Zebrafish anatomy elucidated

Reviewed by Michael Stoskopf, DVM, PhD, D.ACZM

ATLAS OF ZEBRAFISH DEVELOPMENT

By Robert Bryson-Richardson,
Silke Berger and Peter Currie

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The authors of *Atlas of Zebrafish Development* have created a useful tool that will be of interest to researchers using zebrafish-based models. One of several zebrafish anatomy efforts in progress, this high-quality publication promises to be useful for diverse needs.

The book consists of 12 chapters, a one-page reference list and a four-page index. The first three chapters of the book provide an introduction, including a brief history of the use of zebrafish to model development in biology and the study of disease and a discussion of earlier efforts to provide anatomical atlases in book form. The authors also highlight the major competing online resources for zebrafish anatomical information, including a website developed by Steve Wilson's group at University College London (<http://www.zebrafishbrain.org/>), which provides 3-D interactive models of zebrafish neurodevelopment, and the Penn State Atlas project (<http://zfAtlas.psu.edu/>), which is a repository of zebrafish 2-D section information that is currently under development.

The images for the atlas were generated using optical projection tomography, which allows images from all three planes to be derived from a single zebrafish specimen. Autofluorescence of the paraformaldehyde-fixed tissues was used to generate the image contrast; the result is that blood, cartilage and bone appear relatively bright. The technique is sufficiently novel that much of the second

chapter of the book is devoted to explaining how to interpret the black and white images in the atlas.

The latter nine chapters comprise the atlas itself, which is divided into three parts by developmental stage. The first part consists of five chapters focused on the early embryo at 24, 48, 72, 96 and 120 hours of life. The second part contains three chapters examining the developing larvae at 6, 9 and 14 mm. Finally, the last chapter provides images of the 16-mm adult zebrafish. Each chapter is itself comprised of three series of high quality black and white images, presenting sagittal, coronal and transverse sections of the zebrafish at the presented stage of development. The images are labeled using a line and number system with a key at the bottom of each page to identify the locations of major organs and anatomical features. The print stock supports a very good image quality and the labeled structures are generally easy to visualize. The layout is consistent and well thought out. Sagittal and coronal sections are presented three images to a page, and transverse sections are presented six images to a page. One drawback is the lack of an orientation icon or explanation of the pattern of image placement sequence on each page. Though the book is likely intended for use by experts in the field, this might be a problem for less experienced researchers.

As explained in Chapter 3, this book is a condensed version of the web resource FishNet (<http://www.fishnet.org.au/>), a significant internet resource that includes the complete stage series and all sections within each embryo. FishNet is an interactive website that allows users to virtually section 3-D models of the fish, as well as view volume or surface renderings. The authors map out future plans for expansion of the capabilities of the internet resource. Those familiar with the FishNet resource will undoubtedly be both effusive about the resource itself, but also very aware of the importance of the printed book. Even with the fastest internet access, the time required to view high-resolution images significantly impacts the ease of browsing, and efforts to ameliorate this challenge require compromises in image quality. Then, of course, there is the significant benefit of the portability of the book. *Atlas of Zebrafish Development* is a valuable reference that will find considerable use in the laboratories of investigators studying the development of this important model fish.

Stoskopf is Director, Environmental Medicine Consortium and Professor of Wildlife and Aquatic Medicine, Department of Clinical Sciences, College of Veterinary Medicine, North Carolina State University, Raleigh, NC.