Phylum: Annelida
(Segmented Worms)

[Exercise 12; p189]

Identifying Characteristics of Phylum

- cylindrical elongated segmented bodies; segments divided by septa
- well developed true coelom
- closed circulatory system with one to several hearts and dorsal and ventral vessels
- more efficient excretory system of nephridia
- well developed muscular system with circular and longitudinal muscle layers around both the body wall and the GI tract
- more efficient digestive system with typhlosole to improve absorption
- nervous system of paired ventral nerve cord with segmental ganglia
- cephalization with increased development of brain and anterior sense organs (this trait is only seen in the largest class of the phylum the Polychaetes, it has been lost in the other two classes)
- marine members with trophophore larva

Cell Types and Characteristic Structures

setae = thin chitinous bristles used in feeding, burrowing, and locomotion
clitellum = glandular swelling used during sexual reproduction and to produce a cocoon for eggs
parapodium = biramous appendages used in locomotion and respiration
prostomium = a triangular mass of tissue located on top of the first complete segment encircling the mouth (=peristomium)
chlorogogue cells = functions analogous to liver; stores nutrients, manufactures blood cells, helps in body defense and helps to remove metabolic wastes

Body Organization

- body elongated, wormlike with repeating, septate segments (metameres)
- body wall cs: cuticle, hypodermis, circular muscle, longitudinal muscle, peritoneum
- distinct head in polychaetes, not in oligochaetes or hirudineans
- paired appendages (=parapodia) in polychaetes, not in oligochaetes or hirudineans

Classification

Class: Polychaeta (marine worms)
- many segments and many setae per segment
- lateral appendages = parapodia
- distinct head

Class: Oligochaetes (earthworms)
- few setae per segment
- clitellum
- no head or parapodia

Class: Branchiobdellida

Class: Hirudinea (leeches)
- dorsoventrally flattened
- false segmentation, all with 34 true segments
- no head, parapodia or setae
-temporary clitellum during reproductive season
-predators or parasitic

**Lab Activities:**

1. The Clamworm: *Nereis virens* (Ex 12A; p 189):
   - external anatomy: identify: head, jaw, teeth, pharynx, palp, tentacles, eyes, parapodium, setae, cirri

2. *Nereis* parapodium (p191)
   - identify: cirri, notopodium, neuropodium, setae

3. *Nereis* internal structure (p 191):
   - Observe the slide of a polychaete cross section and compare it to illustrations in text and lab materials,
   - Identify the following structures: cuticle, hypodermal cells, circular and longitudinal muscle, peritoneum, coelom, intestine, dorsal and ventral blood vessels, ventral nerve cord, parapodium

4. The common earthworm, *Lumbricus* – behavior (p191)
   - observe use of hydrostatic skeleton in burrowing; can you describe the motion

5. The Earthworm: external structure (p194)
   - identify: prostomium, peristomium, clitellum, anus, dorsal pore, setae

6. The Earthworm: internal structure(p 192):
   - compare to illustration in lab manual and on demonstration
   - identify: pharynx, crop, gizzard, intestine, seminal vesicles, seminal receptacles, dorsal blood vessel, aortic arches (=hearts), nephridia
   - Earthworm Nervous System (p 194):
     - compare to illustrations on demonstration and be able to identify: brain (=suprapharyngeal ganglia), paired ventral nerve cord with segmented ganglia

7. Leeches; Class Hirudinea (p 201)
   - external anatomy, know; oral and caudal sucker, mouth, annuli

**Demonstrations:**

- Earthworm Anatomy:
  Use these illustrations to help you locate the structures listed above and to understand the relationships between organ systems

- Earthworm Nervous System:
  Observe and be able to recognize the basic features of the earthworm nervous system as listed in the activities above

- Earthworm Circulatory and Excretory Systems.
With the presence of a true coelom and mesodermal tissue lining both the body wall and the outside of the intestine note the elaborate development of the closed circulatory system and its association with the paired nephridia for excretion and osmoregulation

- Trochophore larva
  review slide of trochophore larva and be able to recognize it

- Other Polychaetes
  observe the variety of body shapes and sizes
  can you recognize the polychaete traits in each
  
  demo: Aphrodite
  demo: Chaetopterus
  other polychaetes

- Other Oligochaetes
  be able to recognize members of the class

- Other Hirudineans
  be able to recognize members of each class