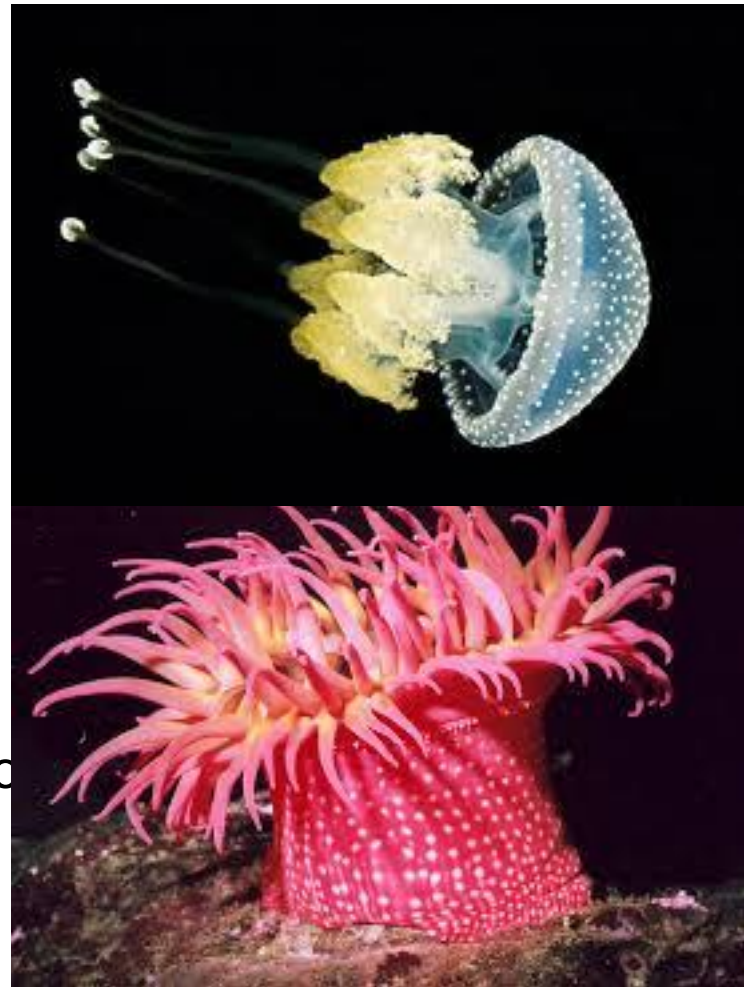


Cnidaria

Jellies, Anemones, Coral and More!

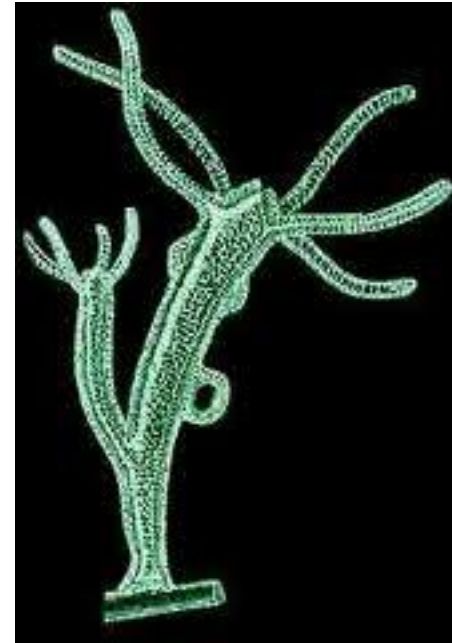
+ What is a Cnidarian?

- Invertebrate
- 9000 species of jellyfishes, corals, sea anemones, hydras
- Mostly marine animals
- Radially symmetrical
- One body opening
- Two layers of cells organized into tissues with specific functions: ectoderm and endoderm



+ Origin of Porifera and Cnidarians

- Porifera fossil evidence:
Precambrian (650 mya)
- Evolved from a group of flagellate protists that resemble the collar cells of sponges
- Cnidarians fossil evidence:
Precambrian (630 mya)
- The larval form of cnidarians resembles protists





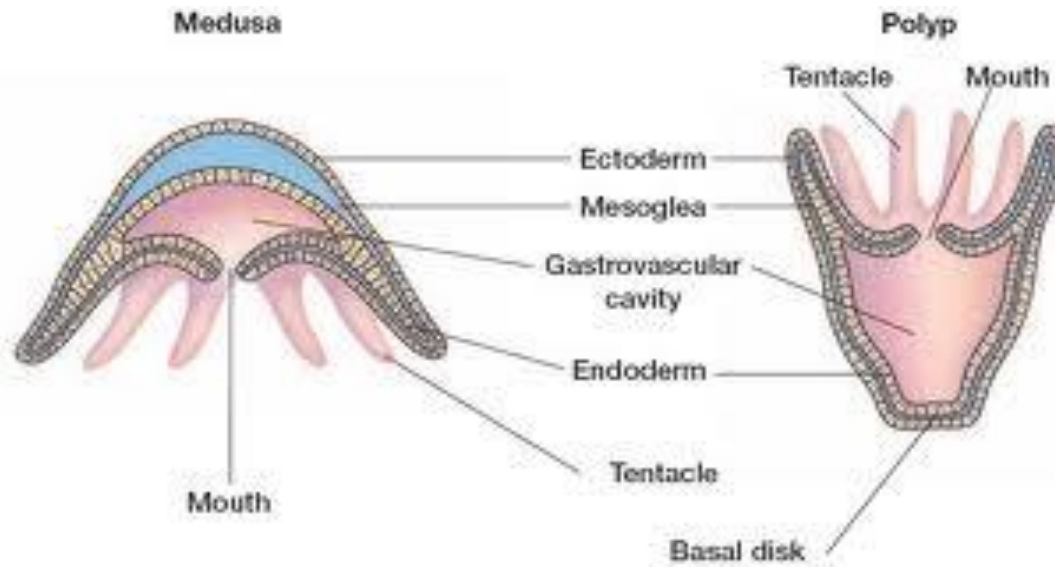
Polyp or Medusa

■ Medusa:

- The free-swimming motile form of a cnidarian
- Umbrella-shaped floating body
- Mouth is on the underside
- Ex. Jellyfishes
- Its mouth is surrounded by tentacles
- Ex. Sea anemones, corals, hydras

■ Polyp:

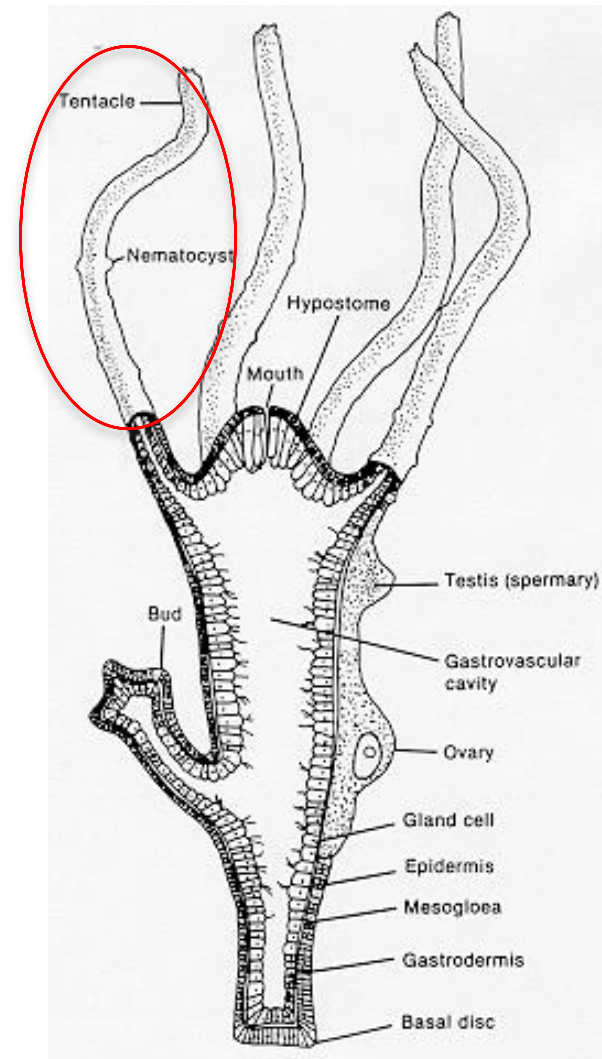
- The sessile form of a cnidarian



+ Body Structure

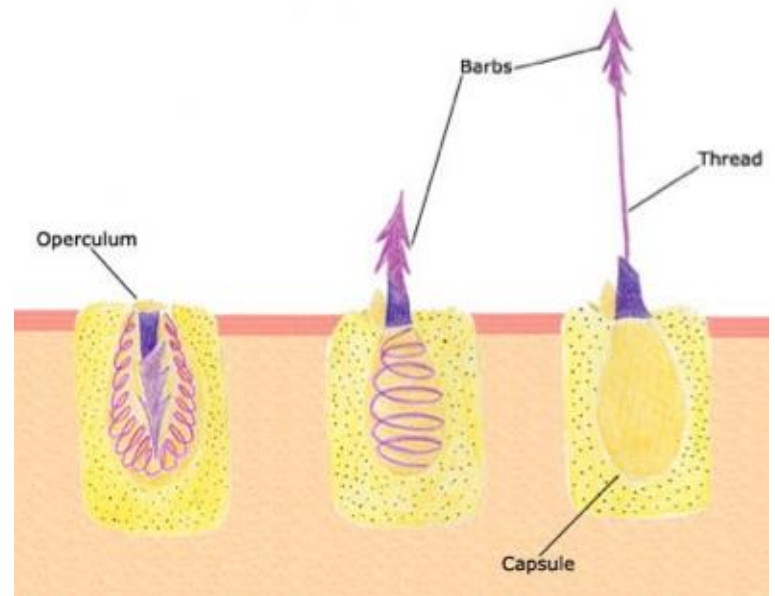
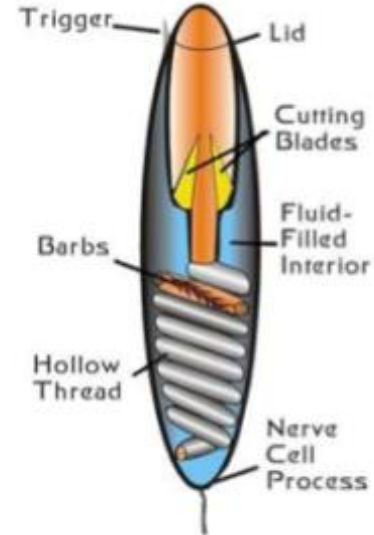
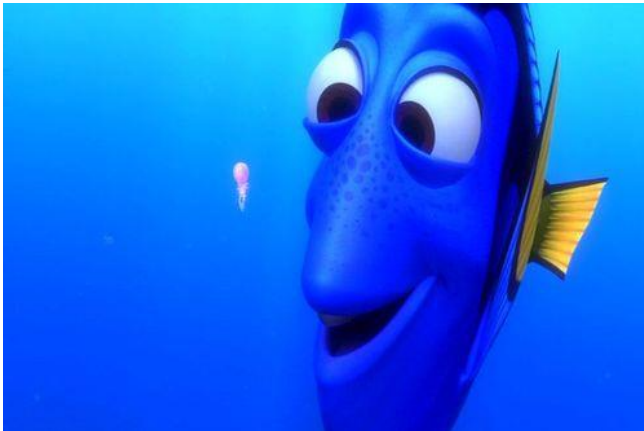
■ Tentacles

- A ring of flexible, tube-like structures surround the mouth
- Vary in length
- Used to capture food
- Cnidae



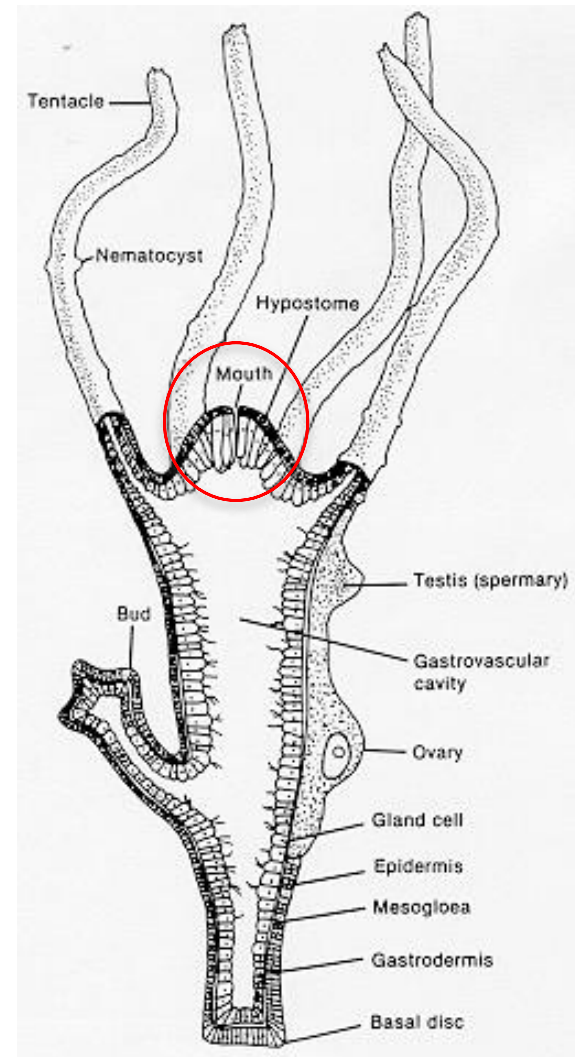
+ Body Structure

- Cnidae:
 - Stinging cells that contain nematocysts
 - Located at the tips of the tentacles
 - Stinging cells discharge nematocysts that capture or paralyze prey
 - May contain toxic substances
 - Discharged in response to touch or chemicals in the environment



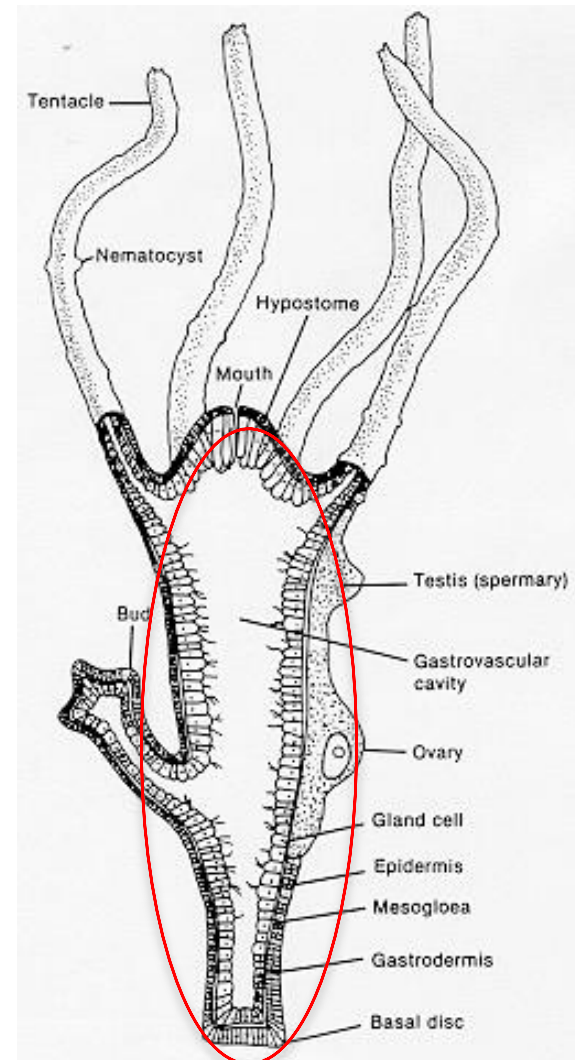
+ Body Structure

- Mouth
 - Simple gut
 - Single opening for incoming and outgoing particles
 - Tentacles bring food into the mouth for digestion



+ Body Structure

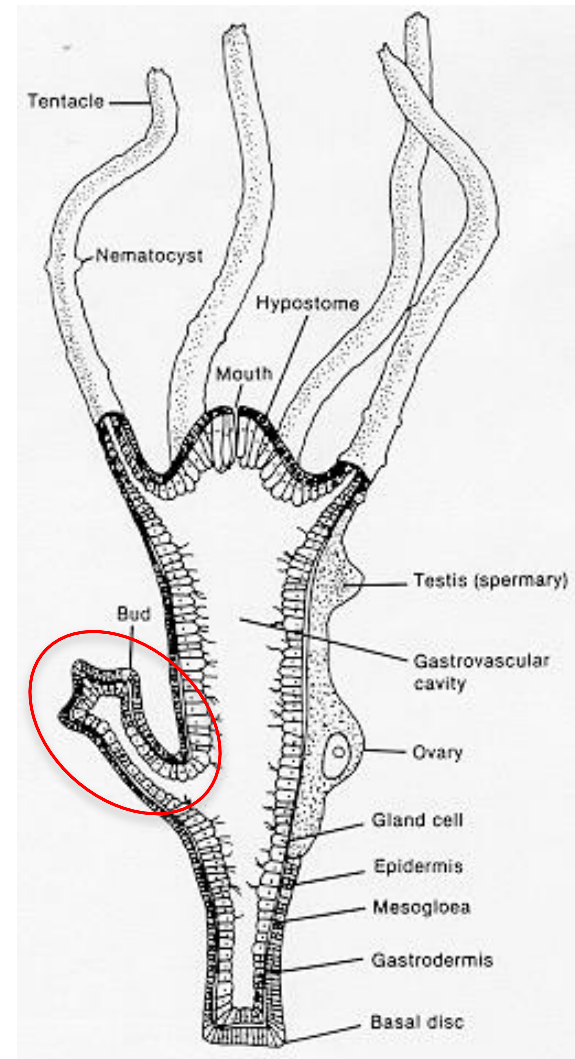
- Gastrovascular Cavity
 - Endoderm that is adapted for digestion, called the gastrodermis
 - Release enzymes
 - Undigested materials are ejected back through the mouth



+ Body Structure

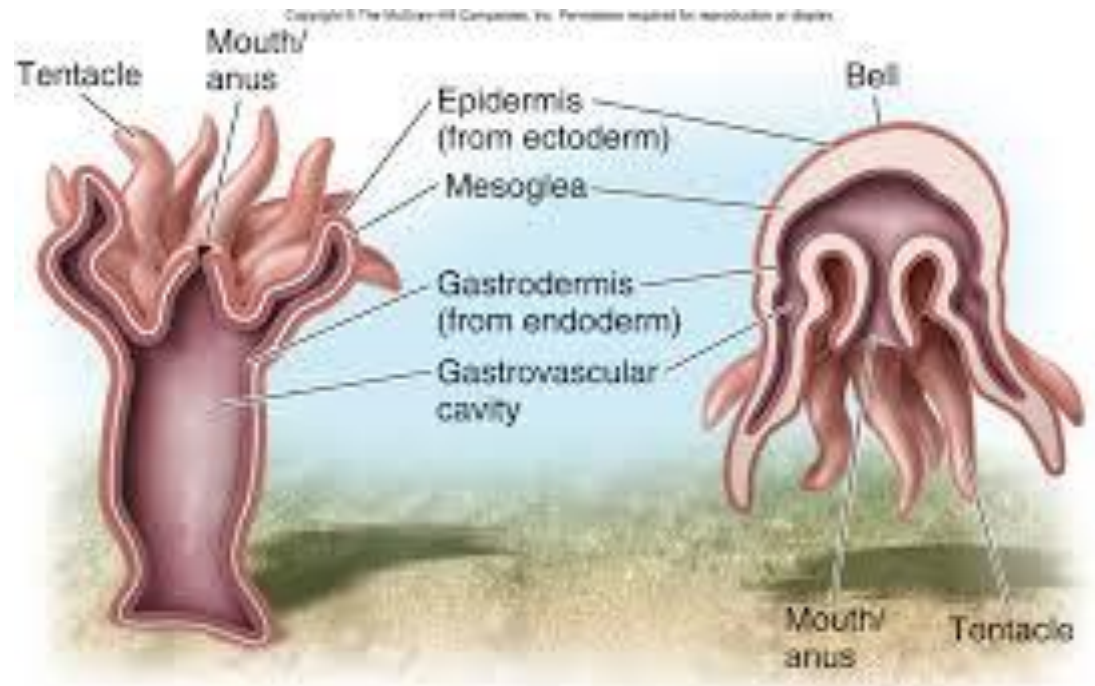
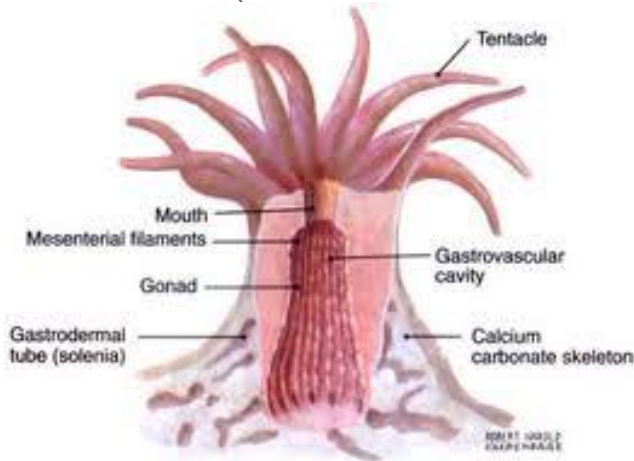
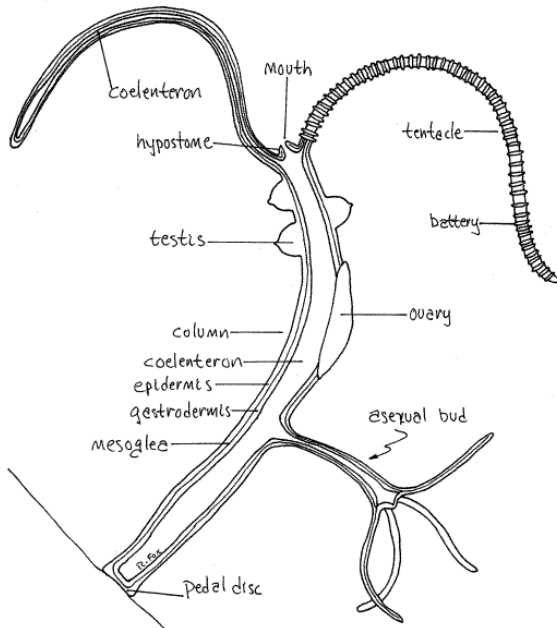
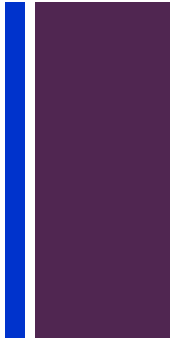
■ Bud

- All cnidarians can reproduce both sexually and asexually
- A polyp reproduces asexually by budding
- A bud is a clone of its parent
- Genetically identical





Comparing Body Structures of Cnidarians



(a) Polyp

(b) Medusa

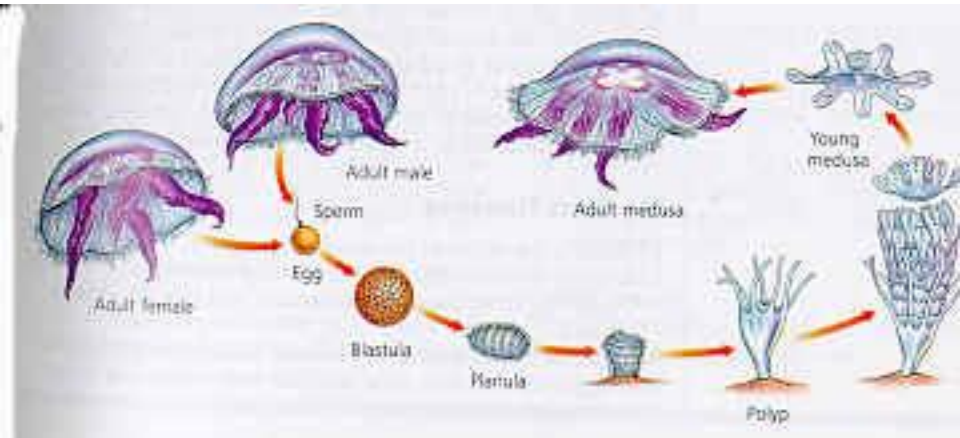
+ Life Functions

- Respiration:
 - Since the cnidarian body is only two cell layers thin, every cell is exposed to water
 - Oxygen dissolved in water is able to diffuse directly into body cells
- Excretion:
 - Carbon dioxide and other wastes can move out a cnidarians' body cells directly into the surrounding water

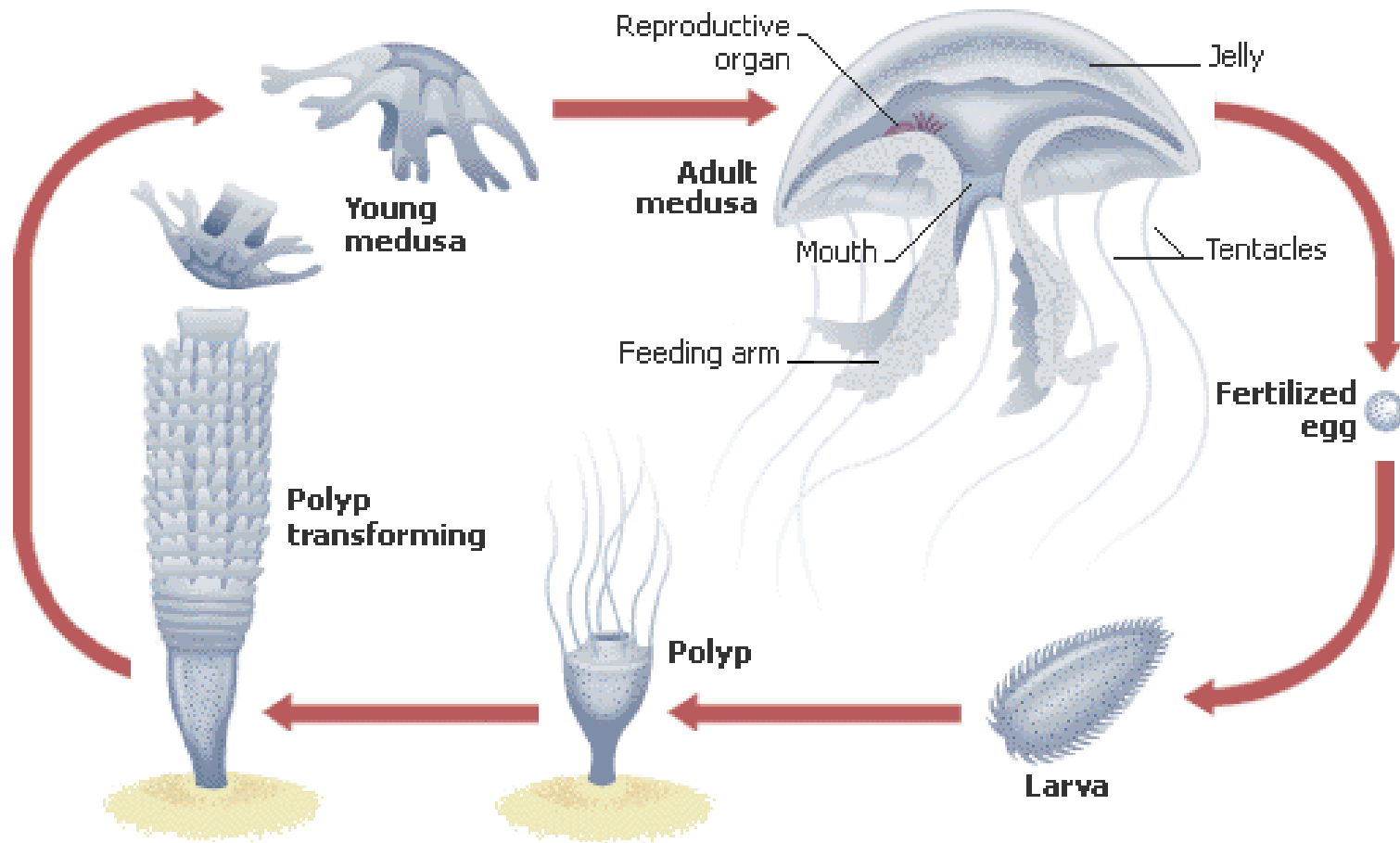


+ Reproduction

- Sexual: egg and sperm
 - Sexual reproduction usually occurs in the medusa stage
- Asexual: budding
 - Asexual reproduction can occur in either the polyp or medusa stage

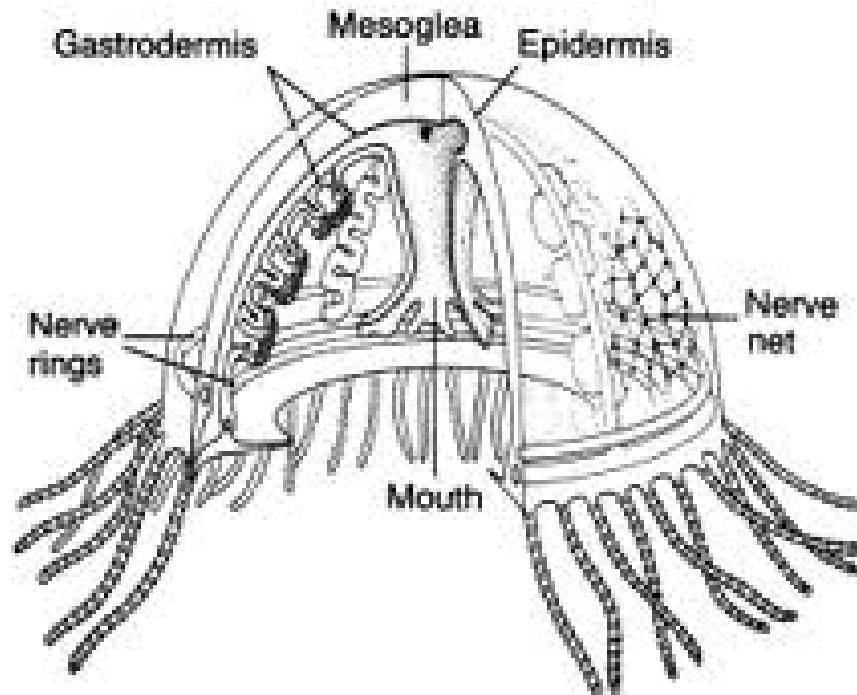


+ Life Cycle



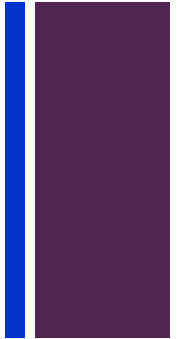
+ Nervous System

- Simple nervous system:
 - No brain
 - Nerve net that conducts impulses to and from all parts of the body
 - Cause muscle-like contraction in the two cell layers (i.e. tentacles)



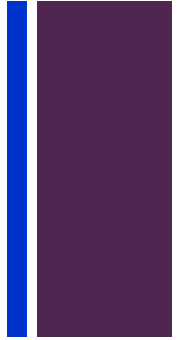
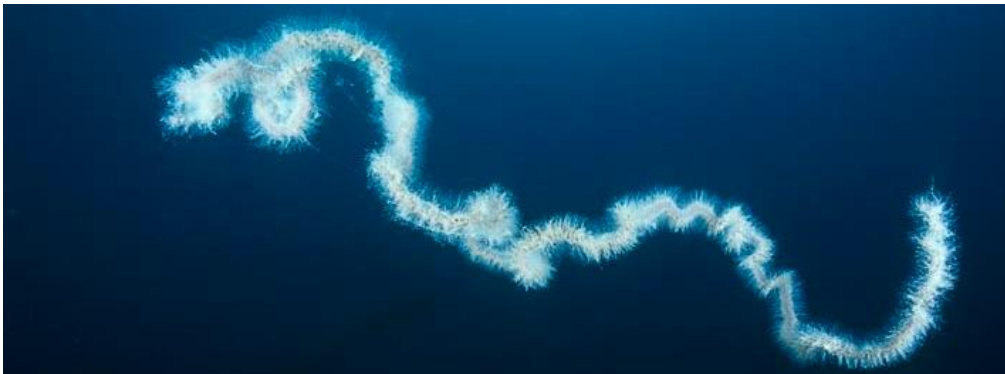
+ Class Hydrozoa

- Open gastrovascular cavity; no internal divisions
- 1. Hydroids
 - Ex. Hydra
 - Branching polyp colonies formed by budding
 - Found attached to pilings and shells



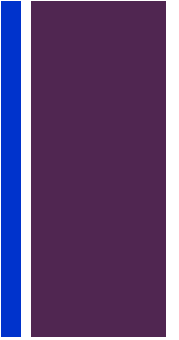
+ Class Hydrozoa

2. Siphonophores
 - Ex. Portuguese man-of-war (*Physalia*)
 - Include floating colonies that drift on the ocean surface
 - Each individual has a function that helps the entire colony
 - One forms a large, blue, gas-filled float
 - Others are responsible for reproduction, feeding



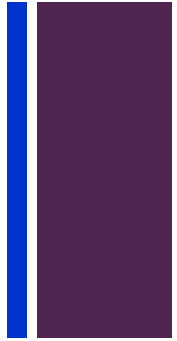
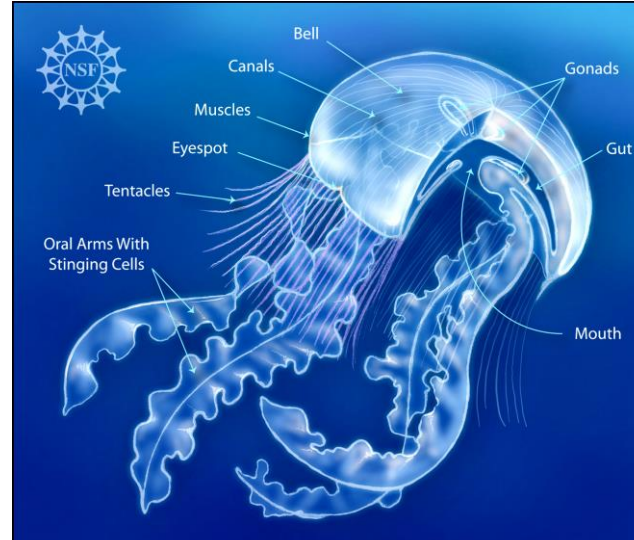


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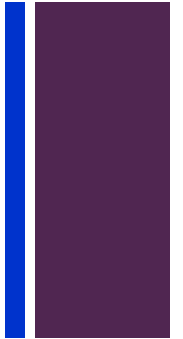
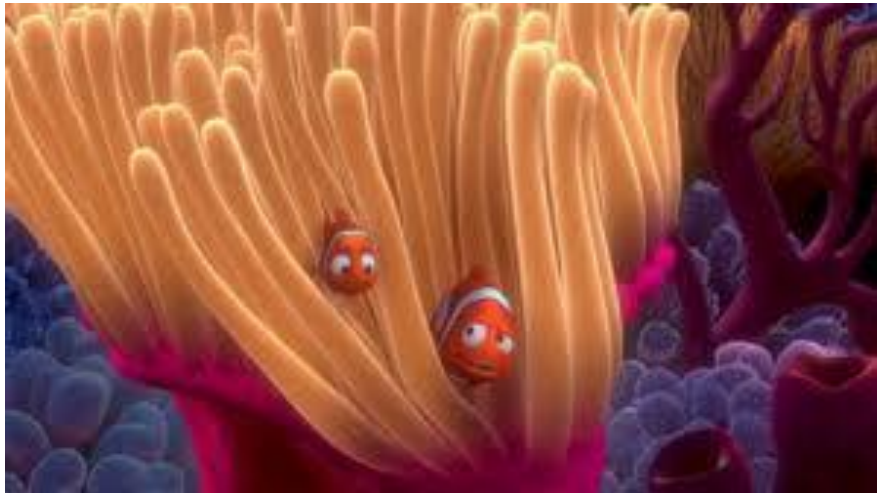
+ Class Scyphozoa

- Gastrovascular cavity has four internal divisions
- Locomotion: muscle-like cells in the outer cell layer that contracts the bell to propel the animal through the water
- Ex. Jellyfishes
- Can be found everywhere in the oceans (artic to tropical water)
- Have been seen at depths of more than 3000 meters



+ Class Anthozoa

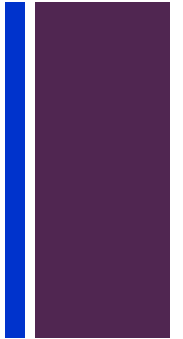
- Only polyp form
- Have many incomplete divisions on the gastrovascular cavities
 - Ex. Sea anemones (thought to live for centuries), corals (colonies or polyps)





Class Anthozoa

- Corals secrete protective calcium carbonate shelters around their soft bodies
 - Provide food and shelter for many other marine species
 - When a coral polyp dies, its shelter is left behind (adds to coral reef's structure)
- A coral polyp extends its tentacles to feed
- Symbiotic relationship with zooxanthellae (photosynthetic protist)
 - Zooxanthellae produce oxygen and food that the coral use, while using carbon dioxide and waste materials produced by the corals
 - Zooxanthellae are responsible for the bright colours found in coral reefs



+ Class Cubozoa

- Ex. Box jellyfish
- Square in shape; four evenly spaced tentacles
- Well-developed eye spots for sensing light

