8. Ph. MOLLUSCA ("soft"), Cl. Polyplacophora and Cl. Gastropoda

MAJOR TAXA
Ph. Mollusca (50-100,000 spp.)
- Cl. Polyplacophora ("many plates")
- Cl. Gastropoda ("stomach foot")
  - Subcl. Prosobranchia ("forward gill")
  - Subcl. Opisthobranchia ("rear gill")
  - Subcl. Pulmonata ("lung")
- Cl. Bivalvia
- Cl. Cephalopoda
- *Cl. Aplacophora ("no plates")*
- *Cl. Monoplacophora ("one plate")*
- *Cl. Scaphopoda* * *ital. not required*

Recap: Worms and more worms! A story of bilateral symmetry, body elongation, cephalization, and functional specialization of body cavities

TOP TEN areas to explore and appreciate about molluscs

10. Regions of the mollusc body plan (**head, foot, mantle, visceral mass, mantle cavity**)
9. The multilayered molluscan **shell**: composition and production
8. Open blood circulation in a spacious **hemocoel**
7. Reduced coelomic space: integration of the **pericardial cavity**, **gonad**, and **renal organs**
6. The **radula**, a unique molluscan feeding structure
5. Integration of **mantle cavity** and **ctenidia** ("ten-i-dea") in respiration and food collection
4. Gastropod **torsion**: internal and external reorientation of body features (distinct from **coiling**)
3. Pulmonate gastropods: adaptation of the mantle cavity as a **"lung"** for life in air
2. Use of different muscle systems for **creeping locomotion**
1. Respiration: paths of water circulation and **countercurrent gas exchange**

GOALS

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

- Name and describe the function of parts of the generalized molluscan body plan, and identify those features in the body plans of classes Polyplacophora and Gastropoda
- Explain how this body plan has been evolutionarily modified among different mollusc classes
- Describe how molluscan body cavities differ from those of related worm groups
- Explain the general process of shell formation, including different shell layers and the portion of body tissue that gives rise to the shell
- Describe torsion (and detorision), and identify classes and subclass(es) in which they occur
- Explain consequences of torsion for the distribution of mass, the layout of the nervous and digestive systems, and differences in how water currents allow ventilation in the Polyplacophora and Gastropoda
- Explain the operation and function of the molluscan radula, including the replacement of worn teeth
- Describe how pulmonate respiration has been modified for transition to terrestrial habitats and the extraction of oxygen from air
- Explain how different sequences of muscle contraction can be used for direct vs. retrograde locomotion
- Describe the process of countercurrent exchange, and why it is important to molluscan respiration