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Treasures in Archived Histopathology Collections: Preserving The Past For Future Understanding

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Abstract:

Extensive collections of histopathology materials from studies of marine and freshwater fish, mollusks, crustaceans, echinoderms, and other organisms are archived in the Registry of Tumors in Lower Animals (RTLTA), the U.S. Environmental Protection Agency, NOAA's National Marine Fisheries Service, and other agency or academic institutions. These collections are valuable resources for scientists seeking to understand health and disease in diverse species, train new aquatic pathologists, predict risks from biotic and abiotic stressors (e.g., toxicant impacts on organisms in multiple locations), determine disease status through DNA extraction and analysis, supply data for historical reconstructions (e.g., when a virus first affected a host species), examine trends in parasite distribution and prevalence, and improve interpretation of host and parasite population fluctuations for modeling ecosystems. However, they are in danger. For example, RTLTA's collection now at Experimental Pathology Laboratories, Sterling, VA, formerly National Cancer Institute funded, lacks current funding for maintenance or processing of additional case submittals. To ensure future availabilities of these irreplaceable resources, online databases with cross-linking records of materials for search and retrieval — as is being developed for the EPA's Atlantic Ecology Division's collections — can provide access, but these collections need cross-agency support to improve their database capabilities, maintain histoslides, and provide hands-on examination and study.

Key words: histology; histopathology; database; archival collections; pathology; marine pathology

Purpose Statement:

Extensive collections of histopathology materials from studies of marine and freshwater fish, mollusks, crustaceans, echinoderms, and other organisms exist around the world. This manuscript illustrates a few examples of the broad applications access to these collections can offer. With shrinking research monies and the increased need to make every dollar count, using new and unique technologies on archived tissues offers great potential benefit. Applying new histological methods to archived materials opens a world of possibilities to understand and predict the future health of these aquatic organisms. From gleaning more scientific information on test organisms and understanding sublethal effects, to following the waves of disease and predicting future epidemics, these resources can be invaluable for studying changes in the ecology, morphology, physiology, biochemistry, systematics, genetics, parasites, and diseases of species over long time periods. Identification of these irreplaceable resources and development of online databases with cross-linking records of materials for search and retrieval will be critical to future scientists.