An Atlas of Comparative Vertebrate Histology

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Histology is the microscopic study of how cells and tissues collaborate to form organs and organ systems. An ***Atlas of Comparative Vertebrate Histology*** examines these processes in a wide variety of organisms possessing a spinal column – the vertebrates. The vertebrate body is a complex system of multiple organs each made up of millions of cells that vary in shape, size, and function. Cells are seen ordered into precise patterns forming tissues and organs, thus providing the specific frameworks and environments for life's processes to happen. These frameworks are determined by the particular function of a tissue or organ — every function imposes a characteristic plan on the arrangement of cells making up the tissues and organs. Vertebrates don't all follow the human or even the mammalian model of tissue and organ structure. Some have taken tissues or organs well beyond their "normal" function. For example, the electric eel has evolved an organ for delivering a paralyzing electric shock to its prey. It has done this by modifying the ability of striated muscle to produce small electric currents to an extreme level. Comparative histology allows the deeper understanding of the structural responses underlying the physiology unique to each vertebrate group. The study of comparative histology in the vertebrates aids students and researchers alike to understand how various groups have addressed similar problems, opening doors to interesting research possibilities.

An Atlas of Comparative Vertebrate Histology looks at the histology of a wide range of vertebrates, a diverse and adaptable group, living in a great variety of environments. The histology of the vertebrates reveals how species and groups have solved the problems of their environmental niches, adapting organs and tissues to meet the specific pressures imposed on them. This process varies substantially from one group to the next; not all the vertebrate classes follow the mammalian model. For instance, in vertebrate groups with no hollow bones such as cartilaginous and bony fishes, hemopoietic tissue occurs in vascular "backwaters" such as the kidneys and sex organs. To deal with excess salt in the diet some marine birds have specialized "salt" glands in the head to excrete excess salt from the blood—a function typically relegated to the kidney.

To demonstrate this diversity, the authors have focused their microscope on commonly seen vertebrates as well as "non-standard" species—such as hagfish, skate, rock bass, Marine toad, Amphiuma, caiman, snake, tuatara, cowbird, llama, bat, oxen, and lemur.

Key Features

- Includes over 2000 images
- Hundreds of original full color micrographs, including unique micrographs from research throughout the 20th and 21st century
- Direct comparison of several species in every section of each chapter
- Comparison of light and electron micrographs provides a deeper understanding
- Illustrates vertebrates from agnathans to primates, including amphioxus
- Digital version features cross-linking between the text, tables, and image gallery

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