

## Lab 9 - Vertebrate Organ Systems

### Objectives:

- Understand the taxonomic relationships and major features of the chordates and the major classes of vertebrates
- Identify structures and their functions associated with major systems - nervous/sensory, respiratory, circulatory, digestive and excretory - in different vertebrates
- Learn the taxonomic relationships between groups, to understand when similarities between structures are based on history (homology) or convergence

### Introduction:

As you will recall from the Introduction to Animal Diversity handout, organisms need to carry out many processes to survive and reproduce. During the next two weeks, you will examine the internal organs of vertebrates as a way of understanding their anatomy and physiology. As before, please approach your studies of vertebrate anatomy and physiology as suggested on pp. 1-2 of the Animal Diversity handout. Once again, you should understand that similarities or differences in vertebrate systems are often a reflection of the environment in which an animal lives and the type of food that it eats. Finally, think about how the anatomical and physiological solutions of vertebrates compare with those that you observed earlier in invertebrates.

**Textbook Reference Pages:** pp. 717-718 and 722 -741

### Phylum Chordata

The Phylum Chordata contains the group most familiar to you – the vertebrates. The members of this phylum are distinguished by:

- 1) They are **triploblastic**, possessing an ectoderm and endoderm, and a middle tissue layer, the **mesoderm**. They are **coelomate**, possessing a true body cavity lined on all sides by mesoderm-derived tissues.
- 2) Chordates are **bilaterally symmetrical**.
- 3) They have a **notochord**, a flexible supportive rod that runs longitudinally through the dorsum.
- 4) Chordates have a **dorsal hollow nerve cord**, which lies dorsal to the notochord.
- 5) They possess **pharyngeal gill slits**, which lie between the oral cavity and the esophagus.
- 6) Chordates also have a **postanal tail**.

These features may not be present throughout the life cycle of chordates, but may only appear during the embryological stages of development.

### The phylum is divided into three subphyla:

**Subphylum Urochordata**, the tunicates.

**Subphylum Cephalochordata**, the lancelets.

**Subphylum Vertebrata**, the vertebrates, and the only group of chordates that we will look at in lab.