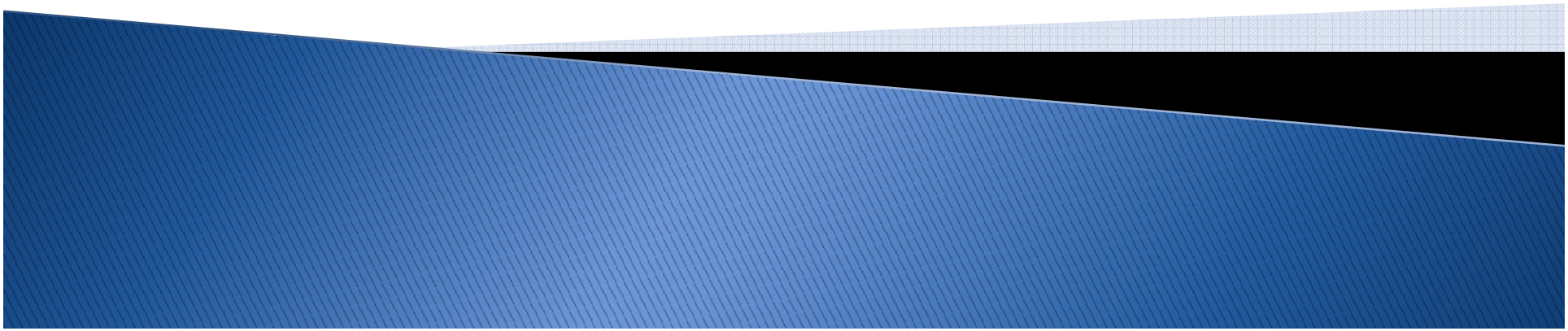
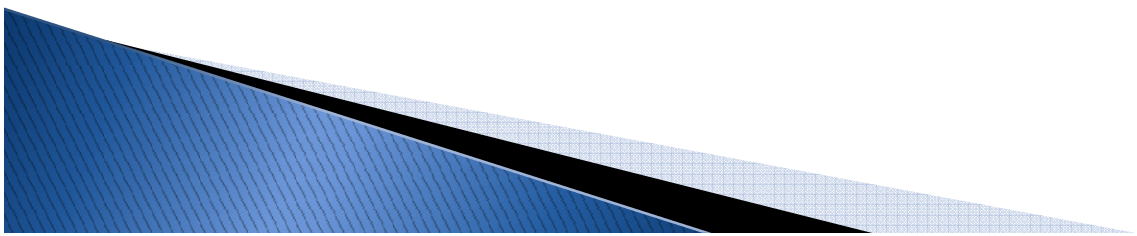
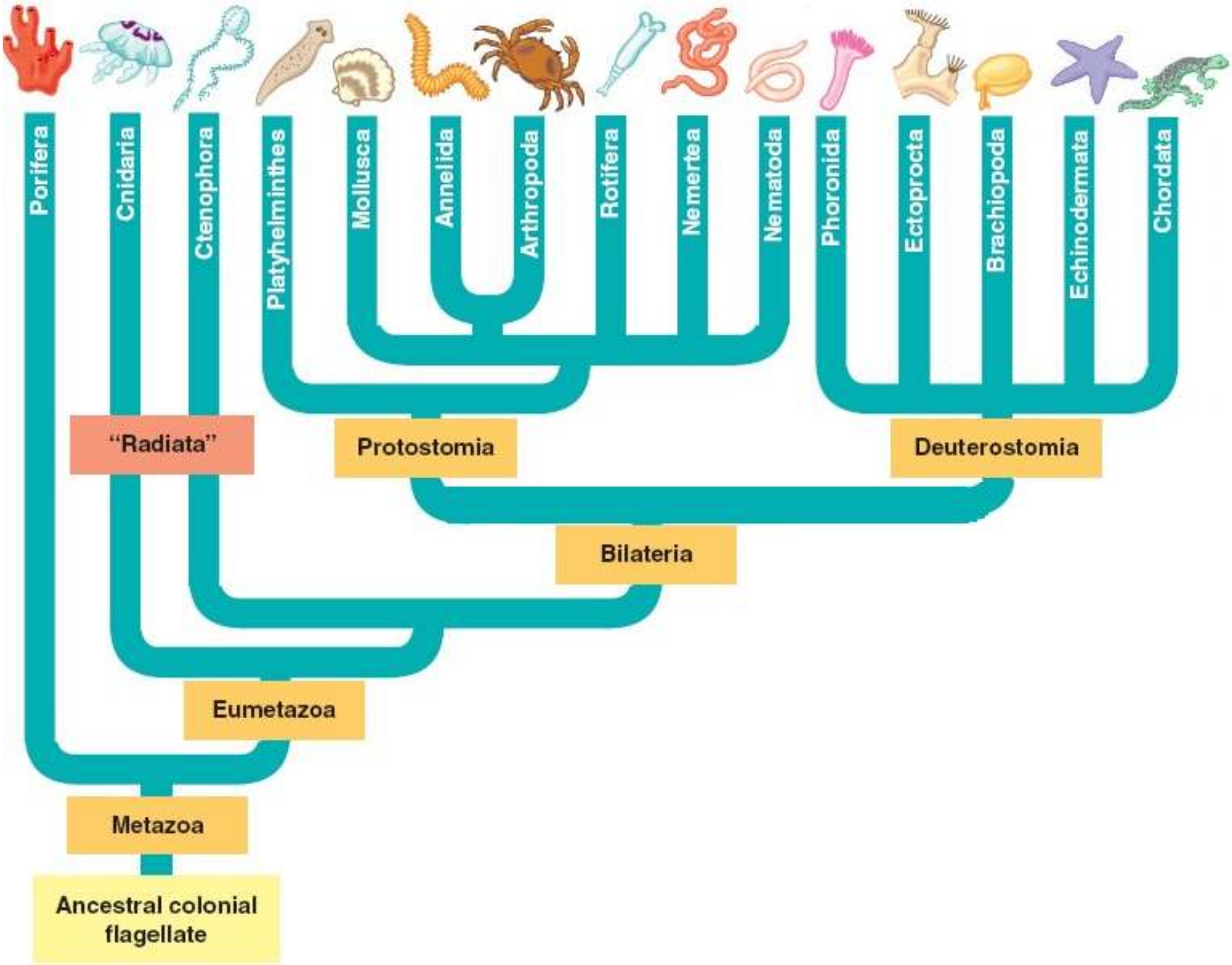
Phylum Chordata

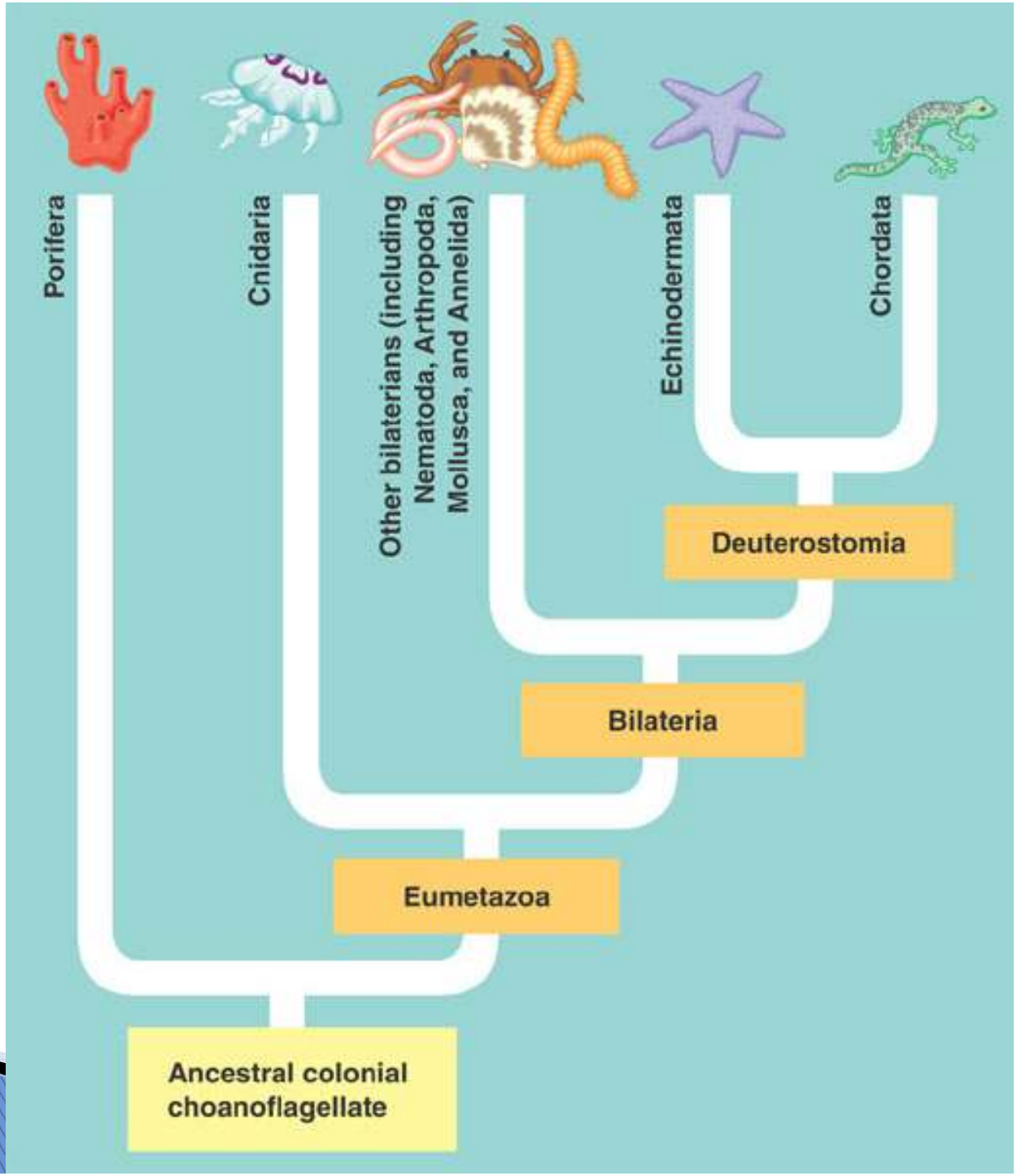
The chordates

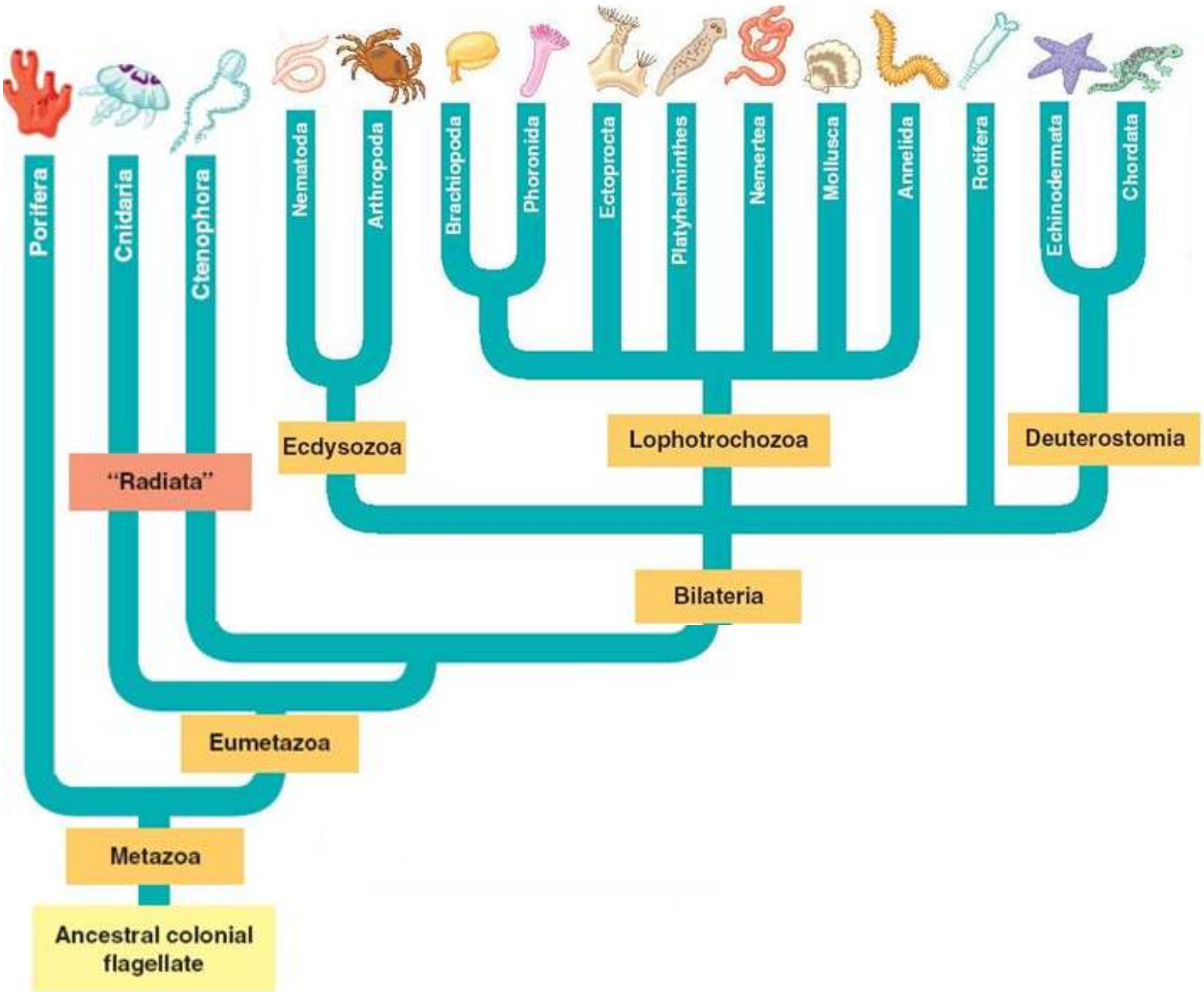


How do all the animals we have studied fit together in an evolutionary perspective?




Porifera
Cnidaria
Ctenophora
Platyhelminthes
Mollusca
Annelida
Arthropoda
Rotifera
Nemertea
Nematoda
Phoronida
Ectoprocta
Brachiopoda
Echinodermata
Chordata
"Radiata"
Protostomia
Deuterostomia
Bilateria
Eumetazoa
Metazoa
Ancestral colonial flagellate

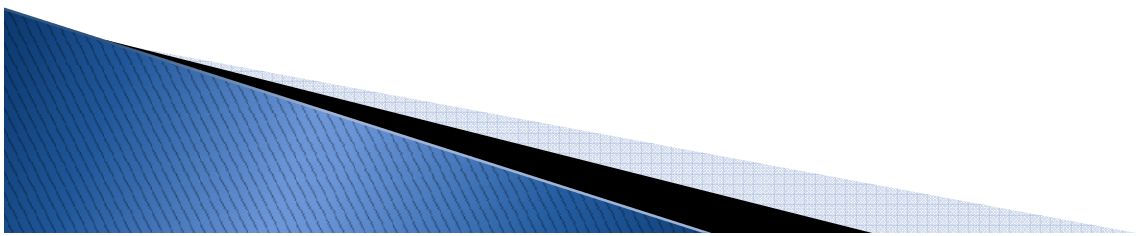

Porifera
Cnidaria
Other bilaterians (including Nematoda, Arthropoda, Mollusca, and Annelida)
Echinodermata
Chordata
Deuterostomia
Bilateria
Eumetazoa
Ancestral colonial choanoflagellate


Porifera
Cnidaria
Ctenophora
Nematoda
Arthropoda
Brachiopoda
Phoronida
Ectoprocta
Platyhelminthes
Nemertea
Mollusca
Annelida
Rotifera
Echinodermata
Chordata
Ecdysozoa
Lophotrochozoa
Deuterostomia
"Radiata"
Bilateria
Eumetazoa
Metazoa
Ancestral colonial flagellate

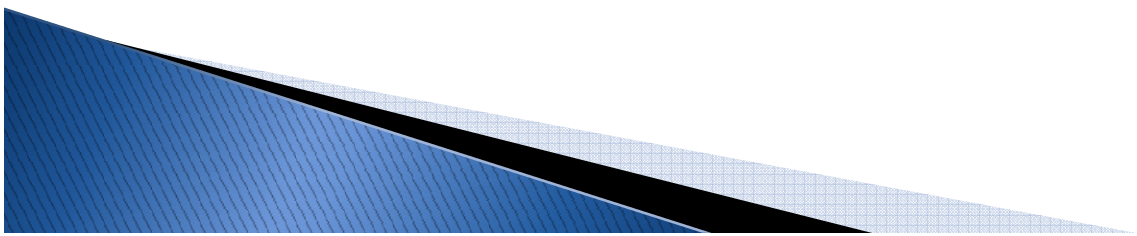
Key characteristics of phylum Chordata

1. Bilaterally symmetry
2. Complete digestive tract
3. Ventral, contractile blood vessel (heart)
4. The 4 major characteristics:

- (found at some time during their life)
  a. Notochord
  b. Pharyngeal slits or pouches
  c. Dorsal, hollow nerve cord
  d. Post-anal tail



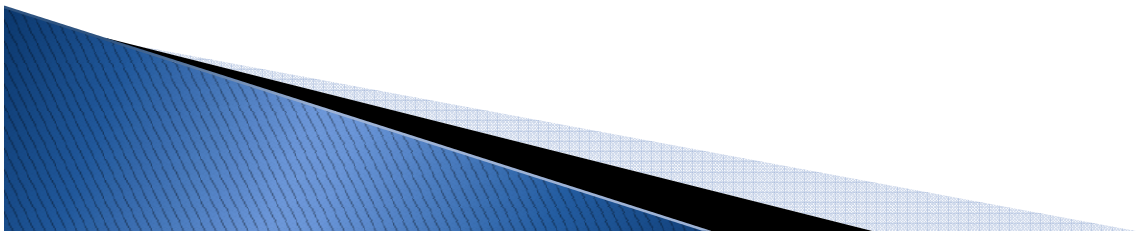
Do these characteristics apply to you?



Fun Facts

- 45,000 species

- Compare that to:
  - 20,000 species of platyhelminthes
  - 20,000 species of nematodes
  - 100,000 species of molluscs
  - 1 million species of arthropods

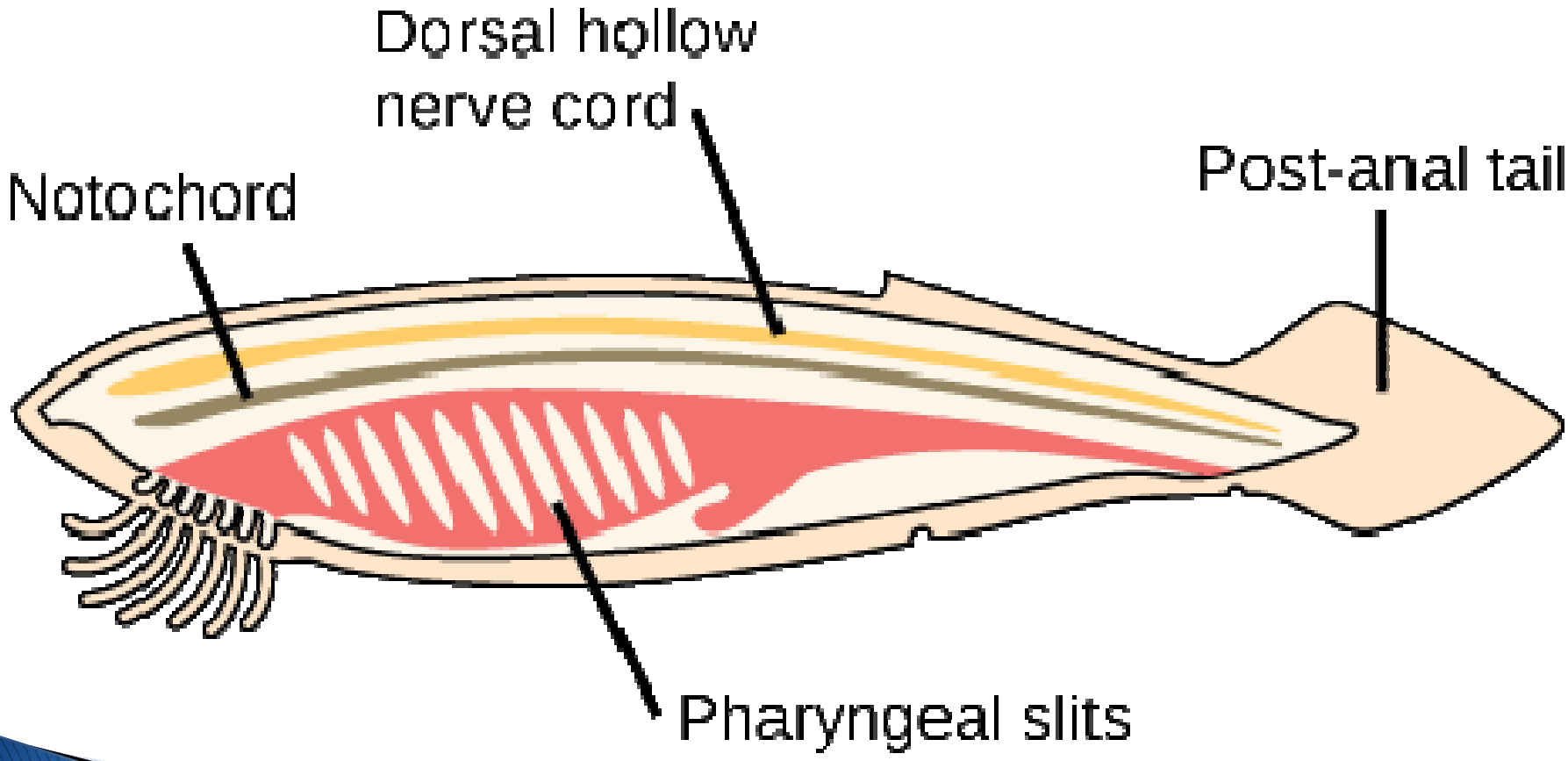


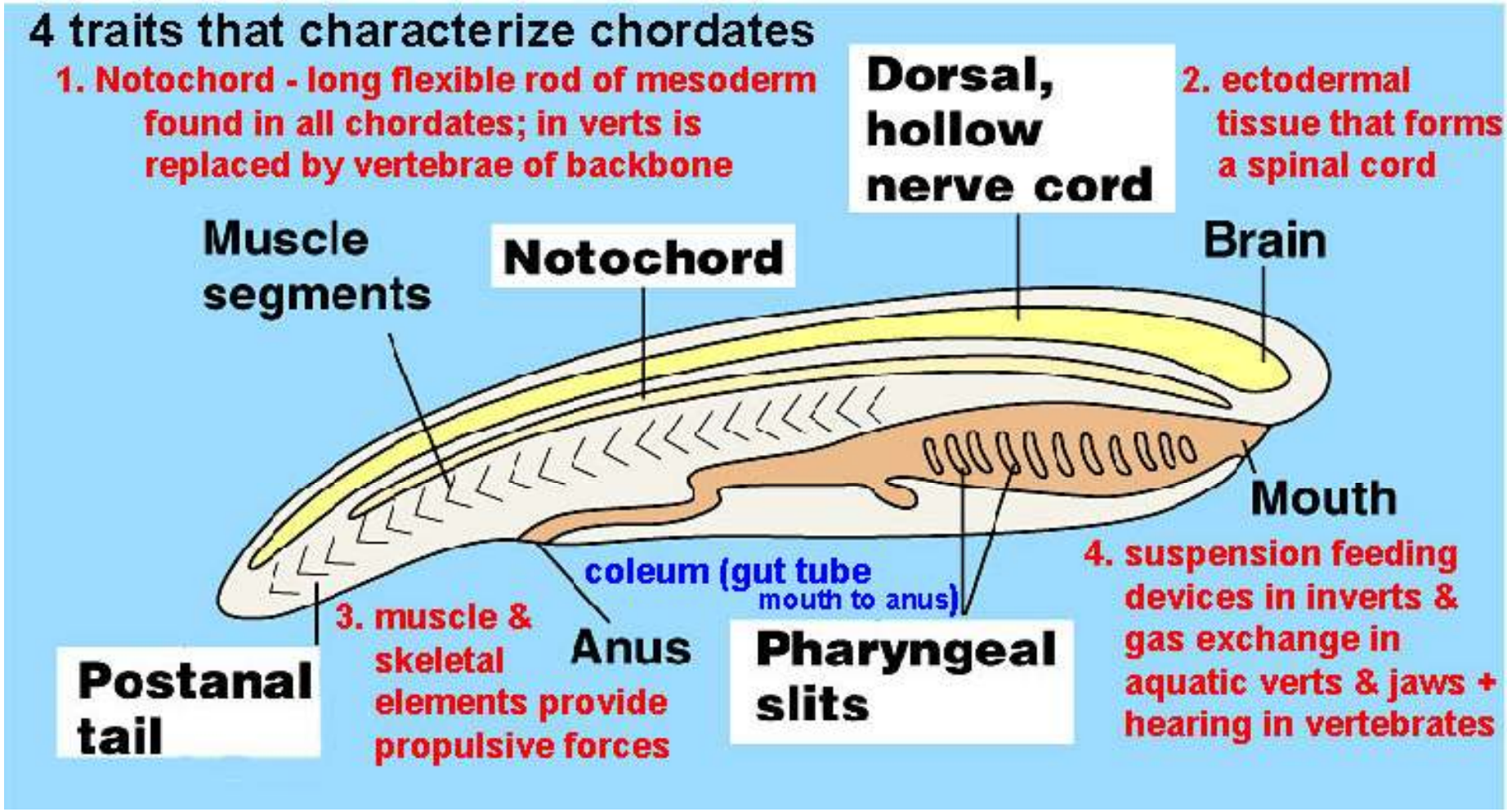
Most chordates are vertebrates

- But not all!
- Urochordata: Tunicates, like the Sea Squirt

- Cephalochordata: Lancelets

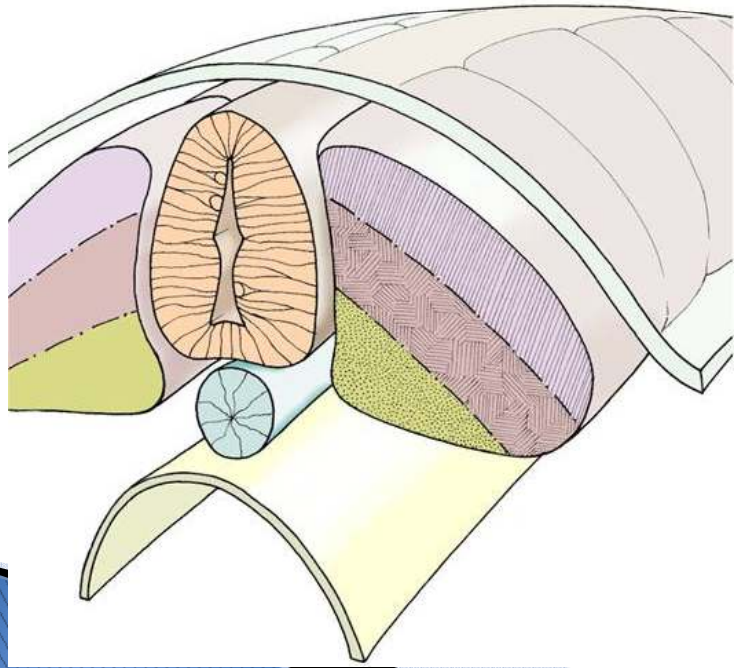
Chordate characteristisc

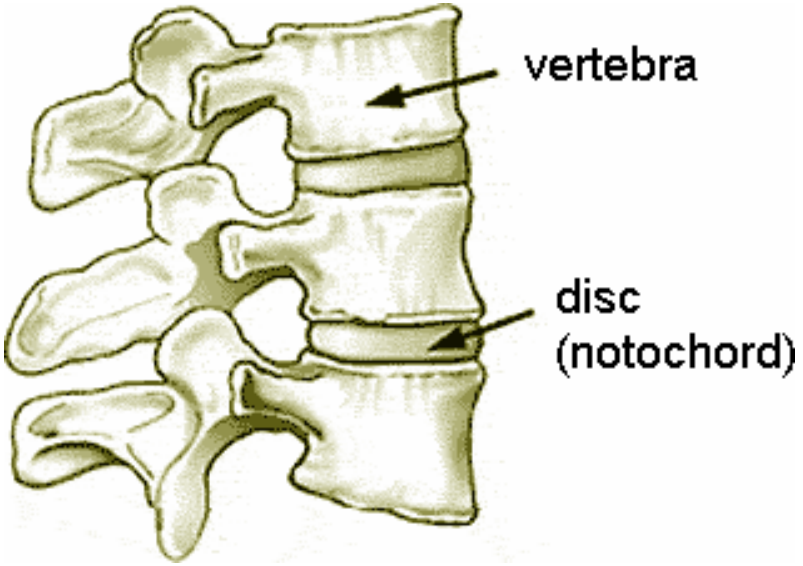



4 traits that characterize chordates
1. Notochord - long flexible rod of mesoderm found in all chordates; in verts is replaced by vertebrae of backbone
Dorsal, hollow nerve cord
2. ectodermal tissue that forms a spinal cord
Muscle segments
Notochord
Brain
Mouth
coleum (gut tube
mouth to anus)
4. suspension feeding devices in inverts & gas exchange in aquatic verts & jaws + hearing in vertebrates
3. muscle & skeletal elements provide propulsive forces
Anus
Pharyngeal slits
Postanal tail

Notochord

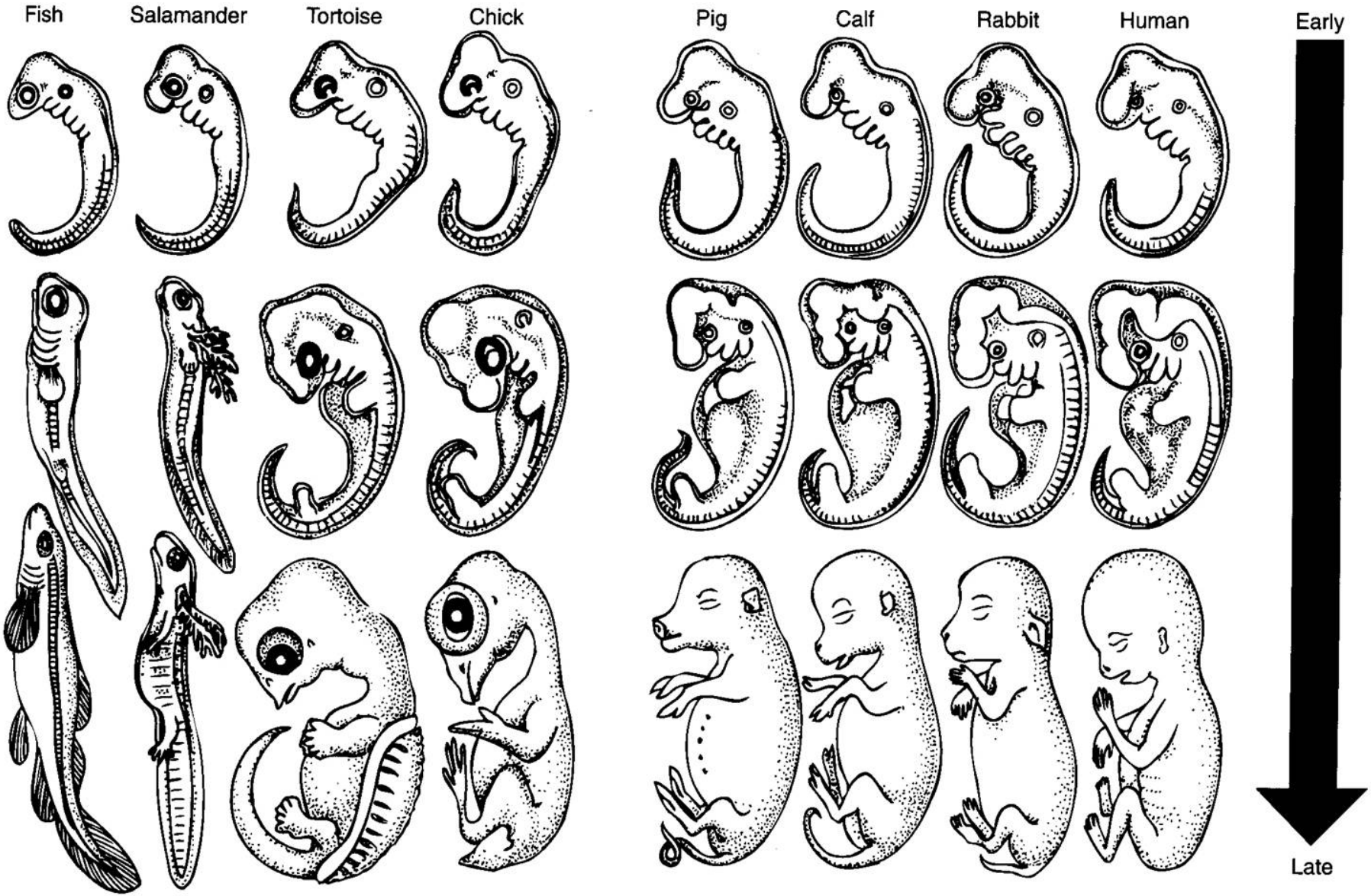
- Flexible, supportive rod that run through the body
  - Dorsal side
- Replaced by cartilage or bone in vertebrates





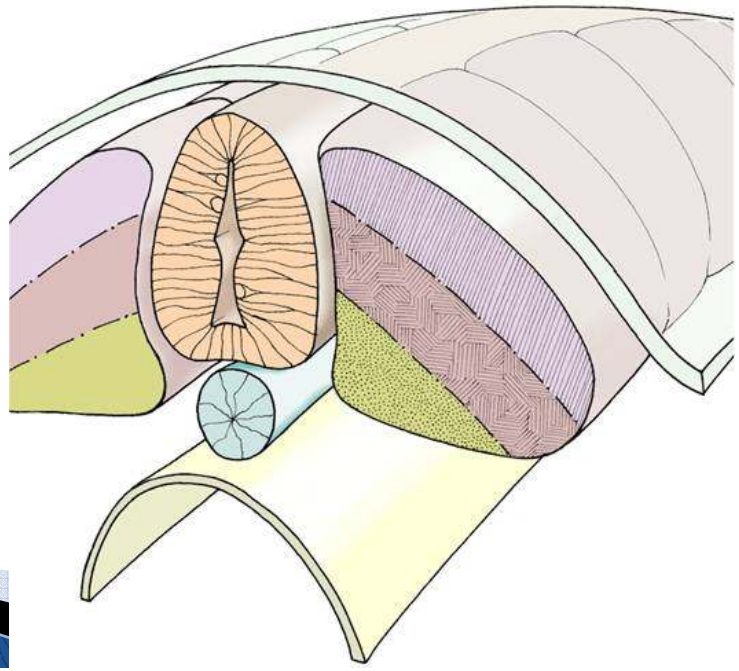
Pharyngeal Slits

- Series of openings between the digestive tract and the body
  - Develop into gills in some species (fish, amphibians)
- Terrestrial vertebrates only have them as embryos


Fish
Salamander
Tortoise
Chick
Pig
Calf
Rabbit
Human
Early
Late

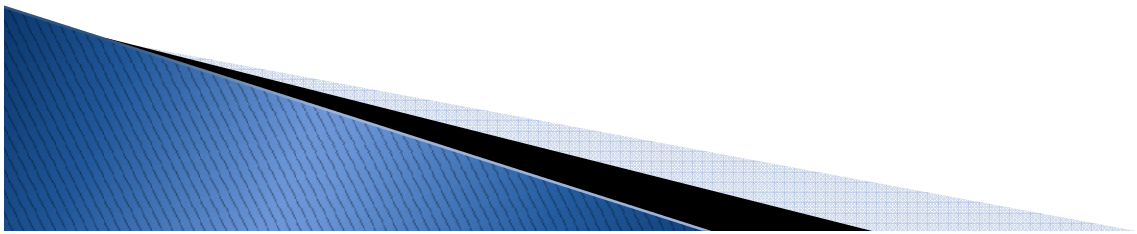
Hollow Nerve Cord

- Runs the length of the body
  - Dorsal to the notochord
- Anterior end expands to form brain
  - Adapted into central nervous system with branches
  - Major reason why vertebrates are successful!



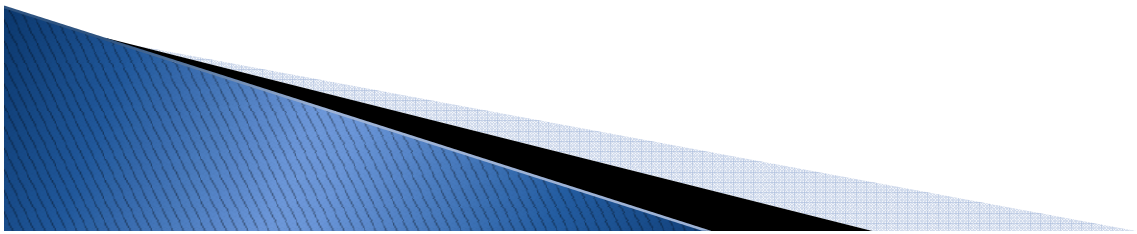
Post-anal Tail

- Extends past anal opening
- Supported by bone (vertebrae) and muscle



3 major groups

- Verterbrata
- Urochordata
- Cephalochordata

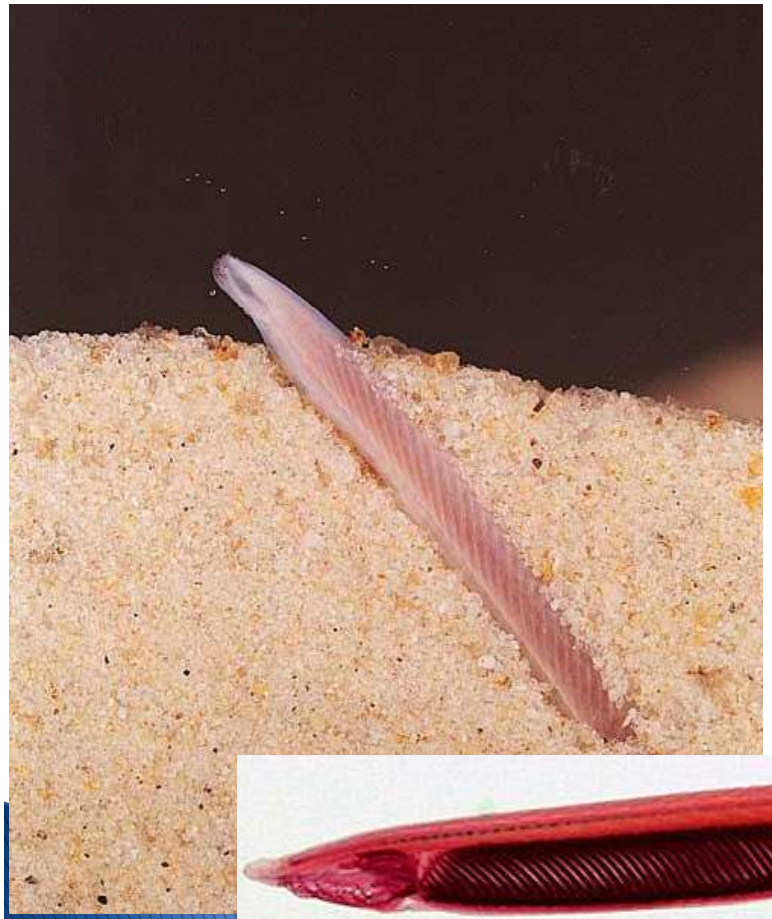


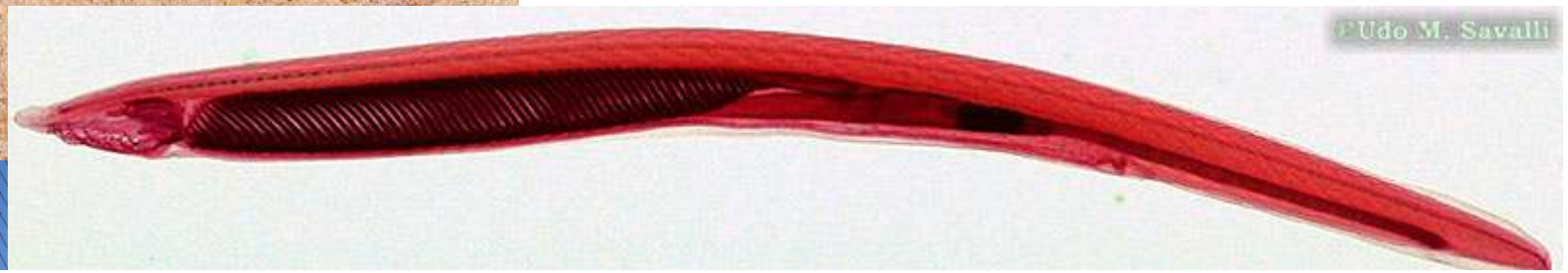
Subphylum Urochordata

- Sea Squirts (tunicates)

Subphylum Cephalochordata

- Lancelets

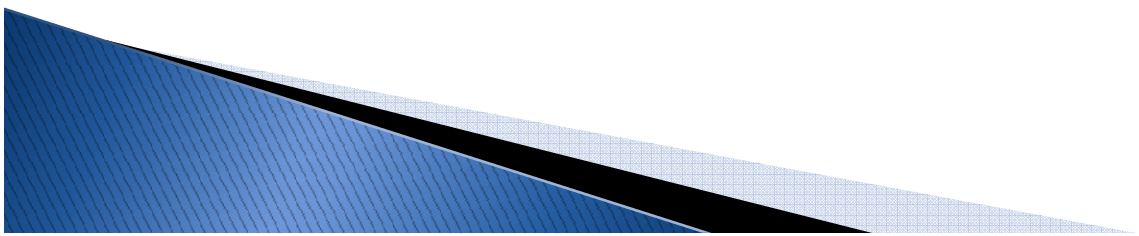




Now its your turn!

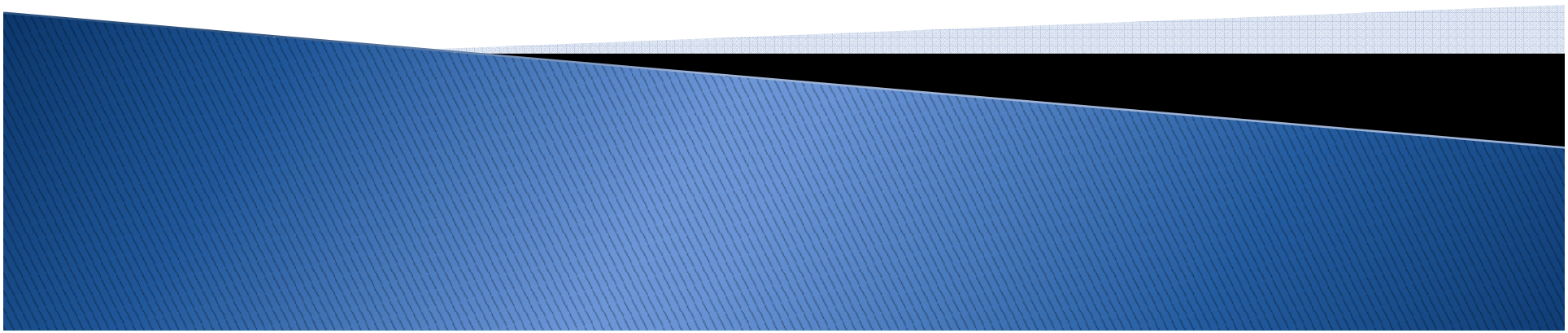
- Take the chromebooks and do an internet search.
- Find 5 facts about each of these groups and add them to your note sheet
  - Subphylum Urochordata: Sea Squirts (tunicates)
  - Subphylum Cephalochordata: Lancelets

- But first…finish the next couple slides of the notes. The sub will tell you when to get a computer



Subphylum Vertebrata

Vertebrate characteristics



You're probably pretty familiar with this group!

So, what makes it a vertebrate?

- Since it is a chordate, what does it have to have? Yep all these things.
  - Notochord
  - Pharyngeal slits or pouches
  - Dorsal tubular nerve cord
  - Post-anal tail

- What are the other characteristics of vertebrates?
  - Take a minute and think of a couple with your partner

Key characteristics that have made vertebrates successful:

1. Living endoskeleton
2. Modifications for respiration
3. Head with advanced nervous system and advanced sensory organs
4. Paired Limbs
5. Backbone
6. Cranium

We'll finish the rest later

- On to the chromebooks!