

# Fathead minnow histology atlas: worldwide web outreach and utilization

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## Abstract

The fathead minnow (*Pimephales promelas*), the 'white rat' of aquatic toxicological studies, is used in USEPA test protocols for examining acute, short-term chronic, early lifestage, and lifecycle toxicity. Additionally, a substantial database cataloguing fathead minnow sensitivity to toxicants is available both in the printed literature and online (AQUIRE, ECOTOX, etc.). Regulatory programs that monitor effluent discharges routinely perform bioassay tests with larval fathead minnows. Test endpoints include survival, growth and reproduction. Recent attention has been directed toward development of sensitive sublethal indicators of contaminant-induced stress in aquatic species. Histopathological identification and quantification of health effects and contaminant-induced lesions are used as such indicators. Identification of tissue lesions requires a baseline appreciation of normal tissue conditions. While histological atlases exist for several commercially valuable species (i.e. striped bass, salmonids, catfish), such a resource has been unavailable for cyprinids, the dominant family of freshwater fishes (with more than 2000 species worldwide including approximately 300 in North America). For this reason we have generated an atlas of photomicrographs detailing the normal microanatomy of the fathead minnow. Currently, the atlas is available as a work in progress on the worldwide web (WWW; <http://som1.ab.umd.edu/AquaticPath/fhm>). Development of the atlas was accomplished through routine histological preparation of representative tissue samples. Photomicrographs of tissue samples were taken at various magnifications and digitized for use in the atlas. Digital images were compiled by organ system into separate sections. Sections are navigable by index and images are retrievable via 'hotbuttons' and hypertext. A WWW version of the atlas will be available for hands-on demonstration. Methods of development and outreach capabilities will be reviewed.

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