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ACTIVITIES REPORT  
REGISTRY OF TUMORS IN LOWER ANIMALS:

1974 SUPPLEMENT

JOHN C. HARSHBARGER, DIRECTOR

PREPARED FOR DISTRIBUTION BY:

REGISTRY OF TUMORS IN LOWER ANIMALS  
NATIONAL MUSEUM OF NATURAL HISTORY  
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WASHINGTON, D.C. 20560

JUNE 1975



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The activities of the Registry increased in all areas during 1974 due largely to an increased concern over the effects of environmental pollution, coupled with an increased interest in the cause and significance of neoplasia in invertebrate and cold-blooded vertebrate animals.

As pointed out in the previous activities report, copies of which are still available, there are numerous proven and hypothesized benefits from studying neoplasms in lower animals including the discovery of: new carcinogens, indicators of carcinogens in the environment, vectors of cancer viruses, reservoirs of chemical carcinogens, multipliers of carcinogens in the food chain, models for the study of mechanisms of neoplastic transformation, sources of anti-cancer compounds, and models for screening the carcinogenicity and mutagenicity of new chemicals (less than half of the new chemicals which go into major production each year are tested for carcinogenicity due largely to the cost and other logistics of using the mammalian test systems).

#### SPECIMEN COLLECTION

The specimen collection is the most important component of the Registry's mission and we invite contributions of any material showing neoplasms or related diseases in cold-blooded vertebrates and invertebrates. Almost all of the cases received add to the information on geographic and phylogenetic distribution of these diseases and their manifestation within the organism. In addition, many of the cases have special significance as they relate to one of the benefits mentioned in the previous section. Unfortunately a report such as this does not portray the total significance of each case, but in conjunction with the literature it will give one a pretty good idea of where we stand.

In 1974 the specimen collection increased by 191 accessions, which represented an eight percent acceleration in rate over the previous reporting period. The complete list of specimens with the diagnosis, name of contributor, and pertinent reference when applicable, is included in this report. The addresses of contributors are given at the end.

Table I gives a breakdown of the major phylogenetic groups with the ratio of neoplastic to non-neoplastic lesions. As in previous years the bulk of the specimens were fish and amphibians with mollusks leading the invertebrates. Approximately two-thirds of the diagnosed material was neoplastic, but mollusca and arthropoda continue to be the only invertebrate phyla from which verifiable neoplasms are known.

#### REFERENCE LIBRARY

Approximately 300 papers were added to the comprehensive library on neoplasms in lower animals bringing the total number to over 2,800. Except for very recent acquisitions and some older articles that need to be translated, all papers have been abstracted by selected key words and computerized. At the conclusion of a thorough editing, now in progress, the entire file will be made available as a publication.



TABLE I

## DISTRIBUTION OF LESIONS AMONG SPECIMENS RECEIVED

Phylogenetic Group	TYPE OF DISEASE			Total
	Neoplastic	Non-Neoplastic	Not Diagnosed	
Reptile	3	10	0	13 (7%)
Amphibian	46	12	2	60 (31%)
Bony fish	66	18	10	94 (49%)
Shark	1	0	0	1 (1%)
Tunicate	0	3	0	3 (2%)
Mollusks	6	10	0	16 (8%)
Arthropods	1	1	0	2 (1%)
Echinoderms	0	1	0	1 (1%)
Nematodes	0	1	0	1 (1%)
Total	123 (64%)	56 (29%)	12 (6%)	191 (ca 100%)
Percent of those diagnosed	(69%)	(31%)		

PAPERS PUBLISHED SINCE THE PRECEDING ACTIVITIES REPORT

- Harshbarger, J.C. Radiation, Neoplasms, Carcinogenic Chemicals, and Insects. In: Insect Diseases, G.E. Cantwell (ed.), 2(Chapter 8): 377-416. Marcel Dekker, Inc.: New York. 1974.
- Harshbarger, J.C. Integumentary Papillomas and Carcinomas in Fish. Symposium No. 43: Environmental Carcinogens in Feral Aquatic Animals. In: Abstracts: Xith International Cancer Congress, Florence, [Italy], 20-26 October 1974, 1: 218-219. Casa Editrice Ambrosiana: Milan. 1974.
- Harshbarger, J.C. The Study of Invertebrate and Poikilothermic Vertebrate Neoplasms by the Registry of Tumors in Lower Animals. Bull. Soc. Pharmacol. Environ. Pathol., 2(3): 10-14. 1974.
- Couch, J., G. Gardner, J.C. Harshbarger, M.R. Tripp, and P.P. Yevich. Histological and Physiological Evaluations in Some Marine Fauna. In the Section, "Pathological Bioassays," edited by G. La Roche of Marine Bioassays: Workshop Proceedings, 1974, pp. 156-173. Marine Technology Society: Washington, D.C. 1974.
- Dawe, C.J. and J.C. Harshbarger. Neoplasms in Feral Fishes: Their Significance to Cancer Research. In: The Pathology of Fishes, W.E. Ribelin and G. Migaki (ed.), Chapter 35, pp. 871-894. The University of Wisconsin Press: Madison. 1975.

OTHER ACTIVITIES IN 1974

1. Participated in a Marine Bioassays Workshop sponsored by the Marine Technology Society (MTS) with support from the U.S. Environmental Protection Agency and the American Petroleum Institute (see above; paper no. 4). The iii + 308 page Proceedings were published in 1974 and are available from MTS, 1730 M Street, N.W., Washington, D.C., 20036, for \$18.00.
2. Hosted the First Marine Biomedical Workshop on 2 and 3 May 1974. The Proceedings will not be published as a discrete unit.
3. Presented the paper, "A Gamut of Oral Neoplasms in Cunners, Tautogolabrus adspersus, (Osteichthyes; Perciformes; Labridae) Ranging From an Epidermal Papilloma to an Odontogenic Ameloblastoma," at the "Symposium on Neoplasms in Aquatic Animals as Indicators of Environmental Carcinogens" held in Cork, Ireland, on 15-17 October 1974. The Symposium was sponsored by The International Union Against Cancer (UICC) and the Proceedings will be published in Volume 21 of the Series, Progress in Experimental Tumor Research, edited by F. Homburger for S. Karger.
4. Served as Secretary of the UICC Committee on Comparative Oncology (chaired by C.J. Dawe of the U.S. National Cancer Institute).
5. Conducted research on integumentary neoplasms in cunners, croakers, catfish, and salamanders under the auspices of the above Committee.

6. Served on the Interagency Collaborative Group on Environmental Carcinogenesis (chaired by H.F. Kraybill of the U.S. National Cancer Institute).
7. Served as Secretary for the Society for Invertebrate Pathology.
8. Served as a member of the Committee on Animal Models and Genetic Stocks of the National Research Council of the National Academy of Sciences.
9. Addressed the Society of Pharmacological and Environmental Pathologists (see page 3; paper no. 3).
10. Participated in a cooperative investigation of the etiology of several diseases of bivalve mollusks, supported in part by the U.S. Food and Drug Administration.
11. Presented a paper (see page 3; paper no. 2) at the XIth International Cancer Congress held in Florence, Italy, on 20-26 October 1974.

#### PERSONNEL

The Project Officer for the contract is Dr. Clyde J. Dawe, Head, Comparative Oncology Section, Laboratory of Pathology, National Cancer Institute, National Institutes of Health, Bethesda, Maryland, 20014.

The Principal Investigator for the contract is Dr. David L. Pawson, Chairman, Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C., 20560.

The staff of the Registry is as follows:

Director	- John C. Harshbarger, Ph.D.
Electron Microscopist	- Sing Chen Chang, Ph.D.
Registrar	- Phyllis M. Schellenger, B.S.
Histopathology Technician	- Linda J. Cullen, B.A.
Bibliographers	- Judith E. Foster, B.S. and Marilyn S. Slatick, B.S.

ACCESSIONS

- RTLA 888. Spot, Leiostomus xanthurus  
Material: One gross specimen with large internal growth  
Diagnosis: Microsporidian (Pleistophora sp.) granuloma  
Submitter: R. M. Overstreet
- RTLA 889. Spot, Leiostomus xanthurus  
Material: One gross specimen with large internal growth  
Diagnosis: Microsporidian (Pleistophora sp.) granuloma  
Submitter: R. M. Overstreet
- RTLA 890. Spot, Leiostomus xanthurus  
Material: One gross specimen with large external growth  
Diagnosis: Microsporidian (Pleistophora sp.) granuloma  
Submitter: R. M. Overstreet
- RTLA 891. Spot, Leiostomus xanthurus  
Material: One piece of tissue removed from a growth located behind  
the right pectoral fin  
Diagnosis: Microsporidian (Pleistophora sp.) granuloma  
Submitter: R. M. Overstreet
- RTLA 892. Spot, Leiostomus xanthurus  
Material: One gross specimen with large internal growth  
Diagnosis: Microsporidian (Pleistophora sp.) granuloma  
Submitter: R. M. Overstreet
- RTLA 893. Amazon molly, Poecilia formosa  
Material: Six lateral hemisections  
Diagnosis: Exhuberant invasive thyroid hyperplasia versus carcinoma;  
visceral granulomas  
Submitter: R. W. Hart
- RTLA 894. Amazon molly, Poecilia formosa  
Material: Twelve lateral hemisections  
Diagnosis: Exhuberant invasive thyroid hyperplasia versus carcinoma;  
visceral granulomas  
Submitter: R. W. Hart
- RTLA 895. Amazon molly, Poecilia formosa  
Material: Eleven lateral hemisections  
Diagnosis: Exhuberant invasive thyroid hyperplasia versus carcinoma;  
visceral granulomas  
Submitter: R. W. Hart
- RTLA 896. Amazon molly, Poecilia formosa  
Material: Twelve lateral hemisections  
Diagnosis: Exhuberant invasive thyroid hyperplasia versus carcinoma;  
visceral granulomas  
Submitter: R. W. Hart

- RTLA 897. Amazon molly, Poecilia formosa  
Material: Ten lateral hemisections  
Diagnosis: Exuberant invasive thyroid hyperplasia versus carcinoma;  
visceral granulomas  
Submitter: R. W. Hart
- RTLA 898. Amazon molly, Poecilia formosa  
Material: Thirty-four lateral hemisections  
Diagnosis: Exuberant invasive thyroid hyperplasia versus carcinoma;  
visceral granulomas  
Submitter: R. W. Hart
- RTLA 899. Rainbow trout, Salmo gairdneri  
Material: Three pieces of tissue from a large subdermal growth located along the lateral line below and somewhat posterior to the dorsal fin; 2 microscope slides  
Diagnosis: Undifferentiated mesenchymal sarcoma  
Submitter: C. E. Smith
- RTLA 900. Rainbow trout, Salmo gairdneri  
Material: One microscope slide  
Diagnosis: Nephroblastoma  
Submitter: C. E. Smith
- RTLA 901. Rainbow trout, Salmo gairdneri  
Material: Eight pieces of tissue: spleen, liver, kidney, and thymus; 5 microscope slides  
Diagnosis: Lymphosarcoma  
Submitter: C. E. Smith
- RTLA 902. Chum salmon, Oncorhynchus keta  
Material: One paraffin block  
Diagnosis: Nephroblastoma  
Submitter: T. P. T. Evelyn
- RTLA 903. Chinook salmon, Oncorhynchus tshawytscha  
Material: Almost the complete head with both pathologic and normal tissue; 1 color photograph  
Diagnosis: Probable malignant lymphoma; tissue too autolyzed for definitive diagnosis  
Submitter: G. R. Bell
- RTLA 904. Sockeye salmon (Kokanee), Oncorhynchus nerka  
Material: Two pieces of kidney tissue; 2 microscope slides  
Diagnosis: Granulocytic leukemia versus infection  
Submitter: C. E. Smith
- RTLA 905A & B. Tiger salamander, Ambystoma tigrinum  
Material: Two pieces of tissue; 1 color transparency  
Diagnosis: 905A - Epidermal papilloma  
905B - Intradermal melanophoroma  
Submitter: F. L. Rose

- RTLA 906. Tiger salamander, Ambystoma tigrinum  
Material: Four pieces of tissue; 2 color transparencies  
Diagnosis: Intradermal melanophoroma  
Submitter: F. L. Rose
- RTLA 907. Tiger salamander, Ambystoma tigrinum  
Material: One piece of tissue; 1 color transparency  
Diagnosis: Epidermal papilloma  
Submitter: F. L. Rose
- RTLA 908. Tiger salamander, Ambystoma tigrinum  
Material: One piece of tissue; 1 color transparency  
Diagnosis: Epidermal papilloma  
Submitter: F. L. Rose
- RTLA 909. Tiger salamander, Ambystoma tigrinum  
Material: Four pieces of tissue; 1 color transparency  
Diagnosis: Polypoid dermal fibroma  
Submitter: F. L. Rose
- RTLA 910. Tiger salamander, Ambystoma tigrinum  
Material: One piece of tissue; 1 color transparency  
Diagnosis: Epidermal papilloma  
Submitter: F. L. Rose
- RTLA 911. Tiger salamander, Ambystoma tigrinum  
Material: One piece of tissue; 1 color transparency  
Diagnosis: Epidermal papilloma  
Submitter: F. L. Rose
- RTLA 912. Tiger salamander, Ambystoma tigrinum  
Material: One piece of tissue; 1 color transparency  
Diagnosis: Epidermal papilloma  
Submitter: F. L. Rose
- RTLA 913. Tiger salamander, Ambystoma tigrinum  
Material: One piece of tissue; 1 color transparency  
Diagnosis: Epidermal papilloma  
Submitter: F. L. Rose
- RTLA 914. Tiger salamander, Ambystoma tigrinum  
Material: One piece of tissue; 1 color transparency  
Diagnosis: Epidermal papilloma  
Submitter: F. L. Rose
- RTLA 915. Tiger salamander, Ambystoma tigrinum  
Material: One piece of tissue; 1 color transparency  
Diagnosis: Epidermal papilloma  
Submitter: F. L. Rose
- RTLA 916. Tiger salamander, Ambystoma tigrinum  
Material: One piece of tissue; 1 color transparency  
Diagnosis: Intradermal melanophoroma  
Submitter: F. L. Rose

- RTLA 917. Largemouth bass, Micropterus salmoides  
Material: One piece of testicular tissue; 1 black and white photograph  
Diagnosis: Leiomyoma  
Submitter: R. L. Herman
- RTLA 918. American smelt, Osmerus mordax  
Material: Six microscope slides; 2 black and white photographs  
Diagnosis: Cavernous hemangioma  
Submitter: J. W. Cornick
- RTLA 919. Amphiuma means  
Material: Two microscope slides  
Diagnosis: Granuloma in response to some crystalline material;  
possibly urates  
Submitter: M. Balls
- RTLA 920. Leopard frog, Rana pipiens  
Material: One gross specimen  
Diagnosis: Widely disseminated septate fungal infection  
Submitter: R. P. Dempster
- RTLA 921. Australian rock oyster, Crassostrea commercialis  
Material: Two microscope slides  
Diagnosis: Epidermal papilloma of mantle  
Submitter: P. H. Wolf
- RTLA 922. Ocean pout, Macrozoarces americanus  
Material: One piece of tissue from a growth on the lip; 1 microscope  
slide; 2 color transparencies  
Diagnosis: Epidermal papilloma  
Submitter: R. E. Wolke
- RTLA 923. Cunner, Tautoglabrus adspersus  
Material: One gross specimen with lip tumor  
Diagnosis: Well-differentiated ameloblastic odontoma  
Submitter: S. E. Shumway
- RTLA 924. Barred sand bass, Paralabrax nebulifer  
Material: One gross specimen with deformed gill rakers  
Diagnosis: Developmental anomaly  
Submitter: M. J. Sherwood
- RTLA 925. California tonguefish, Symphurus atricauda  
Material: One gross specimen  
Diagnosis: Cutaneous hamartoma  
Submitter: M. J. Sherwood
- RTLA 926. Dover sole, Microstomus pacificus  
Material: One gross specimen with multiple growths predominantly on  
the eyed side  
Diagnosis: Epidermal papilloma  
Submitter: M. J. Sherwood

- RTLA 927. Salt water crocodile, Crocodylus porosus  
Material: Four pieces of liver tissue  
Diagnosis: Severe fatty metamorphosis of the liver  
Submitter: J. C. Harshbarger and M. Landolt
- RTLA 928. Rainbow trout (Steelhead), Salmo gairdneri  
Material: A piece of body wall with a gelatin-like growth between the skin and underlying muscle  
Diagnosis: Fibrosarcoma  
Submitter: G. R. Bell
- RTLA 929. Walleye, Stizostedion vitreum vitreum  
Material: Two nodules in skin  
Diagnosis: Fibromas with foci of ossification associated with lymphocystis which occurred elsewhere in the same fish  
Submitter: E. Enamait
- RTLA 930. Oyster, Ostrea lurida  
Material: Four microscope slides  
Diagnosis: Diffuse mesenchymal sarcoma  
Submitter: M. C. Mix
- RTLA 931. Rainbow trout (Steelhead), Salmo gairdneri  
Material: One microscope slide from a gill tumor  
Diagnosis: Neoplasm of bipotential gill epithelium, manifest in some areas as an ameloblastoma and in other areas as a gill arch epithelioma  
Submitter: H. Wolf
- RTLA 932. Rainbow trout, Salmo gairdneri  
Material: Fourteen microscope slides; 1 color photograph  
Diagnosis: Chloroma  
Submitter: H. Wolf
- RTLA 933. Drosophila melanogaster  
Material: Two microscope slides  
Diagnosis: Prohemocytic leukemia  
Submitter: E. A. F. Gateff
- RTLA 934. Carp, Cyprinus carpio  
Material: Seventy-four microscope slides  
Diagnosis: Sertoli cell tumor  
Submitter: R. Sonstegard
- RTLA 935. "Ishimochi," Argyrosomus argentatus  
Material: Nine black and white photographs; 3 paraffin blocks; six microscope slides  
Diagnosis: Melanoma  
Submitter: I. Kimura  
Reprint: Kimura, Ikuo et al. Melanoma on the skin in a teleost fish, Argyrosomus argentatus. Abstracts: XIth International Cancer Congress, Florence, Italy, 20-26 October 1974, 2: 174-175. 1974.



- RTLA 936. Firebellied newt, Cynops pyrrhogaster  
Material: One microscope slide  
Diagnosis: Epidermal papilloma  
Submitter: S. V. Bryant  
Reprint: Bryant, Susan V. Spontaneous Epidermal Tumor in an Adult Newt, Cynops pyrrhogaster. Cancer Res., 33: 623-625. 1973.
- RTLA 937. Northern pike, Esox lucius  
Material: Two gross specimens irradiated with 400 R, one of which was also covered with cutaneous black spots, plus an untreated control  
Diagnosis: Black spot disease (granulomas) due to encysted metacercaria presumably of Neodiplostimum cuticola. Blood picture from irradiated fish in normal range.  
Submitter: E. R. Brown
- RTLA 938. Northern spiky dogfish, Squalus blainvilli  
Material: Large growth with metastases and some surrounding normal liver; 3 color transparencies  
Diagnosis: Probable neurilemmoma (Schwannoma)  
Submitter: P. M. Hine
- RTLA 939. Snapper, Chrysophrys auratus  
Material: Portion of backbone with a large ovoid growth deriving from the area of the backbone  
Diagnosis: Mycotic granuloma  
Submitter: P. M. Hine
- RTLA 940. Chinook salmon, Oncorhynchus tshawytscha  
Material: A large ovarian mass (solid growth adjacent to the ovary) and roe  
Diagnosis: Normal testis; fish is bisexual  
Submitter: J. G. Hnath
- RTLA 941. Butterfly fish  
Material: One gross specimen with black growth involving second and third dorsal spines  
Diagnosis: Benign melanoma arising from dermal melanophores  
Submitter: A. C. Smith
- RTLA 942. Rainbow trout (Steelhead), Salmo gairdneri  
Material: A growth and muscle from abdominal wall  
Diagnosis: Neurofibroma (Schwannoma)  
Submitter: G. R. Bell
- RTLA 943. Armored catfish, Corydoras sp.  
Material: Three microscope slides of the spinal cord  
Diagnosis: Parasitized by Myxosporida (Myxobolus sp.)  
Submitter: G. E. Cosgrove
- RTLA 944. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with 4 skin lesions  
Diagnosis: 1, 3, & 4 - Epidermal papilloma; 2 - normal variation  
Submitter: F. L. Rose

- RTLA 945. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with 3 skin lesions  
Diagnosis: 1 - Early intradermal melanocytoma; 2 - epidermal papilloma; 3 - epidermal hyperplasia  
Submitter: F. L. Rose
- RTLA 946. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with 4 skin lesions  
Diagnosis: 1, 2, & 4 - Epidermal papilloma; 3 - epidermal inclusions cysts  
Submitter: F. L. Rose
- RTLA 947. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with distended abdomen  
Diagnosis: Paraovarian serous cyst  
Submitter: F. L. Rose
- RTLA 948. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with 2 skin lesions  
Diagnosis: 1 - Epidermal papilloma; 2 - intradermal melanocytoma  
Submitter: F. L. Rose
- RTLA 949. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with 4 skin lesions  
Diagnosis: 1 & 3 - Intradermal melanocytoma; 2 & 4 - outer (papillary) layer of dermis is absent  
Submitter: F. L. Rose
- RTLA 950. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with 5 skin lesions  
Diagnosis: 1, 3 & 4 - Intradermal melanocytoma; 2 - epidermal melanocytoma; 5 - invasive dermal melanocytoma  
Submitter: F. L. Rose
- RTLA 951. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with multiple skin lesions  
Diagnosis: Epidermal hyperplasia  
Submitter: F. L. Rose
- RTLA 952. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Epidermal papilloma  
Submitter: F. L. Rose
- RTLA 953. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Intradermal melanocytoma  
Submitter: F. L. Rose
- RTLA 954. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Invasive dermal melanocytoma  
Submitter: F. L. Rose

- RTLA 955. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen  
Diagnosis: Ectopic lung  
Submitter: F. L. Rose
- RTLA 956. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Intradermal melanocytoma  
Submitter: F. L. Rose
- RTLA 957. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with 3 skin lesions  
Diagnosis: 1 - Exceptionally thin dermis; 2 - indeterminate;  
3 invasive dermal melanocytoma  
Submitter: F. L. Rose
- RTLA 958. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with 4 skin lesions  
Diagnosis: 1 - Thin dermis; 2 - epidermal papilloma; 3 - intradermal  
melanocytoma; 4 - intradermal fibroma  
Submitter: F. L. Rose
- RTLA 959. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with cyst on gill  
Diagnosis: Hematoma  
Submitter: F. L. Rose
- RTLA 960. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with skin lesions  
Diagnosis: Polycystic epidermal papilloma; epidermal papilloma;  
epidermal inclusion cysts  
Submitter: F. L. Rose
- RTLA 961. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with multiple skin lesions  
Diagnosis: Epidermal inclusion cysts  
Submitter: F. L. Rose
- RTLA 962. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Intradermal melanocytoma  
Submitter: F. L. Rose
- RTLA 963. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Intradermal melanocytoma  
Submitter: F. L. Rose
- RTLA 964. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with small white spot on tail  
Diagnosis: Indeterminable due to postmortem sloughing of epidermis  
Submitter: F. L. Rose

- RTLA 965. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with papillary skin lesions  
Diagnosis: Indeterminable due to postmortem sloughing of epidermis  
Submitter: F. L. Rose
- RTLA 966. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Early intradermal melanocytoma  
Submitter: F. L. Rose
- RTLA 967. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Early intradermal melanocytoma  
Submitter: F. L. Rose
- RTLA 968. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Invasive dermal melanocytoma  
Submitter: F. L. Rose
- RTLA 969. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Invasive dermal melanocytoma  
Submitter: F. L. Rose
- RTLA 970. Red-footed tortoise, Geochelone carbonaria  
Material: Two microscope slides  
Diagnosis: Parathyroid adenoma  
Submitter: F. L. Frye
- RTLA 971. Brown bullhead, Ictalurus nebulosus  
Material: One microscope slide  
Diagnosis: Epidermal hyperplasia versus epidermal papilloma  
Submitter: J. L. Gaines, Jr.
- RTLA 972. Angelfish, Pterophyllum scalare  
Material: One gross specimen; 2 black and white photographs  
Diagnosis: Fibropapillomatous polyps engulfing normal tooth buds (germs) and associated with underlying new bone formation  
Submitter: P. M. Hine
- RTLA 973. Sea hare, Aplysia californica  
Material: Two opaline glands -- one pathologic and one normal  
Diagnosis: Mycotic granuloma  
Submitter: D. O. Carpenter  
Reprint: [Classic article] Eales, N. B. Transactions of the Liverpool Biological Society, Vol. 35, pp. 183-266. 1921.
- RTLA 974. Rainbow trout, Salmo gairdneri  
Material: One microscope slide of gill tumor  
Diagnosis: Basal cell papilloma versus ameloblastic epithelioma  
Submitter: R. J. Roberts

- RTLA 975. Western fence lizard, Sceloporus occidentalis  
Material: One microscope slide (liver, kidney and heart tissue)  
Diagnosis: Lower nephron nephrosis  
Submitter: F. L. Frye
- RTLA 976. Rainbow trout, Salmo gairdneri  
Material: One piece of tissue; 2 microscope slides  
Diagnosis: Leiomyoma  
Submitter: J. van de Kerkhoff
- RTLA 977. Hawksbill sea turtle, Eretmochelys imbricata  
Material: A growth removed from the left fore flipper  
Diagnosis: Bacterial granuloma  
Submitter: D. Allen and R. Lloyd
- RTLA 978. Starfish, Asterina sp.  
Material: Part of D ray with a raised growth  
Diagnosis: Developmental anomaly  
Submitter: F. H. C. Hotchkiss
- RTLA 979. Atlantic sturgeon, Acipenser oxyrhynchus  
Material: One microscope slide  
Diagnosis: Parafollicular serous cyst adjacent to a smaller  
perifollicular pseudocyst  
Submitter: J. A. Quick, Jr. and J. A. Huff
- RTLA 980. Atlantic sturgeon, Acipenser oxyrhynchus  
Material: One microscope slide  
Diagnosis: Perifollicular pseudocyst  
Submitter: J. A. Quick, Jr. and J. A. Huff
- RTLA 981. Oyster, Ostrea lurida  
Material: Six microscope slides  
Diagnosis: Hematopoietic neoplasm  
Submitter: M. C. Mix
- RTLA 982. Cave isopod, Speocirolana bolivari  
Material: Three gross specimens with sac-like growths  
protruding between the 4th and 5th walking legs  
Diagnosis: Possible distended abdomens of an ectoparasite  
Submitter: T. E. Bowman
- RTLA 983. Australian rock oyster, Crassostrea commercialis  
Material: Four microscope slides  
Diagnosis: Hematopoietic neoplasm  
Submitter: P. H. Wolf
- RTLA 984. Red rattlesnake, Crotalus ruber  
Material: A portion of a large paralyzing mass located on the dorsum,  
dorsal and lateral to the spinal column  
Diagnosis: Undifferentiated sarcoma  
Submitter: E. A. Holzinger

- RTLA 985. American crocodile, Crocodylus acutus  
Material: Two microscope slides; 2 paraffin blocks  
Diagnosis: Parasitized by Capillaria recurva  
Submitter: E. Elkan
- RTLA 986. Eastern garter snake, Thamnophis sirtalis  
Material: Two microscope slides  
Diagnosis: Parasitized by Ophiotaenia perspicua  
Submitter: E. Elkan
- RTLA 987. Emerald tree snake, Ahaetulla prasina  
Material: Four microscope slides; 1 paraffin block  
Diagnosis: Parasitized by Sphaerechinorhynchus (?) serpenticola  
Submitter: E. Elkan
- RTLA 988. Atlantic salmon, Salmo salar  
Material: Two tissue blocks  
Diagnosis: Marked thyroid hyperplasia  
Submitter: J. G. Hnath
- RTLA 989. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with cyst-like growth on head  
Diagnosis: Subdermal serous cyst  
Submitter: F. L. Rose
- RTLA 990. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Dermal fibroma  
Submitter: F. L. Rose
- RTLA 991. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Dermal fibrosarcoma  
Submitter: F. L. Rose
- RTLA 992. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with 2 skin lesions  
Diagnosis: Epidermal papilloma  
Submitter: F. L. Rose
- RTLA 993. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with 4 skin lesions  
Diagnosis: 1 & 3 - Epidermal papilloma; 2 - pending; 4 - intradermal melanocytoma  
Submitter: F. L. Rose
- RTLA 994. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with 2 skin lesions  
Diagnosis: 1 - Intradermal fibroma; 2 - epidermal papilloma  
Submitter: F. L. Rose
- RTLA 995. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with 2 cyst-like growths on head  
Diagnosis: 1 & 2 - Serous cysts  
Submitter: F. L. Rose

- RTLA 996. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with 4 skin lesions  
Diagnosis: 1 - Subdermal serous cyst; 2 - hyperplastic stratum papillosum of dermis; 3 intradermal fibroma; 4 - intradermal melanophoroma  
Submitter: F. L. Rose
- RTLA 997. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Probable epidermal papilloma  
Submitter: F. L. Rose
- RTLA 998. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with cyst-like growth  
Diagnosis: Subdermal serous cyst  
Submitter: F. L. Rose
- RTLA 999. Tiger salamander, Ambystoma tigrinum  
Material: One gross specimen with a skin lesion  
Diagnosis: Dermal myxosarcoma  
Submitter: F. L. Rose
- RTLA 1000. Sea bream, Sparus auratus  
Material: One microscope slide; 1 black and white photograph  
Diagnosis: Oral papillomatosis involving odontogenic epithelium and associated with marked proliferation of odontoblastic tissue  
Submitter: I. Paperna
- RTLA 1001. Smallmouth bass, Micropterus dolomieu  
Material: One microscope slide; 2 color transparencies  
Diagnosis: Scarring probably due to an infection or to a physical or chemical injury  
Submitter: H. Rothenbacher
- RTLA 1002. Chinook salmon, Oncorhynchus tshawytscha  
Material: An anal fin and surrounding musculature bearing a growth  
Diagnosis: Mesenchymal neoplasm; cell type indeterminable due to poorly preserved tissue  
Submitter: P. M. Hine
- RTLA 1003. Rainbow trout, Salmo gairdneri  
Material: One microscope slide; 1 paraffin block; 14 color transparencies  
Diagnosis: Nephroblastoma  
Submitter: H. Wolf
- RTLA 1004. Clam, Macoma balthica  
Material: Two microscope slides  
Diagnosis: Highly invasive carcinoma of gill epithelium  
Submitter: F. G. Kern  
Reprint: Christensen, Darryl J., C. Austin Farley, and Frederick G. Kern. Epizootic Neoplasms in the Clam Macoma balthica (L.) From Chesapeake Bay. J. Natl. Cancer Inst., 52(6): 1739-1749. 1974.

- RTLA 1005. Hard-shell clam (Quahog), Mercenaria mercenaria  
Material: Three microscope slides; 1 paraffin block  
Diagnosis: Chlamydia infection in digestive diverticula  
Submitter: S. V. Otto
- RTLA 1006. Hard-shell clam (Quahog), Mercenaria mercenaria  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Chlamydia infection in digestive diverticula  
Submitter: S. V. Otto
- RTLA 1007. Hard-shell clam (Quahog), Mercenaria mercenaria  
Material: One microscope slide  
Diagnosis: Gill inclusion disease  
Submitter: S. V. Otto
- RTLA 1008A & B. Clam, Anodonta corpulenti  
Material: Six clam hemisections -- 1 pathologic and 5 normal  
Diagnosis: Hematopoietic response to bacterial infection  
Submitter: G. E. Cosgrove
- RTLA 1009A & B. Eastern box turtle, Terrapene carolina  
Material: A. Apical half of enlarged, dense, white right lung  
B. Apical half of normal left lung  
Diagnosis: Hyperplastic inflammatory or acute hypersensitivity reaction  
Submitter: G. E. Cosgrove
- RTLA 1010. Pacific tree frog, Hyla regilla  
Material: One microscope slide; 2 color transparencies  
Diagnosis: Chondomyxoma  
Submitter: F. L. Frye
- RTLA 1011. Lake trout, Salvelinus namaycush  
Material: One microscope slide; a portion of growth found in the mouth,  
upper jaw area  
Diagnosis: Ossifying myxofibroma  
Submitter: T. P. T. Evelyn
- RTLA 1012. Northern pike, Esox lucius  
Material: One microscope slide; a portion of a growth on top of the skull  
Diagnosis: Malignant melanoma  
Submitter: T. P. T. Evelyn
- RTLA 1013. Winter flounder, Pseudopleuronectes americanus  
Material: One fish head with a smooth, spherical fluid-filled cyst  
emerging from the left eye socket and displacing the eye  
Diagnosis: Serous cyst  
Submitter: B. B. Collette and K. W. Collette
- RTLA 1014. Benthocomestes robustus  
Material: Four gross specimens; one with growth above operculum --  
3 normal  
Diagnosis: Protozoan cyst  
Submitter: R. Schoknecht



- RTLA 1015. Ocean pout, Macrozoarces americanus  
Material: Liver, heart, complete alimentary tract, gall bladder, testes with growth, and spleen  
Diagnosis: Adenocarcinoma of the spermatic duct  
Submitter: B. B. Collette
- RTLA 1016. Pacific garter snake, Thamnophis sirtalis  
Material: One microscope slide  
Diagnosis: Malignant chromophoroma  
Submitter: F. L. Frye
- RTLA 1017. Root-knot nematode, Meloidogyne incognita  
Material: Four black and white photographs showing caudal enlargements  
Diagnosis: Teratoid anomalies  
Submitter: R. M. Sayre  
Reprint: Sayre, Richard M. Observations on Aberrant Root-Knot Nematode Larvae. Program & Abstracts of the Joint Meeting XIII Society of Nematologists VII Organization of Tropical American Nematologists, 18-23 August 1974, Riverside, California, p. 24, 1974.
- RTLA 1018. Sea peach, Halocynthia pyriformis  
Material: Tunic lesion near siphon  
Diagnosis: Injury and repair of tunic epithelium  
Submitter: R. S. Anderson
- RTLA 1019. Sea peach, Halocynthia pyriformis  
Material: One gross specimen with lesion near siphon  
Diagnosis: Injury and repair of tunic epithelium  
Submitter: R. S. Anderson
- RTLA 1020. Sea peach, Halocynthia pyriformis  
Material: One gross specimen with teardrop-shaped extension below siphon  
Diagnosis: Probable infectious lesion of tunic  
Submitter: R. A. Anderson
- RTLA 1021. Amazon molly, Poecilia formosa  
Material: Four microscope slides  
Diagnosis: Marked thyroid hyperplasia versus thyroid carcinoma  
Submitter: G. E. Cosgrove
- RTLA 1022. Chinook salmon, Oncorhynchus tshawytscha  
Material: Three microscope slides  
Diagnosis: Acute granulocytic leukemia  
Submitter: W. T. Yasutake
- RTLA 1023. Chinook salmon, Oncorhynchus tshawytscha  
Material: Three microscope slides  
Diagnosis: Acute granulocytic leukemia  
Submitter: W. T. Yasutake
- RTLA 1024. Tuxedo swordtail, Xiphophorus helleri  
Material: Nine black and white photographs; 4 color transparencies; 3 microscope slides  
Diagnosis: Melanoma  
Submitter: T. Ishikawa

- RTLA 1025. Rockfish ("red snapper"), Sebastes sp.  
Material: A large, soft mass of tissue on the lower jaw  
Diagnosis: Dermal fibropapilloma  
Submitter: G. R. Bell
- RTLA 1026. Lake trout, Salvelinus namaycush  
Material: A growth protruding from the body wall  
Diagnosis: Epidermal papilloma  
Submitter: G. E. Hoskins
- RTLA 1027. Goldfish, Carassius auratus  
Material: One specimen with greatly distended abdomen  
Diagnosis: Multiloculated serous cyst of either mesenteric or ovarian origin  
Submitter: W. G. Banfield
- RTLA 1028. Guppy, Poecilia reticulata  
Material: Two microscope slides  
Diagnosis: Marked thyroid hyperplasia (thyroid toxin type) coesitent with visceral granulomas caused by acid-fast organisms  
Submitter: S. Cohen
- RTLA 1029. Oyster, Ostrea lurida  
Material: Two microscope slides  
Diagnosis: Hematopoietic neoplasm  
Submitter: M. C. Mix
- RTLA 1030. African toad, Bufo sp.  
Material: Five microscope slides  
Diagnosis: Hematopoietic neoplasm  
Submitter: R. L. Snyder
- RTLA 1031. Northern pike, Esox lucius  
Material: Ten microscope slides  
Diagnosis: Lymphoma  
Submitter: O. Ljungberg  
Reprint: Winqvist, G., O. Ljungberg, and Birgitta Ivarsson. Electron Microscopy of Sarcoma of the Northern Pike (Esox lucius L). In: Unifying Concepts of Leukemia, Bibl. haemat. No. 39, R. M. Dutcher and L. Chieco-Bianchi (ed.), pp. 26-30, Karger, Basel, 1973.
- RTLA 1032. Northern pike, Esox lucius  
Material: Three microscope slides  
Diagnosis: Lymphoma  
Submitter: O. Ljungberg  
Reprint: [See RTLA 1031]
- RTLA 1033. Northern pike, Esox lucius  
Material: Nine microscope slides  
Diagnosis: Lymphoma  
Submitter: O. Ljungberg  
Reprint: [See RTLA 1031]

- RTLA 1034. Northern pike, Esox lucius  
Material: One microscope slide  
Diagnosis: Lymphoma  
Submitter: O. Ljungberg  
Reprint: [See RTLA 1031]
- RTLA 1035. Northern pike, Esox lucius  
Material: One color photograph of gross specimen  
Diagnosis: Lymphoma  
Submitter: O. Ljungberg  
Reprint: [See RTLA 1031]
- RTLA 1036. European eel, Anguilla anguilla  
Material: Five pieces of tissue  
Diagnosis: A diffusely infiltrating, highly undifferentiated gastric neoplasm  
Submitter: P. Ghittino
- RTLA 1037. Iguana iguana  
Material: One microscope slide  
Diagnosis: Hydronephrosis  
Submitter: F. L. Frye
- RTLA 1038. Coho salmon, Oncorhynchus kisutch  
Material: Two pieces of tumor; 1 color photograph  
Diagnosis: Neoplasm of mesenchymal tissue, but cell type indeterminable due to freezing artifacts  
Submitter: G. E. Hoskins
- RTLA 1039. Chinook salmon, Oncorhynchus tshawytscha  
Material: One fish head including a piece of the right side which had been removed to show the growth  
Diagnosis: Hematopoietic neoplasm (probable thymic lymphoma)  
Submitter: G. E. Hoskins
- RTLA 1040. Chinook salmon, Oncorhynchus tshawytscha  
Material: Tumor with piece of gill attached  
Diagnosis: Neoplasm of mesenchymal tissue, but cell type indeterminable due to freezing artifacts  
Submitter: G. E. Hoskins
- RTLA 1041. Snapper, Chrysophrys auratus  
Material: One block of kidney tissue  
Diagnosis: Granuloma  
Submitter: P. M. Hine
- RTLA 1042. Snapper, Chrysophrys auratus  
Material: One block of kidney tissue; 2 microscope slides  
Diagnosis: Granuloma  
Submitter: P. M. Hine
- RTLA 1043. Rainbow trout, Salmo gairdneri  
Material: One block of kidney tissue; 4 microscope slides; 1 black and white photograph  
Diagnosis: Malignant lymphoma  
Submitter: P. M. Hine

- RTLA 1044. Brown trout, Salmo trutta  
Material: Large growth with attached stomach; 4 microscope slides;  
3 black and white photographs  
Diagnosis: Leiomyoma  
Submitter: P. M. Hine
- RTLA 1045. Coho salmon, Oncorhynchus kisutch  
Material: Three pieces of tissue with lesions on the skin  
Diagnosis: Abscess of scale pockets; etiology undetermined  
Submitter: J. G. Hnath
- RTLA 1046. Lake trout, Salvelinus namaycush  
Material: Tissue from a kidney tumor and from a tumor on gill arches  
Diagnosis: Malignant well-differentiated lymphocytic lymphoma  
Submitter: J. G. Hnath
- RTLA 1047. Yellow bullhead, Ictalurus natalis  
Material: One gross specimen with black spots and raised areas  
on the head  
Diagnosis: Epidermal hyperplasia  
Submitter: J. A. Couch and Bream Fishermen Association
- RTLA 1048. Yellow bullhead, Ictalurus natalis  
Material: One gross specimen with black spots and raised areas  
on the head  
Diagnosis: Incipient epidermal papillomas  
Submitter: J. A. Couch and Bream Fishermen Association
- RTLA 1049. Yellow bullhead, Ictalurus natalis  
Material: One gross specimen with black spots and raised areas  
on the head  
Diagnosis: Epidermal hyperplasia  
Submitter: J. A. Couch and Bream Fishermen Association
- RTLA 1050. Indian monitor lizard, Varanus bengalensis  
Material: Two microscope slides  
Diagnosis: Metaplastic bile ducts probably due to toxicosis  
Submitter: F. L. Frye
- RTLA 1051. Hybrid frog, Rana palustris x pipiens  
Material: One microscope slide  
Diagnosis: Renal adenocarcinoma; induced by 5090 x G fraction  
of Lucké tumor  
Submitter: D. J. Mulcare  
Reprint: Mulcare, Donald J. Non-Specific Transmission of the Lucké  
Tumor. In: Biology of Amphibian Tumors, M. Mizell (ed.),  
pp. 240-253, Springer-Verlag, New York, 1969.
- RTLA 1052. Leopard frog, Rana pipiens  
Material: One microscope slide of blister on kidney  
Diagnosis: Invasive tumor vesicle induced by virus rich 5090 x G  
fraction of Lucké tumor  
Submitter: D. J. Mulcare  
Reprint: [See RTLA 1051]

- RTLA 1053. Hybrid frog, Rana pipiens x palustris  
Material: One microscope slide of blister on kidney  
Diagnosis: Non-invasive kidney vesicle induced by virus rich 5090 x G fraction of Lucké tumor  
Submitter: D. J. Mulcare  
Reprint: [See RTLA 1051]
- RTLA 1054. Pickerel frog, Rana palustris  
Material: One microscope slide  
Diagnosis: Involuted tumor vesicle induced by injecting an embryo with a 5090 x G fraction of Lucké tumor  
Submitter: D. J. Mulcare  
Reprint: [See RTLA 1051]
- RTLA 1055. Pickerel frog, Rana palustris  
Material: One microscope slide  
Diagnosis: Adenocarcinoma of mesonephros induced by 5090 x G fraction of Lucké tumor  
Submitter: D. J. Mulcare  
Reprint: [See RTLA 1051]
- RTLA 1056. Hybrid frog, Rana pipiens x palustris  
Material: One microscope slide  
Diagnosis: Solid renal adenocarcinoma induced by 5090 x G fraction of Lucké tumor  
Submitter: D. J. Mulcare  
Reprint: [See RTLA 1051]
- RTLA 1057A & B. Pickerel frog, Rana palustris  
Material: Two microscope slides of 2 kidney lobes  
Diagnosis: Renal adenocarcinoma induced in the adult by an implant of Lucké tumor into dorsal lymph space  
Submitter: D. J. Mulcare  
Reprint: [See RTLA 1051]
- RTLA 1058. Green frog, Rana clamitans  
Material: One microscope slide  
Diagnosis: Mesonephric adenocarcinoma induced by a 5090 x G fraction of Lucké tumor injected into the embryo  
Submitter: D. J. Mulcare  
Reprint: [See RTLA 1051]
- RTLA 1059. Sea bream, Sparus auratus  
Material: One gross specimen with lip tumor  
Diagnosis: Ameloblastic fibro-odontoma  
Submitter: I. Paperna
- RTLA 1060. Sea bream, Sparus auratus  
Material: One gross specimen with lip tumor  
Diagnosis: Ameloblastic fibro-odontoma  
Submitter: I. Paperna
- RTLA 1061. Sea bream, Sparus auratus  
Material: Segment of fish head with lip tumor  
Diagnosis: Ameloblastic fibro-odontoma  
Submitter: I. Paperna

- RTLA 1062A, B, & C. Oyster, Ostrea lurida  
Material: Tissue samples of gill, mantle, and digestive gland  
Diagnosis: Normal  
Submitter: M. C. Mix
- RTLA 1063. Walleye, Stizostedion vitreum vitreum  
Material: Head with large growth posterior to the left eye  
Diagnosis: Ossifying fibroma  
Submitter: W. J. Buc
- RTLA 1064. Colorado River toad, Bufo alvarius  
Material: Three pieces of tissue: liver, kidney, and possibly spleen  
Diagnosis: Mycotic granuloma  
Submitter: G. C. Blasiola, Jr.
- RTLA 1065. Hard-shell clam, Mercenaria mercenaria  
Material: Fixed digestive diverticula tissue  
Diagnosis: Chlamydia infection  
Submitter: J. C. Harshbarger, S. C. Chang, and S. V. Otto
- RTLA 1066. Hard-shell clam, Mercenaria mercenaria  
Material: Fixed digestive diverticular tissue  
Diagnosis: Chlamydia infection  
Submitter: J. C. Harshbarger, S. C. Chang, and S. V. Otto
- RTLA 1067. Hard-shell clam, Mercenaria mercenaria  
Material: Fixed digestive diverticula tissue  
Diagnosis: Chlamydia infection  
Submitter: J. C. Harshbarger, S. C. Chang, and S. V. Otto
- RTLA 1068. Hard-shell clam, Mercenaria mercenaria  
Material: Fixed digestive diverticula tissue  
Diagnosis: Chlamydia infection  
Submitter: J. C. Harshbarger, S. C. Chang, and S. V. Otto
- RTLA 1069. Ruin lizard, Lacerta sicula  
Material: Six microscope slides  
Diagnosis: Fibrosarcoma  
Submitter: E. Elkan
- RTLA 1070. Trevally (jack?), Caranx lutescens  
Material: Tissue around vent; 3 black and white photographs  
Diagnosis: Neurofibrosarcoma  
Submitter: P. M. Hine
- RTLA 1071. Pacific cod, Gadus macrocephalus  
Material: One fish head with a tumorous growth on the inside  
of the gill covers  
Diagnosis: Parabronchial adenoma  
Submitter: C. R. Forrester
- RTLA 1072. Pacific cod, Gadus macrocephalus  
Material: One fish head with a tumorous growth on the inside  
of the gill covers  
Diagnosis: Parabronchial adenoma  
Submitter: C. R. Forrester

RTLA 1073. Pacific cod, Gadus macrocephalus

Material: One fish head with a tumorous growth on the inside  
of the gill covers

Diagnosis: Parabronchial adenoma

Submitter: C. R. Forrester

RTLA 1074. Pacific cod, Gadus macrocephalus

Material: One fish head with a tumorous growth on the inside  
of the gill covers

Diagnosis: Parabronchial adenoma

Submitter: C. R. Forrester

RTLA 1075. Pacific cod, Gadus macrocephalus

Material: One fish head with a tumorous growth on the inside  
of the gill covers

Diagnosis: Parabronchial adenoma

Submitter: C. R. Forrester

RTLA 1076. Pacific cod, Gadus macrocephalus

Material: One fish head with a tumorous growth on the inside  
of the gill covers

Diagnosis: Parabronchial adenoma

Submitter: C. R. Forrester

RTLA 1077. Pacific cod, Gadus macrocephalus

Material: One fish head with a tumorous growth on the inside  
of the gill covers

Diagnosis: Parabronchial adenoma

Submitter: C. R. Forrester

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Cave isopod	982
Chinook salmon	903, 940, 1002, 1022, 1023, 1039, 1040
<u>Chrysophrys auratus</u>	949, 1041, 1042
Chum salmon	902
Coho salmon	1038, 1045
Colorado River toad	1064
<u>Corydoras</u> sp.	943
<u>Crassostrea commercialis</u>	921, 983
<u>Crocodylus acutus</u>	985
<u>Crocodylus porosus</u>	927

	<u>RTLA NO.</u>
<u>Crotalus ruber</u>	984
Cunner	923
<u>Cynops pyrrhogaster</u>	936
<u>Cyprinus carpio</u>	934
<u>D</u>	
Dover sole	926
<u>Drosophila melanogaster</u>	933
<u>E</u>	
Eastern box turtle	1009A & B
Eastern garter snake	986
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<u>Eretmochelys imbricata</u>	977
<u>Esox lucius</u>	937, 1012, 1031-1035
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<u>Gadus macrocephalus</u>	1071-1077
<u>Geochelone carbonaria</u>	970
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Green frog	1058
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<u>Halocynthia pyriformis</u>	1018-1020
Hard-shell clam	1005-1007, 1065-1068
Hawksbill sea turtle	977
<u>Hyla regilla</u>	1010
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<u>Ictalurus natalis</u>	1047-1049
<u>Ictalurus nebulosus</u>	971
<u>Iguana iguana</u>	1037
Indian monitor lizard	1050
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<u>Lacerta sicula</u>	1069
Lake trout	1011, 1026, 1046
Largemouth bass	917
<u>Leiostomus xanthurus</u>	888-892
Leopard frog	920

RTLA NO.

M

<u>Macoma balthica</u>	1004
<u>Macrozoarces americanus</u>	922, 1015
<u>Meloidogyne incognita</u>	1017
<u>Mercenaria mercenaria</u>	1005-1007, 1065-1068
<u>Micropterus dolomieu</u>	1001
<u>Micropterus salmoides</u>	917
<u>Microstomus pacificus</u>	926

N

Northern pike	937, 1012, 1031-1035
Northern spiky dogfish	938

O

Ocean pout	922, 1015
<u>Oncorhynchus keta</u>	902
<u>Oncorhynchus kisutch</u>	1038, 1045
<u>Oncorhynchus nerka</u>	904
<u>Oncorhynchus tshawytscha</u>	903, 940, 1002, 1022, 1023, 1039, 1040
<u>Osmerus mordax</u>	918
<u>Ostrea lurida</u>	930, 981, 1029, 1062A, B, & C

P

Pacific cod	1071-1077
Pacific garter snake	1016
Pacific tree frog	1010
<u>Paralabrax nebulifer</u>	924
Pickrel frog	1057A & B
<u>Poecilia formosa</u>	893-898, 1021
<u>Poecilia reticulata</u>	1028
<u>Pseudopleuronectes americanus</u>	1013
<u>Pterophyllum scalare</u>	972

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<u>Rana pipiens</u>	920, 1052
<u>Rana pipiens</u> x <u>palustris</u>	1053, 1056

Red-footed tortoise	970
Red rattlesnake	984
Rockfish	1025
Root-knot nematode	1017
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<u>Xiphophorus helleri</u>	1024
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LIST OF CONTRIBUTORS

ALLEN, D.  
National Aquarium  
U.S. Department of the Interior  
Department of Commerce Building  
14th Between E & Constitution  
Avenue, N.W.  
Washington, D.C. 20230  
RTLA 977

ANDERSON, R. S.  
Donald S. Walker Laboratory  
Sloan-Kettering Institute for  
Cancer Research  
145 Boston Post Road  
Rye, New York 10580  
RTLA 1018-1020

BALLS, M.  
Department of Human Morphology  
The Medical School  
University of Nottingham  
Nottingham NG7 2RD, England  
RTLA 919

BANFIELD, W. G.  
Laboratory of Pathology  
National Cancer Institute  
National Institutes of Health  
Building 10, Room 8B-19  
Bethesda, Maryland 20014  
RTLA 1027

BELL, G. R.  
Pacific Biological Station  
Fisheries & Marine Service  
Department of the Environment  
P.O. Box 100  
Nanaimo, B.C. V9R 5K6, Canada  
RTLA 903, 928, 942, 1025

BLASIOLA, G. C. JR.  
Steinhart Aquarium  
California Academy of Sciences  
Golden Gate Park  
San Francisco, California 94118  
RTLA 1064

BOWMAN, T. E.  
Division of Crustacea  
National Museum of Natural History  
Smithsonian Institution  
Washington, D.C. 20560  
RTLA 982

BREAM FISHERMEN ASSOCIATION  
1333 North Spring Street  
Pensacola, Florida 32501  
RTLA 1047-1049

BROWN, E. R.  
Department of Microbiology  
The Chicago Medical School  
University of Health Sciences  
2020 West Ogden Avenue  
Chicago, Illinois 60612  
RTLA 937

BRYANT, S. V.  
Department of Developmental & Cell Biology  
University of California  
Irvine, California 92664  
RTLA 936

BUC, W. J.  
Grayling Field Office  
Michigan Department of Natural Resources  
P.O. Box 507  
Grayling, Michigan 49738  
RTLA 1063

CARPENTER, D. O.  
Neurobiology Department  
Armed Forces Radiobiology Research Institute  
Defense Nuclear Agency  
Bethesda, Maryland 20014  
RTLA 973

CHANG, S. C.  
Registry of Tumors in Lower Animals  
National Museum of Natural History  
Smithsonian Institution  
Washington, D.C. 20560  
RTLA 1065-1068

COHEN, S.  
Permanent Medical Group  
13652 Cantara Street  
Panorama City, California 91402  
RTLA 1028

COLLETTE, B. B.  
NOAA, U.S. Department of Commerce  
National Museum of Natural History  
Smithsonian Institution  
Washington, D.C. 20560  
RTLA 1013, 1015

COLLETTE, K. W.  
c/o B. B. Collette  
RTLA 1013

CORNICK, J. W.  
Halifax Laboratory  
Fisheries & Marine Service  
Department of the Environment  
P.O. Box 429  
Halifax, N.S. B3J 2R3, Canada  
RTLA 918

COSGROVE, G. E.  
Biology Division  
Oak Ridge National Laboratory  
P.O. Box Y  
Oak Ridge, Tennessee 37831  
RTLA 943, 1008, 1009, 1021

COUCH, J. A.  
Gulf Breeze Laboratory  
Office of Research & Monitoring  
U.S. Environmental Protection  
Agency  
Sabine Island  
Gulf Breeze, Florida 32561  
RTLA 1047-1049

DEMPSTER, R. P.  
Steinhart Aquarium  
California Academy of Sciences  
Golden Gate Park  
San Francisco, California 94118  
RTLA 920

ELKAN, E.  
Department of Histopathology  
Mount Vernon Hospital  
Northwood  
Middlesex HA6 2RN, England  
RTLA 985-987, 1069

ENAMAIT, E.  
c/o Albert Powell Hatchery  
Route One, Box 180  
Hagerstown, Maryland 21740  
RTLA 929

EVELYN, T. P. T.  
Pacific Biological Station  
Fisheries & Marine Service  
Department of the Environment  
P.O. Box 100  
Nanaimo, B.C. V9R 5K6, Canada  
RTLA 902, 1011, 1012

FORRESTER, C. R.  
Pacific Biological Station  
Fisheries & Marine Service  
Department of the Environment  
P.O. Box 100  
Nanaimo, B.C. V9R 5K6, Canada  
RTLA 1071-1077

FRYE, F. L.  
Berkeley Dog & Cat Hospital  
2126 Haste Street  
Berkeley, California 94704  
RTLA 970, 975, 1010, 1016, 1037, 1050

GAINES, J. L. JR.  
School of Medicine  
The University of Alabama in Birmingham  
University Station  
Birmingham, Alabama 35294  
RTLA 971

GATEFF, E. A. F.  
Biologisches Institut I (Zoologie) der  
Albert-Ludwigs-Universität  
78 Freiburg IM Breisgau, Schanzlestrasse 9  
West Germany  
RTLA 933

GHITTINO, P.  
Fish Disease Laboratory  
Istituto Zooprofilattico Sperimentale  
Via Bologna, 148  
10154 Torino, Italy  
RTLA 1036

HARSHBARGER, J. C.  
Registry of Tumors in Lower Animals  
National Museum of Natural History  
Smithsonian Institution  
Washington, D.C. 20560  
RTLA 1065-1068

HART, R. W.  
The College of Medicine Facilities  
The Ohio State University Hospitals  
410 West 10th Avenue  
Columbus, Ohio 43210  
RTLA 893-898

HERMAN, R. L.  
Eastern Fish Disease Laboratory  
U.S. Department of the Interior  
Leetown, Route One  
Kearneysville, West Virginia 25430  
RTLA 917

HINE, P. M.  
Fisheries Research Division  
Ministry of Agriculture & Fisheries  
P.O. Box 19062  
Wellington, New Zealand  
RTLA 938, 939, 972, 1002, 1041-1044,  
1070

HOLZINGER, E. W.  
Diagnostic Assistance Laboratory  
College of Veterinary Medicine  
The University of Georgia  
Athens, Georgia 30602  
RTLA 984

HOSKINS, G. E.  
Pacific Biological Station  
Fisheries & Marine Service  
Department of the Environment  
P.O. Box 100  
Nanaimo, B.C. V9R 5K6, Canada  
RTLA 1026, 1038-1040

HOTCHKISS, F. H. C.  
Division of Natural Sciences  
State University of New York  
College at Purchase  
Purchase, New York 10577  
RTLA 978

HNATH, J. G.  
Wolf Lake Pathobiology Laboratory  
Wolf Lake Hatchery  
Michigan Department of Natural  
Resources  
Route One  
Mattawan, Michigan 49071  
RTLA 940, 988, 1045, 1046

HUFF, J. A.  
Marine Research Laboratory  
State of Florida Department of  
Natural Resources  
100 Eighth Avenue, S.E.  
St. Petersburg, Florida 33701  
RTLA 979, 980

ISHIKAWA, T.  
Department of Experimental  
Pathology  
Cancer Institute  
Kami-Ikebukuro, Toshima-ku  
Tokyo, Japan  
RTLA 1024

KERN, F. G.  
Biological Laboratory  
National Marine Fisheries Service, NOAA  
U.S. Department of Commerce  
Oxford, Maryland 21654  
RTLA 1004

KIMURA, I.  
Laboratory of Viral Oncology  
Research Institute, Aichi Cancer Center  
Chikusa-ku, Nagaya, Japan  
RTLA 935

LANDOLT, M. L.  
Washington Cooperative Fisheries  
Research Unit  
College of Fisheries WH-10  
University of Washington  
Seattle, Washington 98195  
RTLA 927

LJUNGBERG, O.  
Department of Anatomy & Histology  
Royal Veterinary College & National  
Veterinary Institute  
S-104 05 Stockholm, Sweden  
RTLA 1031-1035

LLOYD, R.  
National Aquarium  
U.S. Department of the Interior  
Department of Commerce Building  
14th Between E & Constitution Avenue, N.W.  
Washington, D.C. 20230  
RTLA 977

MIX, M. C.  
Department of General Science  
Oregon State University  
Corvallis, Oregon 97331  
RTLA 930, 981, 1029, 1062

MULCARE, D. J.  
College of Arts & Sciences  
Southeastern Massachusetts University  
North Dartmouth, Massachusetts 02747  
RTLA 1051-1058

OTTO, S. V.  
Maryland Department of Natural Resources  
c/o Biological Laboratory  
U.S. Department of Commerce  
Oxford, Maryland 21654  
RTLA 1005-1007, 1065-1068

OVERSTREET, R. M.  
Parasitology Section  
Gulf Coast Research Laboratory  
P.O. Drawer AG  
Ocean Springs, Mississippi 39564  
RTLA 888-892

PAPERNA, I.  
The Heinz Steinitz Marine Biology  
Laboratory  
The Hebrew University of Jerusalem  
P.O. Box 469  
Eilat, Israel  
RTLA 1000, 1059-1061

QUICK, J. A. JR.  
Marine Research Laboratory  
State of Florida Department of  
Natural Resources  
100 Eighth Avenue, S.E.  
St. Petersburg, Florida 32304  
RTLA 979, 980

ROBERTS, R. J.  
Unit of Aquatic Pathobiology  
University of Stirling  
Stirling FK9 4LA, Scotland  
RTLA 974

ROSE, F. L.  
Department of Biological Sciences  
Texas Tech University  
P.O. Box 4149  
Lubbock, Texas 79409  
RTLA 905-916, 944-969, 989-999

ROTHENBACHER, H.  
Department of Veterinary Science  
The Pennsylvania State University  
115 Animal Industries Building  
University Park, Pennsylvania 16802  
RTLA 1001

SAYRE, R. M.  
Nematology Laboratory  
Agricultural Research Center, West  
U.S. Department of Agriculture  
Beltsville, Maryland 20705  
RTLA 1017

SCHOKNECHT, R.  
Museum of Comparative Zoology  
at Harvard College  
Cambridge, Massachusetts 02138  
RTLA 1014

SHERWOOD, M. J.  
Southern California Coastal Water Research  
Project  
1500 East Imperial Highway  
El Segundo, California 90245  
RTLA 924-926

SHUMWAY, S. E.  
N.E.R.C. Unit  
Marine Science Laboratories  
University College of North Wales  
Menai Bridge  
Anglesey LL59, 5EH, Wales  
RTLA 923

SMITH, A. C.  
Department of Clinical Pathology  
University of Hawaii School of Medicine  
St. Francis Hospital  
2260 Liliha  
Honolulu, Hawaii 96817  
RTLA 941

SMITH, C. E.  
Fish Cultural Development Center  
U.S. Department of the Interior  
Route 2, Box 333  
Bozeman, Montana 59715  
RTLA 899-901, 904

SNYDER, R. L.  
Penrose Research Laboratory  
Philadelphia Zoological Garden  
34th Street & Girard Avenue  
Philadelphia, Pennsylvania 19104  
RTLA 1030

SONSTEGARD, R.  
Department of Microbiology  
University of Guelph  
Guelph, Ontario, Canada  
RTLA 934

VAN DE KERKHOFF, J.  
KIWA, Mariahoeve  
De Wiers 17  
Nieuwegein, The Netherlands  
RTLA 976

WOLF, H.  
Fish Disease Laboratory  
California Department of Fish & Game  
2111 Nimbus Road  
Rancho Cordova, California 95670  
RTLA 931, 932, 1003

WOLF, P. H.  
New South Wales State Fisheries  
Laboratories  
211 Kent Street  
Sydney 2000, Australia  
RTLA 921, 983

WOLKE, R. E.  
Seagrant Pathology Laboratory  
University of Rhode Island  
Kingston, Rhode Island 02881  
RTLA 922

YASUTAKE, W. T.  
Western Fish Disease Laboratory  
Fish & Wildlife Service  
U.S. Department of the Interior  
Building No. 204  
Naval Support Activity  
Seattle, Washington 98115  
RTLA 1022, 1023



TEAR OUT ACCESSION SHEET

PLEASE SUBMIT TO:

Dr. John C. Harshbarger  
Registry of Tumors in Lower Animals  
National Museum of Natural History  
Room W216-A  
Smithsonian Institution  
Washington, D.C., 20560, USA

DATE RECD. \_\_\_\_\_  
CONTRIBUTOR'S NO. \_\_\_\_\_  
RTLA NO. \_\_\_\_\_  
USNM NO. \_\_\_\_\_  
NIH HISTOPATH NO. \_\_\_\_\_

COMMON NAME \_\_\_\_\_ FAMILY \_\_\_\_\_  
PHYLUM \_\_\_\_\_ GENUS \_\_\_\_\_  
CLASS \_\_\_\_\_ SPECIES \_\_\_\_\_  
ORDER \_\_\_\_\_

CATEGORY: NEOPLASM \_\_\_\_\_ INFLAMMATION \_\_\_\_\_ INFECTION \_\_\_\_\_ PARASITIC \_\_\_\_\_ TOXIC \_\_\_\_\_  
DEVELOPMENTAL \_\_\_\_\_ TRAUMATIC \_\_\_\_\_ NORMAL \_\_\_\_\_ OTHER \_\_\_\_\_

CONTRIBUTOR (NAME & ADDRESS): \_\_\_\_\_ COLLECTOR (NAME & ADDRESS): \_\_\_\_\_

ITEMS SUBMITTED (QUANTITY):

GROSS MATERIAL \_\_\_\_\_ PHOTOGRAPHS \_\_\_\_\_  
SLIDES \_\_\_\_\_ REPRINTS \_\_\_\_\_  
BLOCKS \_\_\_\_\_ OTHER \_\_\_\_\_

ORIGIN OF ANIMAL: MARINE \_\_\_\_\_ FRESHWATER \_\_\_\_\_ ESTUARINE \_\_\_\_\_ TERRESTRIAL \_\_\_\_\_  
WHERE COLLECTED \_\_\_\_\_

DATE COLLECTED \_\_\_\_\_ SEX \_\_\_\_\_ AGE \_\_\_\_\_ STAGE OF LIFE CYCLE \_\_\_\_\_  
HOW KILLED \_\_\_\_\_ FIXATION \_\_\_\_\_  
GROSS DESCRIPTION \_\_\_\_\_  
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COMMENTS (e.g., possible exposure to chemical pollutants or infectious agents, incidence and duration of this condition in the population, etc.)  
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Zool.

ACTIVITIES REPORT  
REGISTRY OF TUMORS IN LOWER ANIMALS:

1975 SUPPLEMENT

JOHN C. HARSHBARGER, DIRECTOR

PREPARED FOR DISTRIBUTION BY:

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



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The activities of the Registry during 1975 reflected an increased interest in the cause and significance of neoplasia in invertebrate and cold-blooded vertebrate animals. As pointed out in the two previous activities reports (copies of which are still available) there are numerous proven and hypothesized benefits from studying neoplasms in lower animals including the discovery of: new carcinogens, indicators of carcinogens in the environment, vectors of cancer viruses, reservoirs of chemical carcinogens, multipliers of carcinogens in the food chain, models for the study of mechanisms of neoplastic transformation, sources of anti-cancer compounds, and models for screening the carcinogenicity and mutagenicity of new chemicals. Protection of animal populations from epizootic neoplasia and research spinoff in related fields can be added to this list.

#### SPECIMEN COLLECTION

The specimen collection is the most important component of the Registry's mission and we invite contributions of any material showing neoplasms or related diseases in cold-blooded vertebrates and invertebrates. The material will be processed as required and where applicable a set of microscope slides will be returned with the diagnosis. Almost all of the cases received add to the information on geographic and phylogenetic distribution of these diseases and their manifestation within the organism. In addition, many of the cases have special significance as they relate to one of the benefits mentioned above. Unfortunately a report such as this does not portray the total significance of each case, but in conjunction with the literature it will give one a fair estimation of where we stand.

In 1975 the specimen collection increased by 305 accessions, which represented a 62% increase over those received in 1974. The complete list of specimens with the diagnosis, name of contributor, and pertinent reference when applicable, is included in this report. Table I gives a breakdown of the major phylogenetic groups with the ratio of neoplastic to non-neoplastic lesions. The bulk of the specimens are bony fish and bivalve mollusks. Approximately two-thirds of the diagnosed material was neoplastic, but mollusca and arthropoda continue to be the only invertebrate phyla from which verifiable neoplasms are known.

Among the accessions of special interest were 47 hagfish cases having hepatocellular, cholangiocellular, and/or islet cell adenomas and adenocarcinomas. These cases, representing the only known neoplasms of this primitive vertebrate, were discovered in a Baltic Fjord by Sture Falkmer. Incidence decreased from 5.8% (liver lesions) and 0.5% (islet organ lesions) in 1972 to 0.6% and 0.1% respectively in 1974. The cause has not been determined.

Also of note were 102 cases from the soft-shell clam, Mya arenaria, primarily with germinomas and hematopoietic neoplasms. These animals were from an area where spillage of refined petroleum products has occurred. Incidence has averaged 4-5% in about 3,000 animals surveyed since 1971. Incidence of approximately 850 animals collected away from the oil spill site is 0.3-0.4%.

TABLE I

## DISTRIBUTION OF LESIONS AMONG SPECIMENS ACCESSIONED

Phylogenetic Group	TYPE OF DISEASE			Total
	Neoplastic	Non-Neoplastic	Not Diagnosed	
Reptile	6	16	2	24 (8%)
Amphibian	4	3	0	7 (2%)
Bony fish	45	49	5	99 (32%)
Shark	1	0	0	1 (0.3%)
Hagfish	47	2	0	49 (16%)
Tunicate	0	1	0	1 (0.3%)
Mollusks	108	9	2	119 (39%)
Arthropods	0	4	0	4 (1%)
Echinoderms	0	1	0	1 (0.3%)
Total	211 (69%)	85 (28%)	9 (3%)	305 (100%)
Percent of those diagnosed	(71%)	(29%)		



Other cases of interest included: (1) a parabranchial body adenoma in a rockfish (RTLA 1079) received from Gordon Bell and Gary Hoskins. These are well known in Pacific and Atlantic cod but were previously unknown in rockfish; (2) a hematopoietic neoplasm in an Australian oyster, Crassostrea commercialis, (RTLA 1117) from Peter Wolf. Mr. Wolf has discovered well over 100 epidermal papillomas in the mantle of this oyster but this is only the second hematopoietic lesion; (3) ossifying dermal fibromas in mullet (RTLA 1111) and southern flounder (RTLA 1112) were contributed by Robin Overstreet. Donald Lightner has also found lesions of this type in mullet (RTLA 807 and 821) and Tom Wright and Dave Tomljanovich have found them in sauger (RTLA 823). Frank Schwartz contributed an ossifying fibroma in the jaw of a crevalle jack (RTLA 1233); (4) Fredric Frye contributed a second palatine chondromyxofibroma from a tree frog (RTLA 1080); (5) Robert Wolke discovered a second striped bass nephroblastoma (RTLA 1124); (6) the first metastatic fish nephroblastoma occurred in a crucian carp, Carassius carassius, (RTLA 1153) submitted by David Bucke; (7) a metastatic pancreatic carcinoma in a tiger salamander, Ambystoma tigrinum, was submitted by Francis Rose (RTLA 1226). Approximately 50% of the salamanders living in the same sewage settling lagoon have skin neoplasms, some of which are highly invasive, but this is the first case of a metastatic cancer in this population; (8) the first plasma cell tumor in a reptile was in a cotton mouth moccasin submitted by E.P. Finnie (RTLA 1176); (9) three additional cases of benign polypoid neoplasms were discovered in bivalve mollusks. One in an Ostrea lurida (RTLA 1168) and one in a Crassostrea virginica (RTLA 1228) discovered by Michael Mix and by Sara Otto respectively originated from connective tissue proximal to the pericardium. The third case was a myoma of the foot of a surf clam, Spisula solidissima, (RTLA 1227) discovered by Louis Leibovitz; (10) two cases of bile duct adenofibrosis in white perch (RTLA 1226 and 1234) were discovered by Todd Beckerman and R.P. Morgan, II. Similar lesions can be induced in rat livers with hepatotoxic chemicals which suggest the perch may have been responding to an environmental pollutant. A similar case in a Siganus rivulatus (RTLA 1236) was submitted by Ilan Paperna; (11) during a routine autopsy of an apparently healthy spiny dogfish shark caught for experimental purposes, a papilloma of the choroid plexus (RTLA 1221) was discovered by Anthony Guarino, David Prieur, and Joseph Fenstermacher; (12) a komodo dragon received as a diplomatic present to the U.S. and housed at the National Zoo in Washington, D.C., began exhibiting intestinal disorders in 1973 and died in 1975 of congestive heart failure. Autopsy showed adenocarcinomatous lesions in colon, spleen, adrenal and pancreas, plus tumor emboli in blood vessels. The case (RTLA 1166), investigated by Richard Montali of the National Zoo, is the only neoplasm known from this reptilian species. An ancient encapsulated hematoma was also found in its foot pad by Charles Ross as the hide was being preserved; (13) material was received from thyroid hyperplasias and neoplasias in a variety of fish. It is difficult to make a definitive diagnosis of adenocarcinoma in fish thyroids because fish frequently get goiterous hyperplasias from lack of iodine or exposure to thyroid toxins such as thiourea. Since fish thyroids are unencapsulated, the hyperplastic follicles from goiters often invade but do not destroy normal tissues and can even be seen separating muscle fibers. RTLA 1099-1103 were Amazon mollies from Ronald Hart, with greatly enlarged thyroids. The hyperplastic follicles showed extensive tissue damage and local invasion thus favoring an interpretation of thyroid carcinoma. RTLA 1155 and 1157 were roaches from David Bucke with probable thyroid carcinomas although postmortem

change prevented an unqualified diagnosis. RTLA 1167 was an opaleye with a thyroid adenoma submitted by Roger Herman. RTLA 1208 was a Coris flavovittata with a thyroid adenoma from Robert Bourke. RTLA 1219 was a golden trout with either a thyroid or a renal adenocarcinoma from Charlie Smith and RTLA 1224 were several spots with thyroid hyperplasias from Gerry Cosgrove; (14) five fish neural sheath tumors were received: neurilemmomas in a sculpin from G.N. Swinney (RTLA 1078); in a goldfish from Ron Roberts (RTLA 1091); in a rainbow smelt from Vance Logan and Paul Odense (RTLA 1163); and in a snapper from Mike Sigel (RTLA 1378). A neurilemmal sarcoma was submitted in a Pseudo-tropheus tropheops from George Blasiola, Jr. (RTLA 1270); (15) epidermal papillomas from Dover sole (RTLA 1082-4) and a white croaker (RTLA 1086) were submitted by Dilworth Chamberlain. An epidermal papilloma from a bull-head (RTLA 1376) was received from Kenneth Wolf; (16) epizootic multiple myopathic granulomas of unknown etiology in skeletal muscle of walleyes (RTLA 1136-46) are being studied by Philip Economon; (17) a testicular leiomyoma in a kahawai was submitted by P.M. Hine (RTLA 1172); (18) Ted Meyers submitted tissue from the heart of an Atlantic sturgeon showing normal hematopoiesis associated with the epicardium of the heart (RTLA 1118); and, (19) an invasive melanoma from a chinook salmon was submitted by John Hnath (RTLA 1269).

#### REFERENCE LIBRARY

Approximately 150 papers were added to the comprehensive library on neoplasms in lower animals bringing the total to 2,950. Except for recent acquisitions and articles that need to be translated, all papers have been abstracted by selected key words and computerized.

#### PAPERS SINCE 1974

- Dawe, C.J. and J.C. Harshbarger. Neoplasms in Feral Fishes: Their Significance to Cancer Research. In: The Pathology of Fishes, W.E. Ribelin and G. Migaki (ed.), Chapter 35, pp. 871-94. The University of Wisconsin Press: Madison and London. 1975.
- Frye, F.L., J.D. Carney, J.C. Harshbarger, and R.F. Zeigel. Malignant Chromatophoroma in a Western Terrestrial Garter Snake. J. Amer. Vet. Med. Assoc., 167: 557-8. 1975.
- Harshbarger, J.C. Registry of Tumors in Lower Animals. In: O. Bessey, Status of Marine Biomedical Research. Environ. Health Perspect., 13: 152-4. 1976.
- Harshbarger, J.C., S.E. Shumway, and G.W. Bane. Variably Differentiating Oral Neoplasms, Ranging from Epidermal Papilloma to Odontogenic Ameloblastoma, in Cunners Tautogolabrus adspersus (Osteichthyes; Perciformes; Labridae). In: Progress in Experimental Tumor Research, Vol. 20, Neoplasms in Aquatic Animals as Indicators of Environmental Carcinogens. F. Homberger (ed.), pp. 113-28. Karger: Basel. 1976.
- Billups, L.H. and J.C. Harshbarger. Section XII: "Reptiles" of Chapter 6, "Naturally Occurring Neoplastic Diseases of Laboratory Animals". In: CRC Handbook of Laboratory Animal Science, Vol. 3, E.C. Melby, Jr. and N. Altman (ed.). CRC Press: Cleveland. (In press).

Harshbarger, J.C. Spontaneous Neoplasms in Amphibians, a Section of Chapter 1: "Tumors," in: Pathology of Laboratory Animals, Vol. 2, K. Benirschke, F.M. Garner, T.C. Jones, and C. Kozma (ed.). Springer-Verlag: New York. (In press).

OTHER ACTIVITIES IN 1975

1. Hosted and addressed a Marine Biomedical Research Meeting, sponsored by the National Institute of Environmental Health Sciences on 13-14 February 1975 [Bessey, O. Status of Marine Biomedical Research, *Environ. Health Perspect.*, 13: 147-63, 1976; also summarized as Marine Biomedical Scientists Examine Harvest of Knowledge from the Sea, *The NIH Record*, 27(6): 4-5, 25 March 1975].
2. Served as Secretary of the UICC Committee on Comparative Oncology (chaired by C.J. Dawe of the U.S. National Cancer Institute).
3. Conducted research on integumentary neoplasms in cunners, catfish, and salamanders under the auspices of the above Committee.
4. Presented the report, "Malignant Lymphomas of Fish in the Collection of the Registry of Tumors in Lower Animals," at the First International Workshop on Malignant Lymphoma in Esocidae held in Stockholm on 9-11 October 1975.
5. Attended the VIIth International Symposium on Comparative Research on Leukemia and Related Diseases held in Copenhagen on 13-17 October 1975.
6. Collected catfish specimens and consulted with Dr. John Couch (Environmental Research Laboratory, U.S. Environmental Protection Agency, Gulf Breeze, Florida on 5-10 December 1975) on a collaborative study of epidermal and melanophore neoplasms of catfish. Also gave a seminar to the Laboratory's staff.
7. Consulted with personnel of the Mt. Desert Island Biological Laboratory, Salsbury Cove, Maine on 29-30 July 1975 and presented a seminar on the current status and benefits that may accrue from the study of neoplasms in invertebrate and cold-blooded vertebrate animals emphasizing the activities of the Registry of Tumors in Lower Animals.
8. Presented two papers at, and co-authored a third for, the VIIIth Annual Meeting of the Society for Invertebrate Pathology and attended the Executive Council Meeting as the Society's Secretary on 18-21 August 1975 in Corvallis, Oregon.
9. Participated in the planning and addressed a Workshop on Molluscan Pathology held at the Wye Institute, Wye Mills, Maryland on 3-5 September 1975.
10. Served as Secretary of the Washington, D.C. Chapter of Sigma Xi, The Scientific Research Society of North America.

11. Served on the Interagency Collaborative Group on Environmental Carcinogenesis (chaired by H.F. Kraybill of the U.S. National Cancer Institute).
12. Served as Secretary for the Society for Invertebrate Pathology.
13. Served as a member of the Committee on Animal Models and Genetic Stocks of the National Research Council of the National Academy of Sciences.
14. Participated in a cooperative investigation of the etiology of several diseases of bivalve mollusks, supported in part by the U.S. Food and Drug Administration.
15. Served as a member of the Planning Committee for a New York Academy of Sciences sponsored Conference entitled: "Aquatic Pollutants and Biological Effects With Emphasis on Neoplasia" to be held 27-29 September 1976 in New York City.
16. Participated in a meeting to assess the need for a new journal and a new society for comparative pathology held at the Eastern Virginia Medical School in Norfolk, Virginia, hosted by Daniel Cowan and Sanford Vernick, on 1 December 1975.
17. Was interviewed on several occasions by reporters interested in writing semi-popular articles on the biomedical effects of environmental pollution. Some of the resulting articles were: (1) Ember, Lois. The Specter of Cancer, Environ. Sci. Tech., 9(13): 1117-21, 1975; (2) Brett, Abigail Trafford. Fish: Man's Early Warning System, The Washington Post, section B, page 3, Sunday, 14 September 1975; and, (3) Pendelton, Deedee. Fish Tumors: Carcinogenic Indicators? Sci. News, 107(10): 157-8, 8 March 1975.

#### PERSONNEL

The Project Officer for the contract is Dr. Clyde J. Dawe, Head, Comparative Oncology Section, Laboratory of Pathology, National Cancer Institute, National Institutes of Health, Bethesda, Maryland, 20014.

The Principal Investigator for the contract is Dr. W. Duane Hope, Chairman, Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C., 20560.

The staff of the Registry is as follows:

John C. Harshbarger, Ph.D.	- Director
Sing Chen Chang, Ph.D.	- Electron Microscopist
Phyllis M. Schellenger, B.S.	- Registrar
Linda J. Cullen, B.A.	- Histopathology Technician
Judith E. Foster, B.S.	- Bibliographer and Histopathology Technician
Marilyn Slatick, B.S.	- Bibliographer

ACCESSIONS

- RTLA 1078. Sculpin, Cottus gobio  
Material: Posterior portion of specimen with a growth below the dorsal fin  
Diagnosis: Neurilemmoma  
Submitter: G. N. Swinney
- RTLA 1079. Rockfish, Sebastes sp.  
Material: Cleithrum area with a spongy, convoluted growth  
Diagnosis: Parabranchial body adenoma  
Submitter: G. E. Hoskins
- RTLA 1080. Pacific tree frog, Hyla regilla  
Material: A piece of tissue from palate  
Diagnosis: Chondromyxoma  
Submitter: F. L. Frye
- RTLA 1081. Speckled sanddab, Citharichthys stigmaeus  
Material: One gross specimen with missing right eye  
Diagnosis: Probable physical injury  
Submitter: D. W. Chamberlain
- RTLA 1082. Dover sole, Microstomus pacificus  
Material: One gross specimen with a lesion on the lower lip and a lesion on the caudal fin  
Diagnosis: Epidermal papillomas coexistent with extensive inflammation  
Submitter: D. W. Chamberlain
- RTLA 1083. Dover sole, Microstomus pacificus  
Material: One gross specimen with a growth located in a mid-lateral position below the lateral line and involving a portion of the anal fin  
Diagnosis: Epidermal papilloma  
Submitter: D. W. Chamberlain
- RTLA 1084. Dover sole, Microstomus pacificus  
Material: One gross specimen with three growths -- one each on the pectoral, caudal, and anal fins  
Diagnosis: Epidermal papillomas  
Submitter: D. W. Chamberlain
- RTLA 1085. White seaperch, Phanerodon furcatus  
Material: One gross specimen with an eroded operculum on the left side  
Diagnosis: Possible mechanical injury  
Submitter: D. W. Chamberlain
- RTLA 1086. White croaker, Genyonemus lineatus  
Material: One gross specimen with two similar growths attached to the upper lip in opposite corners of the mouth  
Diagnosis: Epidermal papillomas  
Submitter: D. W. Chamberlain

- RTLA 1087. Largescale sucker, Catostomus macrocheilus  
Material: Anal fin and adjoining body wall and growth  
Diagnosis: Myoblastoma  
Submitter: C. D. Becker
- RTLA 1088-9. Mussel, Mytilus edulis  
Material: One gross specimen each with a growth on the foot  
Diagnosis: Parasitic abscess  
Submitter: S. E. Shumway
- RTLA 1090. Brown trout, Salmo trutta  
Material: Caudal peduncle with a black, gelatinous growth  
Diagnosis: Myxofibrosarcoma  
Submitter: P. M. Hine
- RTLA 1091. Goldfish, Carassius auratus  
Material: Two microscope slides; 1 color transparency  
Diagnosis: Neurilemmoma or a neurofibroma  
Submitter: R. J. Roberts
- RTLA 1092. Hard-shell clam, Mercenaria mercenaria  
Material: Fixed digestive diverticula tissue; 3 microscope slides  
Diagnosis: Chlamydia inclusions  
Submitter: S. V. Otto, J. C. Harshbarger, and S. C. Chang
- RTLA 1093. Sitana ponticeriana  
Material: One microscope slide; 1 color transparency  
Diagnosis: Bacterial granuloma of the dermis accompanied by epidermal hyperplasia  
Submitter: G. Matz
- RTLA 1094. Carp, Cyprinus carpio  
Material: One microscope slide  
Diagnosis: Fibromyxoma versus inflammatory polyp  
Submitter: G. Migaki
- RTLA 1095. Croaker  
Material: One eye with a mass of tissue at the margins  
Diagnosis: Edematous conjunctiva due to infection with trematode-like parasites  
Submitter: W. Kandrashoff
- RTLA 1096. Striped (black) mullet, Mugil cephalus  
Material: Crooked pectoral fin  
Diagnosis: Double fracture of fin spine associated with parasitic granulomas  
Submitter: W. Kandrashoff
- RTLA 1097-8. Menhaden, Brevoortia sp.  
Material: One crooked caudal fin each  
Diagnosis: Double fracture of fin spine associated with parasitic granulomas  
Submitter: W. Kandrashoff

- RTLA 1099-1103. Amazon molly, Poecilia formosa  
Material: One gross specimen each  
Diagnosis: Marked hyperplasia versus carcinoma of thyroid  
Submitter: R. W. Hart
- RTLA 1104. Sea urchin  
Material: One gross specimen with enlarged deformed spines  
Diagnosis: Pending  
Submitter: M. E. Downey
- RTLA 1105. Amazon molly, Poecilia formosa  
Material: Twenty-four gross specimens  
Diagnosis: Normal  
Submitter: R. W. Hart
- RTLA 1106. Tunicate, Ascidiella sp.  
Material: One partially dissected specimen with an abnormally enlarged cerebral ganglion/neural gland region  
Diagnosis: Multiple cysts containing protozoa  
Submitter: L. M. Laird
- RTLA 1107. Corn snake, Elaphe guttata guttata  
Material: Four microscope slides; 2 paraffin blocks  
Diagnosis: Parasitic granuloma of algal (Protothecosa sp.) etiology  
Submitter: G. C. Crispens, Jr.  
Reprint: Crispens, Charles G., Jr. and Ken R. Marion. Algal Infection in a Corn Snake (Elaphe guttata guttata). Lab. Anim. Sci., 25: 788-9. 1975.
- RTLA 1108. Shortfin eel, Anguilla australis  
Material: Head with swollen lips and tail with patches of mucus; 3 microscope slides; 2 black and white photographs  
Diagnosis: Hyperplastic epidermis with hypertrophic goblet cells  
Submitter: P. M. Hine
- RTLA 1109. Scissorstail, Rasbora trilineata  
Material: One gross specimen with a growth involving the right side of the head anterior to the eye  
Diagnosis: Adenocarcinoma of unknown origin  
Submitter: G. C. Blasiola, Jr.
- RTLA 1110. Shortfin eel, Anguilla australis  
Material: A piece of skin with attached underlying tissue containing a cyst-like structure  
Diagnosis: Pending  
Submitter: P. M. Hine and N. C. Boustead
- RTLA 1111. Striped mullet, Mugil cephalus  
Material: Two microscope slides  
Diagnosis: Dermal fibroma with areas of ossification  
Submitter: R. M. Overstreet  
Reprint: Edwards, R. H. and R. M. Overstreet. Mesenchymal Tumors of Some Estuarine Fishes of the Northern Gulf of Mexico. I. Subcutaneous Tumors, Probably Fibrosarcomas, in the Striped Mullet, Mugil cephalus. Bull. Mar. Sci., 26: 33-40. 1976.

- RTLA 1112. Southern flounder, Paralichthys lethostigma  
Material: Two microscope slides  
Diagnosis: Subcutaneous fibroma  
Submitter: R. M. Overstreet  
Reprint: Overstreet, Robin M. and Robert H. Edwards. Mesenchymal Tumors of Some Estuarine Fishes of the Northern Gulf of Mexico. II. Subcutaneous Fibromas in the Southern Flounder, Paralichthys lethostigma, and the Sea Catfish, Arius felis. Bull. Mar. Sci., 26: 41-48. 1976.
- RTLA 1113. Sea catfish, Arius felis  
Material: Two microscope slides  
Diagnosis: Subcutaneous chondrofibroma  
Submitter: R. M. Overstreet  
Reprint: (See RTLA 1112)
- RTLA 1114. Boa constrictor  
Material: Two paraffin blocks  
Diagnosis: Intussusception (ileal)  
Submitter: E. Elkan
- RTLA 1115. Boa constrictor  
Material: One paraffin block  
Diagnosis: Possible Anitschkow myocyte tumor  
Submitter: E. Elkan
- RTLA 1116. Boa constrictor  
Material: Two paraffin blocks  
Diagnosis: Lymphocytic thyroiditis resembling Hashimoto's disease  
Submitter: E. Elkan
- RTLA 1117. Sydney rock oyster, Crassostrea commercialis  
Material: Two microscope slides  
Diagnosis: Hematopoietic neoplasm co-existent with a haplosporidan infection  
Submitter: P. H. Wolf
- RTLA 1118. Atlantic sturgeon, Acipenser oxyrhynchus  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Normal hematopoietic tissue peripheral to heart  
Submitter: T. R. Meyers
- RTLA 1119. Coho salmon, Oncorhynchus kisutch  
Material: One microscope slide; 2 black and white photographs; 1 color transparency  
Diagnosis: Glochidia from Margaritifera margaritifera producing epithelial and stromal hyperplasia from host  
Submitter: T. R. Meyers  
Reprint: Master's thesis: Susceptibility of Juvenile Salmonid Fishes to Infection with Glochidia of Margaritifera margaritifera (L.) (Pelecypoda: Margaritanidae).



- RTLA 1120. Chinook salmon, Oncorhynchus tshawytscha  
Material: One microscope slide; 3 black and white photographs;  
1 color transparency  
Diagnosis: Glochidia from Margaritifera margaritifera producing  
epithelial and stromal hyperplasia from host  
Submitter: T. R. Meyers  
Reprint: (See RTLA 1119)
- RTLA 1121. Summer flounder, Paralichthys dentatus  
Material: One microscope slide  
Diagnosis: Stephanostomum sp. metacercariae -- encysted  
Submitter: T. R. Meyers
- RTLA 1122. Copepod, Lernaeenicus radiatus  
Material: One gross specimen with thin, white, wing-like material  
streaming from the abdomen  
Diagnosis: Parasitic fungi  
Submitter: T. R. Meyers
- RTLA 1123. Striped bass, Morone saxatilis  
Material: One piece of tissue containing a segment of a 10x4x1.5 cm  
reddish-brown lesion in flank muscle; 2 microscope slides;  
2 paraffin blocks  
Diagnosis: Scar  
Submitter: D. E. Zwerner
- RTLA 1124. Striped bass, Morone saxatilis  
Material: Four pieces of tissue; 1 microscope slide  
Diagnosis: Nephroblastoma  
Submitter: R. E. Wolke
- RTLA 1125-6. Oyster, Crassostrea virginica  
Material: Three microscope slides each; 1 paraffin block each  
Diagnosis: Rickettsia-like inclusions  
Submitter: S. V. Otto
- RTLA 1127-30. Soft-shell clam, Mya arenaria  
Material: Three microscope slides each; 1 paraffin block each  
Diagnosis: Rickettsia-like inclusions  
Submitter: S. V. Otto
- RTLA 1131. Boa constrictor  
Material: Four microscope slides; 1 paraffin block  
Diagnosis: Subcutaneous multiple mycotic granulomas  
Submitter: C. G. Crispens, Jr.
- RTLA 1132. American toad, Bufo americanus  
Material: Two microscope slides from small yellow growth near tympanum  
Diagnosis: Probably a type of xanthosis  
Submitter: C. L. Counts, III
- RTLA 1133. Tiger salamander, Ambystoma tigrinum  
Material: One piece of tissue  
Diagnosis: Fibrosarcoma  
Submitter: F. L. Rose

- RTLA 1134. Mussel shrimp, Gigantocypris muelleri  
Material: Left seventh limb  
Diagnosis: Probable physical injury  
Submitter: L. S. Kornicker
- RTLA 1135. Red-spotted newt, Notophthalmus viridescens  
Material: One gross specimen from which a growth had been removed from the neck and the excised growth; 2 microscope slides; 1 paraffin block; 2 black and white photographs  
Diagnosis: Neural neoplasm -- type undetermined  
Submitter: C. L. Counts, III
- RTLA 1136. Walleye, Stizostedion vitreum vitreum  
Material: One piece of tissue; 1 microscope slide; 1 paraffin block; 1 laboratory report  
Diagnosis: Multiple myopathic granulomas -- etiology undetermined  
Submitter: P. P. Economon
- RTLA 1137-9. Walleye, Stizostedion vitreum vitreum  
Material: One piece of tissue each  
Diagnosis: Normal  
Submitter: P. P. Economon
- RTLA 1140. Walleye, Stizostedion vitreum vitreum  
Material: Two pieces of tissue; 1 laboratory report  
Diagnosis: Multiple myopathic granulomas -- etiology undetermined  
Submitter: P. P. Economon
- RTLA 1141. Walleye, Stizostedion vitreum vitreum  
Material: Three pieces of tissue; 4 color transparencies; 3 black and white photographs; 1 laboratory report  
Diagnosis: Multiple myopathic granulomas -- etiology undetermined  
Submitter: P. P. Economon
- RTLA 1142-5. Walleye, Stizostedion vitreum vitreum  
Material: One piece of tissue each; 1 laboratory report each  
Diagnosis: Multiple myopathic granulomas -- etiology undetermined  
Submitter: P. P. Economon
- RTLA 1146. Walleye, Stizostedion vitreum vitreum  
Material: Two pieces of tissue; 4 microscope slides; 10 color transparencies; 1 laboratory report  
Diagnosis: Multiple myopathic granulomas -- etiology undetermined  
Submitter: P. P. Economon
- RTLA 1147. Yellow rat snake, Elaphe obsoleta quadrivittata  
Material: One gross specimen with distended oviduct  
Diagnosis: Acute bacterial infection, inflammation, and necrosis  
Submitter: I. L. C. Gorman
- RTLA 1148. Geoduck, Panope generosa  
Material: A pigmented lesion from the siphon  
Diagnosis: Adherent material  
Submitter: A. C. Smith

- RTLA 1149. Chum salmon, Oncorhynchus keta  
Material: A portion of the tail with a large growth  
Diagnosis: Osteoma  
Submitter: G. R. Bell
- RTLA 1150. Tropical red-eared turtle, Chrysemys ornata callirostris  
Material: One piece of tissue; 4 microscope slides; 1 black and white photograph  
Diagnosis: Multiple granulomas of spleen with amyloid deposits -- etiology unknown  
Submitter: E. Elkan
- RTLA 1151. Lake trout, Salvelinus namaycush  
Material: Five pieces of liver tissue; 5 microscope slides  
Diagnosis: Hemangioendothelioma arising from blood vessels in the liver  
Submitter: C. E. Smith
- RTLA 1152. Rainbow trout, Salmo gairdneri  
Material: A growth severed into 2 pieces  
Diagnosis: Nephroblastoma  
Submitter: J. G. Hnath
- RTLA 1153. Crucian carp, Carassius carassius  
Material: Fixed tissue; 1 microscope slide; 2 color transparencies  
Diagnosis: Nephroblastoma metastatic to pancreas  
Submitter: D. Bucke
- RTLA 1154. Common bream, Abramis brama  
Material: Two pieces of tissue; 2 microscope slides  
Diagnosis: Lymphosarcoma  
Submitter: D. Bucke
- RTLA 1155. Roach, Rutilus rutilus  
Material: Four microscope slides; 2 paraffin blocks; 2 color transparencies  
Diagnosis: Probable thyroid adenocarcinoma  
Submitter: D. Bucke
- RTLA 1156. Tench, Tinca tinca  
Material: Two microscope slides; 2 black and white photographs  
Diagnosis: Well-differentiated rhabdomyosarcoma  
Submitter: D. Bucke
- RTLA 1157. Roach, Rutilus rutilus  
Material: Two microscope slides; 1 paraffin block; 1 color transparency  
Diagnosis: Probable thyroid adenocarcinoma  
Submitter: D. Bucke
- RTLA 1158. Rainbow trout, Salmo gairdneri  
Material: Two microscope slides  
Diagnosis: Hepatoma  
Submitter: D. Bucke

- RTLA 1159. European eel, Anguilla anguilla  
Material: One color transparency of a 8 cm lesion in ventral muscle  
Diagnosis: Myositis  
Submitter: D. Bucke
- RTLA 1160-2. Crucian carp, Carassius carassius  
Material: One microscope slide each  
Diagnosis: Polycystic kidney  
Submitter: D. Bucke
- RTLA 1163. Rainbow smelt, Osmerus mordax  
Material: One piece of tissue; 5 microscope slides; 5 electron micrographs; 2 black and white photographs  
Diagnosis: Neurilemmoma  
Submitter: V. H. Logan and P. H. Odense
- RTLA 1164. Sea turtle, Eretmochelys imbricata  
Material: Two small growths from the corner of the right eye  
Diagnosis: Inflammation associated with bacterial infection  
Submitter: R. Bourke
- RTLA 1165. Palani, Acanthurus dusumieri  
Material: Skin from the head region of 2 palani with spreading scale-like lesions  
Diagnosis: Loss of epidermis - no inflammation - possible parasitic etiology  
Submitter: R. Bourke
- RTLA 1166. Komodo dragon, Varanus komodoensis  
Material: A round hard lump from a toe; 4 color transparencies; 8 microscope slides; 1 pathology record  
Diagnosis: Toe - ancient encapsulated hematoma; pancreas - islet cell tumor; colon - carcinoma; spleen - metastatic mucinous adenocarcinoma; adrenal - pheochromocytoma; thyroid - multiple follicular adenomas; testis - cystic interstitial cell tumor  
Submitter: C. A. Ross (toe) and R. J. Montali (other material)
- RTLA 1167. Opaleye, Girella nigricans  
Material: One piece of tissue; 1 microscope slide  
Diagnosis: Thyroid adenoma  
Submitter: R. L. Herman
- RTLA 1168. Oyster, Ostrea lurida  
Material: Eight pathologic microscope slides; 1 normal control microscope slide; 3 black and white photographs  
Diagnosis: Multilobed polypoid neoplasm of pericardial mesothelium associated with a marked proliferation of connective tissue differentiating into heart muscle  
Submitter: M. C. Mix
- RTLA 1169. Soft-shell clam, Mya arenaria  
Material: One microscope slide  
Diagnosis: Diffuse sarcoma of possible amoebocyte stem cell origin  
Submitter: P. P. Yevich

- RTLA 1170. Mussel, Mytilus edulis  
Material: Two microscope slides; 1 black and white photograph  
Diagnosis: Fibroma  
Submitter: P. H. Wolf
- RTLA 1171. Mud turtle, Kinosternon subrubrum  
Material: A growth from an eyelid  
Diagnosis: Conjunctival epidermoid cyst  
Submitter: F. Blasdell
- RTLA 1172. Kahawai, Arripis trutta  
Material: Testicular lesion  
Diagnosis: Leiomyoma  
Submitter: P. M. Hine
- RTLA 1173. Rainbow trout, Salmo gairdneri  
Material: One microscope slide; 5 color transparencies  
Diagnosis: Multiple, minute granulomas in visceral fat due to an infectious agent, a toxin, or a sensitizing dietary by-product  
Submitter: H. Wolf
- RTLA 1174. Bullsnake, Pituophis sp.  
Material: Two microscope slides  
Diagnosis: Intestinal polyposis/intestinal papillomatosis  
Submitter: F. L. Frye
- RTLA 1175. Fat-tailed gecko, Eublepharis macularis  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Pseudocystic lesion of apparent bacterial etiology which is associated with and may be of ovarian origin  
Submitter: C. G. Crispens, Jr.
- RTLA 1176. Cotton mouth moccasin, Agkistrodon piscivorus  
Material: Twenty-five microscope slides  
Diagnosis: Plasma cell tumor which was leukemic in the terminal phase  
Submitter: E. P. Finnie
- RTLA 1177. Atlantic hagfish, Myxine glutinosa  
Material: Three b & w and 11 color transparencies of gross liver tumors; 8 color photomicrographs  
Diagnosis: Hepatocellular and cholangiocellular carcinomas  
Submitter: S. Falkmer  
Reprint: Falkmer, Sture et al. Tumor Pathology of the Hagfish, Myxine glutinosa, and the River Lamprey, Lampetra fluviatilis: A Light Microscopical Study with Particular Reference to the Occurrence of Primary Liver Carcinoma, Islet Cell Tumors, and Epidermoid Cysts of the Skin. In: Progress in Experimental Tumor Research, Vol. 20, Neoplasms in Aquatic Animals as Indicators of Environmental Carcinogens, F. Homberger (ed.), pp. 216-250. Karger: Basel. 1976.
- RTLA 1178. Atlantic hagfish, Myxine glutinosa  
Material: One paraffin block; 1 color photomicrograph  
Diagnosis: Hepatocellular carcinoma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)

- RTLA 1179. Atlantic hagfish, Myxine glutinosa  
Material: One paraffin block; 1 color photomicrograph  
Diagnosis: Cholangiocellular carcinoma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1180. Atlantic hagfish, Myxine glutinosa  
Material: Two paraffin blocks; 1 color photomicrograph  
Diagnosis: Nodular hepatocellular hyperplasia versus adenoma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1181. River lamprey, Lampetra fluviatilis  
Material: Three microscope slides; 1 paraffin block; 3 color transparencies  
Diagnosis: Well-differentiated hepatocellular neoplasm  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1182. Atlantic hagfish, Myxine glutinosa  
Material: One paraffin block; 1 color photomicrograph  
Diagnosis: Islet tumor  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1183. Atlantic hagfish, Myxine glutinosa  
Material: One piece of tissue  
Diagnosis: Normal  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1184. Atlantic hagfish, Myxine glutinosa  
Material: Four pieces of tissue  
Diagnosis: Incipient hepatocellular neoplasm  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1185. Atlantic hagfish, Myxine glutinosa  
Material: Two pieces of tissue  
Diagnosis: Normal  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1186. Atlantic hagfish, Myxine glutinosa  
Material: Five pieces of tissue  
Diagnosis: Multiple hepatocellular neoplasms and cholangiohyperplasias  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1187. Atlantic hagfish, Myxine glutinosa  
Material: Five pieces of tissue  
Diagnosis: Normal  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)

- RTLA 1188. Atlantic hagfish, Myxine glutinosa  
Material: Four pieces of tissue  
Diagnosis: Normal  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1189. Atlantic hagfish, Myxine glutinosa  
Material: Three pieces of tissue  
Diagnosis: Epidermoid cyst  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1190. Atlantic hagfish, Myxine glutinosa  
Material: Three pieces of tissue  
Diagnosis: Cholangioma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1191. Atlantic hagfish, Myxine glutinosa  
Material: Two pieces of tissue  
Diagnosis: Cholangioma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1192. Atlantic hagfish, Myxine glutinosa  
Material: Nine pieces of tissue  
Diagnosis: Cholangiohyperplasia  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1193. Atlantic hagfish, Myxine glutinosa  
Material: Three pieces of tissue  
Diagnosis: Normal  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1194. Atlantic hagfish, Myxine glutinosa  
Material: Two pieces of tissue  
Diagnosis: Moderately well-differentiated hepatocellular carcinoma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1195. Atlantic hagfish, Myxine glutinosa  
Material: Three pieces of tissue  
Diagnosis: Epidermoid cyst  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1196. Atlantic hagfish, Myxine glutinosa  
Material: One piece of tissue  
Diagnosis: Well-differentiated hepatocellular carcinoma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)

- RTLA 1197. Atlantic hagfish, Myxine glutinosa  
Material: One piece of tissue  
Diagnosis: Normal  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1198. Atlantic hagfish, Myxine glutinosa  
Material: One piece of tissue  
Diagnosis: Well-differentiated hepatocellular neoplasm; granuloma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1199. Atlantic hagfish, Myxine glutinosa  
Material: One piece of tissue  
Diagnosis: Well-differentiated hepatocellular neoplasm  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1200. Atlantic hagfish, Myxine glutinosa  
Material: Four pieces of tissue  
Diagnosis: Cholangioma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1201. Atlantic hagfish, Myxine glutinosa  
Material: One gross specimen  
Diagnosis: Normal  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1202. Atlantic hagfish, Myxine glutinosa  
Material: One gross specimen  
Diagnosis: Multiple nodular well-differentiated hepatocellular  
neoplasm  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1203. Atlantic hagfish, Myxine glutinosa  
Material: One gross specimen  
Diagnosis: Hemorrhage  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1204. English sole, Parophrys vetulus  
Material: A wedge of body wall and attached dorsal fin with a  
growth involving both the pigmented and unpigmented sides  
of the fish and dorsal fin  
Diagnosis: A large, ulcerated, excavating, inflammatory lesion  
involving the dermis, subcutaneous connective tissue,  
and skeletal muscle in response to two types of meta-  
zoan parasites  
Submitter: G. R. Bell



- RTLA 1205. Rainbow trout, Salmo gairdneri  
Material: Enlarged kidney, spleen, liver, and heart tissue  
Diagnosis: Probable lymphoma  
Submitter: P. M. Hine
- RTLA 1206. Helmeted turtle, Pelomedusa subruta  
Material: Three microscope slides; 1 laboratory report  
Diagnosis: Myelogenous leukemia  
Submitter: R. J. Montali
- RTLA 1207. Toad, Pipa pipa  
Material: One gross specimen  
Diagnosis: Infestation by helminths; cause of death undetermined  
Submitter: I. L. C. Gorman
- RTLA 1208. Coris flavovittata  
Material: Right gill arch with attached growth  
Diagnosis: Thyroid adenoma  
Submitter: R. Bourke
- RTLA 1209. Lake trout, Salvelinus namaycush  
Material: A piece of tissue from a growth attached to the exterior body wall  
Diagnosis: Well-differentiated lipoma  
Submitter: G. R. Bell
- RTLA 1210. Atlantic salmon, Salmo salar  
Material: Liver and gall bladder with 2 cyst-like growths; 1 microscope slide; 1 black and white photograph  
Diagnosis: Pseudocysts of possible parasitic origin in the liver  
Submitter: C. E. Smith
- RTLA 1211A & B. Milkfish, Chanos chanos  
Material: Normal adipose eyelid (RTLA 1211A); opaque adipose eyelid (RTLA 1211B)  
Diagnosis: Severe pigmentation and opaqueness of eyelid  
Submitter: A. C. Smith
- RTLA 1212A & B. Albula vulpes  
Material: Opaque adipose eyelid (RTLA 1212A); normal adipose eyelid (RTLA 1212B)  
Diagnosis: Mild pigmentation and opaqueness of eyelid  
Submitter: A. C. Smith
- RTLA 1213A & B. Tilapia mossambica  
Material: "Anemic" liver tissue (RTLA 1213A); normal liver tissue (RTLA 1213B)  
Diagnosis: Postmortem change  
Submitter: A. C. Smith
- RTLA 1214. Ceylonese pond frog, Rana hexadactylus  
Material: One gross specimen  
Diagnosis: A massive disseminated infection by a septate spore-forming fungus  
Submitter: G. C. Blasiola, Jr.

- RTLA 1215. Rat snake, Elaphe obsoleta  
Material: One gross specimen  
Diagnosis: Cause of death undetermined  
Submitter: I. L. C. Gorman
- RTLA 1216. Rat snake, Elaphe obsoleta  
Material: One gross specimen  
Diagnosis: Acanthocephalan worm and bacteria in lungs; pneumonia  
Submitter: I. L. C. Gorman
- RTLA 1217. Rock sole, Lepidopsetta bilineata  
Material: A piece of body wall with attached growth  
Diagnosis: Epidermal papilloma associated with dermal parasitic granulomas  
Submitter: G. R. Bell
- RTLA 1218. Lingcod, Ophiodon elongatus  
Material: A large piece of body wall  
Diagnosis: Lymphocystis  
Submitter: G. R. Bell and G. E. Hoskins
- RTLA 1219. Golden trout, Salmo aguabonita  
Material: Two pieces of tissue; 4 microscope slides; 2 color transparencies; 2 black and white photographs  
Diagnosis: Renal versus thyroid adenocarcinoma  
Submitter: C. E. Smith
- RTLA 1220. Striped bass, Morone saxatilis  
Material: Viscera with attached growth  
Diagnosis: Probable leiomyoma; inadequately preserved for a definitive diagnosis  
Submitter: M. W. Smith
- RTLA 1221. Spiny dogfish, Squalus acanthias  
Material: Seven microscope slides; 1 paraffin block; 39 color transparencies; 83 b & w photographs; 7, 4 X 5" & 5, 35 mm b & w negatives  
Diagnosis: A choroid plexus papilloma  
Submitter: A. M. Guarino and D. J. Prieur  
Reprint: Prieur, David J., Joseph D. Fenstermacher, and Anthony M. Guarino. A Choroid Plexus Papilloma in an Elasmobranch, Squalus acanthias. J. Natl. Cancer Inst., 56: 1207-09. 1976.
- RTLA 1222. White perch, Morone americana  
Material: One microscope slide; 1 color transparency  
Diagnosis: Well-vascularized, ulcerated, fibrous hyperplasia of the dermis associated with inflammation  
Submitter: T. Beckerman and R. P. Morgan, II
- RTLA 1223. Guppy, Poecilia reticulata  
Material: Two microscope slides  
Diagnosis: (1) Multiple visceral and body wall granulomas; (2) cholangioma in liver  
Submitter: G. E. Cosgrove

- RTLA 1224. Spot, Leiostomus xanthurus  
Material: Three microscope slides from 3 fish; 1 color photograph  
Diagnosis: (1) Thyroid hyperplasia in all fish; (2) gill hyperplasia  
in one fish  
Submitter: G. E. Cosgrove
- RTLA 1225. White perch, Morone americana  
Material: Two microscope slides; 2 color transparencies  
Diagnosis: Bile duct adenofibrosis of probable hepatotoxin origin  
Submitter: T. Beckerman and R. P. Morgan, II
- RTLA 1226. Tiger salamander, Ambystoma tigrinum  
Material: Viscera; internal growth just anterior to the stomach  
Diagnosis: Metastatic pancreatic carcinoma  
Submitter: F. L. Rose
- RTLA 1227. Surf clam, Spisula solidissima  
Material: A portion of the foot with attached growth; 2 color  
transparencies; 1 black and white photograph  
Diagnosis: Multiple polypoid myomas of the foot  
Submitter: L. Leibovitz
- RTLA 1228. Oyster, Crassostrea virginica  
Material: A growth with adjacent tissue  
Diagnosis: Polypoid vesicular tumor and associated inflammation  
Submitter: S. V. Otto
- RTLA 1229. American alligator, Alligator mississippiensis  
Material: Growth from anterior to left nares  
Diagnosis: Pending  
Submitter: C. A. Ross
- RTLA 1230. Panamint rattlesnake, Crotalus mitchelli  
Material: Four microscope slides; 2 paraffin blocks  
Diagnosis: Multiple subcutaneous mycotic granulomas  
Submitter: C. G. Crispens, Jr.
- RTLA 1231. Striped bass, Morone saxatilis  
Material: Three microscope slides; 4 color transparencies  
Diagnosis: Infectious granulomas in liver and spleen  
Submitter: T. Beckerman and R. P. Morgan, II
- RTLA 1232A & B. Milkfish, Chanos chanos  
Material: Four pieces of stomach tissue -- 2 pathologic; 2 normal  
Diagnosis: Gastritis  
Submitter: A. C. Smith
- RTLA 1233. Crevalle jack, Caranx hippos  
Material: Seventeen microscope slides  
Diagnosis: Fibroma  
Submitter: F. J. Schwartz  
Reprint: Schwartz, Frank J. A Crevalle Jack, Caranx hippos (Pisces,  
Carangidae), With Mandibular Calcified Connective Tissue  
Fibroma. Chesapeake Sci., 16(1): 72-3. 1975.

- RTLA 1234. White perch, *Morone americana*  
Material: One microscope slide; 5 color transparencies  
Diagnosis: Bile duct adenofibrosis associated with a protozoan infection  
Submitter: T. Beckerman and R. P. Morgan, II
- RTLA 1235. Carp, *Cyprinus carpio* (?)  
Material: One microscope slide  
Diagnosis: Focal spermatocytoma/early seminoma  
Submitter: D. Bucke
- RTLA 1236. *Siganus rivulatus*  
Material: Two pieces of liver tissue; 3 microscope slides  
Diagnosis: Probable cholangiofibrosis  
Submitter: I. Paperna
- RTLA 1237. Sea bream, *Sparus auratus*  
Material: One microscope slide; epon embedded tissue  
Diagnosis: Extracellular inclusions (cores of granulomas) in the gills  
Submitter: I. Paperna
- RTLA 1238. Eastern box turtle, *Terrapene carolina*  
Material: One gross specimen (alive) with 2 greatly enlarged areas involving both sides of the head, posterior to the eyes; the jaws were misaligned by the swelling  
Diagnosis: Mastoid granuloma  
Submitter: R. Eschelmann
- RTLA 1239. Eastern box turtle, *Terrapene carolina*  
Material: A growth removed from the right side of the head near the ear  
Diagnosis: Bacterial granuloma  
Submitter: W. Frair
- RTLA 1240. Dover sole, *Microstomus pacificus*  
Material: Dorsal fin with small yellow nodules; 1 microscope slide  
Diagnosis: Possibly some type of fat storage disease  
Submitter: G. E. Hoskins and G. R. Bell
- RTLA 1241. American crocodile, *Crocodylus acutus*  
Material: One microscope slide; 1 color transparency; 1 pathology record  
Diagnosis: Lipoma versus some type of fat storage disease  
Submitter: R. J. Montali
- RTLA 1242. *Boa constrictor*  
Material: One microscope slide; 2 color transparencies; 1 necropsy record  
Diagnosis: Renal adenocarcinoma  
Submitter: R. J. Montali

- RTLA 1243. Atlantic cutlassfish, Trichiurus lepturus  
Material: A piece of body wall with growth around the vent  
Diagnosis: Ulcerated, excavating (muscle), inflammatory lesion mostly composed of fibrocytes, a mixed population of leukocytes, and a large population of several species of bacteria; some type of worm was also present  
Submitter: D. J. Ebert
- RTLA 1244. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Moderately well-differentiated hepatocellular neoplasm  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1245. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Hepatocellular and cholangiocellular -- mixed carcinoma "adenoma" and hamartoma (?)  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1246. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Hepatocellular and cholangiocellular - adenoma (?)  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1247. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Hepatocellular and cholangiocellular - hepatocellular carcinoma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1248. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Hepatocellular and cholangiocellular - bleedings  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1249. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 2 paraffin blocks  
Diagnosis: Hepatocellular and cholangiocellular - adenoma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1250. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 2 paraffin blocks  
Diagnosis: Hepatocellular and cholangiocellular - cholangiocellular carcinoma + nodular hyperplasia (?)  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)

- RTLA 1251. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 3 paraffin blocks  
Diagnosis: Hepatocellular and cholangiocellular - cholangiocellular carcinoma + nodular hyperplasia  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1252. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Hepatocellular and cholangiocellular - cholangiocellular carcinoma + nodular hyperplasia  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1253. Atlantic hagfish, Myxine glutinosa  
Material: Three microscope slides  
Diagnosis: Hamartoma (?) - insuloma-hamartoma (cyst only)  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1254. Atlantic hagfish, Myxine glutinosa  
Material: Three microscope slides; 1 paraffin block  
Diagnosis: Hamartoma (?) - insuloma-hamartoma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1255. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Hamartoma (?) - insuloma-hamartoma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1256. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Hamartoma (?) - poorly-differentiated insuloma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1258. Atlantic hagfish, Myxine glutinosa  
Material: Three microscope slides; 1 paraffin block  
Diagnosis: Hamartoma (?) - highly-differentiated insuloma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1259. Atlantic hagfish, Myxine glutinosa  
Material: Two microscope slides; 2 paraffin blocks  
Diagnosis: Adenocarcinoma - solid tumor - mucus granuloma (?)  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1260. Atlantic hagfish, Myxine glutinosa  
Material: Two microscope slides; 1 paraffin block  
Diagnosis: Adenocarcinoma - solid tumor  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)

- RTLA 1261. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Cutaneous leiomyosarcoma - fibroma (?) - sarcoma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1262. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide  
Diagnosis: Cutaneous leiomyosarcoma - leiomyosarcoma  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1263. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Cutaneous leiomyosarcoma - sessile skin polyp, containing ganglion cells (?) myelomeningocele (?) "myxoma"  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1264. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide  
Diagnosis: Cutaneous leiomyosarcoma - fibroma of the tentacles  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1265. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide  
Diagnosis: Non-neoplastic cysts  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1266. Atlantic hagfish, Myxine glutinosa  
Material: One microscope slide; 1 paraffin block  
Diagnosis: Non-neoplastic cysts  
Submitter: S. Falkmer  
Reprint: (See RTLA 1177)
- RTLA 1267. Shortfin eel, Anguilla australis  
Material: Fixed material; 2 black and white photographs  
Diagnosis: Hepatoma  
Submitter: P. M. Hine
- RTLA 1268A & B. American lobster, Homarus americanus  
Material: Normal and abnormal structures from diseased animal (RTLA 1268A); same structures from control animal (RTLA 1268B)  
Diagnosis: Developing egg masses that adhered to the appendages and coxa during spawning  
Submitter: S. A. MacLean
- RTLA 1269. Chinook salmon, Oncorhynchus tshawytscha  
Material: Piece of body wall with a large, black, granular growth  
Diagnosis: Melanoma  
Submitter: J. G. Hnath

- RTLA 1270. Pseudotropheus tropheops  
Material: Gross specimen with a growth on the body wall  
Diagnosis: Neurilemmal sarcoma  
Submitter: G. C. Blasiola, Jr.
- RTLA 1271. Hard-shell clam, Mercenaria mercenaria  
Material: One paraffin block  
Diagnosis: Intracellular inclusions  
Submitter: S. V. Otto
- RTLA 1272. Mussel, Modiolus modiolus  
Material: Four microscope slides  
Diagnosis: Benign neoplasm of vesicular connective tissue  
Submitter: R. J. Roberts
- RTLA 1273. Coho salmon, Oncorhynchus kisutch  
Material: One gross specimen with a large growth on the left side  
Diagnosis: Nephroblastoma  
Submitter: G. E. Hoskins and G. R. Bell
- RTLA 1274-1374. Soft-shell clam, Mya arenaria  
Material: One hundred twenty-five microscope slides; 211 paraffin blocks  
Diagnosis: Approximately one-third of the cases have been examined; all are germinomas  
Submitter: P. P. Yevich
- RTLA 1375. Creek chub, Semotilus atromaculatus  
Material: One gross specimen with 4 lesions: 1 under the right lower jaw; 1 on the left lateral body wall, posterior to the vent; 1 on the left peduncle; and 1 internally (mid-ventral) attached to the body wall  
Diagnosis: Protozoan cyst, Myxobolus sp. suspected  
Submitter: W. J. Buc
- RTLA 1376. Brown bullhead, Ictalurus nebulosus  
Material: Four microscope slides  
Diagnosis: Oral epidermal papilloma  
Submitter: K. E. Wolf and E. J. Washuta
- RTLA 1377. Chinook salmon, Oncorhynchus tshawytscha  
Material: A large piece of body wall; 4 color photographs  
Diagnosis: Partial reduplication of the digestive tract; developmental anomaly  
Submitter: J. G. Hnath
- RTLA 1378. Snapper  
Material: Nineteen microscope slides  
Diagnosis: Neurilemmoma  
Submitter: M. M. Sigel



RTLA 1379. Honey bee, Apis mellifera

Material: Twenty microscope slides

Diagnosis: The following bacterial and mycotic (fungal) diseases, protozoan and gregarine infections, mites, and louses are represented:

American foulbrood - Bacillus larvae  
European foulbrood - Streptococcus pluton;  
Bacillus laterosporus (probable secondary invader)  
Septicemia - Pseudomonas (Bacillus) apisepctica  
Stonebrood - Aspergillus flavus  
Chalkbrood - Ascospaera apis  
Nosema apis  
Monocia apis  
Varroa jacobsoni  
Tropilaelaps clareae  
Braula coeca

Submitter: G. E. Cantwell

Reprint: Cantwell, George E. Honey Bee Diseases, Parasites, and Pests. In: Insect Diseases, Vol. 2, G. E. Cantwell (ed.), pp. 501-47. Marcel Dekker: New York. 1974.

RTLA 1380. Gulf coast box turtle, Terrapene carolina major

Material: Two microscope slides; 1 paraffin block

Diagnosis: Infectious granuloma of mixed bacterial etiology

Submitter: C. G. Crispens, Jr. and K. R. Marion

RTLA 1381. Soft-shell clam, Mya arenaria

Material: One paraffin block

Diagnosis: Teratoid anomaly

Submitter: S. V. Otto

RTLA 1382. Rainbow trout, Salmo gairdneri

Material: One microscope slide

Diagnosis: Adenocarcinoma

Submitter: B. L. Munday

RTLA 1383. "Fancy" carp (Nishikigoi), Cyprinus sp.

Material: Forty-five microscope slides representing six cases

Diagnosis: Ovarian teratoid tumors

Submitter: T. Ishikawa

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CONTRIBUTORS

BECKER, C. D.  
Ecosystems Department  
Battelle Pacific Northwest  
Laboratories  
Battelle Boulevard  
Richland, Washington 99352  
RTLA 1087

BECKERMAN, T.  
Chesapeake Biological  
Laboratory  
Solomons, Maryland 20688  
RTLA 1222, 1225, 1231, 1234

BELL, G. R.  
Pacific Biological Station  
Fisheries and Marine Service  
Department of the Environment  
P. O. Box 100  
Nanaimo, B.C., Canada V9R 5K6  
RTLA 1149, 1204, 1209, 1217,  
1218, 1240, 1273

BLASDELL, F.  
Division of Amphibians and  
Reptiles  
National Museum of Natural History  
Smithsonian Institution  
Washington, D.C. 20560  
RTLA 1171

BLASIOLA, G. C., JR.  
Steinhart Aquarium Laboratory  
California Academy of Sciences  
Golden Gate Park  
San Francisco, California 94118  
RTLA 1109, 1214, 1270

BOURKE, R.  
Hawaiian Reef Tank  
Sea Life, Inc.  
Makapuu Point  
Waimanalo, Hawaii 96795  
RTLA 1164, 1165, 1208

BOUSTEAD, N. C.  
Fisheries Research Division  
Ministry of Agriculture and Fisheries  
P. O. Box 19062  
Wellington, New Zealand  
RTLA 1110

BUG, W. J.  
Grayling Field Office  
Michigan Department of Natural Resources  
P. O. Box 507  
Grayling, Michigan 49738  
RTLA 1375

BUCKE, D.  
20 Queens Close  
St. Ives, Cambridgeshire  
England  
RTLA 1153-1162, 1235

CANTWELL, G. E.  
Insect Pathology Laboratory  
Plant Protection Institute  
Agricultural Research Service  
U.S. Department of Agriculture  
Beltsville, Maryland 20705  
RTLA 1379

CHAMBERLAIN, D. W.  
Atlantic Richfield Company  
515 South Flower Street  
Los Angeles, California 90047  
RTLA 1081-1086

CHANG, S. C.  
Registry of Tumors in Lower Animals  
National Museum of Natural History  
Smithsonian Institution  
Washington, D.C. 20560  
RTLA 1092

COSGROVE, G. E.  
Biology Division  
Oak Ridge National Laboratory  
P. O. Box Y  
Oak Ridge, Tennessee 37831  
RTLA 1223, 1224

COUNTS, C. L., III  
Department of Biological Sciences  
Marshall University  
Huntington, West Virginia 25701  
RTLA 1132, 1135

CRISPENS, C. G., JR.  
Department of Biology  
The University of Alabama in Birmingham  
University Station  
Birmingham, Alabama 35294  
RTLA 1107, 1131, 1175, 1230, 1380

DOWNEY, M. E.  
Division of Echinoderms  
National Museum of Natural History  
Smithsonian Institution  
Washington, D.C. 20560  
RTLA 1104

EBERT, D. J.  
Department of Biology  
SS Box 18  
University of Southern  
Mississippi  
Hattiesburg, Mississippi 39401  
RTLA 1243

ECONOMON, P. P.  
Minnesota Department of  
Natural Resources  
390 Centennial Office Building  
St. Paul, Minnesota 55155  
RTLA 1136-1146

ELKAN, E.  
Department of Histopathology  
Mount Vernon Hospital  
Northwood, Middlesex HA6 2RN  
England  
RTLA 1114-1116, 1150

ESCHELMAN, R.  
Calvert Marine Museum  
Solomons, Maryland 20688  
RTLA 1238

FALKMER, S.  
Institute of Pathology  
University of Umea  
S901 87 Umea 6, Sweden  
RTLA 1177-1203, 1244-1266

FINNIE, E. P.  
Taronga Zoo  
P. O. Box 20  
Mosman, New South Wales  
Australia 2088  
RTLA 1176

FRAIR, W.  
The King's College  
Briarcliff Manor, New York 10510  
RTLA 1239

FRYE, F. L.  
235 Willamette Avenue  
Kensington, California 94708  
RTLA 1080, 1174

GORMAN, I. L. C.  
Sharkey-Simpson  
1500-1502 West Santa Barbara Avenue  
Los Angeles, California 90062  
RTLA 1147, 1207, 1215, 1216

GUARINO, A. M.  
Mt. Desert Island Biological Laboratory  
Salsbury Cove, Maine 04672  
RTLA 1221

HARSHBARGER, J. C.  
Registry of Tumors in Lower Animals  
National Museum of Natural History  
Smithsonian Institution  
Washington, D.C. 20560  
RTLA 1092

HART, R. W.  
The College of Medicine Facilities  
The Ohio State University Hospitals  
410 West 10th Avenue  
Columbus, Ohio 43210  
RTLA 1099-1103, 1105

HERMAN, R. L.  
Eastern Fish Disease Laboratory  
U.S. Department of the Interior  
Leetown, Route 1, Box 17A  
Kearneysville, West Virginia 25430  
RTLA 1167

HINE, P. M.  
Fisheries Research Division  
Ministry of Agriculture and Fisheries  
P. O. Box 19062  
Wellington, New Zealand  
RTLA 1090, 1108, 1110, 1172, 1205, 1267

HNATH, J. G.  
Wolf Lake Pathobiology Laboratory  
Wolf Lake Hatchery  
Michigan Department of Natural Resources  
Route 1  
Mattawan, Michigan 49071  
RTLA 1152, 1269, 1377

HOSKINS, G. E.  
Pacific Biological Station  
Fisheries and Marine Service  
Department of the Environment  
P. O. Box 100  
Nanaimo, B.C., Canada V9R 5K6  
RTLA 1079, 1218, 1240, 1273

ISHIKAWA, T.  
Cancer Institute  
Kami-Ikebukuro, Toshima-ku  
Tokyo 170, Japan  
RTLA 1383

KANDRASHOFF, W.  
951 Euclid Avenue  
Miami Beach, Florida 33139  
RTLA 1095-1098

KORNICKER, L. S.  
Division of Crustacea  
National Museum of Natural History  
Smithsonian Institution  
Washington, D.C. 20560  
RTLA 1134

LAIRD, L. M.  
Department of Zoology  
The University of Liverpool  
Brownlow Street  
P. O. Box 147  
Liverpool L69 3BX, England  
RTLA 1106

LEIBOVITZ, L.  
Department of Avian and Aquatic  
Animal Medicine  
New York State Veterinary College  
Cornell University  
Ithaca, New York 14853  
RTLA 1227

LOGAN, V. H.  
Halifax Laboratory  
Fisheries and Marine Service  
Department of the Environment  
P. O. Box 429  
Halifax, N.S., Canada B3J 2R3  
RTLA 1163

MACLEAN, S. A.  
Pathobiology Investigations  
Middle Atlantic Coastal Fisheries  
Center, NMFS, NOAA  
U.S. Department of Commerce  
Oxford, Maryland 21654  
RTLA 1268A & B

MARION, K. R.  
Department of Biology  
The University of Alabama in  
Birmingham  
University Station  
Birmingham, Alabama 35294  
RTLA 1380

MATZ, G.  
Laboratoire de Biologie Animale  
Faculte des Sciences  
Universite d'Angers  
Avenue Lavoisier -- Belle-Beille  
49045 Angers Cedex, France  
RTLA 1093

MEYERS, T. R.  
Shelter Valley Road  
R.D. 3, Lot 30  
Newfield, New York 14867  
RTLA 1118-1122

MIGAKI, G.  
Division of Comparative Pathology  
The American Registry of Pathology  
Armed Forces Institute of Pathology  
Washington, D.C. 20306  
RTLA 1094

MIX, M. C.  
Department of General Science  
Oregon State University  
Corvallis, Oregon 97331  
RTLA 1168

MONTALI, R. J.  
Office of Pathology  
National Zoological Park  
Smithsonian Institution  
Washington, D.C. 20009  
RTLA 1166, 1206, 1241, 1242

MORGAN, R. P., II  
Chesapeake Biological Laboratory  
Solomons, Maryland 20688  
RTLA 1222, 1225, 1231, 1234

MUNDAY, B. L.  
Mt. Pleasant Laboratories  
Department of Agriculture  
Box 46, Launceston South  
Tasmania, Australia 7250  
RTLA 1382

ODENSE, P. H.  
Halifax Laboratory  
Fisheries and Marine Service  
Department of the Environment  
P. O. Box 429  
Halifax, N.S., Canada B3J 2R3  
RTLA 1163

OTTO, S. V.  
Maryland Department of Natural  
Resources  
c/o Middle Atlantic Coastal  
Fisheries Center, NMFS, NOAA  
U.S. Department of Commerce  
Oxford, Maryland 21654  
RTLA 1092, 1125-1130, 1228,  
1271, 1381

OVERSTREET, R. M.  
Parasitology Section  
Gulf Coast Research Laboratory  
P. O. Drawer AG  
Ocean Springs, Mississippi 39564  
RTLA 1111-1113

PAPERNA, I.  
The Heinz Steinitz Marine  
Biology Laboratory  
The Hebrew University of  
Jerusalem  
P. O. Box 469  
Eilat, Israel  
RTLA 1236, 1237

PRIEUR, D. J.  
Department of Veterinary Pathology  
Washington State University  
Pullman, Washington 99163  
RTLA 1221

ROBERTS, R. J.  
Unit of Aquatic Pathobiology  
University of Stirling  
Stirling FK9 4LA, Scotland  
RTLA 1091, 1272

ROSE, F. L.  
Department of Biology  
Texas Tech University  
P. O. Box 4149  
Lubbock, Texas 79409  
RTLA 1133, 1226

ROSS, C. A.  
Department of Natural Science  
The Florida State Museum  
University of Florida  
Gainesville, Florida 32611  
RTLA 1166, 1229

SCHWARTZ, F. J.  
Institute of Marine Sciences  
University of North Carolina  
Morehead City, North Carolina 28557  
RTLA 1233

SHUMWAY, S. E.  
Marine Science Laboratories  
Department of Marine Biology  
University College of North Wales  
Menai Bridge, Anglesey LL59 5EH  
Wales  
RTLA 1088, 1089

SIGEL, M. M.  
Laboratory of Virology  
Department of Microbiology  
University of Miami School of Medicine  
P. O. Box 520875  
Biscayne Annex  
Miami, Florida 33152  
RTLA 1378

SMITH, A. C.  
Department of Pathology  
University of Hawaii School of Medicine  
The Biomedical Science Building  
1960 East-West Road  
Honolulu, Hawaii 96822  
RTLA 1148, 1211A & B-1213A & B, 1232A & B

SMITH, C. E.  
Fish Cultural Development Center  
Fish and Wildlife Service  
U.S. Department of the Interior  
Route 2, Box 333  
Bozeman, Montana 59715  
RTLA 1151, 1210, 1219

SMITH, M. W.  
Fish and Wildlife Service  
U.S. Department of the Interior  
P. O. Box 4586  
Panama City, Florida 32401  
RTLA 1220

SWINNEY, G. N.  
Freshwater Fisheries Unit  
Department of Zoology  
The University of Liverpool  
Life Sciences Building  
Crown Street  
Liverpool L69 3BX, England  
RTLA 1078

WOLF, H.  
Fish Disease Laboratory  
California Department of  
Fish and Game  
2111 Nimbus Road  
Rancho Cordova, California 95670  
RTLA 1173

WOLF, K. E.  
Eastern Fish Disease Laboratory  
U.S. Department of the Interior  
Leetown, Route 1, Box 17A  
Kearneysville, West Virginia 25430  
RTLA 1376

WOLF, P. H.  
New South Wales State Fisheries  
Laboratories  
211 Kent Street  
Sydney, Australia 2000  
RTLA 1117, 1170

WOLKE, R. E.  
Department of Animal Pathology  
Agricultural Experiment Station  
University of Rhode Island  
Kingston, Rhode Island 02881  
RTLA 1124

YEVICH, P. P.  
National Marine Water Quality  
Laboratory  
U.S. Environmental Protection  
Agency  
South Ferry Road  
Narragansett, Rhode Island 02882  
RTLA 1169, 1274-1374

ZWERNER, D. E.  
Parasitology Section  
Virginia Institute of Marine  
Science  
Gloucester Point, Virginia 23062  
RTLA 1123



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Registry of Tumors in Lower Animals  
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Room W216-A  
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NIH HISTOPATH NO. \_\_\_\_\_

COMMON NAME \_\_\_\_\_ FAMILY \_\_\_\_\_  
PHYLUM \_\_\_\_\_ GENUS \_\_\_\_\_  
CLASS \_\_\_\_\_ SPECIES \_\_\_\_\_  
ORDER \_\_\_\_\_

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CONTRIBUTOR (NAME & ADDRESS): \_\_\_\_\_ COLLECTOR (NAME & ADDRESS): \_\_\_\_\_

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ORIGIN OF ANIMAL: MARINE \_\_\_\_\_ FRESHWATER \_\_\_\_\_ ESTUARINE \_\_\_\_\_ TERRESTRIAL \_\_\_\_\_

WHERE COLLECTED \_\_\_\_\_

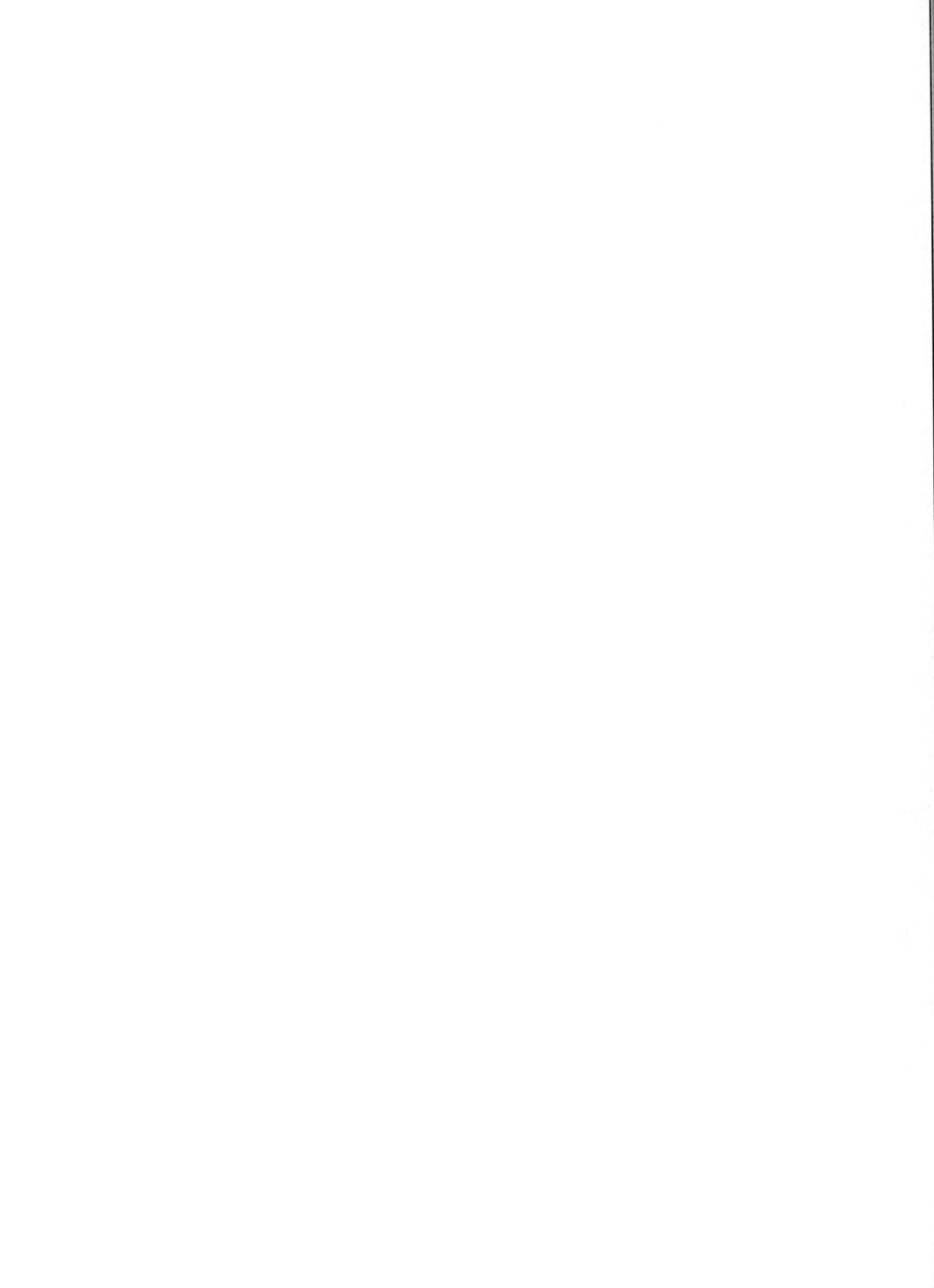
DATE COLLECTED \_\_\_\_\_ SEX \_\_\_\_\_ AGE \_\_\_\_\_ STAGE OF LIFE CYCLE \_\_\_\_\_

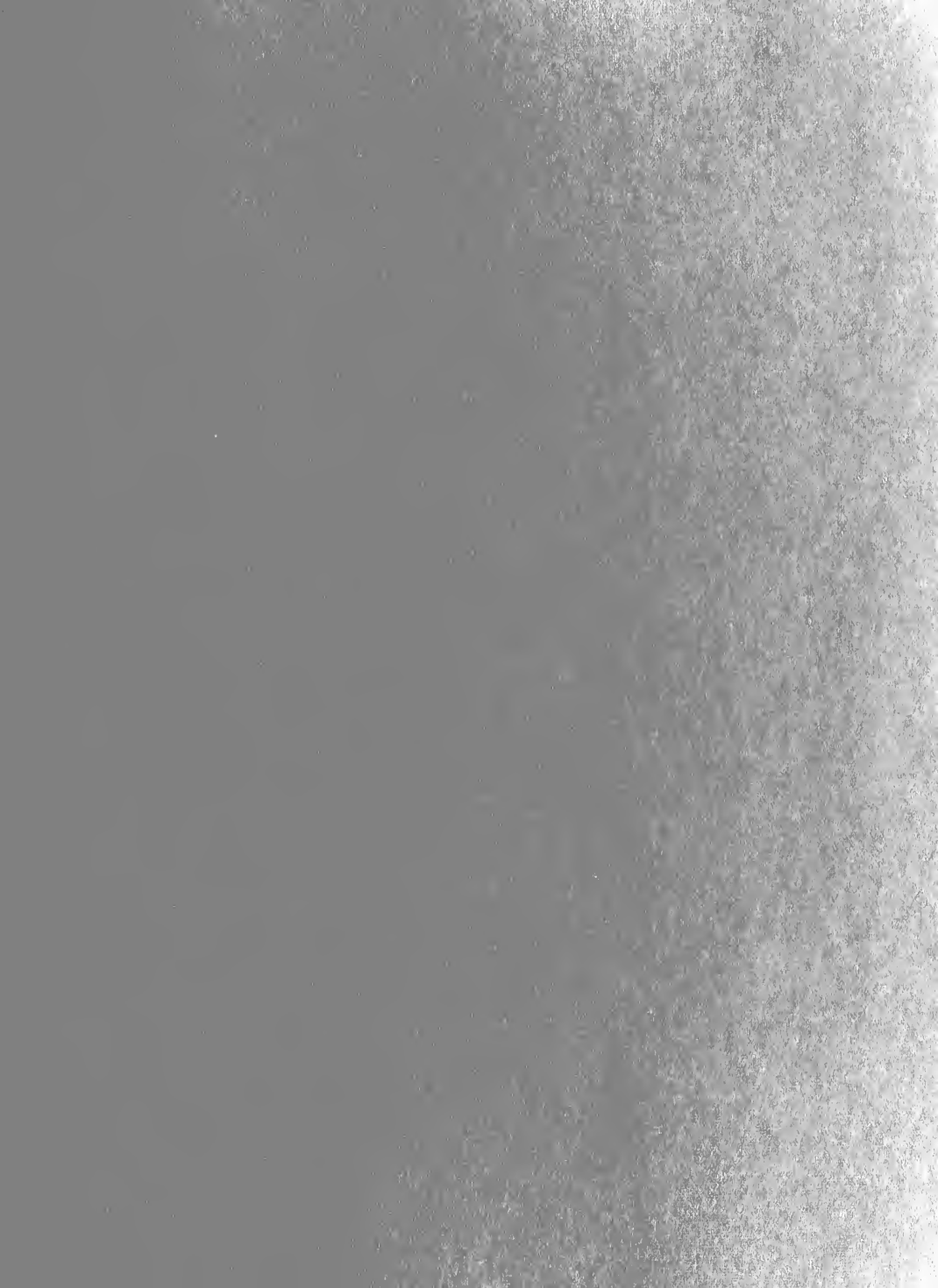
HOW KILLED \_\_\_\_\_ FIXATION \_\_\_\_\_

GROSS DESCRIPTION \_\_\_\_\_  
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MICROSCOPE DX \_\_\_\_\_  
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COMMENTS (e.g., possible exposure to chemical pollutants or infectious agents, incidence and duration of this condition in the population, etc.)  
\_\_\_\_\_  
\_\_\_\_\_  
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ACTIVITIES REPORT  
REGISTRY OF TUMORS IN LOWER ANIMALS:

1976 SUPPLEMENT

JOHN C. HARSHBARGER, DIRECTOR

PREPARED FOR DISTRIBUTION BY:

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





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## OVERVIEW

During 1976 the Registry of Tumors in Lower Animals fulfilled one decade as a diagnostic center, a literature center, a specimen depository, a research group, and a general clearinghouse for information on neoplasia and related disorders in invertebrate and poikilothermic vertebrate animals. Its founding in 1966 (initially approved in 1965) was made possible by funds provided by the National Cancer Institute, due largely to the efforts of Drs. Clyde J. Dawe, Harold L. Stewart, Thelma B. Dunn, and Mearl F. Stanton, and by space provided at the Smithsonian Institution due largely to the efforts of Dr. Donald F. Squires.

Two hundred thirteen accessions (several containing multiple specimens) were added to the collection. The phylogenetic and the neoplastic versus non-neoplastic distributions are given in Table I; an itemized list comprises the body of this report. Among those specimens received was material from the largest tumor ever found in a lower animal, a 45 lb. lipoma, from a 400 lb. bluefin tuna (RTLA 1518) contributed by Paul P. Yevich. No epidemiological trend has appeared to suggest a cause for the one to several lipomas discovered annually in fish. Another tuna (albacore) which had an osteoma (RTLA 1384), a type of tumor usually associated with croakers, was contributed by Jerry D. Hendricks. Mr. Yevich also contributed a lymphocytic leukemia in a brook trout (RTLA 1519) and two significant molluscan tumors including a hematopoietic neoplasm of possible amoebocytic origin in a black quahog (RTLA 1392), and a diffuse, undifferentiated sarcoma in an oyster (RTLA 1435). Other molluscan specimens received with neoplastic and non-neoplastic lesions were: a mussel from J. M. Ward, A. Guarino, and W. L. Doyle which had a vesicular connective tissue tumor of the gonad (RTLA 1474); an Asiatic clam from Brian S. Morton with granulomas associated with incubating larvae (RTLA 1391); a three-ridge naiad from Fred Hink and Carol Stein showing inflammatory polyps of the vesicular connective tissue (RTLA 1396); and, hard clams from Sara Otto, Sing C. Chang, and me, containing chlamydial inclusions (RTLA 1414-1418). Chlamydia are obligate, intracytoplasmic, zoonotic procaryotes believed to have evolved from bacteria. They produce psittacosis in many species of birds and a type of pneumonia in humans. This discovery suggests that hard clams and possibly other mollusks play an intermediate host role, which could have large economic and public health significance. A large number of soft clams were received from John Hurst (RTLA 1448-1461) and from Edward Gilfillan (RTLA 1500-1515) from several sites in Maine polluted with various petroleum products. While many of these animals remain to be studied, initial findings confirm Paul Yevich's contention that germinomas arise in some of these populations. A polyoma type virus was also found. A soft clam specimen from the Northeast U.S. coast with a diffuse hematopoietic neoplasm was contributed by Robert Brown (RTLA 1413).

Eight fish cases (RTLA 1478-1485) from coastal waters of southeast Florida were contributed by Walter Kandrashoff who has observed an increase in fish anomalies over the years as water in this area has become more polluted. Two of the lesions were neoplastic -- a neurilemmoma in a mangrove snapper and a mesothelioma in a carp. The other lesions appeared to be parasitic or traumatic. Neurilemmomas had previously been reported in snappers from southwest Florida (Key West/Dry Tortugas) by Lucké in 1942 and are regularly received by the Registry from many species from widespread locations.

Other examples in this report include goldfish from I. M. Obdeyn (RTLA 1436) and R. R. Cowden (RTLA 1393), a brown trout from Barry J. Stevenson (RTLA 1476), two sockeye salmon from Gordon R. Bell (RTLA 1492 and 1493), and a black bullhead from C. Dale Becker (RTLA 1496). A rare albino African lungfish from N. Herwig with a pigmented malignant melanoma (RTLA 1495) and a probable neurofibrosarcoma in a blue gourami from D. O. Carpenter (RTLA 1401) represent two additional neural tumors.

Another block of cases (RTLA 1531-1597) resulted from an Ohio River Valley Water Sanitation Commission survey of the Ohio and Kanawha Rivers coordinated by Bill Klein. Surprisingly, only about four neoplastic lesions (papillomas) were found in this heavily industrialized watershed. Since the method of collection was to rotenone lock chambers, it is quite possible that the older bottom feeders most likely to have tumors are least likely to migrate through lock chambers, and a different sampling method will be needed to collect these fish.

Interesting reptile lesions received included a lymphoblastic leukemia in an Indian monitor lizard from J. N. Shively (RTLA 1499), a fibroblastic sarcoma in a gopher snake from G. Pendlebury (RTLA 1400), a pancreatic adenocarcinoma in a snake (Spilotes sp.) from Fred Frye (RTLA 1387), a parathyroid adenoma versus hyperplasia in a Greek tortoise from Fred Frye (RTLA 1402), and papillomatosis in an emerald lizard from O. F. Jackson (RTLA 1389).

An epidermal papilloma versus a low grade papillary carcinoma of a tautog was contributed by Richard Wolke (RTLA 1434). Five flatfish epidermal papillomas were received: one from an unpolluted area of Baja California contributed by Marjorie Sherwood (RTLA 1390), and four from Japan contributed by Keiichi Oishi (RTLA 1486 and 1516) and Takeo Harada (RTLA 1487 and 1517). A paper soon to be published in the "Journal of the National Cancer Institute" by Wellings et al gives evidence that the X-cells in these flatfish tumors and in cod pseudobranch tumors may be unicellular organisms. Other possible unicellular organisms in fish are the rodlets in the frequently seen rodlet cells several examples of which were contributed by E. K. Miller (RTLA 1463-1467). While some people think the rodlets are most likely some type of protozoans, I can see similarities to some of the insect viruses.

In addition to the hematopoietic neoplasms already mentioned, Elisabeth Gateff contributed two mutant Drosophila with "malignant blood neoplasms" (RTLA 1489 and 1490). Dr. Gateff has identified more than 15 mutants on three chromosomes that result in neoplasms of various origins. Hematopoietic fish neoplasms also included a lymphosarcoma in a cutthroat trout from Charlie Smith (RTLA 1399) and a northern pike from Gary Hoskins (RTLA 1442).

Liver lesions included a hepatoma in a largescale sucker from C. Dale Becker (RTLA 1395), a hepatoma or possibly a hepatoblastoma in a rainbow trout from Charlie Smith (RTLA 1469), diethylnitrosamine induced hepatomas in Medaka from Takatoshi Ishikawa (RTLA 1426). Michael Sigel contributed a tiger shark with multiple biliary duct cysts (RTLA 1412).

TABLE I  
DISTRIBUTION OF LESIONS AMONG SPECIMENS ACCESSIONED

Phylogenetic group	TYPE OF DISEASE			Total
	Neoplastic	Non-neoplastic	Not diagnosed	
Reptile	10	14	0	24 (11.3%)
Amphibian	0	2	0	2 (.9%)
Bony fish	44	70	22	136 (63.8%)
Shark	0	1	0	1 (.5%)
Tunicate	0	1	0	1 (.5%)
Mollusk	18	12	15	45 (21.1%)
Arthropod	2	0	0	2 (.9%)
Annelid	0	2	0	2 (.9%)
Total	74 (34.7%)	102 (47.9%)	37 (17.4%)	213 (100%)
Percent of those diagnosed	(42%)	(58%)		

Muscle tumors were represented by a rhabdomyoma in a brown trout from Barry J. Stevenson (RTLA 1477) and a leiomyosarcoma in a sockeye salmon from Gordon Bell (RTLA 1475). Other cases of interest include a thyroid adenoma in a butterfly fish from Michael Lagios (RTLA 1439) and in a striped killifish from John Grizzle (RTLA 1525). A poorly-differentiated rainbow trout nephroblastoma was contributed by Harold Wolf (RTLA 1446). A rainbow trout with an ectopic reduplication of visceral organs was received from John Hnath (RTLA 1423) and Bob Anderson sent a sea peach showing excess tunic production in response to a hydrozoan (RTLA 1406).

#### REFERENCE LIBRARY

Approximately 200 papers were added to the comprehensive library on neoplasms in lower animals bringing the total to 3,150. Except for recent acquisitions and articles that need to be translated, all papers have been abstracted by selected key words and computerized.

#### PAPERS SINCE 1975

- Billups, L. H. and Harshbarger, J. C. "Reptiles" a Section of the Chapter, "Naturally Occurring Neoplastic Diseases". In: CRC Handbook of Laboratory Animal Science, Vol. 3, E. C. Melby, Jr. and N. H. Altman (ed.), pp. 343-356, (CRC Press, Inc., Cleveland 1976).
- Leibovitz, L., Harshbarger, J. C., and Chanley, P. A Polypoid Myoma of the Foot of a Surf Clam (Spisula solidissima). In: Proceedings of the First International Colloquium on Invertebrate Pathology and IXth Annual Meeting Society for Invertebrate Pathology, Queen's University at Kingston, Canada, 1976, pp. 148-150, (Queen's University 1976).
- Harshbarger, J. C., Shumway, S. E., and Bane, G. W. Variably Differentiating Oral Neoplasms, Ranging from Epidermal Papilloma to Odontogenic Ameloblastoma, in Cunners {(Tautogolabrus adspersus) Osteichthyes; Perciformes: Labridae}. In: Progress in Experimental Tumor Research, Vol. 20, F. Homburger (ser. ed.), Tumors in Aquatic Animals, C. J. Dawe, D. G. Scarpelli, and S. R. Wellings (vol. ed.), pp. 113-128, (Karger, Basel 1976).
- Harshbarger, J. C. Description of Polyps and Epidermal Papillomas in Three Bivalve Mollusk Species. Mar. Fish. Rev., 38: 25-29. 1976.
- Harshbarger, J. C. "Spontaneous Neoplasms in Amphibians" and "Spontaneous Neoplasms in Reptiles," two Sections of Chapter 1: "Tumors". In: Pathology of Laboratory Animals, Vol. 2, K. Benirschke, F. M. Garner, T. C. Jones, and C. Kozma (ed.), (Springer-Verlag, New York; In press).
- Harshbarger, J. C. The Role of the Registry of Tumors in Lower Animals in the Study of Environmental Carcinogenesis in Aquatic Animals. Ann. N. Y. Acad. Sci. (In press).
- Anderson, R. S., Jordan, L. A., and Harshbarger, J. C. Tunic Abnormalities of the Urochordate Halocynthia pyriformis (Rathke). J. Invertebr. Pathol. (In press).

Harshbarger, J. C., Chang, S. C., and Otto, S. V. Chlamydiae (with Phages), Mycoplasmas, and Rickettsiae in Chesapeake Bay Bivalves. Science. (In press).

Rose, F. L. and Harshbarger, J. C. Neoplastic and Possibly Related Skin Lesions in Neotenic Tiger Salamanders, Ambystoma tigrinum, from a Sewage Lagoon. Science. (In press).

#### SELECTED OTHER ACTIVITIES IN 1976

1. Convened a symposium on invertebrate tumors at the Annual Meeting of the Society for Invertebrate Pathology, Kingston, Ontario, Canada, August 1976, and co-authored one of the presentations at that symposium.
2. Served as Secretary of the Society for Invertebrate Pathology until August 1976 and subsequently as a member of the Permanent Program Committee.
3. Served as Secretary of the Washington, D.C. Chapter of Sigma Xi, The Scientific Research Society of North America.
4. Served as a member of the Planning Committee, as a Session Chairman, and as a speaker at the New York Academy of Sciences Conference entitled: "Aquatic Pollutants and Biological Effects with Emphasis on Neoplasia," held 27-29 September 1976.
5. Served as a member of the Committee on Animal Models and Genetic Stocks of the National Research Council of the National Academy of Sciences.
6. Served as a member of the Interagency Collaborative Group on Environmental Carcinogenesis (chaired by H. F. Kraybill of the U.S. National Cancer Institute).
7. Participated in a cooperative investigation of the etiology of several diseases in bivalve mollusks, supported in part by the U.S. Food and Drug Administration, which has resulted in the discovery of chlamydiae, mycoplasmas, rickettsiae, and polyoma viruses in these animals.
8. Made a field survey of fish collected from nine sites on the Ohio River and one site on the Kanawha River, for tumors, as part of the annual fish survey conducted by the Ohio River Valley Water Sanitation Commission.

#### PERSONNEL

The Project Officer for the contract is Dr. Clyde J. Dawe, Head, Comparative Oncology Section, Laboratory of Pathology, National Cancer Institute, National Institutes of Health, Bethesda, Maryland, 20014.

The Principal Investigator for the contract is Dr. W. Duane Hope, Chairman, Department of Invertebrate Zoology, National Museum of Natural

History, Smithsonian Institution, Washington, D.C., 20560.

The Staff of the Registry is as follows:

John C. Harshbarger, Ph.D. - Director  
Sing Chen Chang, Ph.D. - Electron Microscopist  
Phyllis M. Schellenger, B.S. - Registrar  
Linda J. Cullen, B.A. - Histopathology Technician  
Judith E. Foster, B.S. - Research Assistant  
Marilyn S. Slatick, B.S. - Bibliographer

ACCESSIONS

RTLA 1384. Albacore, Thunnus alalunga

Material: Three separate, but consecutive segments of the vertebral column -- 2 "normal"; 1 pathologic -- pathologic segment has an attached ossified growth  
Habitat: Northeastern Pacific Ocean  
Diagnosis: Osteoma  
Submitter: J. D. Hendricks

RTLA 1385. Iguana iguana

Material: Four microscope slides; 1 pathology record  
Habitat: Pet; California  
Diagnosis: Lymphoma; poorly-differentiated lymphocytic type  
Submitter: F. L. Frye

RTLA 1386. Indian monitor lizard, Varanus bengalensis

Material: Five microscope slides  
Diagnosis: Osteocartilaginous exostoses  
Submitter: F. L. Frye  
Reprint: Frye, Fredric L. and Frank Dutra. Multiple Osteocartilaginous Exostoses in a Monitor Lizard, Vet. Med. Small Anim. Clin., 68: 1414-1416. 1973.

RTLA 1387. Spilotes sp.

Material: One microscope slide  
Diagnosis: Pancreatic adenocarcinoma  
Submitter: F. L. Frye

RTLA 1388. Clemmys sp.

Material: Three microscope slides  
Diagnosis: Verrucal papillomatosis  
Submitter: F. L. Frye

RTLA 1389. Green lizard, Lacerta viridis

Material: Two, 35 mm color transparencies; 1 pathology record  
Diagnosis: Squamous keratotic papillomatosis  
Submitter: O. F. Jackson

RTLA 1390. Dover sole, Microstomus pacificus

Material: Granular raised growths which were scattered over the body wall and fins  
Habitat: Pacific Ocean off Baja California  
Diagnosis: Papilloma  
Submitter: M. J. Sherwood  
Reprint: Sherwood, Marjorie J. and Alan J. Means. Occurrence of Tumor-Bearing Dover Sole (Microstomus pacificus) Off Point Arguello, California and Off Baja California, Mexico. Trans. Am. Fish. Soc., 105(4): 561-563. 1976.

- RTLA 1391. Asiatic clam, Corbicula fluminea  
Material: Nine microscope slides representing 4 cases  
Habitat: Plover Cove Reservoir, Hong Kong  
Diagnosis: Inflammatory granulomas  
Submitter: B. Morton  
Reprint: Morton, Brian. The Occurrence of Inflammatory Granulomas in the Ctenidial Marsupium of Corbicula fluminea (Muller 1774) (Mollusca; Bivalvia) - Consequence of Larval Incubation. (In preparation).
- RTLA 1392. Black quahog, Artica islandica  
Material: Fourteen microscope slides (pathologic); 12 microscope slides ("normal")  
Habitat: Rhode Island Sound  
Diagnosis: Hematopoietic neoplasm, amoebocytic type  
Submitter: P. P. Yevich
- RTLA 1393. Goldfish, Carassius auratus  
Material: Five microscope slides  
Habitat: Outdoor pool  
Diagnosis: Neurilemmoma  
Submitter: R. R. Cowden
- RTLA 1394. Longear sunfish, Lepomis megalotis  
Material: Gross specimen  
Habitat: Laboratory  
Diagnosis: Prolapsed rectum  
Submitter: W. E. Smith
- RTLA 1395. Largescale sucker, Catostomus macrocheilus  
Material: "Diseased" liver including the spleen and part of the intestine  
Habitat: Columbia River, Washington  
Diagnosis: Well-differentiated hepatoma  
Submitter: C. D. Becker
- RTLA 1396. Three-ridge naiad, Amblema plicata  
Material: One pathologic and one "normal" specimen including soft tissues and 4 shells; 2 black and white photographs  
Habitat: Mohican River, Ohio  
Diagnosis: Inflammatory polyp  
Submitter: W. F. Hink and C. B. Stein
- RTLA 1397. Rainbow trout, Salmo gairdneri  
Material: Two pieces of tissue from a growth attached to the lower jaw; 2 microscope slides  
Habitat: Fish Cultural Development Center, Bozeman, Montana  
Diagnosis: Fibroma  
Submitter: C. E. Smith
- RTLA 1398. Lake trout, Salvelinus namaycush  
Material: A piece of tissue from a growth; 4 microscope slides; 2, 35 mm color transparencies



RTLA 1398 (contd.)

Habitat: Flathead Lake, Montana  
Diagnosis: Fibrolipoma  
Submitter: C. E. Smith

RTLA 1399. Lahontan cutthroat trout, Salmo clarki

Material: Two pieces of tissue from a growth; 2 microscope slides  
Habitat: Lahontan National Fish Hatchery, Gardnerville, Nevada  
Diagnosis: Lymphosarcoma  
Submitter: C. E. Smith

RTLA 1400. Great Basin gopher snake, Pituophis melanoleucus deserticola

Material: Fourteen microscope slides from a growth in the cloacal region; 1 black and white photograph  
Habitat: Near Bruneau Dunes State Park, Idaho  
Diagnosis: Fibroblastic sarcoma  
Submitter: G. Pendlebury

RTLA 1401. Blue gourami, Trichogaster trichopterus sumatranus

Material: One gross specimen with a growth near the base of the tail  
Diagnosis: Sarcoma of probable neural origin; neurilemmal sarcoma  
Submitter: D. O. Carpenter

RTLA 1402. Greek tortoise, Testudo graeca

Material: One microscope slide  
Diagnosis: Parathyroid adenoma versus compensatory hyperplasia  
Submitter: F. L. Frye

RTLA 1403, 1404, 1408-1411, 1419, 1421, 1422. Iguana iguana

Material: Two to four microscope slides each; pathology reports for 4 cases  
Diagnosis: Metabolic disorder characterized collectively by mineralization of renal vessels, dilation of renal tubules, crystals in lumens of renal tubules and in spleen, histiocytic islands in spleen, collections of mature lymphocytes in liver sinusoids  
Submitter: F. L. Frye

RTLA 1405. Rummy nose tetra, Hemigrannus rhodostomus

Material: One gross specimen with a protrusion on the right side  
Habitat: The specimen arrived at a San Antonio, Texas, pet shop from a tropical fish wholesaler with the growth already present  
Diagnosis: Two cysts containing worm parasites  
Submitter: N. Herwig

RTLA 1406. Sea peach, Halocynthia pyriformis

Material: One gross specimen with an exuberant growth of the tunic  
Habitat: Bay of Fundy  
Diagnosis: Excess tunic production in response to a hydrozoan  
Submitter: R. S. Anderson

RTLA 1407. Coho salmon, Oncorhynchus kisutch

Material: One microscope slide

RTLA 1407 (contd.)

Habitat: Pacific Biological Station, Nanaimo, B.C., Canada  
Diagnosis: Undifferentiated sarcoma  
Submitter: G. E. Hoskins

RTLA 1408-1411. (See RTLA 1403)

RTLA 1412. Tiger shark, Galeocerdo cuvieri

Material: Three microscope slides; 1 pathology report  
Diagnosis: Multiple biliary duct cysts  
Submitter: M. M. Sigel

RTLA 1413. Soft-shell clam, Mya arenaria

Material: Three microscope slides  
Diagnosis: Diffuse neoplasm of hyaline hemocyte origin  
Submitter: R. Brown

RTLA 1414-1418. Hard-shell clam, Mercenaria mercenaria

Material: Digestive tissue  
Habitat: Maryland part of Chincoteague Bay  
Diagnosis: Chlamydiae inclusions  
Submitter: S. V. Otto, J. C. Harshbarger, and S. C. Chang  
Reprint: Harshbarger, John C., Sing Chen Chang, and S. V. Otto.  
Chlamydiae (with Phages), Mycoplasmas, and Rickettsiae  
in Chesapeake Bay Bivalves. Science. (In press).

RTLA 1419. (See RTLA 1403)

RTLA 1420. Pacific pond turtle, Clemmys marmorata

Material: Two microscope slides  
Diagnosis: Intranuclear virus inclusions in liver, kidney, and spleen  
Submitter: F. L. Frye

RTLA 1421 and 1422. (See RTLA 1403)

RTLA 1423. Rainbow trout, Salmo gairdneri

Material: One tissue block  
Habitat: Little Manistee River, Michigan  
Diagnosis: Ectopic reduplication of visceral organs  
Submitter: J. G. Hnath

RTLA 1424. Bullsnake, Pituophis melanoleucus

Material: Two microscope slides; 1 color transparency  
Diagnosis: Algal infection, Prototheca sp., versus fungal infection  
Submitter: T. E. Hamm

RTLA 1425. Carp, Cyprinus carpio

Material: One piece of tissue; 2 microscope slides; 2 color trans-  
parencies  
Habitat: Private pond in Mystic, Connecticut  
Diagnosis: Leiomyoma versus teratoma  
Submitter: R. E. Wolke

RTLA 1426. Cisco, Coregonus artedii

Material: Section of liver tissue

Habitat: Smith Bay, on the eastern shore of the northern end of  
Lake George, New York

Diagnosis: Cholangioma or cholangiocarcinoma

Submitter: C. J. George

RTLA 1427. American anole, Anolis carolinensis

Material: Gross specimen with lump on neck; 2 microscope slides

Habitat: Pet; Maryland

Diagnosis: Epithelial lined cyst of probable pharyngeal origin --  
etiology unknown

Submitter: F. McQuay

RTLA 1428. Iguana iguana

Material: Two microscope slides

Habitat: Raised in captivity since 1965; California

Diagnosis: Pyelonephritis

Submitter: F. L. Frye

RTLA 1429. Pacific pond turtle, Clemmys marmorata

Material: Two microscope slides

Diagnosis: Intranuclear virus-like inclusions in liver, kidney, and  
spleen

Submitter: F. L. Frye

RTLA 1430 & 1431. Mt. Whitney rainbow trout, Salmo gairdneri

Material: One microscope slide each

Diagnosis: Chronic inflammation and fibrosis with hyperplasia of  
overlying lip epidermis, probably due to trauma

Submitter: H. Wolf

RTLA 1432. Earthworm

Material: Two vials -- one containing multiple minute white cysts --  
the other containing 3 gross earthworm specimens

Diagnosis: Simultaneous infections of protozoa, nematodes, and  
bacteria

Submitter: D. Armstrong, E. L. Cooper, and E. Stein

RTLA 1433. Pacific halibut, Hippoglossus stenolepis

Material: A piece of a large tumor

Diagnosis: Traumatic cyst in body wall

Submitter: G. E. Hoskins

RTLA 1434. Tautog (Black fish), Tautoga onitis

Material: Four pieces of tissue excised from a growth; 2 microscope  
slides; 1, 35 mm color transparency

Diagnosis: Epidermal papilloma versus low-grade papillary carcinoma  
of the jaw

Submitter: R. E. Wolke

RTLA 1435. American oyster, Crassostrea virginica

RTLA 1435 (contd.)

Material: Two microscope slides  
Habitat: New Haven area of Long Island Sound  
Diagnosis: Diffuse undifferentiated mesenchymal sarcoma  
Submitter: P. P. Yevich

RTLA 1436. Goldfish, Carassius auratus

Material: Four microscope slides; 1 paraffin block; 1 color transparency  
Habitat: In summer fish lives in a garden pond; in winter in an aquarium together with 2 other goldfishes  
Diagnosis: Neurilemmoma  
Submitter: I. M. Obdeyn

RTLA 1437. Red-eared turtle, Chrysemys scripta elegans

Material: One microscope slide  
Diagnosis: Leukoplakia and dyskeratosis possibly transitional to a well-differentiated squamous carcinoma  
Submitter: F. L. Frye

RTLA 1438. Hard-shell clam, Mercenaria mercenaria

Material: Digestive tissue  
Habitat: Maryland part of Chincoteague Bay  
Diagnosis: Chlamydiae inclusions  
Submitter: S. V. Otto, J. C. Harshbarger, and S. C. Chang  
Reprint: (See RTLA 1414-1418)

RTLA 1439. Butterfly fish, Chelmon rostratus

Material: One microscope slide; 2 color transparencies; 3 electron photomicrographs; 1 pathology report  
Habitat: A pet in a home aquarium  
Diagnosis: Thyroid adenoma  
Submitter: M. D. Lagios

RTLA 1440. California moray, Gymnothorax mordax

Material: One microscope slide  
Diagnosis: Epidermal papilloma of the lip  
Submitter: M. D. Lagios

RTLA 1441. Chinook salmon, Oncorhynchus tshawytscha

Material: Two pieces of body wall from the caudal peduncle with hard fibrous lumps in the muscle  
Habitat: Upper Rakaia River, Canterbury, South Island, New Zealand  
Diagnosis: Traumatic atrophy of the muscle  
Submitter: P. M. Hine

RTLA 1442. Northern pike, Esox lucius

Material: An intact section of fish with an ulcerated lesion; 1 microscope slide; 2 color transparencies  
Diagnosis: Lymphosarcoma  
Submitter: G. E. Hoskins

RTLA 1443. Rainbow trout, Salmo gairdneri

RTLA 1443 (contd.)

Material: Three microscope slides  
Habitat: Mojave River Hatchery, California  
Diagnosis: Toxicosis characterized by intestinal peritonitis, liver edema and necrosis, and gill inflammation and microaneurysms  
Submitter: H. Wolf

RTLA 1444. American oyster, Crassostrea virginica

Material: One microscope slide; 1 pathology report; 2 reprints  
Habitat: Herring Bay: Western shore of Chesapeake Bay  
Diagnosis: Xenoma due to ciliated thigmotrichs  
Submitter: S. V. Otto

RTLA 1445. Bluntnose minnow, Pimephales notatus

Material: One gross specimen with 3, white, amorphous lesions: on the head; below dorsal fin; and near the vent. Specimen also had numerous cutaneous black spots scattered randomly over the body surface and fins.  
Habitat: Trace Creek, Tennessee  
Diagnosis: Epidermal hyperplasia and black spot disease characterized by melanophore proliferation in trematode granulomas  
Submitter: J. Grizzle

RTLA 1446. Rainbow trout, Salmo gairdneri

Material: One microscope slide  
Habitat: Fish Springs Hatchery, California  
Diagnosis: Poorly-differentiated nephroblastoma  
Submitter: H. Wolf

RTLA 1447. Common shiner, Notropis cornutus

Material: One gross specimen  
Habitat: Ramapo River, New York  
Diagnosis: Protozoan cysts, probably Myxobolus sp.  
Submitter: C. L. Smith

RTLA 1448-1461. Soft-shell clam, Mya arenaria

Material: Several hundred whole clams from 14 petroleum spill sites  
Habitat: Searsport, Maine  
Diagnosis: Germinomas (RTLA 1453-1458), intranuclear virus-inclusions (RTLA 1458), gill hyperplasia (RTLA 1448-1461), trematode parasites (1448-1461), and cytoplasmic inclusions (RTLA 1448-1451)  
Submitter: J. Hurst

RTLA 1462. Montana (Arctic) grayling, Thymallus arcticus

Material: Two microscope slides; 1 paraffin block  
Diagnosis: Excavating fungal granuloma of mandible associated with ectopic bone formation  
Submitter: C. E. Smith

RTLA 1463-1465. Clownfish, Amphiprion ocellaris

RTLA 1463-1465 (contd.)

Material: Four microscope slides each  
Habitat: In vitro spawn  
Diagnosis: Rodlet cells  
Submitter: E. K. Miller

RTLA 1466. Planehead filefish, Monacanthus hispidus

Material: Two microscope slides  
Habitat: Gulf of Mexico  
Diagnosis: Rodlet cells  
Submitter: E. K. Miller

RTLA 1467. Three-spot damsel, Dascyllus trimaculatus

Material: Two microscope slides  
Habitat: South Pacific  
Diagnosis: Rodlet cells  
Submitter: E. K. Miller

RTLA 1468. Coho salmon, Oncorhynchus kisutch

Material: A large growth and adjacent body wall; 1 microscope slide;  
1, 35 mm color transparency  
Habitat: French Creek, Vancouver Island, B.C., Canada  
Diagnosis: Fibrosarcoma  
Submitter: G. E. Hoskins

RTLA 1469. Rainbow trout, Salmo gairdneri

Material: Two pieces of liver tissue; 2 microscope slides  
Habitat: Mattawan State Hatchery, Michigan  
Diagnosis: Possible hepatoblastoma  
Submitter: C. E. Smith

RTLA 1470. Fathead minnow, Pimephales promelas

Material: Two microscope slides  
Diagnosis: Liposarcoma (?)  
Submitter: C. E. Smith

RTLA 1471. Medaka, Oryzias latipes

Material: Manuscript; 8 color prints; 11 black and white prints  
Habitat: Obtained from a commercial breeder; maintained in laboratory tanks  
Diagnosis: Diethylnitrosamine induced hepatoma  
Submitter: T. Ishikawa  
Reprint: Ishikawa, Takatoshi, Tetsuro Shimamine, and Shozo Takayama. Histologic and Electron Microscopy Observations on Diethylnitrosamine-Induced Hepatomas in Small Aquarium Fish (Oryzias latipes). J. Nat. Cancer Inst., 55(4): 909-917. 1975.

RTLA 1472. Earthworm

Material: Three microscope slides  
Habitat: Anderson County, Tennessee  
Diagnosis: Granulomas due to nematode infestation  
Submitter: G. E. Cosgrove

RTLA 1473. Fathead minnow, Pimephales promelas

Material: One half of the head with multiple large tumors; 3 black and white photographs  
Diagnosis: Liposarcoma  
Submitter: C. E. Smith

RTLA 1474. Mussel, Mytilus sp.

Material: One microscope slide  
Habitat: Mt. Desert Island Biological Laboratory, Salsbury Cove, Maine  
Diagnosis: Vesicular connective tissue neoplasm in gonad of a hermaphroditic mussel  
Submitter: J. M. Ward, A. Guarino, and W. L. Doyle

RTLA 1475. Sockeye salmon, Oncorhynchus nerka

Material: Large growth associated with the ovaries  
Diagnosis: Leiomyosarcoma  
Submitter: G. R. Bell

RTLA 1476. Brown trout, Salmo trutta

Material: Two microscope slides; 2 color transparencies  
Habitat: Lake Benmore, New Zealand  
Diagnosis: Neurilemmal sarcoma  
Submitter: B. Stevenson

RTLA 1477. Brown trout, Salmo trutta

Material: Two microscope slides; 2 color transparencies  
Habitat: Lake Rotorua, New Zealand  
Diagnosis: Two lesions: neurilemmal sarcoma; well-differentiated rhabdomyoma  
Submitter: B. Stevenson

RTLA 1478. Pinfish, Lagodon (?) rhomboides (?)

Material: Gross specimen with misaligned lower jaw  
Habitat: Miamarina -- North Biscayne Bay adjacent to the Miami River, Florida  
Diagnosis: Encystment of trematode parasites within the skeletal muscle of the jaw  
Submitter: W. Kandrashoff

RTLA 1479. Pinfish, Lagodon (?) rhomboides (?)

Material: Gross specimen with wound-like depression predominantly on right side, dorsally  
Habitat: Miamarina -- North Biscayne Bay adjacent to the Miami River, Florida  
Diagnosis: Probable trauma; tissue too autolyzed for definitive diagnosis  
Submitter: W. Kandrashoff

RTLA 1480. Menhaden, Brevoortia sp.

Material: Two caudal fins with similar raised lesions  
Habitat: North Biscayne Bay, Florida  
Diagnosis: Healing fractures of the fin ribs, probably due to trauma  
Submitter: W. Kandrashoff

- RTLA 1481. Mangrove (gray) snapper, Lutjanus griseus  
Material: A spherical growth with some skin and scales attached from  
the side of the specimen  
Habitat: Reef area of South Florida  
Diagnosis: Neurilemmoma  
Submitter: W. Kandrashoff
- RTLA 1482. Black drum, Pogonias cromis  
Material: One eyeball with undilated pupil  
Habitat: North Biscayne Bay, Florida  
Diagnosis: Undetermined  
Submitter: W. Kandrashoff
- RTLA 1483. Atlantic (?) bonito, Sarda (?) sarda (?)  
Material: Large piece of body wall with deep ulceration of skin  
Habitat: Just off Miami Beach, Florida  
Diagnosis: Infection and inflammation following a severe injury to  
the body wall  
Submitter: W. Kandrashoff
- RTLA 1484. Florida pompano, Trachinotus carolinus  
Material: Caudal fin with several lumps  
Habitat: Probably area around Ft. Pierce, Florida  
Diagnosis: Undetermined  
Submitter: W. Kandrashoff
- RTLA 1485. Carp, Cyprinus carpio  
Material: Large, white spherical growth found lying free in the  
abdominal cavity  
Diagnosis: Mesothelioma of probable ovarian origin  
Submitter: W. Kandrashoff
- RTLA 1486. Kareius bicoloratus  
Material: One gross specimen with a large lesion involving both the  
dorsal and ventral sides of the fish and most of the ven-  
tral fin  
Habitat: Okhotsuk Sea, outside of the Komuke Lake, Mombetsu,  
Hokkaido Island, Japan  
Diagnosis: Epidermal papilloma  
Submitter: K. Oishi  
Reprint: Oishi, Keiichi, Fumio Yamazaki, and Takeo Harada. Epider-  
mal Papillomas of Flatfish in the Coastal Waters of  
Hokkaido, Japan. J. Fish. Res. Board Can., 33(9): 2011-  
2017. 1976.
- RTLA 1487. Starry flounder, Platichthys stellatus  
Material: One gross specimen with a large growth involving both the  
dorsal and ventral sides of the fish and a portion of the  
ventral fin  
Habitat: Okhotsuk Sea, outside of the Komuke Lake, Mombetsu,  
Hokkaido Island, Japan  
Diagnosis: Epidermal papilloma



RTLA 1487 (contd.)

Submitter: T. Harada  
Reprint: (See RTLA 1486)

RTLA 1488. Rainbow trout, Salmo gairdneri

Material: One gross specimen with multiple lesions on the body wall and in the webbing of the fins  
Diagnosis: Marked basal cell hyperplasia with cellular atypia suggestive of carcinoma in situ  
Submitter: C. E. Smith

RTLA 1489. Drosophila melanogaster

Material: One microscope slide  
Habitat: Laboratory stock  
Diagnosis: Lethal (2) malignant blood neoplasm {1(2)mbn}  
Submitter: E. Gateff  
Reprint: Gateff, Elisabeth. Neoplasms of Genetic Origin in Drosophila melanogaster. In: Proceedings of the First International Colloquium on Invertebrate Pathology and IXth Annual Meeting Society for Invertebrate Pathology, Queen's University at Kingston, Canada, 1976. pp. 142-146. 1976.

RTLA 1490. Drosophila melanogaster

Material: One microscope slide  
Habitat: Laboratory stock  
Diagnosis: Lethal (3) malignant blood neoplasm {1(3)mbn}  
Submitter: E. Gateff  
Reprint: (See RTLA 1489)

RTLA 1491. Rainbow trout, Salmo gairdneri

Material: Two microscope slides  
Diagnosis: Epidermal hyperplasia  
Submitter: C. E. Smith

RTLA 1492. Sockeye salmon, Oncorhynchus nerka

Material: One microscope slide  
Diagnosis: Neurilemmal sarcoma  
Submitter: G. R. Bell

RTLA 1493. Sockeye salmon, Oncorhynchus nerka

Material: Two microscope slides  
Diagnosis: Neurilemmoma  
Submitter: G. R. Bell

RTLA 1494. Dolly Varden, Salvelinus malma

Material: Two microscope slides  
Habitat: Ospika River, Williston Lake, B.C., Canada  
Diagnosis: Myxofibroma  
Submitter: G. E. Hoskins

RTLA 1495. African lungfish (albino), Protopterus dolloi

RTLA 1495 (contd.)

Material: A portion of intestine with the remainder of a black, firm, oval growth; 12, 35 mm color transparencies  
Habitat: From collection at the San Antonio Zoological Gardens and Aquarium, San Antonio, Texas  
Diagnosis: Melanosarcoma  
Submitter: N. Herwig

RTLA 1496. Black bullhead, Ictalurus melas

Material: A large growth removed from the right side of the fish; 2 black and white photographs  
Habitat: Laboratory reared for several months  
Diagnosis: Neurilemmoma  
Submitter: C. D. Becker

RTLA 1497. Hard-shell clam, Mercenaria mercenaria

Material: Digestive tissue  
Habitat: Maryland part of the Chincoteague Bay  
Diagnosis: Chlamydiae inclusions  
Submitter: S. V. Otto, J. C. Harshbarger, and S. C. Chang  
Reprint: (See RTLA 1414-1418)

RTLA 1498. Hard-shell clam, Mercenaria mercenaria

Material: Digestive tissue  
Habitat: Maryland part of the Chincoteague Bay  
Diagnosis: Chlamydiae inclusions  
Submitter: S. V. Otto, J. C. Harshbarger, and S. C. Chang  
Reprint: (See RTLA 1414-1418)

RTLA 1499. Indian monitor lizard, Varanus bengalensis

Material: Wet tissue; 4 microscope slides  
Habitat: Randolph Park Zoo, Tucson, Arizona  
Diagnosis: Lymphoblastic leukemia  
Submitter: J. N. Shively

RTLA 1500. Soft-shell clam, Mya arenaria

Material: Twenty whole clams  
Habitat: Hezzies Point, Maine  
Diagnosis: Normal  
Submitter: E. Gilfillan

RTLA 1501-1515. Soft-shell clam, Mya arenaria

Material: Several hundred whole clams, total from 15 petroleum spill sites  
Habitat: Searsport, Maine  
Diagnosis: Germinomas (RTLA 1501, 1503, 1505, 1507-1510, 1513); cytoplasmic inclusions (RTLA 1501-1515); gill hyperplasia (RTLA 1501-1515)  
Submitter: E. Gilfillan

RTLA 1516. Limanda schrenki

Material: One gross specimen with a large growth involving both the

RTLA 1516 (contd.)

dorsal and ventral sides of the caudal fin. Specimen also had two growths attached to the webbing of the dorsal fin and opaque, slightly raised patches of skin randomly scattered over the body wall on the ocular side.

Habitat: Notoro Lake, Abashiri City, Japan

Diagnosis: Epidermal papilloma; parasitization by Philometra mariae

Submitter: K. Oishi

RTLA 1517. Limanda schrenki

Material: One gross specimen with a large growth involving both the ocular and blind sides of the fish and a portion of the dorsal fin. Specimen also had two growths attached to the webbing of the dorsal fin.

Habitat: Notoro Lake, Abashiri City, Japan

Diagnosis: Epidermal papilloma; parasitization by Philometra mariae

Submitter: T. Harada

RTLA 1518. Bluefin tunna, Thunnus thynnus

Material: Tissue from a 45 lb. mass located on the back of the fish; 3 microscope slides; 6 paraffin blocks

Habitat: Atlantic Ocean

Diagnosis: Lipoma

Submitter: P. P. Yevich

RTLA 1519. Brook trout, Salvelinus fontinalis

Material: Tissue; 10 microscope slides; 12 paraffin blocks

Diagnosis: Lymphocytic leukemia

Submitter: P. P. Yevich

RTLA 1520. South African clawed frog, Xenopus laevis

Material: Six microscope slides

Habitat: Laboratory

Diagnosis: Ova regression; probably induced by hormone injection being out of phase with the level of ovarian maturation

Submitter: G. E. Cosgrove

RTLA 1521. Spot, Leiostomus xanthurus

Material: Gross specimen with a growth displacing the pectoral fin. Specimen also had mucus-like, opaque patches of skin randomly scattered over the body wall.

Habitat: Patuxent River, Maryland

Diagnosis: Microsporidan xenoma

Submitter: J. Peng

RTLA 1522. Chinook salmon, Oncorhynchus tshawytscha

Material: A portion of body wall with an attached protruding ulcerated lesion

Habitat: Little Manistee River, near Manistee, Michigan

Diagnosis: Well-differentiated fibrosarcoma

Submitter: J. G. Hnath

- RTLA 1523. Marine toad, Bufo marinus  
Material: One gross specimen with multiple, cyst-like lesions on liver  
Habitat: Probably collected in Barro Colorado Islands, Panama  
Diagnosis: Parasitic cysts containing egg-laden trematodes  
Submitter: G. R. Zug
- RTLA 1524. Green lizard, Lacerta viridis  
Material: Three microscope slides; 2 color transparencies  
Habitat: Pet  
Diagnosis: Verrucal type of squamous papillomatosis  
Submitter: O. F. Jackson
- RTLA 1525. Striped killifish, Fundulus majalis  
Material: One gross specimen with a growth protruding from under the opercula  
Diagnosis: Thyroid hyperplasia (colloid goiter)  
Submitter: J. Grizzle
- RTLA 1526. Banded cichlid (?), Cichlasoma severum  
Material: Three pieces of tissue from a growth just below skin between swimbladder and gill chamber  
Habitat: Aquarium  
Diagnosis: Renal tubular carcinoma versus nephroblastoma  
Submitter: J. Grizzle
- RTLA 1527. Largemouth bass, Micropterus salmoides  
Material: Two portions of body wall with nodules associated with muscle just under the skin  
Habitat: Table Rock Reservoir, near Branson, Missouri  
Diagnosis: Multiple infectious granulomas  
Submitter: J. Grizzle
- RTLA 1528. Largemouth bass, Micropterus salmoides  
Material: Lower jaw with growth  
Diagnosis: Osteochondroma versus a healing fracture  
Submitter: J. Grizzle
- RTLA 1529. Gulf menhaden, Brevoortia patronus  
Material: One gross specimen with a growth attached to the left side of the upper jaw  
Habitat: Gulf Shores, Alabama  
Diagnosis: Edematous snout  
Submitter: J. Grizzle
- RTLA 1530. Bluegill, Lepomis macrochirus  
Material: The caudal fin and adjacent body wall with a growth near the base of the caudal fin  
Habitat: Farm pond, Haralson County, Georgia  
Diagnosis: Granuloma  
Submitter: J. Grizzle

- RTLA 1531. Carp, Cyprinus carpio  
Material: One gross specimen with a black spot at the fork of the caudal fin  
Habitat: Ohio River; Dashfield Lock and Dam (L & D)  
Diagnosis: Chronic inflammatory reaction  
Submitter: ORSANCO Survey
- RTLA 1532. Carp, Cyprinus carpio  
Material: Eroded caudal, pectoral and pelvic fins  
Habitat: Ohio River; Dashfield L & D  
Diagnosis: Not processed  
Submitter: ORSANCO Survey
- RTLA 1533. White catfish, Ictalurus catus  
Material: Kidney with a white body; a small mesenteric cyst  
Habitat: Ohio River; Dashfield L & D  
Diagnosis: Normal stannius body; cyst not determined  
Submitter: ORSANCO Survey
- RTLA 1534. White catfish, Ictalurus catus  
Material: Fish head with lesion under jaw  
Habitat: Ohio River; Dashfield L & D  
Diagnosis: Ulcerated inflammatory reaction  
Submitter: ORSANCO Survey
- RTLA 1535. White catfish, Ictalurus catus  
Material: Stannius bodies  
Habitat: Ohio River; Dashfield L & D  
Diagnosis: Normal  
Submitter: ORSANCO Survey
- RTLA 1536. Minnow  
Material: Gross specimen with a ventral lesion behind the lower jaw  
Habitat: Ohio River; Hannibal L & D  
Diagnosis: Bacterial granuloma  
Submitter: ORSANCO Survey
- RTLA 1537. Catfish  
Material: A piece of tissue; fish had discolorations on the right side, dorsally, just posterior to the operculum  
Habitat: Ohio River; Hannibal L & D  
Diagnosis: Dermal inflammation overlain by thinned goblet cell less epidermis  
Submitter: ORSANCO Survey
- RTLA 1538. Gizzard shad, Dorosoma cepedianum  
Material: Fish head with corneal overgrowth  
Habitat: Ohio River; Hannibal L & D  
Diagnosis: Hemorrhage and fibrosis  
Submitter: ORSANCO Survey
- RTLA 1539. Flathead catfish, Pylodictis olivaris

RTLA 1539 (contd.)

Material: Viscera  
Habitat: Ohio River; Hannibal L & D  
Diagnosis: Hepatic arteritis  
Submitter: ORSANCO Survey

RTLA 1540. Channel catfish, Ictalurus punctatus

Material: Gut with parasite; eye lesion  
Habitat: Ohio River; Hannibal L & D  
Diagnosis: Cestode; paraorbital inflammation and scarring  
Submitter: ORSANCO Survey

RTLA 1541. Channel catfish, Ictalurus punctatus

Material: Two pieces of anal tissue showing apparent erosion  
Habitat: Ohio River; Hannibal L & D  
Diagnosis: Ulcerative inflammatory reaction  
Submitter: ORSANCO Survey

RTLA 1542. Channel catfish, Ictalurus punctatus

Material: Two pieces of a black skin lesion  
Habitat: Ohio River; Hannibal L & D  
Diagnosis: Epidermoid cyst  
Submitter: ORSANCO Survey

RTLA 1543. Channel catfish, Ictalurus punctatus

Material: Skin lesion removed from lower jaw  
Habitat: Ohio River; Hannibal L & D  
Diagnosis: Inflammation of the dermis  
Submitter: ORSANCO Survey

RTLA 1544. Bullhead, Ictalurus sp.

Material: Caudal fin with pigmented spot  
Habitat: Ohio River; Hannibal L & D  
Diagnosis: Partially sloughed epidermis allowed basal melanin layer to show through  
Submitter: ORSANCO Survey

RTLA 1545. Channel catfish, Ictalurus punctatus

Material: An opaque eye  
Habitat: Ohio River; Hannibal L & D  
Diagnosis: Inflammation and fibrosis of anterior chamber  
Submitter: ORSANCO Survey

RTLA 1546. Carp, Cyprinus carpio

Material: Two opaque eyes  
Habitat: Ohio River; Hannibal L & D  
Diagnosis: Paraorbital hemorrhage  
Submitter: ORSANCO Survey

RTLA 1547. Mirror scale carp, Cyprinus carpio

Material: Right pectoral fin with pigmented spot  
Habitat: Ohio River; Hannibal L & D

- RTLA 1547 (contd.)  
Diagnosis: Inflammation and epidermal exfoliation due to bacterial infection  
Submitter: ORSANCO Survey
- RTLA 1548. Channel catfish, Ictalurus punctatus  
Material: Liver lesions  
Habitat: Ohio River; Hannibal L & D  
Diagnosis: Helminthic and protozoan granulomas  
Submitter: ORSANCO Survey
- RTLA 1549. Carp, Cyprinus carpio  
Material: Liver lesion  
Habitat: Ohio River; Hannibal L & D  
Diagnosis: Granuloma  
Submitter: ORSANCO Survey
- RTLA 1550. Carp, Cyprinus carpio  
Material: Skin lesions on both sides of the caudal peduncle  
Habitat: Ohio River; Pike Island L & D  
Diagnosis: Not processed  
Submitter: ORSANCO Survey
- RTLA 1551. Spotted bass, Micropterus punctulatus  
Material: A small piece of oral mucosa with plaque  
Habitat: Ohio River; Pike Island L & D  
Diagnosis: Ulcerative inflammatory reaction containing bacteria  
Submitter: ORSANCO Survey
- RTLA 1552. Carp, Cyprinus carpio  
Material: Operculum with hemorrhagic raised plaque  
Habitat: Ohio River; Pike Island L & D  
Diagnosis: Epidermal papilloma  
Submitter: ORSANCO Survey
- RTLA 1553. Carp, Cyprinus carpio  
Material: Right operculum with protrusion on posterior edge  
Habitat: Ohio River; Pike Island L & D  
Diagnosis: Bone deformity associated with an old fracture  
Submitter: ORSANCO Survey
- RTLA 1554. Mimic shiner, Notropis volucellus  
Material: One gross specimen with a lesion near the vent  
Habitat: Ohio River; Pike Island L & D  
Diagnosis: Helminthic granuloma and ectopic fat  
Submitter: ORSANCO Survey
- RTLA 1555. Brown bullhead, Ictalurus nebulosus  
Material: A portion of body wall with spots and mucus-like patches on skin  
Habitat: Ohio River; Belleville L & D  
Diagnosis: Epidermis containing large numbers of alarm cells and goblet cells

- RTLA 1555 (contd.)  
Submitter: ORSANCO Survey
- RTLA 1556. Gizzard shad, Dorosoma cepedianum  
Material: A lump  
Habitat: Ohio River; Belleville L & D  
Diagnosis: Not processed  
Submitter: ORSANCO Survey
- RTLA 1557. Brown bullhead, Ictalurus nebulosus  
Material: A piece of body wall with crater-like (eroded) lesions  
on the skin  
Habitat: Ohio River; Belleville L & D  
Diagnosis: Inflammation and ulceration of skin; atrophy of adjacent  
muscle  
Submitter: ORSANCO Survey
- RTLA 1558. Channel catfish, Ictalurus punctatus  
Material: A piece of body wall with skin lesions  
Habitat: Ohio River; Belleville L & D  
Diagnosis: Tissue on slides not diagnostic  
Submitter: ORSANCO Survey
- RTLA 1559. Channel catfish, Ictalurus punctatus  
Material: Two pieces of tissue (red lesions on belly)  
Habitat: Ohio River; Gallipolis L & D  
Diagnosis: Ulcerative, hemorrhagic, inflammatory reaction  
Submitter: ORSANCO Survey
- RTLA 1560. Flathead catfish, Pylodictis olivaris  
Material: A piece of tissue probably removed from the upper jaw  
because of discoloration  
Habitat: Ohio River; Meldahl L & D  
Diagnosis: Ulcerated, inflammatory reaction  
Submitter: ORSANCO Survey
- RTLA 1561. Flathead catfish, Pylodictis olivaris  
Material: A small piece of body wall with a small, oval, flat lesion  
Habitat: Ohio River; Meldahl L & D  
Diagnosis: Tissue on slides not diagnostic  
Submitter: ORSANCO Survey
- RTLA 1562. Flathead catfish, Pylodictis olivaris  
Material: Lump in body wall  
Habitat: Ohio River; Meldahl L & D  
Diagnosis: Dermal inflammatory reaction  
Submitter: ORSANCO Survey
- RTLA 1563. Flathead catfish, Pylodictis olivaris  
Material: Liver with several black pigmented areas  
Habitat: Ohio River; Meldahl L & D  
Diagnosis: Hemosiderosis  
Submitter: ORSANCO Survey



- RTLA 1564. Channel catfish, Ictalurus punctatus  
Material: Two pieces of tissue; upper jaw lesion  
Habitat: Ohio River; Meldahl L & D  
Diagnosis: Ulcerated, inflammatory reaction  
Submitter: ORSANCO Survey
- RTLA 1565. Channel catfish, Ictalurus punctatus  
Material: Fatty nodules  
Habitat: Ohio River; Meldahl L & D  
Diagnosis: Lymphocystis  
Submitter: ORSANCO Survey
- RTLA 1566. Carp, Cyprinus carpio  
Material: Protruding growth below eye  
Habitat: Ohio River; McApline L & D  
Diagnosis: Bone deformity  
Submitter: ORSANCO Survey
- RTLA 1567. Gizzard shad, Dorosoma cepedianum  
Material: White muscle-like tissue surrounding the right pelvic fin; fin spines protrude through the growth  
Habitat: Ohio River; McApline L & D  
Diagnosis: Edematous, inflammatory reaction  
Submitter: ORSANCO Survey
- RTLA 1568. Crappie, Pomoxis sp.  
Material: Gross specimen with lymphocystis- (tapioca) like growth on anal and caudal fins  
Habitat: Ohio River; McApline L & D  
Diagnosis: Lymphocystis  
Submitter: ORSANCO Survey
- RTLA 1569. Carp, Cyprinus carpio  
Material: An eye completely occluded  
Habitat: Ohio River; Markland L & D  
Diagnosis: Eye replaced by multiple granulomas  
Submitter: ORSANCO Survey
- RTLA 1570. Carp, Cyprinus carpio  
Material: Eye socket with missing orbit  
Habitat: Ohio River; Markland L & D  
Diagnosis: Fatty replacement  
Submitter: ORSANCO Survey
- RTLA 1571. Carp, Cyprinus carpio  
Material: Darkly pigmented lesion from behind the operculum  
Habitat: Ohio River; Markland L & D  
Diagnosis: Not processed  
Submitter: ORSANCO Survey
- RTLA 1572. Carp, Cyprinus carpio  
Material: Two pieces of tissue; both appear to be eye remnants  
Habitat: Ohio River; Markland L & D

RTLA 1572 (contd.)

Diagnosis: Inflammatory reaction  
Submitter: ORSANCO Survey

RTLA 1573. Channel catfish, Ictalurus punctatus

Material: Slightly raised milky skin on lower jaw  
Habitat: Ohio River; Gallipolis L & D  
Diagnosis: Granuloma  
Submitter: ORSANCO Survey

RTLA 1574. Channel catfish, Ictalurus punctatus

Material: Flush black spot on lower jaw  
Habitat: Ohio River; Gallipolis L & D  
Diagnosis: Epidermal hyperplasia associated with chronic inflammatory reaction  
Submitter: ORSANCO Survey

RTLA 1575. Brown bullhead, Ictalurus nebulosus

Material: Gross specimen with rugose growth on the upper lip; the growth extended inside the mouth  
Habitat: Ohio River; Belleville L & D  
Diagnosis: Epidermal papilloma  
Submitter: ORSANCO Survey

RTLA 1576. Channel catfish, Ictalurus punctatus

Material: A large piece of body wall with minute, flush, dark splotches  
Habitat: Kanawha River; Winfield L & D  
Diagnosis: Dermal papillae reach surface, normal  
Submitter: ORSANCO Survey

RTLA 1577. Channel catfish, Ictalurus punctatus

Material: Liver with white lesions  
Habitat: Kanawha River; Winfield L & D  
Diagnosis: Multiple granulomas  
Submitter: ORSANCO Survey

RTLA 1578. Channel catfish, Ictalurus punctatus

Material: Hemorrhagic liver  
Habitat: Kanawha River; Winfield L & D  
Diagnosis: Granuloma  
Submitter: ORSANCO Survey

RTLA 1579. Channel catfish, Ictalurus punctatus

Material: White, mottled, dome-shaped bodies in kidney  
Habitat: Kanawha River; Winfield L & D  
Diagnosis: Normal stannius bodies  
Submitter: ORSANCO Survey

RTLA 1580. Channel catfish, Ictalurus punctatus

Material: Multiple, white, dome-shaped lesions in the liver  
Habitat: Kanawha River; Winfield L & D  
Diagnosis: Helminthic granulomas

RTLA 1580 (contd.)

Submitter: ORSANCO Survey

RTLA 1581. Channel catfish, Ictalurus punctatus

Material: Spleen

Habitat: Kanawha River; Winfield L & D

Diagnosis: Normal

Submitter: ORSANCO Survey

RTLA 1582. Channel catfish, Ictalurus punctatus

Material: Liver and mesentery with 3 discrete, white, dome-shaped lesions embedded in the liver

Habitat: Kanawha River; Winfield L & D

Diagnosis: Multiple granulomas

Submitter: ORSANCO Survey

RTLA 1583. Carp, Cyprinus carpio

Material: Unattached mass from under swim bladder, near kidney

Habitat: Kanawha River; Winfield L & D

Diagnosis: Dry abscess containing bacteria

Submitter: ORSANCO Survey

RTLA 1584. Channel catfish, Ictalurus punctatus

Material: Liver with multiple, discrete, white lesions; liver also pale around edges

Habitat: Kanawha River; Winfield L & D

Diagnosis: Granulomas

Submitter: ORSANCO Survey

RTLA 1585. Spotted sucker, Minytrema melanops

Material: Liver with very slight darkening in lobe

Habitat: Kanawha River; Winfield L & D

Diagnosis: Helminthic granulomas in mesentery

Submitter: ORSANCO Survey

RTLA 1586. Smallmouth buffalo, Ictiobus bubalus

Material: Liver

Habitat: Ohio River; Cannelton L & D

Diagnosis: Tissue on slides not diagnostic

Submitter: ORSANCO Survey

RTLA 1587. River carpsucker, Carpionodes carpio

Material: Fish head with small, white nasal protrusion

Habitat: Ohio River; Cannelton L & D

Diagnosis: Cartilaginous metaplasia of connective tissue associated with underlying parasitic granulomas

Submitter: ORSANCO Survey

RTLA 1588. Carp, Cyprinus carpio

Material: A dome-shaped bony projection from the hard palate

Habitat: Ohio River; Cannelton L & D

Diagnosis: Abnormal osseous projection of palatine bone

Submitter: ORSANCO Survey

- RTLA 1589. Channel catfish, Ictalurus punctatus  
Material: Caudal peduncle with a white, dome-shaped protrusion  
Habitat: Ohio River; Cannelton L & D  
Diagnosis: Protozoan cyst  
Submitter: ORSANCO Survey
- RTLA 1590. White catfish, Ictalurus catus  
Material: Liver with a small protrusion  
Habitat: Ohio River; Cannelton L & D  
Diagnosis: Multiple helminthic granulomas  
Submitter: ORSANCO Survey
- RTLA 1591. Channel catfish, Ictalurus punctatus  
Material: A piece of body wall with flush, white blemishes in the skin  
Habitat: Ohio River; Cannelton L & D  
Diagnosis: Patches of intradermal, chronic, inflammatory reaction  
Submitter: ORSANCO Survey
- RTLA 1592. Channel catfish, Ictalurus punctatus  
Material: Liver and mesentery with several discrete, oval, white growths  
Habitat: Ohio River; Cannelton L & D  
Diagnosis: Multiple granulomas  
Submitter: ORSANCO Survey
- RTLA 1593. Buffalo, Ictiobus sp.  
Material: Posterior portion of fish with a palpable lump in muscle dorsal to lateral line, anterior to caudal fin  
Habitat: Ohio River; Uniontown L & D  
Diagnosis: Hyperplastic nodule of metabolic fat  
Submitter: ORSANCO Survey
- RTLA 1594. Buffalo, Ictiobus sp.  
Material: Posterior portion of fish with a palpable lump in muscle dorsal to lateral line, anterior to caudal fin  
Habitat: Ohio River; Uniontown L & D  
Diagnosis: Not processed  
Submitter: ORSANCO Survey
- RTLA 1595. Carp, Cyprinus carpio  
Material: Liver with multiple minute black spots  
Habitat: Ohio River; Uniontown L & D  
Diagnosis: Multiple granulomas  
Submitter: ORSANCO Survey
- RTLA 1596. Paddlefish, Polyodon spathula  
Material: Gastric caeca from two fish with raised, multiple lumps  
Habitat: Ohio River; Uniontown L & D  
Diagnosis: Helminthic granulomas in muscularis  
Submitter: ORSANCO Survey
- RTLA 1597. White catfish, Ictalurus catus

RTLA 1597 (contd.)

Material: Liver with white lesions  
Habitat: Ohio River; Dashfield L & D  
Diagnosis: Helminthic granulomas  
Submitter: ORSANCO Survey

RTLA 1598. Coho salmon, Oncorhynchus kisutch

Material: Two microscope slides  
Habitat: Strait of Georgia, Canada  
Diagnosis: Neurofibroma  
Submitter: G. R. Bell

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CONTRIBUTORS

ANDERSON, R. S.  
Donald S. Walker Laboratory  
Sloan-Kettering Institute for  
Cancer Research  
145 Boston Post Road  
Rye, New York 10580  
RTLA 1406

ARMSTRONG, D.  
Land, Air, Water Resources (LAWR)  
University of California  
Davis, California 95616  
RTLA 1432

BECKER, C. D.  
Ecosystems Department  
Battelle Pacific Northwest  
Laboratories  
Battelle Boulevard  
Richland, Washington 99352  
RTLA 1395, 1496

BELL, G. R.  
Pacific Biological Station  
P. O. Box 100  
Nanaimo, B. C., V9R 5K6, Canada  
RTLA 1475, 1492, 1493, 1598

BROWN, R.  
Agricultural Experiment Station  
Department of Animal Pathology  
University of Rhode Island  
Kingston, Rhode Island 02881  
RTLA 1413

CARPENTER, D. O.  
Neurobiology Department  
Armed Forces Radiobiology  
Research Institute  
Defense Nuclear Agency  
Bethesda, Maryland 20014  
RTLA 1401

CHANG, S. C.  
Registry of Tumors in  
Lower Animals  
National Museum of Natural History  
Room W216-a  
Smithsonian Institution  
Washington, D. C. 20560  
RTLA 1414-1418, 1438, 1497, 1498

COOPER, E. L.  
Department of Anatomy  
School of Medicine  
University of California  
Los Angeles, California 90024  
RTLA 1432

COSGROVE, G. E.  
Biology Division  
Oak Ridge National Laboratory  
P. O. Box Y  
Oak Ridge, Tennessee 37830  
RTLA 1472, 1520

COWDEN, R. R.  
College of Medicine  
East Tennessee State University  
Johnson City, Tennessee 37601  
RTLA 1393

DOYLE, W. L.  
Department of Anatomy  
University of Chicago  
1025 East 57th Street  
Chicago, Illinois 60637  
RTLA 1474

FRYE, F. L.  
235 Willamette Avenue  
Kensington, California 94708  
RTLA 1385-1388, 1402-1404, 1408-1411,  
1419-1422, 1428, 1429, 1437

GATEFF, E.  
Biologisches Institut I (Zoologie) der  
Albert-Ludwigs-Universität  
Schänzlestrasse 9  
78 Freiburg IM Breisgau, West Germany  
RTLA 1489, 1490

GEORGE, C. J.  
Department of Biological Sciences  
Union College  
Schenectady, New York 12308  
RTLA 1426

GILFILLAN, E.  
Bigelow Laboratory for Ocean Sciences  
McKown Point  
West Boothbay Harbor, Maine 04575  
RTLA 1500-1515

- GRIZZLE, J.  
Department of Fisheries and  
Allied Aquacultures  
School of Agriculture and  
Agricultural Experiment  
Station System  
Auburn University  
Auburn, Alabama 36830  
RTLA 1445, 1525-1530
- GUARINO, A.  
Laboratory of Toxicology  
National Cancer Institute, NIH  
Building 37, Room 5B-22  
Bethesda, Maryland 20014  
RTLA 1474
- HAMM, T. E.  
Medical Center  
University of Colorado  
4200 East 9th Avenue  
Denver, Colorado 80262  
RTLA 1424
- HARADA, T.  
Faculty of Fisheries  
Hokkaido University  
Hakodate, Japan  
RTLA 1487, 1517
- HARSHBARGER, J. C.  
Registry of Tumors in  
Lower Animals  
National Museum of Natural History  
Room W216-a  
Smithsonian Institution  
Washington, D. C. 20560  
RTLA 1414-1418, 1438, 1497, 1498
- HENDRICKS, J. D.  
Department of Food Science and  
Technology  
Oregon State University  
Corvallis, Oregon 97331  
RTLA 1384
- HERWIG, N.  
San Antonio Zoological Gardens  
and Aquarium  
3903 North St. Mary's Street  
San Antonio, Texas 78212  
RTLA 1405, 1495
- HINE, P. M.  
Fisheries Research Division  
Ministry of Agriculture and Fisheries  
P. O. Box 19062  
Wellington, New Zealand  
RTLA 1441
- HINK, W. F.  
Department of Entomology  
Ohio State University  
Columbus, Ohio 43210  
RTLA 1396
- HNATH, J. G.  
Pathobiology Laboratory  
Wolf Lake Fish Hatchery  
Michigan Department of Natural  
Resources  
Route #1  
Mattawan, Michigan 49071  
RTLA 1423, 1522
- HOSKINS, G. E.  
Pacific Biological Station  
P. O. Box 100  
Nanaimo, B. C., V9R 5K6, Canada  
RTLA 1407, 1433, 1442, 1468, 1494
- HURST, J.  
Maine Department of Marine Resources  
West Boothbay Harbor, Maine 04575  
RTLA 1448-1461
- ISHIKAWA, T.  
Department of Experimental Pathology  
Cancer Institute  
Kami-Ikebukuro, Toshima-ku  
Tokyo 170, Japan  
RTLA 1471
- JACKSON, O. F.  
Royal Free Hospital School of Medicine  
University of London  
8 Hunter Street  
London, WC1N 1BP, England  
RTLA 1389, 1524
- KANDRASHOFF, W.  
951 Euclid Avenue  
Miami Beach, Florida 33139  
RTLA 1478-1485



LAGIOS, M. D.  
Department of Pathology  
Children's Hospital of San Francisco  
P. O. Box 3805  
San Francisco, California 94119  
RTLA 1439, 1440

MCQUAY, F.  
Towson, Maryland 21204  
RTLA 1427

MILLER, E. K.  
Palms of Pasadena Hospital  
P. O. Box 6158  
1501 Pasadena Avenue South  
St. Petersburg, Florida 33736  
RTLA 1463-1467

MORTON, B. S.  
Department of Zoology  
University of Hong Kong  
Pokfulam Road  
Hong Kong  
RTLA 1391

OBDEYN, I. M.  
Regentesselaan 17  
Amersfoort, The Netherlands  
RTLA 1436

OISHI, K.  
Faculty of Fisheries  
Hokkaido University  
Hakodate, Japan  
RTLA 1486, 1516

ORSANCO  
W. L. Klein  
Ohio River Valley Water Sanitation  
Commission  
414 Walnut Street  
Cincinnati, Ohio 45202  
RTLA 1531-1597

OTTO, SARA V.  
State Laboratory  
Maryland Department of Natural  
Resources  
Oxford, Maryland 21654  
RTLA 1414-1418, 1438, 1444, 1497,  
1498

PENDLEBURY, G. B.  
304 Manora Road, Northeast  
Calgary, Alberta, T2A 4R6, Canada  
RTLA 1400

PENG, J.  
National Cancer Institute, NIH  
Building 10, Room 6B-10  
Bethesda, Maryland 20014  
RTLA 1521

SHERWOOD, M. J.  
Southern California Coastal Water  
Research Project  
1500 East Imperial Highway  
El Segundo, California 90245  
RTLA 1390

SHIVELY, J. N.  
Department of Veterinary Science  
College of Agriculture  
University of Arizona  
Tucson, Arizona 85721  
RTLA 1499

SIGEL, M. M.  
Department of Microbiology  
University of Miami School of  
Medicine  
P. O. Box 520875, Biscayne Annex  
Miami, Florida 33152  
RTLA 1412

SMITH, C. E.  
Fish Cultural Development Center  
U.S. Department of the Interior  
Route 2, Box 333  
Bozeman, Montana 59715  
RTLA 1397-1399, 1462, 1469, 1470,  
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SMITH, C. L.  
Department of Ichthyology  
The American Museum of Natural History  
Central Park West at 79th Street  
New York, New York 10024  
RTLA 1447

SMITH, W. E.  
National Water Quality Laboratory  
U.S. Environmental Protection Agency  
6201 Congdon Boulevard  
Duluth, Minnesota 55804  
RTLA 1394

STEIN, C. B.  
Museum of Zoology  
Ohio State University  
1813 North High Street  
Columbus, Ohio 43210  
RTLA 1396

STEIN, E.  
Department of Anatomy  
School of Medicine  
University of California  
Los Angeles, California 90024  
RTLA 1432

STEVENSON, B.  
Palmerston North Animal Health Laboratory  
Palmerston North, New Zealand  
RTLA 1476, 1477

WARD, J. M.  
Laboratory of Toxicology  
National Cancer Institute, NIH  
Building 37, Room 5B-22  
Bethesda, Maryland 20014  
RTLA 1474

WOLF, H.  
Fish Disease Laboratory  
California Department of Fish and Game  
2111 Nimbus Road  
Rancho Cordova, California 95670  
RTLA 1430, 1431, 1443, 1446

WOLKE, R. E.  
Seagrant Pathology Laboratory  
University of Rhode Island  
Kingston, Rhode Island 02881  
RTLA 1425, 1434

YEVICH, P. P.  
Environmental Research Laboratory  
U.S. Environmental Protection Agency  
South Ferry Road  
Narragansett, Rhode Island 02882  
RTLA 1392, 1435, 1518, 1519

ZUG, G. R.  
Division of Reptiles and Amphibians  
National Museum of Natural History  
Room W-205  
Smithsonian Institution  
Washington, D. C. 20560  
RTLA 1523

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Smithsonian Institution  
Washington, D.C., 20560, USA

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CONTRIBUTOR'S NO. \_\_\_\_\_  
RTLA NO. \_\_\_\_\_  
USNM NO. \_\_\_\_\_  
NIH HISTOPATH NO. \_\_\_\_\_

COMMON NAME \_\_\_\_\_ FAMILY \_\_\_\_\_  
PHYLUM \_\_\_\_\_ GENUS \_\_\_\_\_  
CLASS \_\_\_\_\_ SPECIES \_\_\_\_\_  
ORDER \_\_\_\_\_

CATEGORY: NEOPLASM \_\_\_\_\_ INFLAMMATION \_\_\_\_\_ INFECTION \_\_\_\_\_ PARASITIC \_\_\_\_\_ TOXIC \_\_\_\_\_  
DEVELOPMENTAL \_\_\_\_\_ TRAUMATIC \_\_\_\_\_ NORMAL \_\_\_\_\_ OTHER \_\_\_\_\_

CONTRIBUTOR (NAME & ADDRESS): \_\_\_\_\_ COLLECTOR (NAME & ADDRESS): \_\_\_\_\_

ITEMS SUBMITTED (QUANTITY):

GROSS MATERIAL \_\_\_\_\_ PHOTOGRAPHS \_\_\_\_\_  
SLIDES \_\_\_\_\_ REPRINTS \_\_\_\_\_  
BLOCKS \_\_\_\_\_ OTHER \_\_\_\_\_

ORIGIN OF ANIMAL: MARINE \_\_\_\_\_ FRESHWATER \_\_\_\_\_ ESTUARINE \_\_\_\_\_ TERRESTRIAL \_\_\_\_\_

WHERE COLLECTED \_\_\_\_\_

DATE COLLECTED \_\_\_\_\_ SEX \_\_\_\_\_ AGE \_\_\_\_\_ STAGE OF LIFE CYCLE \_\_\_\_\_

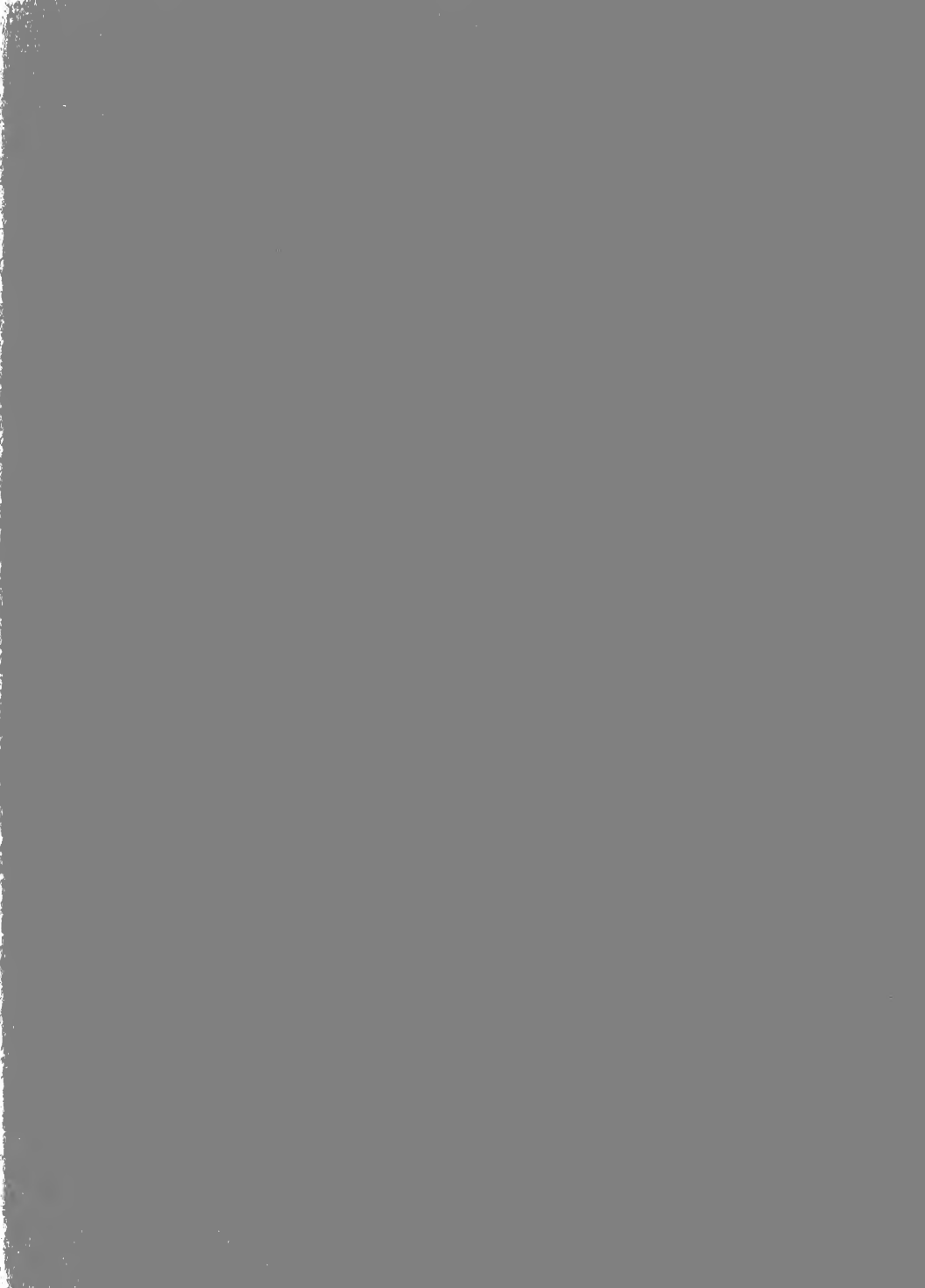
HOW KILLED \_\_\_\_\_ FIXATION \_\_\_\_\_

GROSS DESCRIPTION \_\_\_\_\_  
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MICROSCOPE DX \_\_\_\_\_  
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COMMENTS (e.g., possible exposure to chemical pollutants or infectious agents, incidence and duration of this condition in the population, etc.)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_







10  
92R33  
Invert.  
Zool.

ACTIVITIES REPORT  
REGISTRY OF TUMORS IN LOWER ANIMALS

1977 SUPPLEMENT

JOHN C. HARSHBARGER, DIRECTOR

PREPARED FOR DISTRIBUTION BY:

REGISTRY OF TUMORS IN LOWER ANIMALS  
NATIONAL MUSEUM OF NATURAL HISTORY  
ROOM W216A  
SMITHSONIAN INSTITUTION  
WASHINGTON, D.C. 20560



NIH Contract #N01-CB-33874; Contractor: Smithsonian Institution





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## OVERVIEW

The Registry of Tumors in Lower Animals facilitates the study of neoplasms and related disorders in invertebrate and poikilothermic vertebrate animals by serving as a specimen depository, a diagnostic center, an information center, and a research group.

Two hundred thirty-nine accessions were entered into the Registry's permanent collection in 1977. As shown in Table I, slightly over one-half were neoplasms which occurred, in decreasing numbers, in bivalve mollusks, bony fish, amphibians, reptiles, and one shark.

Among the many interesting and significant cases received was an oyster contributed by John A. Couch (RTLA 1599) with both a Dermocystidium marinum infection and the condition widely interpreted as a hematopoietic neoplasm characterized by a diffuse infiltration of small, unassociated, uniform, rapidly proliferating cells. This case, coupled with "Dermo" only cases and "hematopoietic neoplasm" only cases, would seem to provide conclusive evidence that the populations of proliferating, infiltrating cells known from at least six bivalve species are hematopoietic neoplasms rather than a stage of Dermocystidium marinum as once proposed.

Other mollusks with neoplasms included Australian rock oysters from Peter H. Wolf with mantle papillomas (RTLA 1608-1614, 1795); American oysters from Sara V. Otto with hematopoietic neoplasms (RTLA 1749, 1750, 1752-1754, 1757-1761, 1765), undifferentiated sarcomas (RTLA 1763, 1764), a germinoma (RTLA 1748), and cryptic adenomatous hyperplasias of the mantle (RTLA 1751, 1755, 1756, 1762); European flat oysters from Paul van Banning with hematopoietic neoplasms (RTLA 1808, 1809); a mussel from David J. Alderman with a hematopoietic neoplasm (RTLA 1833); a scallop with a possible hematopoietic neoplasm from Robert S. Brown (RTLA 1834); and, soft-shell clams from Paul P. Yevich with germinomas from the Searsport, Maine, oil spill site (RTLA 1694-1703). With regard to soft-clam germinomas, we recently found intranuclear virus-like inclusions in the tumor cells and Dr. Sing Chen Chang, the Registry's Electron Microscopist, is attempting to verify their viral nature. Thus, these germinomas may be caused by a virus with possible activation and/or enhancement by stress from petroleum hydrocarbons rather than by direct chemical carcinogenesis.

Mollusk accessions containing basophilic cytoplasmic inclusions, included soft-shell clams (RTLA 1620-1640), a hard-shell clam (RTLA 1766), and American oysters (RTLA 1735, 1736) from Sara V. Otto; mussels from Paul P. Yevich and Carolyn A. Barszcz (RTLA 1741-1743); and, a thin tellin from James S. Buchanan (RTLA 1810). These inclusions have recently been found to be very widespread and to represent infections by procaryotic organisms such as chlamydiae, rickettsiae, and possibly mycoplasmas.

One possible shark neoplasm was received from S. Gruber, W. Riemer, and M. Michael Sigel (RTLA 1836). The lesion was either an adenoma or hyperplasia of probable thyroid origin in a nurse shark. Lack of a definitive diagnosis was partly due to an unfamiliarity with the normal histology.

TABLE I  
DISTRIBUTION OF LESIONS AMONG SPECIMENS ACCESSIONED

Phylogenetic group	TYPE OF DISEASE			Total
	Neoplastic	Non-neoplastic	Not diagnosed	
Reptile	9	11	0	20 (8%)
Amphibian	23	10	1	34 (14%)
Bony fish	40	39	2	81 (34%)
Shark	1	0	0	1 (<1%)
Echinoderm	0	1	0	1 (<1%)
Arthropod	0	4	0	4 (2%)
Mollusk	47	44	7	97 (41%)
Total	121 (50%)	109 (46%)	10 (4%)	239 (100%)
Percent of those diagnosed	(52%)	(48%)		

Neoplasms of neural origin predominated the bony fish accessions including three of only five central nervous system tumors ever received. Peripheral nerve tumors included a ganglioneuroma in a weakfish from D. E. Zwerner and Craig L. Ruddell (RTLA 1605); neurilemmomas/neurilemmal sarcomas in carp from George C. Blasiola, Jr. (RTLA 1618) and Dave Tomljanovich (RTLA 1747); in rainbow trout from Peter H. Wolf (RTLA 1642) and Barry J. Stevenson (RTLA 1786), and in goldfish from Harold Wolf (RTLA 1643) and Robert Marino (RTLA 1771); a malignant melanophoroma in an aquarium catfish from June Herrin (RTLA 1647); a blue nevus in a trevally from Barry J. Stevenson (RTLA 1694); and, a neural fibrosarcoma whose species and contributor are unknown (RTLA 1658). The central nervous system tumors were a well-differentiated olfactory neuroepithelioma in a carp from Prince Masahito Hitachi (RTLA 1707) and two ependymoblastomas in coho salmon, one from Gary E. Hoskins (RTLA 1783) and one from Jerry D. Hendricks (RTLA 1811).

Renal neoplasms included nephroblastomas in a rainbow trout from Harold Wolf (RTLA 1615), a rose bitterling from Prince Masahito Hitachi (RTLA 1711), and a carp from George C. Blasiola, Jr. (RTLA 1775). Muscle tumors included dramatic virus-containing leiomyosarcomas in swim bladders of cultured Atlantic salmon from Ian J. McKnight and K. G. R. Elson (RTLA 1660); a leiomyoma in a brown trout from Barry J. Stevenson (RTLA 1651); and, a rhabdomyosarcoma induced in a platyfish swordtail backcross hybrid with N-methyl-N-nitroso-urea from M. Schwab (RTLA 1732). Dr. Schwab also induced a fibrosarcoma in these hybrids with the same compound (RTLA 1733). An undifferentiated spindle cell sarcoma in a chinook salmon from Barry J. Stevenson (RTLA 1785) may be an embryonal rhabdomyoma. Huge cranial lipoma-like lesions, induced in fathead minnows with ammonia, were contributed by Charlie E. Smith (RTLA 1653-1657) and further experiments are in progress to determine if they are neoplastic or hyperplastic. J. Pal contributed a lipoma in a catfish (RTLA 1815) and Allyn G. Johnson contributed a lipoma in a finescale menhaden (RTLA 1664) and a two-pound fibrolipoma in a drum (RTLA 1662). Lipomas in a porgy (RTLA 1718) and a mojarra (RTLA 1730) were received from Walter Kandrashoff in a large batch of specimens (RTLA 1714-1722, 1724-1730) from North Biscayne Bay, Florida. The preponderance of lesions in the other fish in the batch were various gross manifestations of acute and chronic inflammatory reactions, often involving ulceration and/or parasites. Mr. Kandrashoff has seen an increasing prevalence of these conditions during the decade and feels that this increased susceptibility to parasites is related to increased amounts of organic chemicals going into the bay.

Hematopoietic neoplasms included malignant lymphomas in a rainbow trout from Charlie E. Smith (RTLA 1814) and in a blackfin pearlfish from George C. Blasiola, Jr. (RTLA 1646). Individual cases included a cavernous hemangioma in a rainbow trout from Barry J. Stevenson (RTLA 1650), a mesothelioma in a jewfish from Robert R. Shields (RTLA 1617), an epidermal papilloma in a climbing perch from Joydeb Pal (RTLA 1738), a carcinoma possibly of ultimobranchial gland origin in a cutthroat trout from Charlie E. Smith (RTLA 1837), a thyroid adenoma in a Kinubari from Prince Masahito Hitachi (RTLA 1712), and an ichthyematoma (fish scale tumor) in a goldfish from Nelson Herwig (RTLA 1822). Over the years, we have re-

ceived at least three ichthyematomas or skin tumors in which pegs of epidermis are interacting with dermal connective tissue, similar to the process of tooth formation, resulting in variably differentiated levels of scale production.

Among amphibians, 20 Mexican axolotl specimens contributed by Louis E. Delaney (RTLA 1674-1693) had one adenoma, one intradermal melanophoroma, and 18 very interesting cutaneous lesions primarily composed of mast cells. The fine structure is currently being studied in an effort to differentiate between the possibility these are mast cell tumors versus nodules of mastocytosis. A transplanted melanophoroma in a tiger salamander from Francis L. Rose (RTLA 1740) appeared to be viable. Two hematopoietic neoplasms were accessioned from South African clawed frogs. One, contributed by Gerry E. Cosgrove (RTLA 1665), was a lymphosarcoma. The cell type of the other case, contributed by R. Verhoeff-de Fremery (RTLA 1769), could not be determined.

Among reptiles were five snake neoplasms: a malignant lymphoma in an Indian rock python from Phillip T. Robinson (RTLA 1600), a lymphosarcoma in a California king snake from Elliott Jacobson (RTLA 1770), an oral squamous versus epidermoid sarcoma in a California king snake from James R. Hill (RTLA 1835), a lipoma in a boa constrictor from Fredric L. Frye (RTLA 1823), and an angiosarcoma in a timber rattlesnake from Elliott Jacobson and S. W. Nielsen (RTLA 1819), but which preliminary electron microscopy suggests may actually be a carcinoma. Material from two green sea turtles with cutaneous fibropapillomas was received from George H. Balazs (RTLA 1767, 1774). A wart-like epidermal papilloma containing intranuclear inclusions in a green lizard was contributed by E. Elkan (RTLA 1821).

#### REFERENCE LIBRARY

Approximately 360 papers were added to the comprehensive library on neoplasms in lower animals bringing the total to 3,510. Except for recent acquisitions and articles that need to be translated, all papers have been abstracted by selected key words and computerized.

#### PAPERS SINCE 1976

Harshbarger, J.C. The Role of the Registry of Tumors in Lower Animals in the Study of Environmental Carcinogenesis in Aquatic Animals. *Ann. N.Y. Acad. Sci.*, 298: 280-289. 1977.

Rose, F.L. and Harshbarger, J.C. Neoplastic and Possibly Related Skin Lesions in Neotenic Tiger Salamanders, *Ambystoma tigrinum*, from a Sewage Lagoon. *Science*, 196: 315-317. 1977.

Harshbarger, J.C., Chang, S.C., and Otto, S.V. Chlamydiae (with Phages), Mycoplasmas, and Rickettsiae in Chesapeake Bay Bivalves. *Science*, 196: 666-668. 1977.

Anderson, R.S., Jordan, L.A., and Harshbarger, J.C. Tunic Abnormalities of the Urochordate Halocynthia pyriformis (Rathke). J. Invertebr. Pathol., 30: 160-168. 1977.

Harshbarger, J.C. "Spontaneous Neoplasms in Amphibians" and "Spontaneous Neoplasms in Reptiles," two Sections of Chapter 1: "Tumors," In: Pathology of Laboratory Animals, Vol. 2, K. Benirschke, F.M. Garner, T.C. Jones, and C. Kozma (ed.), (Springer-Verlag, New York; in press).

Harshbarger, J.C., Otto, S.V., and Chang, S.C. Proliferative Disorders in Crassostrea virginica and Mya arenaria from the Chesapeake Bay and Intranuclear Virus-Like Inclusions in Mya arenaria with Germinomas from a Maine Oil Spill Site. Haliotis (in press).

Otto, S.V., Harshbarger, J.C., and Chang, S.C. Status of Selected Unicellular Eucaryote Pathogens, and Prevalence and Histopathology of Inclusions Containing Obligate Procaryote Parasites, in Commercial Bivalve Mollusks from Maryland Estuaries. Haliotis (in press).

#### SELECTED OTHER ACTIVITIES IN 1977

1. Attended the Fish Health Workshop on 26 and 27 May 1977 at Easton, Maryland.
2. Attended the Xth Annual Meeting of the Society for Invertebrate Pathology on 22-26 August 1977 in East Lansing, Michigan.
3. Presented two papers: (1) "Status of Selected Unicellular Eucaryote Pathogens, and Prevalence and Histopathology of Inclusions Containing Obligate Procaryote Parasites, in Commercial Bivalve Mollusks from Maryland Estuaries" (Otto, S.V., Harshbarger, J.C., and Chang, S.C.) and (2) "Proliferative Disorders in Crassostrea virginica and Mya arenaria from the Chesapeake Bay and Intranuclear Virus-Like Inclusions in Mya arenaria with Germinomas from a Maine Oil Spill Site" (Harshbarger, J.C., Otto, S.V., and Chang, S.C.) at the Colloque International de Pathologie et Parasitologie des Mollusques on 9-12 September 1977 in Perpignan, France.
4. Visited and consulted with personnel of the Fish Diseases Laboratory, Weymouth, England, on 14 and 15 September 1977, regarding neoplasia in fin fish and shellfish.
5. Presented the paper, "Feral Populations in Monitoring Environmental Pollution. Part II - Aquatic," at the 105th Annual Meeting of the American Public Health Association, on 30 October - 3 November 1977, in Washington, D.C.
6. Participated in cooperative investigations of the ultrastructural pathology of: (a) neoplasms in bivalves; (b) procaryotic organisms in bivalves; and, (c) neoplasms in axolotls. {(a) and (b) were supported in part by the U.S. Food and Drug Administration.}



7. Attended Noon microscope slide pathology seminars at the U.S. National Cancer Institute.
8. Attended lecture series on ultrastructural pathology at the U.S. National Institutes of Health.
9. Served as a member of the planning committee for a forthcoming (2-4 October 1978) meeting on comparative pathology of zoo animals.
10. Served as a member of the Interagency Collaborative Group on Environmental Carcinogenesis (chaired by Herman F. Kraybill of the U.S. National Cancer Institute).
11. Served as a member of the Committee on Animal Models and Genetic Stocks of the Institute of Laboratory Animal Resources, National Research Council, National Academy of Sciences.
12. Served as a member of the Permanent Program Committee of the Society for Invertebrate Pathology.
13. Served as Vice President of the Washington, D.C. Chapter of Sigma Xi, The Scientific Research Society of North America.

#### PERSONNEL

The Project Officer for the contract is Dr. Clyde J. Dawe, Head, Comparative Oncology Section, Laboratory of Pathology, National Cancer Institute, National Institutes of Health, Bethesda, Maryland, 20014.

The Principal Investigator for the contract is Dr. W. Duane Hope, Chairman, Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C., 20560.

The Staff of the Registry is as follows:

John C. Harshbarger, Ph.D. - Director  
Sung Chen Chang, Ph.D. - Electron Microscopist  
Phyllis M. Schellenger, B.S. - Registrar  
Linda J. Cullen, B.A. - Histopathology Technician  
Judith E. Foster, B.S. - Research Assistant  
Marilyn S. Slatick, B.S. - Bibliographer

ACCESSIONS

- RTLA 1599. American oyster, Crassostrea virginica  
Material: Three microscope slides  
Habitat: Apalachicola Bay, Florida  
Diagnosis: Hematopoietic neoplasm (gills heavily invaded); infected with Dermocystidium marinum (particularly foci of epithelium); a ciliate is present in the gills; Nematopsis spores in the parenchymal tissue of body and mantle  
Submitter: J. A. Couch
- RTLA 1600. Indian rock python, Python molorus  
Material: Two microscope slides; 2 black and white prints  
Habitat: Collection of the San Diego Zoo, San Diego, California  
Diagnosis: Malignant lymphoma  
Submitter: P. T. Robinson
- RTLA 1601. Two-color parrotfish, Bolbometopon bicolor  
Material: Gross specimen with a growth in the opercular cavity  
Habitat: Off Lapu Lapu City, Sabu, Philippines  
Diagnosis: Multiple protozoan cysts  
Submitter: G. C. Blasiola, Jr.
- RTLA 1602. Spiny granite lizard, Sceloporus orcutti  
Material: Gross specimen with large, highly raised, firm, amorphous lesion on right dorsal surface of neck; multiple, similar, but smaller lesions on neck, dorsal surface of right foreleg, and ventral surface of body  
Habitat: Pet; purchased from a dealer in California  
Diagnosis: Keratinizing epidermis in response to heavy fungus infection  
Submitter: S. B. Hedges
- RTLA 1603. Sockeye salmon, Oncorhynchus nerka  
Material: Two microscope slides  
Habitat: Mariculture pens in Departure Bay, Nanaimo, B. C., Canada  
Diagnosis: Teratoid anomaly  
Submitter: G. R. Bell
- RTLA 1604. Dusky pigmy rattlesnake, Sistrurus milianus  
Material: Two microscope slides; 1 paraffin block  
Habitat: Jackson County, Florida  
Diagnosis: Mycotic granuloma due to a septate branching fungus  
Submitter: C. G. Crispens, Jr.
- RTLA 1605. Weakfish, Cynoscion regalis  
Material: Four pieces of tissue; 2 microscope slides  
Habitat: York River, Virginia  
Diagnosis: Ganglioneuroma  
Submitter: D. E. Zwerner and C. L. Ruddell

- RTLA 1606. Boa constrictor  
Material: Tissue: liver, pancreas, non-functioning testis and ovary; 2 microscope slides  
Diagnosis: Hermaphrodite; sertoli cells prominent due to loss of spermatogenesis  
Submitter: F. L. Fry
- RTLA 1607. Sea star, Asterias forbesi  
Material: Three gross specimens: one with a small, firm, raised growth on an arm; the other two injected with viruses  
Diagnosis: Specimen with growth: deformity of regeneration; two specimens injected with viruses: no apparent reaction  
Submitter: F. B. Bang
- RTLA 1608-1614. Rock oyster, Crassostrea commercialis  
Material: Seven growths cut into cubes; 7 paraffin blocks  
Habitat: Greenwell Point, Shoalhaven River, Australia  
Diagnosis: Epidermal papillomas of the mantle  
Submitter: P. H. Wolf
- RTLA 1615. Rainbow trout, Salmo gairdneri  
Material: One microscope slide; 1, 35 mm color transparency  
Diagnosis: Nephroblastoma  
Submitter: H. Wolf
- RTLA 1616. Mexican axolotl, Ambystoma mexicanum  
Material: Two nodules  
Diagnosis: Granulomas of probable helminthologic etiology  
Submitter: R. Verhoeff-de Fremery
- RTLA 1617. Jewfish, Epinephelus itajara  
Material: Two microscope slides; 6, 35 mm color transparencies; 4 electron photomicrographs  
Diagnosis: Mesotheliomas; rodlet cells  
Submitter: R. R. Shields
- RTLA 1618. Koi carp, Cyprinus carpio  
Material: Three small lesions surgically removed from the body wall  
Habitat: Outdoor pond; Japanese Tea Gardens, San Jose, California  
Diagnosis: Neurilemmal sarcomas  
Submitter: G. C. Blasiola, Jr.
- RTLA 1619. Red-spotted newt, Notophthalmus viridescens  
Material: Spleen with a large growth and several nodules  
Diagnosis: Infectious granulomas of acid-fast bacterial etiology  
Submitter: N. Cohen
- RTLA 1620-1640. Soft-shell clam, Mya arenaria  
Material: Twenty-one paraffin blocks; 1 pathology report  
Habitat: Various sites in the Chesapeake Bay  
Diagnosis: Cytoplasmic inclusions  
Submitter: S. V. Otto

- RTLA 1641. Indigo snake, Drymarchion corais  
Material: Two microscope slides  
Habitat: Captive animal; Wolverhampton, England  
Diagnosis: Multiple mycotic granulomas  
Submitter: J. E. Cooper
- RTLA 1642. Rainbow trout, Salmo gairdneri  
Material: Two pieces of tissue from a lump  
Habitat: Lake Eucumbene, New South Wales, Australia  
Diagnosis: Neurilemmoma  
Submitter: P. H. Wolf
- RTLA 1643. Goldfish, Carassius auratus  
Material: Two gross specimens; 1 microscope slide; 3, 35 mm  
color transparencies  
Habitat: Backyard pond; Sacramento, California  
Diagnosis: Neurilemmomas  
Submitter: H. Wolf
- RTLA 1644. Roach, Rutilus rutilus  
Material: Two microscope slides  
Habitat: River in east of England  
Diagnosis: Early bile duct adenofibrosis, probably due to a  
hepatotoxin  
Submitter: D. Bucke
- RTLA 1645. Orgyia pseudotsugata  
Material: Three pieces of a larva: 1 piece with a protrusion  
between the first and second pair of prolegs  
Diagnosis: Teratosis or developmental anomaly, probably con-  
genital or resulted from an injury in an early instar  
Submitter: M. E. Martignoni and P. J. Iwai
- RTLA 1646. Black fin pearlfish, Cynolebias nigripinnis  
Material: Gross specimen with a large growth involving the  
left pectoral fin  
Habitat: Tank raised  
Diagnosis: Malignant lymphoma  
Submitter: G. C. Blasiola, Jr.
- RTLA 1647. Catfish, Corydoras sp.  
Material: Gross specimen with black lesion on head  
Habitat: Pet in a home aquarium  
Diagnosis: Malignant melanophoroma  
Submitter: J. Herrin
- RTLA 1648. Trevally (jack), Caranx georgianus  
Material: Two paraffin blocks  
Habitat: Bay of Plenty, New Zealand  
Diagnosis: Collagen reaction similar to acid injury to skin  
Submitter: B. J. Stevenson

- RTLA 1649. Trevally (jack), Caranx lutescens  
Material: Two paraffin blocks  
Habitat: Kaipara Harbour, New Zealand  
Diagnosis: Melanocytic neurilemmoma (blue nevus)  
Submitter: B. J. Stevenson
- RTLA 1650. Rainbow trout, Salmo gairdneri  
Material: Two paraffin blocks from soft fluctuant lesion on dorsum  
Diagnosis: Cavernous hemangioma  
Submitter: B. J. Stevenson
- RTLA 1651. Brown trout, Salmo trutta  
Material: Three microscope slides of white visceral growths  
Habitat: Four miles from mouth of Grey River, New Zealand  
Diagnosis: Leiomyoma  
Submitter: B. J. Stevenson
- RTLA 1652. Channel catfish, Ictalurus punctatus  
Material: Two microscope slides of lesion in spleen  
Diagnosis: Infectious granuloma  
Submitter: A. L. Scott
- RTLA 1653-1657. Fathead minnow, Pimephales promelas  
Material: Gross specimen in 2 pieces: portion of head and remainder of animal (RTLA 1653); 2 gross specimens (RTLA 1654 and 1655); 1 microscope slide and 1 paraffin block (RTLA 1656); 9 microscope slides (RTLA 1657)  
Diagnosis: Induced lipoma  
Submitter: C. E. Smith
- RTLA 1658. Fish  
Material: A portion of body wall with eroded musculature  
Diagnosis: Neural fibrosarcoma  
Submitter: Unknown
- RTLA 1659. Spot, Leiostomus xanthurus  
Material: Gross specimen with 2 growths in abdominal region  
Habitat: Bolivar Peninsula in Galveston Bay, Texas  
Diagnosis: Microsporidan infection  
Submitter: R. R. Stickney
- RTLA 1660. Atlantic salmon, Salmo salar  
Material: Three gross specimens; 2 microscope slides; 9 black and white photographs; 18 color transparencies  
Habitat: A sea loch on West coast of Scotland  
Diagnosis: Leiomyosarcoma of the swim bladder  
Submitter: I. McKnight and K. G. R. Elson  
Reprint: McKnight, Ian J. Sarcoma of the Swim Bladder of Atlantic Salmon (Salmo salar L.). Aquaculture, 13: 55-60. 1978.  
Duncan, I. B. Evidence for an Oncovirus in Swimbladder Fibrosarcoma of Atlantic Salmon Salmo salar L. J. Fish Dis., 1: 127-131. 1978.

- RTLA 1661. Eel  
Material: Two gross specimens: 1 with multiple head lesions; 1 control  
Diagnosis: Bacterial granulomas; organism resembles Streptococcus sp.  
Submitter: C. M. Bailey
- RTLA 1662. Black drum, Pogonias cromis  
Material: Two pound growth from visceral cavity  
Habitat: Gulf of Mexico off Port Aransas, Texas  
Diagnosis: Fibrolipoma  
Submitter: A. G. Johnson
- RTLA 1663. Brown shrimp, Penaeus aztecus  
Material: Two gross shrimp; 6 microscope slides; manuscript  
Habitat: Mississippi Sound, near Ocean Springs Small Boat Harbor  
Diagnosis: Hamartoma; involved musculature within the sixth abdominal segment  
Submitter: R. M. Overstreet  
Reprint: Overstreet, Robin M. and Thomas Van Devender. Implication of an Environmentally-Induced Hamartoma in Commercial Shrimps. J. Invertebr. Pathol., 31: 234-238. 1978.
- RTLA 1664. Finescale menhaden, Bevoortia gunteri  
Material: Gross specimen with growth on back between dorsal and caudal fins  
Habitat: National Marine Fisheries Service dock, Port Aransas, Texas  
Diagnosis: Lipoma  
Submitter: A. G. Johnson
- RTLA 1665. South African clawed frog, Xenopus laevis  
Material: Two microscope slides; enlarged spleen and spotted liver  
Habitat: Laboratory  
Diagnosis: Lymphosarcoma, multiple sites; hyperplastic, sclerotic capsule surrounds spleen  
Submitter: G. E. Cosgrove
- RTLA 1666. South African clawed frog, Xenopus laevis  
Material: One paraffin block  
Habitat: Laboratory  
Diagnosis: Hyperplasia (?) -- pancreatic islet  
Submitter: G. E. Cosgrove
- RTLA 1667. South African clawed frog, Xenopus laevis  
Material: Two microscope slides  
Habitat: Laboratory  
Diagnosis: Granulomas near eye and near heart; strigeoid metacercaria in blood clot; nematode (Capillaria sp.) infection in skin  
Submitter: G. E. Cosgrove
- RTLA 1668. South African clawed frog, Xenopus laevis

RTLA 1668 (contd.)

Material: One paraffin block from emaciated male  
Habitat: Laboratory  
Diagnosis: Bone marrow dysplasia associated with unidentified particles in peripheral blood; nematode infection in skin  
Submitter: G. E. Cosgrove

RTLA 1669. South African clawed frog, Xenopus laevis

Material: Two microscope slides  
Habitat: Laboratory  
Diagnosis: Ovarian atrophy; nematode infection (Capillaria sp.) in skin  
Submitter: G. E. Cosgrove

RTLA 1670. South African clawed frog, Xenopus laevis

Material: Two microscope slides  
Habitat: Laboratory  
Diagnosis: Ovarian degeneration; severe congestion  
Submitter: G. E. Cosgrove

RTLA 1671. South African clawed frog, Xenopus laevis

Material: Two microscope slides  
Habitat: Laboratory  
Diagnosis: Infected skin wound and body wall associated with massive "monocytosis"; partial ovarian atrophy with mold sclerosis; nematode infection (Capillaria sp.) in skin  
Submitter: G. E. Cosgrove

RTLA 1672. White cloud, Tanichthys albonubes

Material: Three microscope slides  
Habitat: Aquarium  
Diagnosis: Subepidermal focus of cells -- probably unicellular parasites of some undeterminate type  
Submitter: G. E. Cosgrove

RTLA 1673. Red-spotted newt, Notophthalmus viridescens

Material: Eleven fragments from a dissected newt with enlarged fluid filled abdomen  
Habitat: Near Caryville, Tennessee (Campbell County)  
Diagnosis: Severe cystic glomerular degeneration; intestinal tapeworms  
Submitter: G. E. Cosgrove

RTLA 1674-1693. Mexican axolotl, Ambystoma mexicanum

Material: Tissue; color transparencies  
Habitat: Laboratory  
Diagnosis: Adenoma (RTLA 1674); intradermal melanophoroma (RTLA 1691); mast cell tumors versus cutaneous nodules of mastocytosis (RTLA 1675-1690, 1692, 1693)  
Submitter: L. E. DeLanney

RTLA 1694-1703. Soft-shell clam, Mya arenaria

RTLA 1694-1703 (contd.)

Material: Eleven paraffin blocks from 3 specimens (RTLA 1694); 28 paraffin blocks from 12 specimens (RTLA 1695); 39 paraffin blocks from 12 specimens (RTLA 1696); 6 paraffin blocks from 1 specimen (RTLA 1697); 4 paraffin blocks from 2 specimens (RTLA 1698); 5 paraffin blocks from 3 specimens (RTLA 1699); 6 paraffin blocks from 3 specimens (RTLA 1700); 31 paraffin blocks from 12 specimens (RTLA 1701); 20 paraffin blocks from 10 specimens (RTLA 1702); 20 paraffin blocks from 11 specimens (RTLA 1703); map of collecting sites

Habitat: Ten collecting sites in Long Cove, Searsport, Maine, representing various concentrations of petroleum from spills

Diagnosis: Gonadal neoplasms (RTLA 1694-1697, 1699-1703); hemato-poietic neoplasm (RTLA 1698)

Submitter: P. P. Yevich

RTLA 1704. Brazilian snake, Spilotes pullatus

Material: Piece of liver tissue; 4 microscope slides; 2 paraffin blocks

Diagnosis: Haemogregarine infection

Submitter: E. Elkan

RTLA 1705. Oscar, Astronotus ocellatus

Material: Two paraffin blocks

Diagnosis: Ichthyosporidium hoferi infection

Submitter: E. Elkan

RTLA 1706. King snake, Lampropeltis sp.

Material: The remains of a multilocular cyst with clusters of smaller type cysts attached to its outside surface

Diagnosis: Pseudocystic calcinosis of probable bacterial etiology (similar to tumoral calcinosis described by Slavin et al. 1973. Brit. Med. J., p. 147-149)

Submitter: E. Elkan

RTLA 1707. Carp, Cyprinus carpio

Material: Thirteen microscope slides; 3, 35 mm color transparencies; 7 black and white photographs; 5 diagrams; 3 color photomicrographs; 3 electron photomicrographs

Habitat: Niigata Prefecture, Japan

Diagnosis: Well-differentiated olfactory neuroepithelioma

Submitter: Prince Masahito Hitachi

RTLA 1708. Gulf croaker, Micropogon megalops

Material: Two gross specimens: 1 pathologic (widely-scattered, amorphous, flush black lesions on all body surfaces and fins) -- 1 control; specimen form and catalog record form

Habitat: Golfo de California: passageway between Isla Montague and coast of Baja California Norte, Mexico



RTLA 1708 (contd.)

Diagnosis: Probably an unusual type of host response to a parasite (trematode ?); nematodes were associated with the viscera  
Submitter: A. J. Mearns

RTLA 1709. Gulf croaker, Micropogon megalops

Material: Gross specimen with widely-scattered lesions on the body and fins and with enlarged lips; specimen form and catalog record form  
Habitat: Golfo de California: Puerto Penasco; Station Beach, Mexico  
Diagnosis: Probably an unusual type of host response to a parasite (trematode ?)  
Submitter: A. J. Mearns

RTLA 1710. Brown shrimp, Penaeus aztecus

Material: Six microscope slides  
Habitat: Reared at the University of Arizona-University of Sonora shrimp culture research station at Puerto Penasco, Sonora, Mexico  
Diagnosis: Papillary hyperplasia of the epidermis  
Submitter: D. V. Lightner

RTLA 1711. Rose bitterling, Rhodeus ocellatus

Material: Five microscope slides; 4 black and white photographs  
Diagnosis: Nephroblastoma  
Submitter: Prince Masahito Hitachi

RTLA 1712. Kinubari, Pterogobius elapoides

Material: One microscope slide; 1 black and white photograph  
Habitat: Enoshima Aquarium, Japan  
Diagnosis: Adenoma  
Submitter: Prince Masahito Hitachi

RTLA 1713. Coho salmon, Oncorhynchus kisutch

Material: Six color transparencies; 1 electron photomicrograph  
Habitat: Pacific Ocean off Newport, Oregon  
Diagnosis: Response to a parasitic (microsporidan ?; haplosporidan ?) infestation of kidney tubules  
Submitter: R. Stroud

RTLA 1714. Lane snapper, Lutjanus synagris

Material: Gross specimen with tail erosion  
Habitat: North Biscayne Bay, Miami, Florida  
Diagnosis: Ulceration and fibrosis  
Submitter: W. Kandrashoff

RTLA 1715. Sea catfish, Arius felis

Material: Gross specimen with amorphous, flush skin lesions variously located on trunk  
Habitat: North Biscayne Bay, Miami, Florida

RTLA 1715 (contd.)

Diagnosis: Loss of epidermis, bacterial infection and inflammation of dermis, subcutaneous fibrosis, atrophy of underlying skeletal muscle with fibrous replacement

Submitter: W. Kandrashoff

RTLA 1716. Pinfish, Lagodon rhomboides

Material: Gross specimen with scale disorientation

Habitat: North Biscayne Bay, Miami, Florida

Diagnosis: Slides not diagnostic

Submitter: W. Kandrashoff

RTLA 1717. Gray (mangrove) snapper, Lutjanus griseus

Material: Gross specimen with curvature of distal portion of lower spines of the caudal fin

Habitat: North Biscayne Bay, Miami, Florida

Diagnosis: Intermittent disappearance of supporting osseous sheath concomitant with connective tissue swelling

Submitter: W. Kandrashoff

RTLA 1718. Porgy

Material: A piece of body wall with a round, gold, greasy lesion

Habitat: North Biscayne Bay, Miami, Florida

Diagnosis: Lipoma

Submitter: W. Kandrashoff

RTLA 1719. Mojarra

Material: Caudal fin with central portion missing

Habitat: North Biscayne Bay, Miami, Florida

Diagnosis: Some type of worm parasite in peduncle

Submitter: W. Kandrashoff

RTLA 1720. Pinfish, Lagodon rhomboides

Material: Gross specimen with missing fin rays on the dorsal fin and a missing left pelvic fin

Habitat: North Biscayne Bay, Miami, Florida

Diagnosis: Trematode-like worm parasite in muscle

Submitter: W. Kandrashoff

RTLA 1721. Pinfish, Lagodon rhomboides

Material: Gross specimen with scale disorientation

Diagnosis: Trematode-like worm parasite in dermis

Submitter: W. Kandrashoff

RTLA 1722. Porgy

Material: Disoriented eye

Habitat: North Biscayne Bay, Miami, Florida

Diagnosis: Periorbital fibrosis associated with parasite

Submitter: W. Kandrashoff

RTLA 1723. Guppy, Poecilia reticulata

Material: One microscope slide

RTLA 1723 (contd.)

Habitat: Aquarium  
Diagnosis: Liver undergone some fibrosis and contains granulomas; specimen experimentally treated with estrogen  
Submitter: S. Sherman

RTLA 1724. Weakfish, Cynoscion regalis

Material: Two livers, one with abundant black pigment in the mesentery  
Habitat: Off North Carolina coast  
Diagnosis: Infectious granulomas in both livers at least some of which are due to nematode-like worm parasites. Multiple granulomas in mesentery of the one with excessive black pigment  
Submitter: W. Kandrashoff

RTLA 1725. Mojarra

Material: Disoriented eye  
Habitat: North Biscayne Bay, Miami, Florida  
Diagnosis: Nothing diagnostic in plane of section  
Submitter: W. Kandrashoff

RTLA 1726. Spotted sea trout, Cynoscion nebulosus

Material: Disoriented eye; severely eroded tail; 1 color photograph  
Habitat: North Biscayne Bay, Miami, Florida  
Diagnosis: Caudal peduncle heavily infected with worm parasites and protozoan parasites. Unicellular organisms in periorbital region of eye  
Submitter: W. Kandrashoff

RTLA 1727. Margate, Haemulon album

Material: Deformed tail  
Habitat: North Biscayne Bay, Miami, Florida  
Diagnosis: Granulomas in caudal peduncle  
Submitter: W. Kandrashoff

RTLA 1728. Grunt, Haemulon sp.

Material: Fish head with twisted, misaligned lower jaw  
Habitat: Near Soldiers Key in South Biscayne Bay, Florida  
Diagnosis: Jaw contains worm granulomas  
Submitter: W. Kandrashoff

RTLA 1729. Pinfish, Lagodon rhomboides

Material: A portion of body wall with scale disorientation and dorsal fin with one missing ray and one mislocated ray  
Habitat: North Biscayne Bay, Miami, Florida  
Diagnosis: Worm parasite in dermis  
Submitter: W. Kandrashoff

RTLA 1730. Mojarra

Material: Posterior portion of fish with a firm, raised, oval

RTLA 1730 (contd.)

- area on one side of the caudal peduncle  
Habitat: North Biscayne Bay, Miami, Florida  
Diagnosis: Lipoma  
Submitter: W. Kandrashoff
- RTLA 1731. Sea bream (porgy), Archosargus rhomboidalis  
Material: Growth: sliced into 4 pieces; drawing showing location of growth on fish  
Habitat: Biscayne Bay, Miami, Florida  
Diagnosis: Exuberant fibrous response with associated inflammation to a parasitic infection  
Submitter: E. P. Kraus
- RTLA 1732. Platyfish swordtail backcross hybrid, Platypoecilus variatus x Xiphophorus helleri x X. helleri  
Material: Two black and white photographs; 1 schematic drawing of lineage through hybridization  
Habitat: Research Laboratory; Genetisches Institut, Giessen, Germany  
Diagnosis: Rhabdomyosarcoma induced by N-methyl-N-nitroso-urea  
Submitter: M. Schwab
- RTLA 1733. Platyfish swordtail backcross hybrid, Platypoecilus variatus x Xiphophorus helleri x X. helleri  
Material: Two black and white photographs; 1 schematic drawing of lineage through hybridization  
Habitat: Research Laboratory, Genetisches Institut, Giessen, Germany  
Diagnosis: Fibrosarcoma induced by N-methyl-N-nitroso-urea  
Submitter: M. Schwab
- RTLA 1734. Greenling, Hexagrammos otakii  
Material: Piece of tissue (filet) covered with minute, white, dome-shaped lesions and minute, black flush lesions  
Habitat: Kojima, Matsumae Town, Matsumae gun, Hokkaido, Japan  
Diagnosis: Parasitic granulomas in response to a nematode  
Submitter: K. Oishi
- RTLA 1735 & 1736. American oyster, Crassostrea virginica  
Material: One paraffin block each; 1 pathology report each  
Habitat: Chesapeake Bay; Chester River, Piney Point  
Diagnosis: Cytoplasmic inclusions  
Submitter: S. V. Otto
- RTLA 1737. Ribbed mussel, Brachidontes recurvus  
Material: One paraffin block; pathology report  
Habitat: Chesapeake Bay; Chester River, Piney Point  
Diagnosis: Cytoplasmic inclusions  
Submitter: S. V. Otto
- RTLA 1738. Climbing perch, Anabas testudineus

RTLA 1738 (contd.)

Material: Six microscope slides; 2 photomicrographs  
Diagnosis: Epidermal papilloma  
Submitter: J. Pal

RTLA 1739. Siren lacertina

Material: One of two growths removed from the right side of the animal  
Diagnosis: Granulomas due to a bacterium  
Submitter: K. Martin

RTLA 1740. Tiger salamander, Ambystoma tigrinum

Material: Two microscope slides; 1 paraffin block  
Diagnosis: Transplanted melanophoroma  
Submitter: F. L. Rose

RTLA 1741. Mussel, Mytilus californianus

Material: Two paraffin blocks  
Habitat: Bodega, California  
Diagnosis: Cytoplasmic inclusions in digestive diverticula and in gut goblet cells  
Submitter: P. P. Yevich and C. A. Barszcz

RTLA 1742. Mussel, Mytilus edulis

Material: Two paraffin blocks  
Diagnosis: Cytoplasmic inclusions in both the plicate membrane and the gills  
Submitter: P. P. Yevich and C. A. Barszcz

RTLA 1743. Mussel, Mytilus edulis

Material: One microscope slide; 1 paraffin block  
Diagnosis: Cytoplasmic inclusions in gills and plicate membrane; trematode, Bucephalus, in connective tissue  
Submitter: P. P. Yevich and C. A. Barszcz

RTLA 1744. Soft-shell clam, Mya arenaria

Material: One microscope slide  
Diagnosis: Kidney hyperplasia associated with foci of necrotic hemocytes  
Submitter: P. P. Yevich and C. A. Barszcz  
Reprint: Barry, M. M., P. P. Yevich, and N. H. Thayer. Atypical Hyperplasia in the Soft-Shell Clam Mya arenaria. J. Invertebr. Pathol., 17: 17-27. 1971.

RTLA 1745. Soft-shell clam, Mya arenaria

Material: Two microscope slides  
Diagnosis: Kidney hyperplasia associated with foci of necrotic hemocytes  
Submitter: P. P. Yevich and C. A. Barszcz  
Reprint: (See RTLA 1744)

RTLA 1746. Mussel, Mytilus edulis

Material: One microscope slide

RTLA 1746 (contd.)

Diagnosis: Cytoplasmic inclusions in gills and inflammation  
Submitter: P. P. Yevich and C. A. Barszcz

RTLA 1747. Carp, Cyprinus carpio

Material: Gross specimen with a large protruding growth on the left dorsal side; 1 black and white photograph; 1, 35 mm color transparency  
Habitat: Watts Bar Reservoir, Tennessee  
Diagnosis: Neurilemmoma  
Submitter: D. Tomljanovich

RTLA 1748. American oyster, Crassostrea virginica

Material: Nine microscope slides; collecting data  
Habitat: Chesapeake Bay; Punch Island, Tar Bay  
Diagnosis: Germinoma  
Submitter: S. V. Otto

RTLA 1749. American oyster, Crassostrea virginica

Material: Twelve microscope slides; collecting data  
Habitat: Chesapeake Bay; Manokin River, Georges Bay  
Diagnosis: Hematopoietic neoplasm  
Submitter: S. V. Otto

RTLA 1750. American oyster, Crassostrea virginica

Material: Eleven microscope slides  
Diagnosis: Hematopoietic neoplasm  
Submitter: S. V. Otto

RTLA 1751. American oyster, Crassostrea virginica

Material: Nine microscope slides  
Diagnosis: Cryptic adenomatous hyperplasia of mantle epithelium; gill hyperplasia  
Submitter: S. V. Otto

RTLA 1752. American oyster, Crassostrea virginica

Material: Ten microscope slides; collecting data  
Habitat: Chesapeake Bay; Cedar Point Hollow  
Diagnosis: Hematopoietic neoplasm  
Submitter: S. V. Otto

RTLA 1753. American oyster, Crassostrea virginica

Material: Eight microscope slides; collecting data  
Habitat: Chesapeake Bay; Piney Island Swash Tray Area, Manokin River, Broad Creek  
Diagnosis: Hematopoietic neoplasm  
Submitter: S. V. Otto

RTLA 1754. American oyster, Crassostrea virginica

Material: Nine microscope slides; collecting data  
Habitat: Chincoteague Bay, Franklin City, Chesapeake Bay, Manokin Spat  
Diagnosis: Hematopoietic neoplasm

RTLA 1754 (contd.)

Submitter: S. V. Otto

RTLA 1755. American oyster, Crassostrea virginica

Material: Ten microscope slides; collecting data

Habitat: Chesapeake Bay; Big Annemessex River

Diagnosis: Cryptic adenomatous hyperplasia of mantle epithelium

Submitter: S. V. Otto

RTLA 1756. American oyster, Crassostrea virginica

Material: One microscope slide; collecting data

Habitat: Chesapeake Bay; Manokin River, Broad Creek Spat

Diagnosis: Cryptic adenomatous hyperplasia of mantle epithelium;  
gill hyperplasia

Submitter: S. V. Otto

RTLA 1757. American oyster, Crassostrea virginica

Material: Ten microscope slides; collecting data

Habitat: Chesapeake Bay; Choptank River, Cook Point

Diagnosis: Hematopoietic neoplasm

Submitter: S. V. Otto

RTLA 1758. American oyster, Crassostrea virginica

Material: One microscope slide; collecting data

Diagnosis: Hematopoietic neoplasm

Submitter: S. V. Otto

RTLA 1759. American oyster, Crassostrea virginica

Material: Ten microscope slides; collecting data

Habitat: Chesapeake Bay; Poplar Island

Diagnosis: Hematopoietic neoplasm

Submitter: S. V. Otto

RTLA 1760. American oyster, Crassostrea virginica

Material: One microscope slide; collecting data

Habitat: Chesapeake Bay; Broad Creek, Middleground

Diagnosis: Hematopoietic neoplasm

Submitter: S. V. Otto

RTLA 1761. American oyster, Crassostrea virginica

Material: Five microscope slides; collecting data

Habitat: Manokin River

Diagnosis: Hematopoietic neoplasm

Submitter: S. V. Otto

RTLA 1762. American oyster, Crassostrea virginica

Material: One microscope slide; collecting data

Habitat: Chesapeake Bay; Tangier Sound, Lambstone

Diagnosis: Cryptic adenomatous hyperplasia of mantle epithelium

Submitter: S. V. Otto

RTLA 1763. American oyster, Crassostrea virginica

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 1777 (contd.)

Diagnosis: Acute necrotizing enteritis  
Submitter: I. Gorman

RTLA 1778. White sucker, Catostomus commersoni

Material: Two pieces of a lesion adhering to gut and liver  
Habitat: Bozen Kill (part of Hudson River drainage, New York)  
Diagnosis: Pancreatitis  
Submitter: E. G. Hayunga

RTLA 1779. European flat oyster, Ostrea edulis

Material: Six microscope slides  
Habitat: Ribadeo, Galicia, Spain; animals originally imported from Italian Adriatic  
Diagnosis: Hematopoietic neoplasm  
Submitter: D. J. Alderman  
Reprint: Alderman, D. J., P. van Banning, and A. Perez-Colomer. Two European Oyster (Ostrea edulis) Mortalities Associated with an Abnormal Haemocytic Condition. Aquaculture, 10: 335-340. 1977.

RTLA 1780. European flat oyster, Ostrea edulis

Material: Four microscope slides  
Habitat: Carantec, Finisterre, France  
Diagnosis: Aber disease; parasitized by the haplosporidan, Marteilia refringens  
Submitter: D. J. Alderman  
Reprint: Alderman, David. Foreign Diseases Hazard British Shellfish. New Scientist, pp. 122-124, 8 July 1974.

RTLA 1781. European flat oyster, Ostrea edulis

Material: One microscope slide  
Habitat: Menai Straits, North Wales  
Diagnosis: Systemic herpes virus infection  
Submitter: D. J. Alderman

RTLA 1782. Lobster, Homarus vulgaris

Material: One microscope slide  
Habitat: Maintained in experimental tanks at Ministry of Agriculture, Fisheries and Food, Conway, North Wales  
Diagnosis: Fungi (Ramularia sp.) in gut chitin  
Submitter: D. J. Alderman

RTLA 1783. Coho salmon, Oncorhynchus kisutch

Material: One microscope slide  
Diagnosis: Ependymoblastoma  
Submitter: G. E. Hoskins

RTLA 1784. Congo tetra, Phenacogammus interruptus

Material: Two microscope slides  
Habitat: Metro Toronto Zoo, Toronto, Canada  
Diagnosis: Well-differentiated epidermal carcinoma

RTLA 1784 (contd.)

Submitter: B. Hicks

RTLA 1785. Chinook salmon, Oncorhynchus tshawytscha

Material: Three microscope slides

Habitat: Rakaia River, New Zealand

Diagnosis: Undifferentiated spindle cell sarcoma; possibly an embryonal rhabdomyoma

Submitter: B. J. Stevenson

RTLA 1786. Rainbow trout, Salmo gairdneri

Material: One microscope slide

Habitat: Coleridge, New Zealand

Diagnosis: Neurilemmoma

Submitter: B. J. Stevenson

RTLA 1787. Clam, Micromya (?)

Material: One clam

Habitat: Ten Mile Creek, Knox County, Tennessee

Diagnosis: Pending

Submitter: G. E. Cosgrove

RTLA 1788. Floater clam, Anodonta corpulenta

Material: Twenty-eight clams

Habitat: Melton Hill Lake, Anderson County, Tennessee

Diagnosis: Pending

Submitter: G. E. Cosgrove

RTLA 1789. Heel-splitter clam, Protoptera alata

Material: Eighteen clams

Habitat: Melton Hill Lake, Anderson County, Tennessee

Diagnosis: Pending

Submitter: G. E. Cosgrove

RTLA 1790. Floater clam (?), Anodonta corpulenta (?)

Material: Two clams

Habitat: White Oak Lake, Roane County, Tennessee

Diagnosis: Pending

Submitter: G. E. Cosgrove

RTLA 1791. Floater clam (?), Anodonta corpulenta (?)

Material: One clam

Habitat: White Oak Lake, Roane County, Tennessee

Diagnosis: Pending

Submitter: G. E. Cosgrove

RTLA 1792. Floater clam, Anodonta corpulenta

Material: Ten clams

Habitat: White Oak Lake, Roane County, Tennessee

Diagnosis: Pending

Submitter: G. E. Cosgrove

- RTLA 1793. Heel-splitter clam, Protoptera alata  
Material: Three clams  
Habitat: Melton Hill Lake, Anderson County, Tennessee  
Diagnosis: Pending  
Submitter: G. E. Cosgrove
- RTLA 1794. Rock oyster, Crassostrea commercialis  
Material: Three microscope slides  
Habitat: Myora Flat, Moreton Bay, Queensland, Australia  
Diagnosis: Hematopoietic neoplasm; Tylocephalum sp. cysts present; Ancistrocoma sp. in wall of digestive diverticula  
Submitter: P. H. Wolf
- RTLA 1795. Rock oyster, Crassostrea commercialis  
Material: Three microscope slides  
Habitat: Greenwell Point near Nowra, New South Wales, Australia  
Diagnosis: Mantle papilloma  
Submitter: P. H. Wolf
- RTLA 1796. Pearl oyster, Pinctada maxima  
Material: Three microscope slides  
Habitat: Kuri Bay, North Western Australia (between Wyndham and Derby) from a pearl farm  
Diagnosis: Unidentified protistan parasite  
Submitter: P. H. Wolf  
Reprint: Wolf, Peter H. and Victor Sprague. An Unidentified Protistan Parasite of the Pearl Oyster, Pinctada maxima, in Tropical Australia. J. Invertebr. Pathol., 31: 262-263. 1978.
- RTLA 1797. Rock oyster, Crassostrea commercialis  
Material: Four microscope slides  
Habitat: Terranora Creek, Tweed River, New South Wales, Australia  
Diagnosis: Early infection of Marteilia sydneyi  
Submitter: P. H. Wolf
- RTLA 1798. Rock oyster, Crassostrea commercialis  
Material: Six microscope slides  
Habitat: Tweed River, New South Wales, Australia  
Diagnosis: Heavy infection of Marteilia sydneyi  
Submitter: P. H. Wolf
- RTLA 1799. Blacklipped oyster, Crassostrea echinata  
Material: Six microscope slides; 1 reprint  
Habitat: Mangrove roots in Middle Arm, Darwin, Northern Territory, Australia  
Diagnosis: Unidentified protistan parasite; also Tylocephalum sp. cysts  
Submitter: P. H. Wolf  
Reprint: Wolf, Peter H. An Unidentified Protistan Parasite in the Ova of the Blacklipped Oyster, Crassostrea echinata, from Northern Australia. J. Invertebr. Pathol., 29: 244-246. 1977.

- RTLA 1800. Threespine stickleback, Gasterosteus aculeatus  
Material: Twelve microscope slides  
Habitat: Ventura River System, Ventura County, California --  
in the lower few miles of the river  
Diagnosis: Pseudocystic microsporidan granuloma  
Submitter: M. A. Bell
- RTLA 1801. Threespine stickleback, Gasterosteus aculeatus  
Material: Gross specimen with a pea-shaped growth on right ven-  
tro-lateral aspect  
Habitat: Ventura River System, Ventura County, California --  
lower few miles of the river  
Diagnosis: Pseudocystic microsporidan granuloma  
Submitter: M. A. Bell
- RTLA 1802. Threespine stickleback, Gasterosteus aculeatus  
Material: Gross specimen with pea-shaped growth on right dorso-  
lateral aspect  
Habitat: Ventura River System, Ventura County, California --  
lower few miles of the river  
Diagnosis: Pseudocystic microsporidan granuloma  
Submitter: M. A. Bell
- RTLA 1803. Threespine stickleback, Gasterosteus aculeatus  
Material: Gross specimen with pea-shaped growth on left mid-  
lateral aspect  
Habitat: Ventura River System, Ventura County, California,  
Ojai in San Antonio Creek  
Diagnosis: Pseudocystic microsporidan granuloma  
Submitter: M. A. Bell
- RTLA 1804. Threespine stickleback, Gasterosteus aculeatus  
Material: Gross specimen with pea-shaped growth on right ventro-  
lateral aspect  
Habitat: Ventura River System, Ventura County, California --  
lower few miles of the river  
Diagnosis: Pseudocystic microsporidan granuloma  
Submitter: M. A. Bell
- RTLA 1805. Threespine stickleback, Gasterosteus aculeatus  
Material: One x-ray positive of "normal" gross specimens and  
gross specimens with foreshortened vertebral columns  
Habitat: Ventura River System, Ventura County, California  
Diagnosis: Skeletal anomalies possibly associated with chemical  
pollution  
Submitter: M. A. Bell
- RTLA 1806. Emerald shiner, Notropis atherinoides; Sand shiner, Notropis  
stramineus; Bluntnose minnow, Pimephales notatus; Mimic  
shiner, Notropis volucellus  
Material: Two hundred five gross specimens from the above genera  
and species

RTLA 1806 (contd.)

Habitat: Ohio River: Pike Island Lock and Dam  
Diagnosis: Cubic nuclear inclusions in ganglion cells  
Submitter: ORSANCO Survey

RTLA 1807. European flat oyster, Ostrea edulis

Material: One paraffin block; reprint  
Habitat: Mali-Ston area of Yugoslavia near Dubrovnic  
Diagnosis: Hematopoietic neoplasm  
Submitter: P. van Banning  
Reprint: (See RTLA 1779)

RTLA 1808. European flat oyster, Ostrea edulis

Material: One paraffin block  
Habitat: Paimpol, France  
Diagnosis: Hematopoietic neoplasm  
Submitter: P. van Banning

RTLA 1809. European flat oyster, Ostrea edulis

Material: One paraffin block  
Habitat: Paimpol, France  
Diagnosis: Hematopoietic neoplasm  
Submitter: P. van Banning

RTLA 1810.1 - 1810.5. Thin tellin, Tellina tenuis

Material: Five microscope slides; 10, 35 mm color transparencies  
Habitat: Aultbea, Loch Ewe, Wester Ross, Scotland  
Diagnosis: RTLA 1810.1 - Procaryote-like inclusions in digestive diverticulum; RTLA 1810.2 - procaryote-like inclusions in gut epithelium and digestive diverticulum; RTLA 1810.3 - normal male and female; coccidian in ovary; RTLA 1810.4 & 1810.5 - pending  
Submitter: J. S. Buchanan  
Reprint: Buchanan, J. S. On the Presence of a New Species of Rickettsia Found Together with an Associated Phage in the Digestive Gland of the Marine Pelecypod Mollusc, Tellina tenuis (da Costa). Haliotis. (in press).

RTLA 1811. Coho salmon, Oncorhynchus kisutch

Material: Four microscope slides  
Habitat: Reared in fiberglass tanks; water source was river water which was chlorinated-dechlorinated  
Diagnosis: Ependymoblastoma  
Submitter: J. D. Hendricks

RTLA 1812. Tiger snake, Notechis ater

Material: One microscope slide  
Diagnosis: Pancreatic trematodiasis  
Submitter: B. L. Munday

RTLA 1813. Metallic skink, Leiopisma metallicum

Material: One microscope slide

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 1822. Goldfish, Carassius auratus  
Material: Growth removed from the right side of the head, near eye  
Habitat: Aquarium pet; Texas  
Diagnosis: Ichthyematoma (fish scale tumor)  
Submitter: N. Herwig
- RTLA 1823. Boa constrictor  
Material: One microscope slide  
Diagnosis: Lipoma  
Submitter: F. L. Frye
- RTLA 1824. Lampfish (?), Lampanyctus cuprarius  
Material: Gross specimen with a growth on the right caudal peduncle  
Habitat: South of Bermuda  
Diagnosis: Lesion contains multinucleate lavender cells thought to be parasites  
Submitter: B. J. Zahuranec
- RTLA 1825-1830. Rock oyster, Crassostrea commercialis  
Material: Fixed tumor tissue for electron microscopy  
Habitat: Nowra (Greenwell Point), New South Wales, Australia  
Diagnosis: Papilloma of mantle epithelium  
Submitter: P. H. Wolf
- RTLA 1831 & 1832. European flat oyster, Ostrea edulis  
Material: Six microscope slides  
Habitat: Carantec, Brittany, France  
Diagnosis: Aber disease (Marteilia refringens)  
Submitter: D. J. Alderman
- RTLA 1833. Mussel, Mytilus edulis  
Material: Seven microscope slides  
Habitat: Menai Straits, North Wales  
Diagnosis: Hematopoietic neoplasm  
Submitter: D. J. Alderman
- RTLA 1834. Scallop  
Material: Two microscope slides  
Diagnosis: Hematopoietic neoplasm versus reactive hematopoiesis  
Submitter: R. S. Brown
- RTLA 1835. California king snake, Lampropeltis getulus  
Material: Two microscope slides; 4 photomicrographs; reprint  
Habitat: Walnut Creek, California  
Diagnosis: Squamous (versus mucoepidermoid) carcinoma of probable salivary gland origin  
Submitter: J. R. Hill  
Reprint: Hill, James R. Oral Squamous Cell Carcinoma in a California King Snake. J. Amer. Vet. Med. Assoc., 171: 982. 1977.



RTLA 1836. Nurse shark, Ginglymostoma cirratum

Material: Three microscope slides; 3 paraffin blocks; pathology report

Habitat: Florida Keys

Diagnosis: Adenoma or follicular hyperplasia, possibly of thyroid origin

Submitter: S. Gruber, W. Riemer, and M. M. Sigel

RTLA 1837. Lahonton cutthroat trout, Salmo clarki

Material: Tissue block; 5 microscope slides

Habitat: Pyramid Lake, Nevada

Diagnosis: Carcinoma, probably of ultimobranchial gland origin

Submitter: C. E. Smith

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- Carcinoma: Bony fish - RTLA 1837
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CONTRIBUTORS

- ALDERMAN, D. J.  
Fish Diseases Laboratory  
Ministry of Agriculture,  
Fisheries and Food  
The Nothe, Weymouth  
Dorset DT4 8UB, England  
RTLA 1779-1782, 1831-1833
- BAILEY, C. M.  
Sea-Arama Marineworld  
Seawall Boulevard at 91st Street  
P. O. Box 3068  
Galveston, Texas 77550  
RTLA 1661
- BALAZS, G. H.  
Hawaii Institute of  
Marine Biology  
University of Hawaii at Manoa  
P. O. Box 1346  
Coconut Island  
Kaneohe, Hawaii 96744  
RTLA 1767, 1774, 1816
- BANG, F. B.  
Department of Pathobiology  
The Johns Hopkins University  
615 North Wolfe Street  
Baltimore, Maryland 21205  
RTLA 1607
- BARSZCZ, C. A.  
Environmental Research Laboratory  
U.S. Environmental Protection  
Agency  
South Ferry Road  
Narragansett, Rhode Island 02882  
RTLA 1741-1746
- BELL, G. R.  
Pacific Biological Station  
P. O. Box 100  
Nanaimo, B. C., V9R 5K6, Canada  
RTLA 1603
- BELL, M. A.  
Department of Biology  
University of California  
Los Angeles, California 90024  
RTLA 1800-1805
- BLASIOLA, G. C., JR.  
Steinhart Aquarium  
California Academy of Sciences  
Golden Gate Park  
San Francisco, California 94118  
RTLA 1601, 1618, 1646, 1775
- BRANNIAN, R. E.  
4529 West 36-1/2 Street  
St. Louis Park, Minnesota 55416  
RTLA 1820
- BROWN, R. S.  
Animal Pathology Department  
University of Rhode Island  
Kingston, Rhode Island 02881  
RTLA 1834
- BUCHANAN, J. S.  
Unit of Aquatic Pathobiology  
University of Stirling  
Stirling FK9 4LA, Scotland  
RTLA 1810
- BUCKE, D.  
Fish Diseases Laboratory  
Ministry of Agriculture,  
Fisheries and Food  
The Nothe, Weymouth  
Dorset DT4 8UB, England  
RTLA 1644
- COHEN, N.  
Department of Microbiology  
The University of Rochester  
Rochester, New York 14642  
RTLA 1619
- COOPER, J. E.  
Clinical Research Centre  
Watford Road  
Harrow, Middlesex HA1 3UJ  
England  
RTLA 1641
- COSGROVE, G. E.  
Zoological Society of San Diego  
Box 551  
San Diego, California 92112  
RTLA 1665-1673, 1787-1793

COUCH, J. A.  
Environmental Research Laboratory  
U.S. Environmental Protection  
Agency  
Sabine Island  
Gulf Breeze, Florida 32561  
RTLA 1599

CRISPENS, C. G., JR.  
Department of Biology  
The University of Alabama  
in Birmingham  
University Station  
Birmingham, Alabama 35294  
RTLA 1604

CUBIT, J.  
Smithsonian Tropical Research  
Institute, P. O. Box 2072  
Balboa, Canal Zone  
RTLA 1776

DELANNEY, L. E.  
4712 Northeast 60th Street  
Seattle, Washington 98105  
RTLA 1674-1693

ELKAN, E.  
Department of Histopathology  
Mt. Vernon Hospital  
Northwood, Middlesex HA6 2RN  
England  
RTLA 1704-1706, 1821

ELSON, K. G. R.  
Department of Agriculture and  
Fisheries for Scotland  
Marine Laboratory, P. O. Box 101  
Torry, Aberdeen AB9 8DB, Scotland  
RTLA 1660

FRYE, F. L.  
School of Veterinary Medicine  
University of California  
Davis, California 95616  
RTLA 1606, 1823

GORMAN, I.  
Sharkey - Simpson  
1500-1502 W. Santa Barbara Avenue  
Los Angeles, California 90062  
RTLA 1777, 1817

GRUBER, S.  
Department of Microbiology  
School of Medicine  
University of Miami  
P. O. Box 520875  
Biscayne Annex  
Miami, Florida 33152  
RTLA 1836

HAYUNGA, E. G.  
Immunoparasitology  
Naval Medical Research Institute  
National Naval Medical Center  
Building 142  
Bethesda, Maryland 20014  
RTLA 1778

HEDGES, S. B.  
Division of Reptiles and Amphibians  
National Museum of Natural History  
Room W-203  
Smithsonian Institution  
Washington, D. C. 20560  
RTLA 1602

HENDRICKS, J. D.  
Department of Food Science and  
Technology  
Oregon State University  
Corvallis, Oregon 97331  
RTLA 1811

HERRIN, J.  
Apartment #1  
2026 Columbia Pike  
Arlington, Virginia 22204  
RTLA 1647

HERWIG, N.  
San Antonio Zoological Gardens  
and Aquarium  
3903 North St. Mary's Street  
San Antonio, Texas 78212  
RTLA 1822

HICKS, B.  
Department of Pathology  
Ontario Veterinary College  
University of Guelph  
Guelph, Ontario N1G 2W1, Canada  
RTLA 1784

HILL, J. R.  
Department of Pathology  
Syntex Research  
Palo Alto, California 94304  
RTLA 1835

HITACHI, PRINCE MASAHITO  
Cancer Institute  
Kami-Ikebukuro, Toshima-ku  
Tokyo 170, Japan  
RTLA 1707, 1711, 1712

HNATH, J. G.  
Wolf Lake Fish Hatchery  
Michigan Department of  
Natural Resources  
Route #1  
Mattawan, Michigan 49071  
RTLA 1773

HOSKINS, G. E.  
Pacific Biological Station  
P. O. Box 100  
Nanaimo, B. C. V9R 5K6, Canada  
RTLA 1783

IWAI, P. J.  
Forestry Sciences Laboratory  
U.S. Department of Agriculture  
3200 Jefferson Way  
Corvallis, Oregon 97331  
RTLA 1645

JACOBSON, E.  
Division of Comparative Medicine  
Health Center Animal Resources  
Department  
J. Hillis Miller Health Center  
University of Florida  
P. O. Box J-6  
Gainesville, Florida 32610  
RTLA 1770, 1819, 1820

JOHNSON, A. G.  
Port Aransas Laboratory  
Southeast Fisheries Center  
Port Aransas, Texas 78373  
RTLA 1662, 1664

KANDRASHOFF, W.  
951 Euclid Avenue  
Miami Beach, Florida 33139  
RTLA 1714-1722, 1724-1730

KRAUS, E. P.  
Department of Microbiology  
School of Medicine  
University of Miami  
P. O. Box 520875, Biscayne Annex  
Miami, Florida 33152  
RTLA 1731

LIGHTNER, D. V.  
Environmental Research Laboratory  
The University of Arizona  
Tucson International Airport  
Tucson, Arizona 85706  
RTLA 1710

MCKNIGHT, I.  
Department of Agriculture and  
Fisheries for Scotland  
Marine Laboratory, P. O. Box 101  
Torry, Aberdeen AB9 8DB, Scotland  
RTLA 1660

MARINO, R.  
1924 Northwest 21st  
Oklahoma City, Oklahoma 73106  
RTLA 1771

MARTIGNONI, M. E.  
Forestry Sciences Laboratory  
U.S. Department of Agriculture  
3200 Jefferson Way  
Corvallis, Oregon 97331  
RTLA 1645

MARTIN, K.  
Department of Zoology  
The University of Oklahoma  
730 Van Vleet Oval, Room 222  
Norman, Oklahoma 73069  
RTLA 1739

MEARNS, A. J.  
Southern California Coastal Water  
Research Project  
1500 East Imperial Highway  
El Segundo, California 90245  
RTLA 1708, 1709

MUNDAY, B. L.  
Mt. Pleasant Laboratories  
Department of Agriculture  
Launceston South, Tasmania 7250  
RTLA 1812, 1813

NIELSEN, S. W.  
Northeastern Research Center for  
Wildlife Diseases  
The University of Connecticut  
Storrs, Connecticut 06268  
RTLA 1819

OISHI, K.  
Faculty of Fisheries  
Hokkaido University  
Hakodate, Japan  
RTLA 1734

ORSANCO  
W. L. Klein  
Ohio River Valley Water  
Sanitation Commission  
414 Walnut Street  
Cincinnati, Ohio 45202  
RTLA 1806

OTTO, S. V.  
State Laboratory  
Maryland Department of  
Natural Resources  
Oxford, Maryland 21654  
RTLA 1620-1640, 1735-1737,  
1748-1766

OVERSTREET, R. M.  
Gulf Coast Research Laboratory  
East Beach  
Ocean Springs, Mississippi 39564  
RTLA 1663

PAL, J.  
Department of Zoology  
University of Kalyani  
Kalyani 741235  
West Bengal, India  
RTLA 1738, 1815

RIEMER, W.  
Baptist Hospital of Miami  
8900 North Kendall Drive  
Miami, Florida 33156  
RTLA 1836

ROBINSON, P. T.  
Zoological Society of San Diego  
P. O. Box 551  
San Diego, California 92112  
RTLA 1600

ROSE, F. L.  
Department of Biological Sciences  
Texas Tech University  
Lubbock, Texas 79409  
RTLA 1740

RUDELL, C. L.  
Virginia Institute of Marine  
Science  
Gloucester Point, Virginia 23062  
RTLA 1605

SCHWAB, M.  
Genetisches Institut  
der Justus Liebig-Universität  
Heinrich-Buff-Ring 58-62  
D-6300 Giessen, Germany  
RTLA 1732, 1733

SCOTT, A. L.  
Department of Fisheries  
Auburn University  
Auburn, Alabama 36830  
RTLA 1652

SHERMAN, S.  
23840 Jerome  
Oak Park, Michigan 48237  
RTLA 1723

SHIELDS, R. R.  
J. Hillis Miller Health Center  
P. O. Box J-6  
University of Florida  
Gainesville, Florida 32610  
RTLA 1617

SIGEL, M. M.  
Department of Microbiology  
School of Medicine  
University of Miami  
P. O. Box 520875, Biscayne Annex  
Miami, Florida 33152  
RTLA 1836

SMITH, C. E.  
Fish Cultural Development Center  
U.S. Department of the Interior  
Route 2, Box 333  
Bozeman, Montana 59715  
RTLA 1653-1657, 1814, 1837

STEVENSON, B. J.  
Animal Health Laboratory  
Palmerston North, New Zealand  
RTLA 1648-1651, 1785, 1786

STICKNEY, R. R.  
School of Natural BioSciences  
Texas A & M University  
College Station, Texas 77843  
RTLA 1659

STROUD, R.  
School of Veterinary Medicine  
Oregon State University  
Corvallis, Oregon 97331  
RTLA 1713

TOMLJANOVICH, D.  
Tennessee Valley Authority  
Forestry, Fisheries, and  
Wildlife Development  
Norris, Tennessee 37828  
RTLA 1747

VAN BANNING, P.  
Rijksinstituut voor  
Visserijonderzoek  
Haringkade 1  
IJmuiden 1620, The Netherlands  
RTLA 1807-1809

VERHOEFF-DE FREMERY, R.  
Hubrecht Laboratory  
Uppsalalaan 8  
Universiteitscentrum de „Uithof“  
Utrecht, The Netherlands  
RTLA 1616, 1768, 1769

WOLF, H.  
Fish Disease Laboratory  
California Department of  
Fish and Game  
2111 Nimbus Road  
Rancho Cordova, California 95670  
RTLA 1615, 1643

WOLF, P. H.  
N.S.W. State Fisheries  
P. O. Box N211  
Grosvenor Street  
Sydney 2000, Australia  
RTLA 1608-1614, 1642, 1772,  
1794-1799, 1825-1830

YEVICH, P. P.  
Environmental Research Laboratory  
U.S. Environmental Protection  
Agency  
South Ferry Road  
Narragansett, Rhode Island 02882  
RTLA 1694-1703, 1741-1746, 1818

ZAHURANEC, B. J.  
Oceanic Biology Program  
Office of Naval Research  
Arlington, Virginia 22217  
RTLA 1824

ZWERNER, D. E.  
Virginia Institute of Marine Science  
Gloucester Point, Virginia 23062  
RTLA 1605





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Dr. John C. Harshbarger  
Registry of Tumors in Lower Animals  
National Museum of Natural History  
Room W216-A  
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DATE RECD. \_\_\_\_\_  
CONTRIBUTOR'S NO. \_\_\_\_\_  
RTL NO. \_\_\_\_\_  
USNM NO. \_\_\_\_\_  
NIH HISTOPATH NO. \_\_\_\_\_

COMMON NAME \_\_\_\_\_ FAMILY \_\_\_\_\_  
PHYLUM \_\_\_\_\_ GENUS \_\_\_\_\_  
CLASS \_\_\_\_\_ SPECIES \_\_\_\_\_  
ORDER \_\_\_\_\_

CATEGORY: NEOPLASM \_\_\_\_\_ INFLAMMATION \_\_\_\_\_ INFECTION \_\_\_\_\_ PARASITIC \_\_\_\_\_ TOXIC \_\_\_\_\_  
DEVELOPMENTAL \_\_\_\_\_ TRAUMATIC \_\_\_\_\_ NORMAL \_\_\_\_\_ OTHER \_\_\_\_\_

CONTRIBUTOR (NAME & ADDRESS): \_\_\_\_\_ COLLECTOR (NAME & ADDRESS): \_\_\_\_\_

ITEMS SUBMITTED (QUANTITY):

GROSS MATERIAL \_\_\_\_\_ PHOTOGRAPHS \_\_\_\_\_  
SLIDES \_\_\_\_\_ REPRINTS \_\_\_\_\_  
BLOCKS \_\_\_\_\_ OTHER \_\_\_\_\_

ORIGIN OF ANIMAL: MARINE \_\_\_\_\_ FRESHWATER \_\_\_\_\_ ESTUARINE \_\_\_\_\_ TERRESTRIAL \_\_\_\_\_  
WHERE COLLECTED \_\_\_\_\_

DATE COLLECTED \_\_\_\_\_ SEX \_\_\_\_\_ AGE \_\_\_\_\_ STAGE OF LIFE CYCLE \_\_\_\_\_  
HOW KILLED \_\_\_\_\_ FIXATION \_\_\_\_\_  
GROSS DESCRIPTION \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

MICROSCOPE DX \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

COMMENTS (e.g., possible exposure to chemical pollutants or infectious agents, incidence and duration of this condition in the population, etc.)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_











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