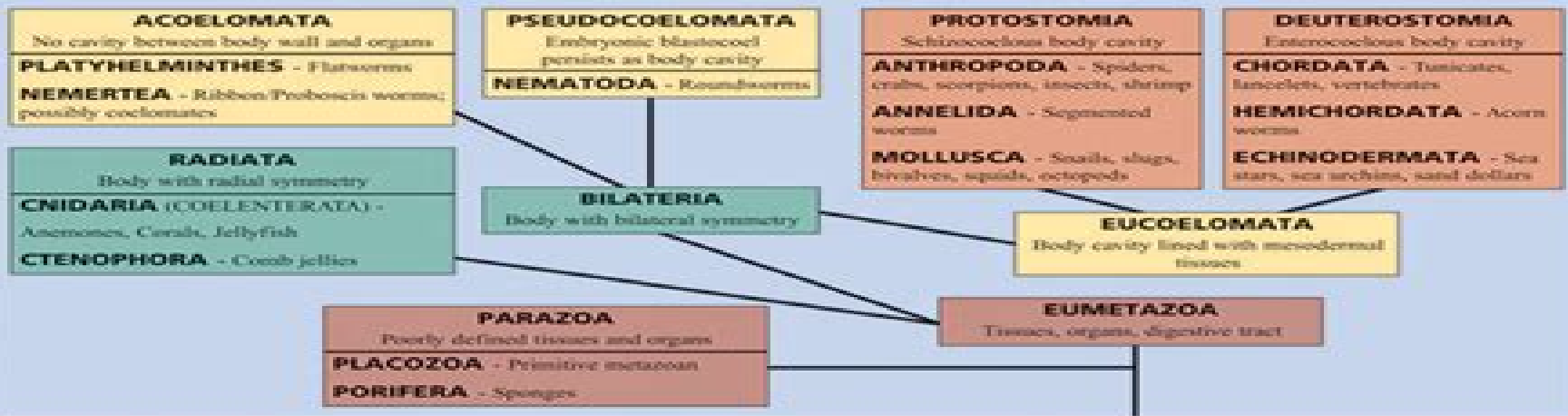


# ZOOLOGY

parazoa

What is an animal? A multicellular, eukaryotic, heterotrophic organism lacking cell walls

## CLASSIFICATION OF THE METAZOAN KINGDOM



## METAZOAN CHARACTERISTICS

- Advantages
  - Larger size
  - Increased mobility
  - Internal locomotion
  - Relative independence from environment

### Symmetry

- Radial - Circular arrangement with numerous planes creating equal halves; no front/back or left/right sides; possess top/bottom or oral/aboral surfaces (1)
  - Sessile or pelagic forms
- Bilateral - Possess left/right sides (2)
  - "Cephalization" or concentration of sensory structures in the head
  - Unidirectional, active movement using head for orientation

#### 1 RADIAL



#### 2 BILATERAL



### Embryology

- Zygote → 2 cell → 4 cell → 8 cell → 16 cell → Morula (solid ball of cells) → Blastula w/ blastocoel chamber → Gastrula w/ blastopore and archenteron (embryonic gut) (3)



- Three germ layers (from which all tissues develop) in place during gastrula phase: **Ectoderm, Mesoderm, Endoderm**
- Diploblastic - Organisms produce only ectoderm and endoderm
- Triploblastic - organisms produce all three layers

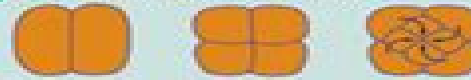
### 3. Protostome/deuterostome classification

#### a. Cleavage patterns

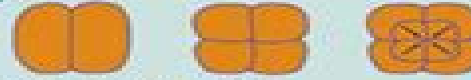
**Spiral cleavage** - New cells placed at juncture between previous cells; protostome feature (4)

**Radial cleavage** - New cells placed directly beside or on top of previous cells; deuterostome feature (5)

#### 4 SPIRAL CLEAVAGE (TOP VIEW)



#### 5 RADIAL CLEAVAGE (TOP VIEW)



- Developmental fate of cells
  - Determinate** - Fate of cells determined early; separated early cells incapable of developing into entire organism; protostome feature
  - Indeterminate** - Fate of cells determined relatively late; separated early cells can develop into entire organism; allows for "twinning" or genetically identical individuals; deuterostome feature

- Coelem formation - Body cavity lined by mesodermal tissues
  - Schizocoely** - Derived from split in mesoderm; protostome feature (6)
  - Enterocoely** - Derived from outgrowth of archenteron; deuterostome feature (7)



- Blastopore fate
  - Mouth**: a second opening in embryo forms anus; protostome feature
  - Anus**: a second opening in embryo forms mouth; deuterostome feature

#### c. Body plans

- Acoelomates** - No cavity between body wall and organs (1a)
- Pseudocoelomates** - Embryonic blastocoel persists as body cavity (1b)
- Coelemates** - Body cavity lined with mesodermal tissues (1c)

#### ACOELOMATES



#### PSEUDOCOELOMATES



#### COELOMATES



# Zoology Study Guide

**Richard A. Boolootian**



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