dactylomela  
 Material: Piece of tissue with soft elevated growth  
 Diagnosis: Developmental anomaly; all cells normal  
 Submitter: A. C. Smith  
 Reprint: [see RTLA 329]
- RTLA 357. Sea hare, Aplysia sp.  
 Material: Gross specimen with pale patches  
 Diagnosis: Subepidermal edema  
 Submitter: A. C. Smith
- RTLA 358. Sea hare, Aplysia dactylomela  
 Material: Gross specimen with large growth on right parapodium  
 Diagnosis: Developmental anomaly  
 Submitter: A. C. Smith  
 Reprint: [see RTLA 329]
- RTLA 359. Sea anemone  
 Material: Gross specimen with brown protrusions on column  
 Diagnosis: Normal ova  
 Submitter: A. C. Smith



- RTLA 651. Green turtle, Chelonia mydas  
 Material: Six microscope slides  
 Diagnosis: Fibropapilloma  
 Submitter: R. M. Overstreet *FLORIDA KEYS*
- RTLA 652. Lingcod, Ophiodon elongatus  
 Material: One piece of tissue  
 Diagnosis: Lymphocystis  
 Submitter: G. R. Bell
- RTLA 653. Sockeye salmon, Oncorhynchus nerka  
 Material: An excised growth  
 Diagnosis: Papillary adenocarcinoma  
 Submitter: G. R. Bell
- RTLA 654. Florida softshell (turtle), Trionyx ferox  
 Material: Three microscope slides  
 Diagnosis: Granulocytic neoplasm versus a reticulum cell sarcoma  
 Submitter: P. Zwart
- RTLA 655. Goldfish, Carassius auratus  
 Material: The right half of the head and a transverse section  
 through the gill chamber  
 Diagnosis: Fibroma  
 Submitter: E. C. Bay
- RTLA 656. Leopard frog, Rana pipiens  
 Material: Two microscope slides  
 Diagnosis: Epidermal papilloma  
 Submitter: B. J. Cohen
- RTLA 657. Leopard frog, Rana pipiens  
 Material: Four microscope slides  
 Diagnosis: Squamous cell carcinoma  
 Submitter: B. J. Cohen
- RTLA 658. Leopard frog, Rana pipiens  
 Material: Four microscope slides  
 Diagnosis: Squamous cell carcinoma; epidermal hyperplasia  
 Submitter: B. J. Cohen
- RTLA 659. Leopard frog, Rana pipiens  
 Material: Two microscope slides  
 Diagnosis: Dermal gland adenocarcinoma  
 Submitter: B. J. Cohen
- RTLA 660. Leopard frog, Rana pipiens  
 Material: Eight microscope slides  
 Diagnosis: Invasive squamous cell carcinoma  
 Submitter: B. J. Cohen
- RTLA 661A. & B. Spotted-newt, Notophthalmus viridescens  
 Material: Six pathologic gross specimens; two normal gross specimens  
 Diagnosis: Adiaspiromycosis  
 Submitter: N. Cohen

RTLA 1813 (contd.)

Diagnosis: Sarcosporidiosis  
Submitter: B. L. Munday

RTLA 1814. Rainbow trout, Salmo gairdneri

Material: Sixteen microscope slides; 3 color transparencies  
Diagnosis: Malignant lymphoma, diffuse, poorly-differentiated type  
Submitter: C. E. Smith

RTLA 1815. Heteropneustes fossilis

Material: Two microscope slides; 4 pieces of a growth; 1 black and white photograph  
Diagnosis: Lipoma  
Submitter: J. Pal

RTLA 1816. Hawksbill turtle, Eretmochelys imbricata

Material: Tissue: section of small intestine adjacent to stomach -- growth associated with metal fragment  
Habitat: Held in captivity at the Waikiki Aquarium, Waikiki, Hawaii  
Diagnosis: Granuloma  
Submitter: G. H. Balazs

RTLA 1817. Boa constrictor

Material: Gross specimen  
Habitat: Captive bred; Los Angeles, California  
Diagnosis: Acute necrotizing enteritis  
Submitter: I. Gorman

RTLA 1818. Oyster

Material: Twenty microscope slides  
Habitat: Laboratory; Narragansett, Rhode Island  
Diagnosis: Arsenic induced hematopoiesis  
Submitter: P. P. Yevich

RTLA 1819. Timber rattlesnake, Crotalus horridus horridus

Material: One microscope slide; necropsy report  
Habitat: Wethersfield Nature Center, Connecticut  
Diagnosis: Angiosarcoma  
Submitter: E. Jacobson and S. W. Nielsen

RTLA 1820. Corn snake, Elaphe guttata guttata

Material: Four microscope slides; necropsy report  
Diagnosis: Extramedullary hematopoiesis versus low grade granulocytic leukemia  
Submitter: E. Jacobson and R. E. Brannian

RTLA 1821. Green lizard, Lacerta viridis

Material: One paraffin block; 1 photomicrograph  
Diagnosis: Epidermal papilloma containing intranuclear virus-like inclusions  
Submitter: E. Elkan

RTLA 1856. Green turtle, Chelonia mydas

Material: Tissue: front flippers with associated pectoral musculature; complete pelvic section including hind flippers and tail; head, neck, heart, and section of lung  
Habitat: Kaneohe Bay, Island of Oahu, Hawaii  
Diagnosis: Fibropapilloma of skin; fibroma of lung  
Submitter: G. H. Balazs

RTLA 1857. African bullfrog, Pyxicephalus adspersus

Material: Digit with multiple nodular growths  
Habitat: Reptile House, San Antonio Zoological Gardens and Aquarium, San Antonio, Texas  
Diagnosis: Osteomyelitis associated with bone destruction and prickle cell hyperplasia  
Submitter: K. C. Fletcher

RTLA 1858-1860. Carp, Cyprinus carpio

Material: Three tissue samples each: liver, gill, and kidney  
Habitat: Kalamazoo River at Plainwell Damsite, Otsego, Michigan  
Diagnosis: Extensive gill hyperplasia probably due to chemical pollution resulting in asphyxiation; liver and kidney tissue "normal"  
Submitter: J. G. Hnath

RTLA 1861. White sucker, Catostomus commersoni

Material: Two tissue samples: gill and liver  
Habitat: Kalamazoo River at Plainwell Damsite, Otsego, Michigan  
Diagnosis: Extensive gill hyperplasia probably due to chemical pollution resulting in asphyxiation; liver tissue "normal"  
Submitter: J. G. Hnath

RTLA 1862. Rainbow trout, Salmo gairdneri

Material: Two pieces of tissue; one microslide  
Diagnosis: Hemangioendotheliosarcoma  
Submitter: C. E. Smith

RTLA 1863, 1864. Black crappie, Pomoxis nigromaculatus

Material: Two cassettes each, containing tissue  
Habitat: Cornwall Lake, Van Buren County, Michigan  
Diagnosis: Probable hematopoietic sarcoma; tissue too autolyzed for a definitive diagnosis  
Submitter: J. G. Hnath

RTLA 1865. California (?) needlefish, Strongylura exilis (?)

Material: Head with multiple growths along the lower jaw; gill with scars; 2, 35 mm color transparencies  
Habitat: Shelter Island, San Diego Bay, California  
Diagnosis: Exuberant, excavating, multifocal bacterial granuloma  
Submitter: G. E. Cosgrove

- RTLA 1883. Green turtle, Chelonia mydas  
Material: Biopsies from tumor surface and surface of "stalk" or attachment site of tumor  
Habitat: Hawaiian Islands then held in captivity for 5+ years  
Diagnosis: Fibropapilloma  
Submitter: G. H. Balazs
- RTLA 1884. Brown trout, Salmo trutta  
Material: A large, white, firm growth with a hollow core, divided into 3 portions; viscera (attachment to growth severed); 1, 35 mm color transparency  
Habitat: Glenarrife, Raikia River, New Zealand  
Diagnosis: Fibroma  
Submitter: N. Boustead
- RTLA 1885. Painted turtle, Chrysemys picta  
Material: Gross specimen with head and shell removed; large, dark red growth on ventral surface of bladder  
Habitat: Wisconsin  
Diagnosis: Hematoma associated with multiple granulomas in response to a worm parasite -- probably nematode  
Submitter: V. Lance
- RTLA 1886. Mexican axolotl, Ambystoma mexicanum  
Material: Two microslides; 1 black and white print of gross specimen  
Diagnosis: Multiple melanophoromas  
Submitter: V. V. Khudoley and V. V. Eliseev
- RTLA 1887. Smokey jungle frog, Leptodactylus pentadactylus  
Material: Three microslides  
Habitat: Seneca Park Zoo, Rochester, New York  
Diagnosis: Generalized leukemoid reaction secondary to acute bacterial (coccal) endocarditis  
Submitter: A. J. Herron
- RTLA 1888. Rainbow trout, Salmo gairdneri  
Material: Liver; kidney and spleen with nodules; pancreas; 1, 35 mm color transparency  
Habitat: Lake Taupo, New Zealand  
Diagnosis: Tissue too autolyzed for diagnosis  
Submitter: N. Boustead
- RTLA 1889. Goldfish, Carassius auratus  
Material: Two microslides  
Diagnosis: Neurilemmoma or possibly some type of pigment cell tumor  
Submitter: J. Carney
- RTLA 1890. Drosophila melanogaster  
Material: One microslide

- RTLA 56. American cockroach, Periplaneta americana  
 Material: Eight slides; 8 vials of specimens; 36 photographs  
 Diagnosis: Abnormal salivary glands induced by ligature or nerve severance  
 Submitter: D. J. Sutherland  
 Reprints: Sutherland, D. J. Experimentally Induced Tumours in Periplaneta americana L. J. Insect Physiol., 9: 131-135. 1963.
- Sutherland, Donald J. The Development of Salivary Tumours in Periplaneta americana (L.) as Induced by Duct Ligation. J. Insect Physiol., 13: 137-152. 1967.
- RTLA 57. Silver dollar or Spotted metynnis, Metynnis maculatus  
 Material: Gross specimen; 7 slides; 2 photographs  
 Diagnosis: Parasitic infestation (protozoan)  
 Submitter: M. Stanton
- RTLA 58. Yellowfin goby, Acanthogobius flavimanus  
 Material: Four fish; 9 slides; 4 photographs  
 Diagnosis: Epithelial papillomas  
 Submitter: Y. Ito
- RTLA 59. Crayfish, Procambarus clarki  
 Material: One crayfish  
 Diagnosis: Limb loss with failure of regeneration; etiology (?)  
 Submitter: C. A. G. Wiersma
- RTLA 60. Leopard frog, Rana pipiens  
 Material: Two slides  
 Diagnosis: Renal adenocarcinoma  
 Submitter: A. Granoff
- RTLA 61. Splitnose rockfish, Sebastes diploproa  
 Material: Nineteen slides; 47 photographs  
 Diagnosis: Lipoma  
 Submitter: J. C. Harshbarger  
 Reprint: Harshbarger, John C. and G. W. Bane. Case Report of a Fibrolipoma on a Rockfish, Sebastes diploproa. Natl. Cancer Inst. Monogr. 31: 219-221. 1969.
- RTLA 62. White croaker, Genyonemus lineatus  
 Material: Numerous fish; slides; photographs  
 Diagnosis: Epithelial papillomas  
 Submitter: J. C. Harshbarger  
 Reprint: Harshbarger, John C. Work of the Registry of Tumours in Lower Animals with Emphasis on Fish Neoplasms. Symp. Zool. Soc. London, No. 30: 285-303. 1972.
- RTLA 63. Giant leathery turtle, Dermochelys coriacea  
 Material: Nine slides; 3 photographs  
 Diagnosis: Granulomatous reaction; etiology (?)  
 Submitter: J. R. Hendrickson

- RTLA 117. Cobra, Naja naja  
 Material: Heart and tumor-like growth of specimen  
 Diagnosis: Fibrinous pericarditis and subepicardial myocarditis  
 Submitter: W. E. Haast
- RTLA 118. Largescale sucker, Catostomus macrocheilus  
 Material: Specimen of anal fin; 7 photographs; 2 slides  
 Diagnosis: Papillary epithelioma (non-invasive)  
 Submitter: J. R. Adams
- RTLA 119. Planarians, Dugesia and Crenobia  
 Material: Seven slides  
 Diagnosis: Histopathologic effects of insecticides  
 Submitter: H. An der Lan  
 Reprint: An der Lan, Hannes. Histopathologische Auswirkungen von Insektiziden (DDT und Sevin) bei Wirbellosen und ihre cancerogene Beurteilung. Mikroskopie, 17: 85-112. 1962.
- RTLA 120. Water snake, Xenochrophis piscator  
 Material: Nine slides; 8 photographs  
 Diagnosis: Granulomas  
 Submitter: P. Zwart
- RTLA 121. Green turtle, Chelonia mydas  
 Material: Six bottles of specimens; 5 slides; 27 photographs  
 Diagnosis: Fibroma  
 Submitter: A. C. Smith *Hawaii*
- RTLA 122. Skipjack tuna, Euthynnus pelamis  
 Material: Two photographs; 2 slides  
 Diagnosis: Puffy snout disease (fibrosis and inflammation)  
 Submitter: J. C. Marr
- RTLA 123. Mountain pine beetle, Dendroctonus ponderosae  
 Material: Three beetles with cuticular vesicle on elytral declivities  
 Diagnosis: Possible physical trauma in emergence  
 Submitter: G. D. Amman
- RTLA 124. Firemouth, Cichlasoma meeki  
 Material: One fish; 2 slides; 11 photographs  
 Diagnosis: Mechanical injury  
 Submitter: H. McCarthy
- RTLA 125. Pilot black snake, Elaphe obsoleta obsoleta  
 Material: One snake; 9 slides; 7 photographs  
 Diagnosis: Infectious granuloma  
 Submitter: R. Tuck, Jr.
- RTLA 126. Edible shrimp, Penaeus aztecus  
 Material: Two gross specimens; 10 photographs  
 Diagnosis: Ulcerative ventral lesion posterior to walking legs  
 Submitter: R. Neal

RTLA 1763 (contd.)

Material: Nine microscope slides; collecting data  
Habitat: Chesapeake Bay; Old Field, Chester River  
Diagnosis: Undifferentiated sarcoma  
Submitter: S. V. Otto

RTLA 1764. American oyster, Crassostrea virginica

Material: Five microscope slides; collecting data  
Habitat: Chesapeake Bay; Chester River, Piney Point  
Diagnosis: Undifferentiated sarcoma  
Submitter: S. V. Otto

RTLA 1765. American oyster, Crassostrea virginica

Material: One microscope slide; collecting data  
Habitat: Chesapeake Bay; Broad Creek, Middleground  
Diagnosis: Hematopoietic neoplasm  
Submitter: S. V. Otto

RTLA 1766. Hard clam, Mercenaria mercenaria

Material: One microscope slide  
Diagnosis: Nuclear inclusions in gonad  
Submitter: S. V. Otto

RTLA 1767. Green turtle, Chelonia mydas

Material: Six pieces of tissue consisting of rugose growths attached to the skin of the lower jaw, right limb, and surrounding both eyes; 4, 35 mm color transparencies  
Habitat: Kailua Beach, Island of Oahu, Hawaii  
Diagnosis: Fibropapillomas  
Submitter: G. H. Balazs

RTLA 1768. Mexican axolotl, Ambystoma mexicanum

Material: Three pieces of tissue: 1 piece of liver with part of a growth and 2 pieces of skin and muscle with the remaining portion of the growth  
Diagnosis: Not diagnostic  
Submitter: R. Verhoeff-de Fremery

RTLA 1769. South African clawed frog, Xenopus laevis

Material: Spherical growth with irregular surface crisscrossed by blood vessels; 2 color transparencies  
Diagnosis: Hematopoietic neoplasm -- cell type undetermined  
Submitter: R. Verhoeff-de Fremery

RTLA 1770. California king snake, Lampropeltis getulus

Material: Sixteen microscope slides; 10 electron photomicrographs; data sheet  
Habitat: Hatched and raised at The American Museum of Natural History, New York  
Diagnosis: Lymphosarcoma  
Submitter: E. Jacobson

- RTLA 1771. Goldfish, Carassius auratus  
Material: Gross specimen with a flat, fungating, amorphous lesion straddling the back  
Habitat: Pet  
Diagnosis: Neurilemmoma -- poorly-differentiated  
Submitter: R. Marino
- RTLA 1772. Gemfish (hake), Rexea solandri  
Material: Hard lesion from left side; 5 microscope slides  
Habitat: Between Sydney and Wollongong, New South Wales, Australia  
Diagnosis: Scar tissue containing metaplastic bone -- probably related to an injury  
Submitter: P. H. Wolf
- RTLA 1773. Atlantic salmon, Salmo salar  
Material: Gross specimen with a firm, bean-shaped growth attached to the belly, between the pectoral and pelvic fins. The growth has a pectoral fin on the right, a less developed pectoral fin on the left, and a pelvic fin.  
Diagnosis: Teratoid anomaly manifested by incomplete twinning  
Submitter: J. G. Hnath
- RTLA 1774. Green turtle, Chelonia mydas  
Material: Total of eight growths: extending out of right posterior lung; associated with right shoulder area; associated with ventral area of esophagus and trachea; associated with right lung; associated with lower intestine; 2 growths externally, one on each side of neck/head; growth externally on right side of neck; 1 print of live animal  
Habitat: Off of Waikiki Beach, Island of Oahu, Hawaii  
Diagnosis: Fibropapillomas  
Submitter: G. H. Balazs
- RTLA 1775. Koi carp, Cyprinus carpio  
Material: Four microscope slides; autopsy report  
Habitat: Captive specimen  
Diagnosis: Nephroblastoma  
Submitter: G. C. Blasiola, Jr.
- RTLA 1776. Porcupinefish, Diodon hystrix  
Material: Gross specimen with a cluster of amorphous, cyst-like, granular growths attached to the spines on the right side of the animal  
Habitat: Naos Island Marine Lab, Balboa, Canal Zone (Pacific)  
Diagnosis: Lymphocystis  
Submitter: J. Cubit
- RTLA 1777. Boa constrictor  
Material: Three gross juvenile specimens  
Habitat: Captive specimens



- RTLA 2094. Sea fan (gorgonian), Gorgonia ventalina  
Material: Two skeletal branches with lesions  
Habitat: Carrie Bow Cay, Belize, Central America  
Diagnosis: Gorgonin pearl in response to algal infection  
Submitter: K. Muzik and J. N. Norris
- RTLA 2095. Striped mullet, Mugil cephalus  
Material: Head with a growth in the region of the left eye and left side of the upper lip  
Habitat: Auckland Region, New Zealand  
Diagnosis: Neurofibroma  
Submitter: N. Boustead
- RTLA 2096. South African clawed frog, Xenopus laevis  
Material: Enlarged spleen  
Diagnosis: Splenomegaly; tissue unsuitable for diagnosis  
Submitter: R. Verhoeff-de Fremery
- RTLA 2097. Green turtle, Chelonia mydas  
Material: Two growths removed from the ventral neck region; 1 color transparency  
Habitat: Trig Island, French Frigate Shoals, Northwestern Hawaiian Islands  
Diagnosis: Fibropapilloma  
Submitter: G. H. Balazs
- RTLA 2098. Chinook (king) salmon, Oncorhynchus tshawytscha  
Material: Piece of tissue from one of nine growths  
Habitat: Rampart on the Yukon River, Alaska  
Diagnosis: Lipoma  
Submitter: K. A. Neiland
- RTLA 2099. Shrimp, Pandalus borealis  
Material: Two whole animals -- one "normal"; one with a bulging carapace in the region of the right gill  
Habitat: Japan Sea (Rebun Pile)  
Diagnosis: Gill chamber parasitized by a bopyrid isopod  
Submitter: T. Harada, K. Oishi, and S. Yamamoto
- RTLA 2100. Blue hake, Antimora microlepis  
Material: Tissue with internal cyst-like lesions  
Habitat: Pacific Ocean, near Erimo Cape, Hokkaido, Japan  
Diagnosis: Pseudocyst  
Submitter: T. Harada, K. Oishi, and S. Yamamoto
- RTLA 2101. Walleye pollock, Theragra chalcogramma  
Material: Viscera  
Habitat: Pacific Ocean  
Diagnosis: Parasitism by Anisakis sp. and Nybelinia surmenicola  
Submitter: T. Harada, K. Oishi, and S. Yamamoto