

**13. Ph. HEMICHORDATA & Ph. CHORDATA (Subph. Urochordata & Cephalochordata)**

“A handful of patience is worth more than a bushel of brains.” --Dutch Proverb

MAJOR TAXA	Cl. Ascidiacea ("sea squirts")
Ph. Hemichordata (≅ 85 species)	Cl. Larvacea (= Cl. Appendicularia)
enteropneusts, pterobranchs (classes)	Cl. Thaliacea (salps, doliolids, pyrosomes)
Ph. Chordata	Subph. Cephalochordata (≅ 23 species)
Subph. Urochordata (tunicates; ≅ 1400 spp)	<i>Subph. Vertebrata (≅ 47,000 species)</i>

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Recap: Class-level variation in the pentaradial echinoderm body plan

**TOP TEN areas to explore and appreciate about hemichordates and urochordates**

10. Hemichordates: burrowing or colonial suspension-feeding *deuterostome* worms
9. Urochordate ("tunicate") body plan: bilateral symmetry, exoskeleton, oral & atrial **siphons**
8. Composition and growth mechanism of the urochordate **tunic** exoskeleton
7. Methods of filter feeding: **pharynx** and **atrium**, **pharyngeal slits**, **endostyle**, **mucous sheet**
6. Pathways of water flow and methods of generating water currents for feeding and movement
5. Solitary and colonial body forms and functions among urochordate classes
4. Vertebrate affinities: **notochord**, **dorsal hollow nerve cord**, **pharyngeal slits**, **endostyle**, **tail**
3. Uses of cilia vs. muscles among urochordate classes
2. Adult vs. larval body forms; body transformations during metamorphosis of ascidians
1. Phylogenetic relationships among the four deuterostome phyla and character conflicts

**GOALS**

After studying from lecture notes and the associated reading, you should be able to:

- Explain the body construction and function of a typical enteropneust hemichordate
- Recognize and identify members of classes within the chordate subphylum Urochordata
- Identify parts of the ascidian bauplan and describe roles in feeding, respiration, circulation
- Show features that reflect bilateral symmetry in urochordate individuals or colony members
- Describe how cilia and muscles are used for locomotion by different life-stages and by different classes of urochordates
- Describe the general composition and structure of the urochordate tunic
- Describe variation in how ascidian zooids are organized into colonies
- Describe features that show evolutionary relatedness among chordate subphyla
- Describe general aspects of how the body plan is reoriented during the metamorphosis of ascidians
- Describe the passage of water within the ascidian body, and how a mucous sheet is secreted and used in the process of feeding
- Describe differences between ascidians and larvaceans in how water currents are generated for the purpose of filter-feeding
- Explain how different stages of the urochordate life cycle are emphasized in each class
- Relate basic features of the body construction of cephalochordates and urochordates
- Tell your friends a disturbing story about colonial pyrosomes, ghost radar images, and U.S. involvement in the Vietnam War (back in the news! see <http://tinyurl.com/dypqg>)