

Topics of Discussion

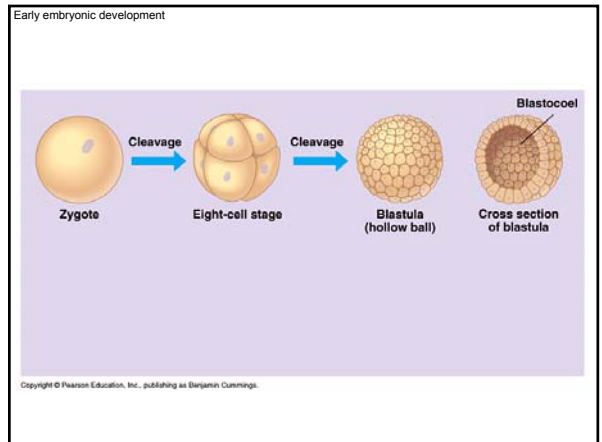
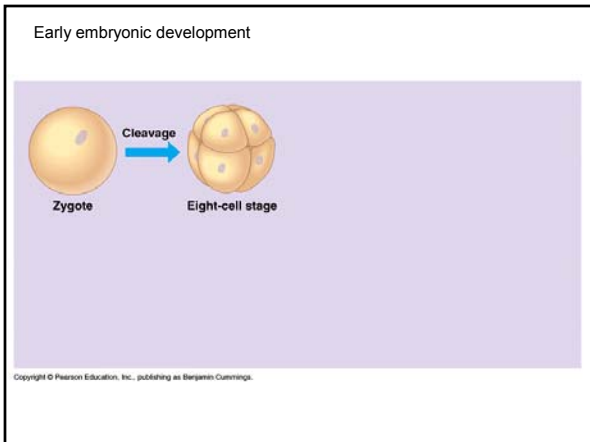
- What is an animal?
 - Structure
 - Nutrition
 - Life history
- Two Views of Animal Diversity
 - Phylogenetic trees
- Origins of Animal Diversity
 - Pyla
 - Classification

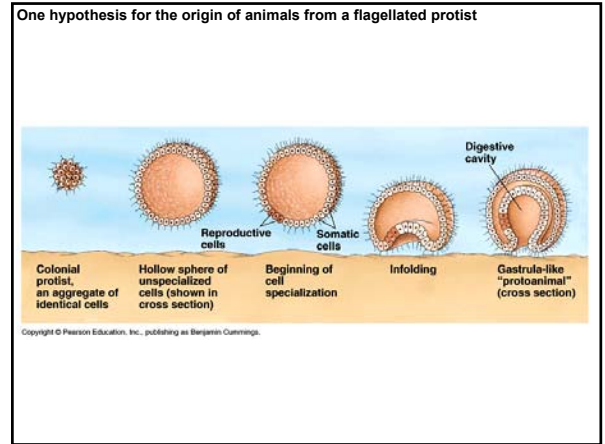
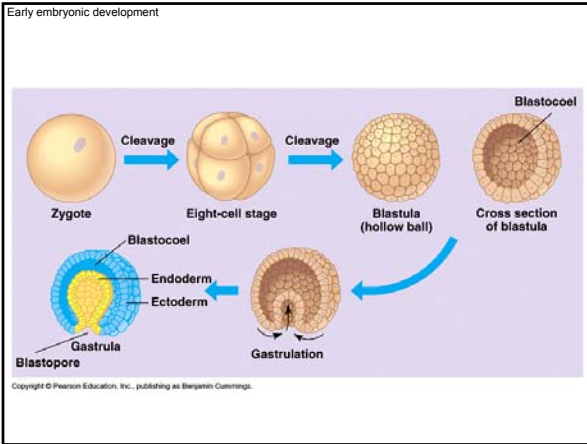
Animals

- multicellular
- eukaryotic
- heterotrophic
- ingestion feeder
- stores glycogen
- nervous system
- no cell walls
- muscle system
- sexual
- flagellated sperm
- dominant diploid

Most well known phyla kingdom Animalia

- [Mollusca](#)
- [Porifera](#)
- [Cnidaria](#)
- [Platyhelminthes](#)
- [Nematoda](#)
- [Annelida](#)
- [Arthropoda](#)
- [Echinodermata](#)
- [Chordata](#)
- There are more than 35 phyla in all
- These nine comprise bulk of kingdom



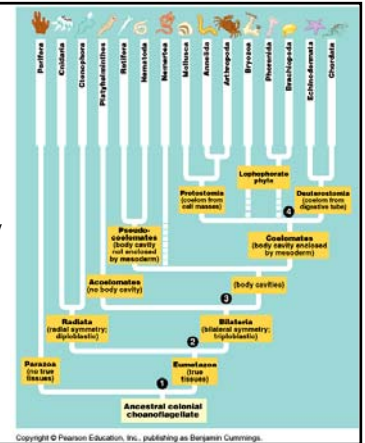


Overview of Animal Diversity and Phylogeny

- Diversified during Precambrian and Cambrian periods
- Monophyletic
- Parazoans—first branch, lack true tissues
- Radiata and bilateria two major branches of Eumetazoa
- Evolution of body cavities
- Protostomes and deuterostomes

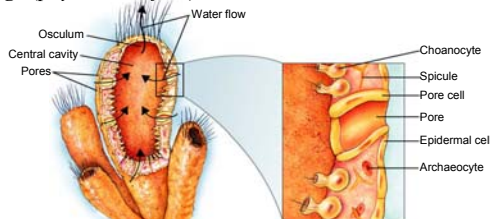
A traditional view of animal diversity based on body-plan grades

Dashed lines: relationships unresolved based on anatomy and embryology



Parazoa- Eumetazoa Dichotomy

Sponge (phylum Porifera)



Simple body plan

•Lack true tissues

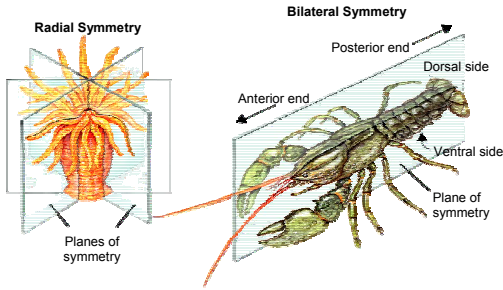
•Unique development and structural simplicity which separates them from the rest of the animal phyla

Eumetazoa

Two major branches:

- **Radiata**
 - radial symmetry
 - top and bottom
 - no front, back, or sides,
 - diploblastic larva
- **Bilateria**
 - bilateral symmetry
 - Triploblastic
 - cephalization

Body Symmetry



Importance of Coelom

Acoelomates

- Triploblastic: solid body
- no body cavity between digestive tract & outer body wall
 - Platyhelminthes

Pseudocoelomates

- fluid filled body cavity, partially lined with mesoderm – tube within a tube
 - Nematoda
 - Rotifera

Coelomates

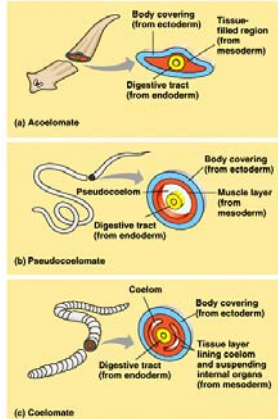
- True coelom-fluid filled, completely lined with mesoderm
 - Annelida

Coelom

- body cavity that protects internal organs

Body plans of the bilateria

- Acoelomate
- Pseudocoelomate
- Coelomate



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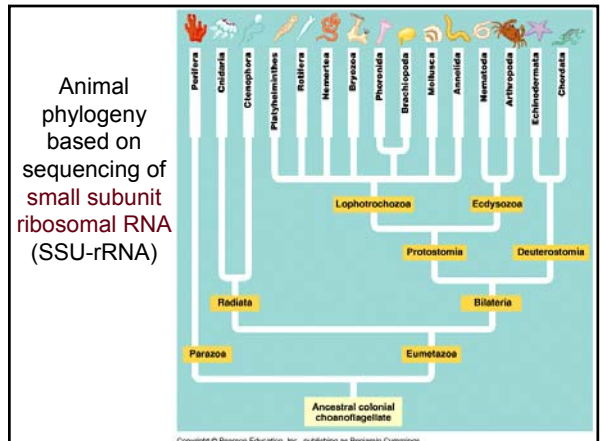
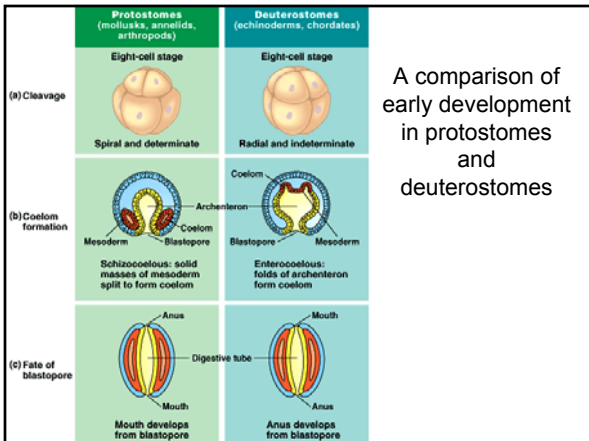
Protostomes and Deuterostomes *coelomates*

Protostomes:

- Mollusks, Annelids, Arthropods
- Spiral cleavage
- Determinate cleavage
- Blastopore forms the mouth

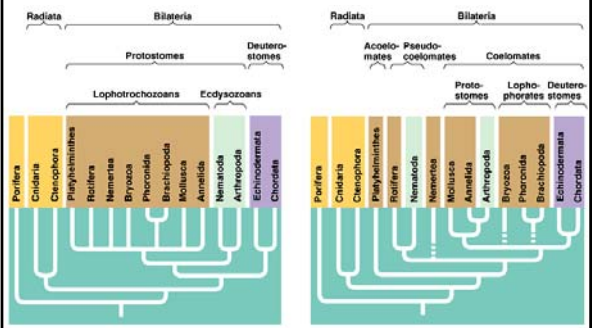
Deuterostomes:

- Echinoderms and Chordates
- Radial cleavage
- Indeterminate cleavage
- Blastopore forms the anus



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Comparing the molecular based and grade-based trees of animal phylogeny



(a) Tree based on molecular comparisons
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(b) Tree based on body-plan grades
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A sample of some of the animals that evolved during the Cambrian explosion



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