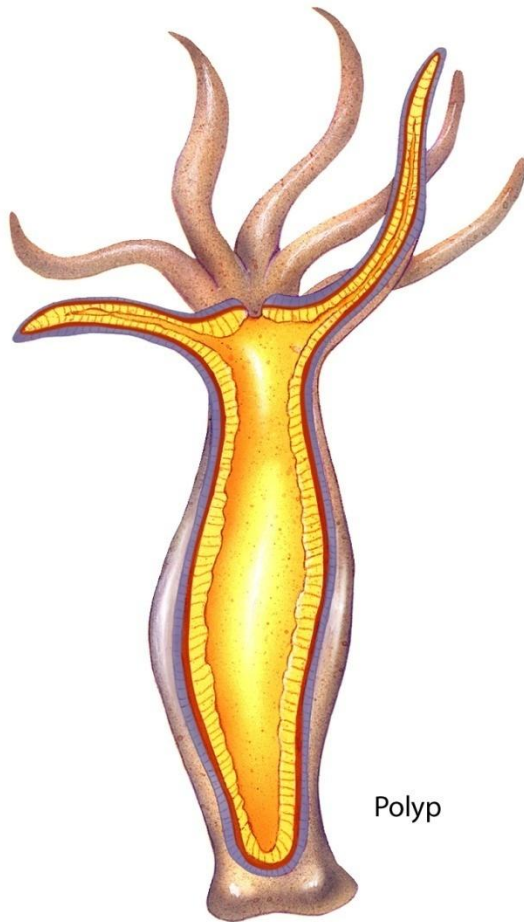
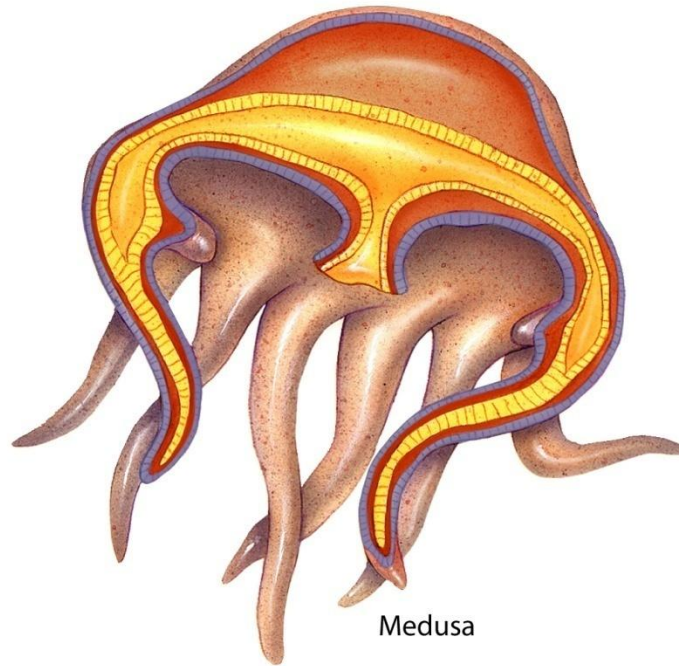


# 26-3 Cnidarians



Polyp



Medusa



**What is a cnidarian?**

# What Is a Cnidarian?

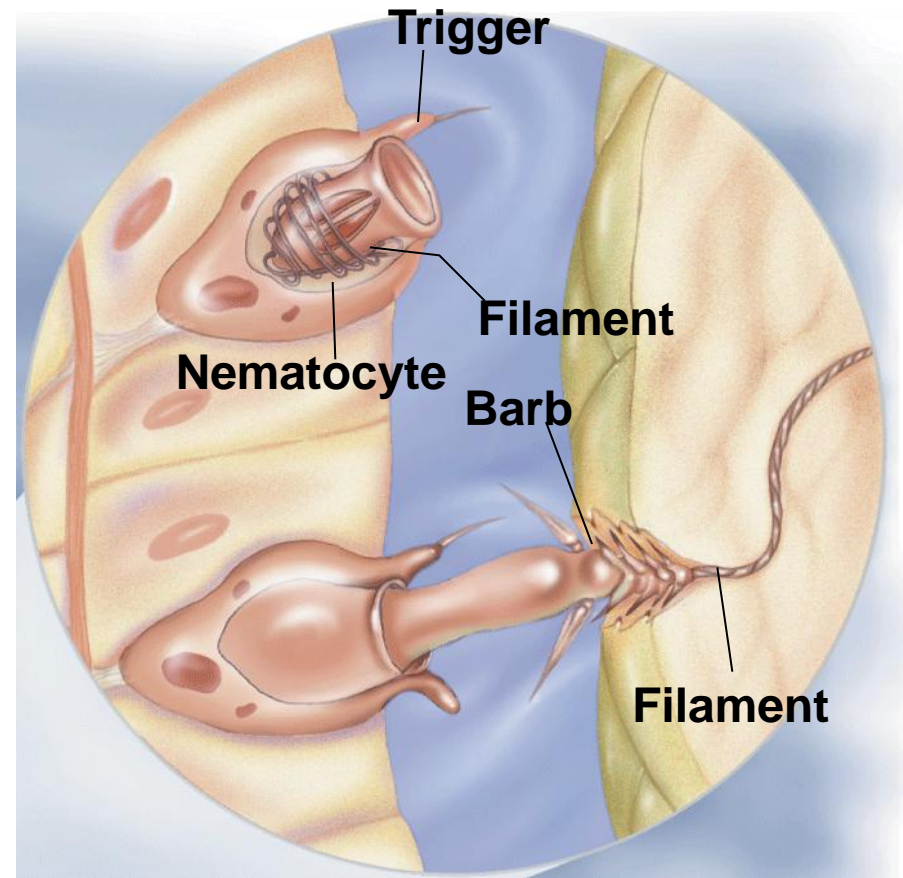


**Cnidarians are soft-bodied, carnivorous animals that have stinging tentacles arranged in circles around their mouths. They are the simplest animals to have body symmetry and specialized tissues.**

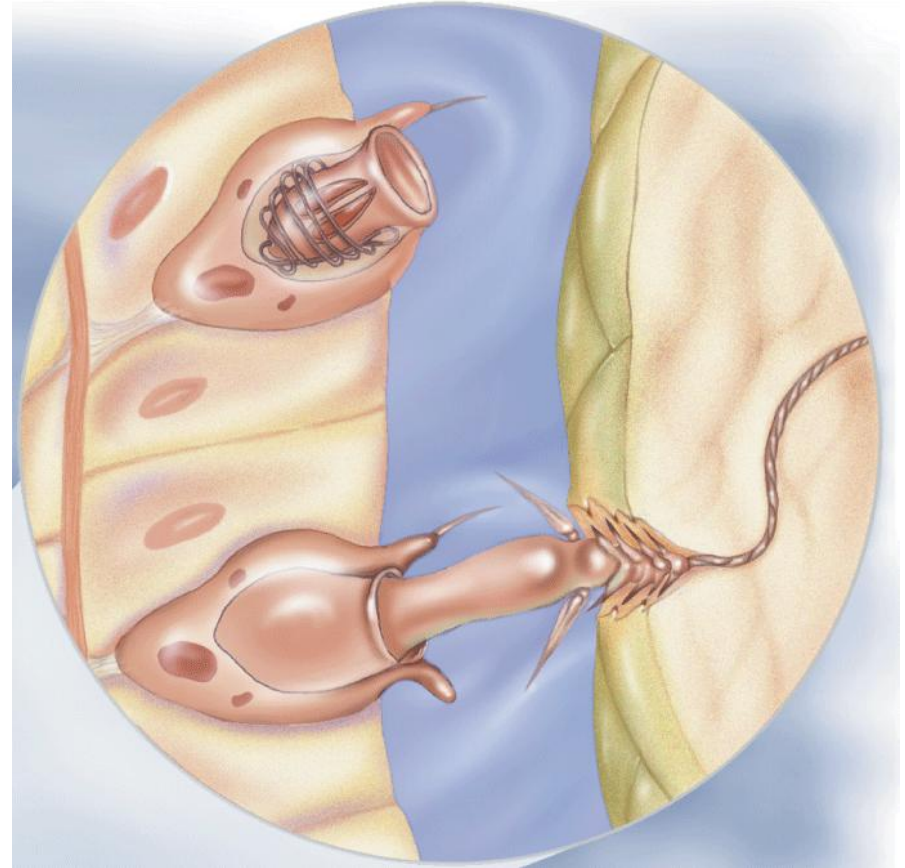
Cnidarians get their name from the **cnidocytes**, or **stinging cells**, located along their tentacles.

Cnidarians use cnidocytes **for defense and to capture prey.**

Within each cnidocyte is a **nematocyst**—a poison-filled, stinging structure that contains a tightly coiled dart.



When a shrimp or small fish brushes up against the tentacles, thousands of nematocysts explode, releasing enough poison to paralyze or kill the prey.







**What two body plans exist in the cnidarian life cycle?**

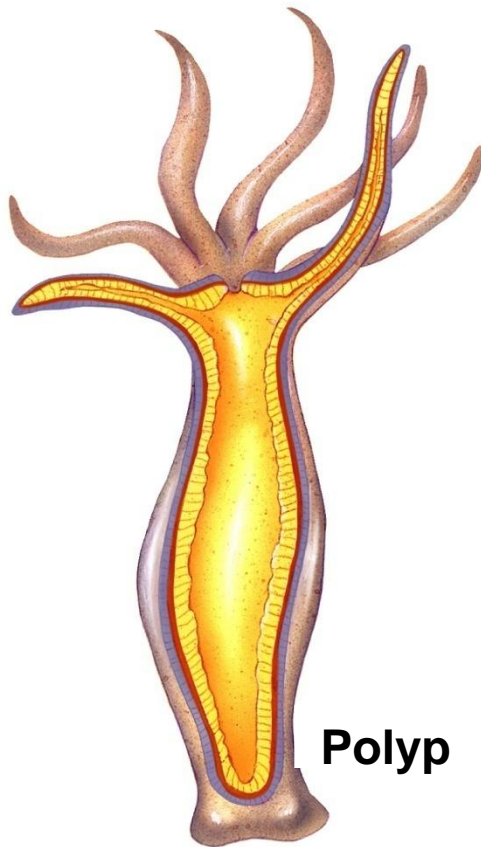
## Form and Function in Cnidarians

Cnidarians are **radially symmetrical**. They have a **central mouth surrounded by numerous tentacles** that extend outward from the body.

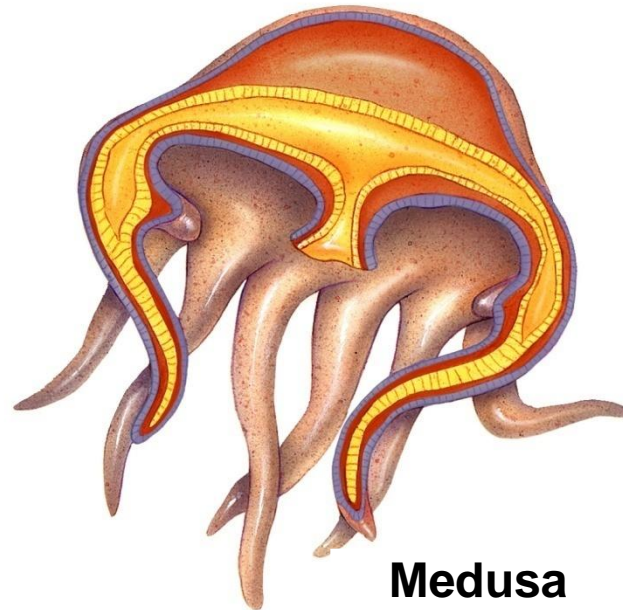




Cnidarians typically have a life cycle that includes **two different-looking stages: a polyp and a medusa.**



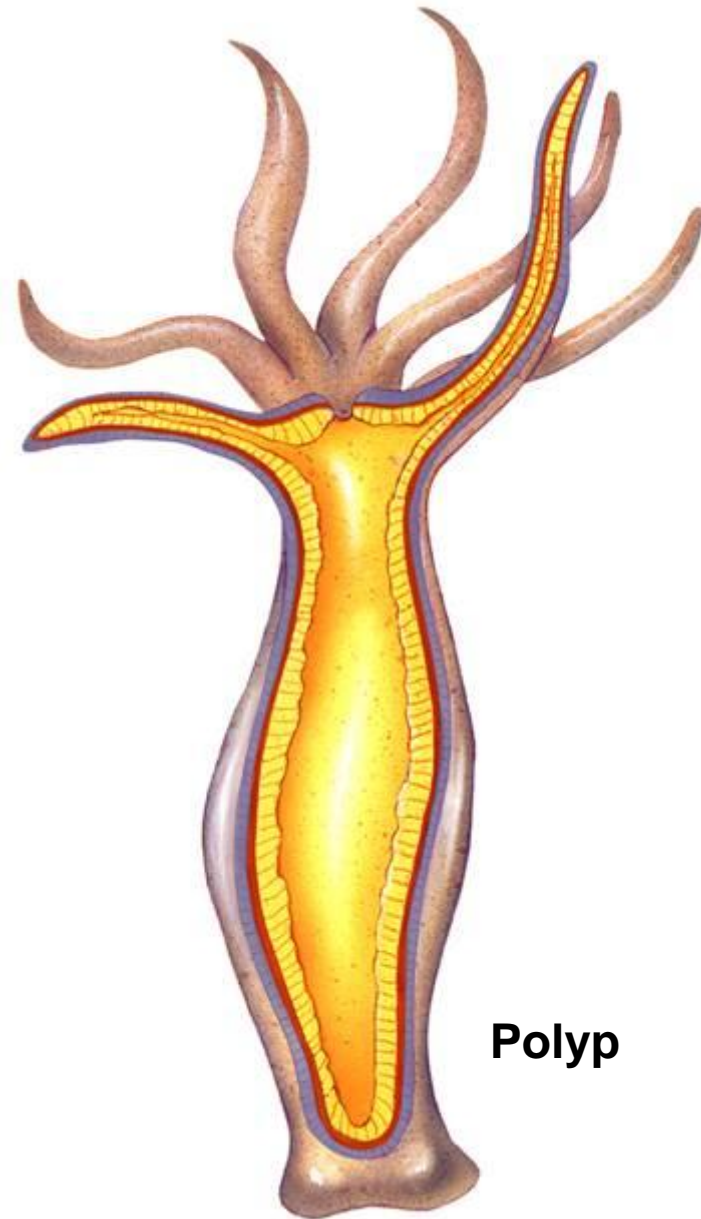
**Polyp**



**Medusa**

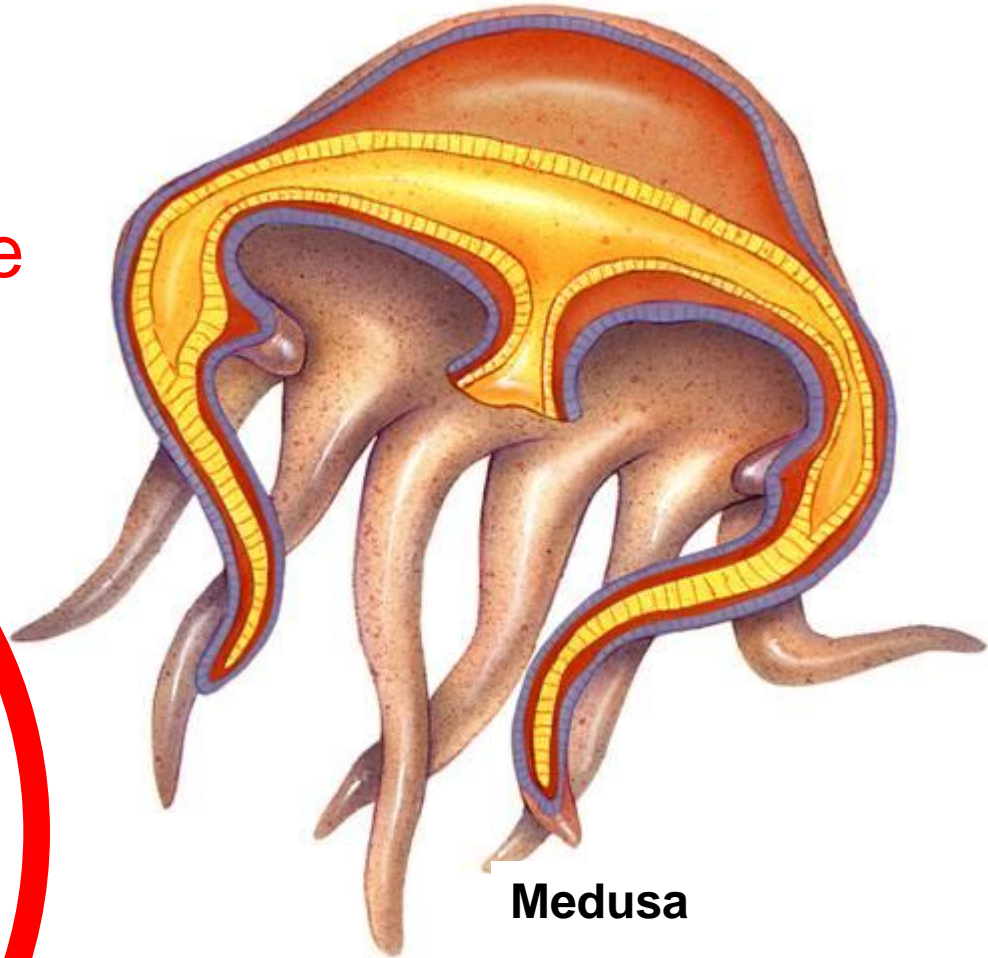
A **polyp** is a cylindrical body with armlike tentacles. In a polyp, the mouth points upward.

Polyps are usually sessile.



**Polyp**

A **medusa** has a motile, bell-shaped body with the mouth on the bottom.

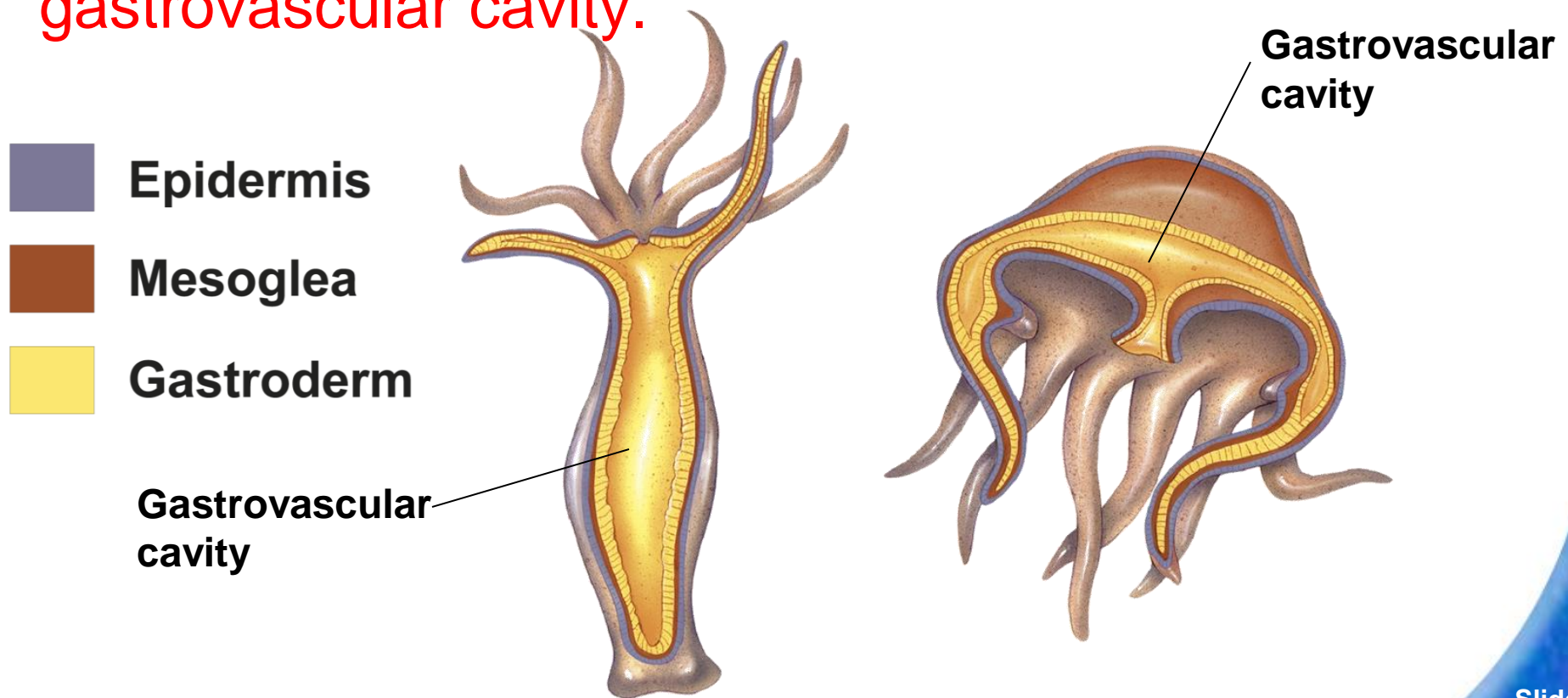


Medusa

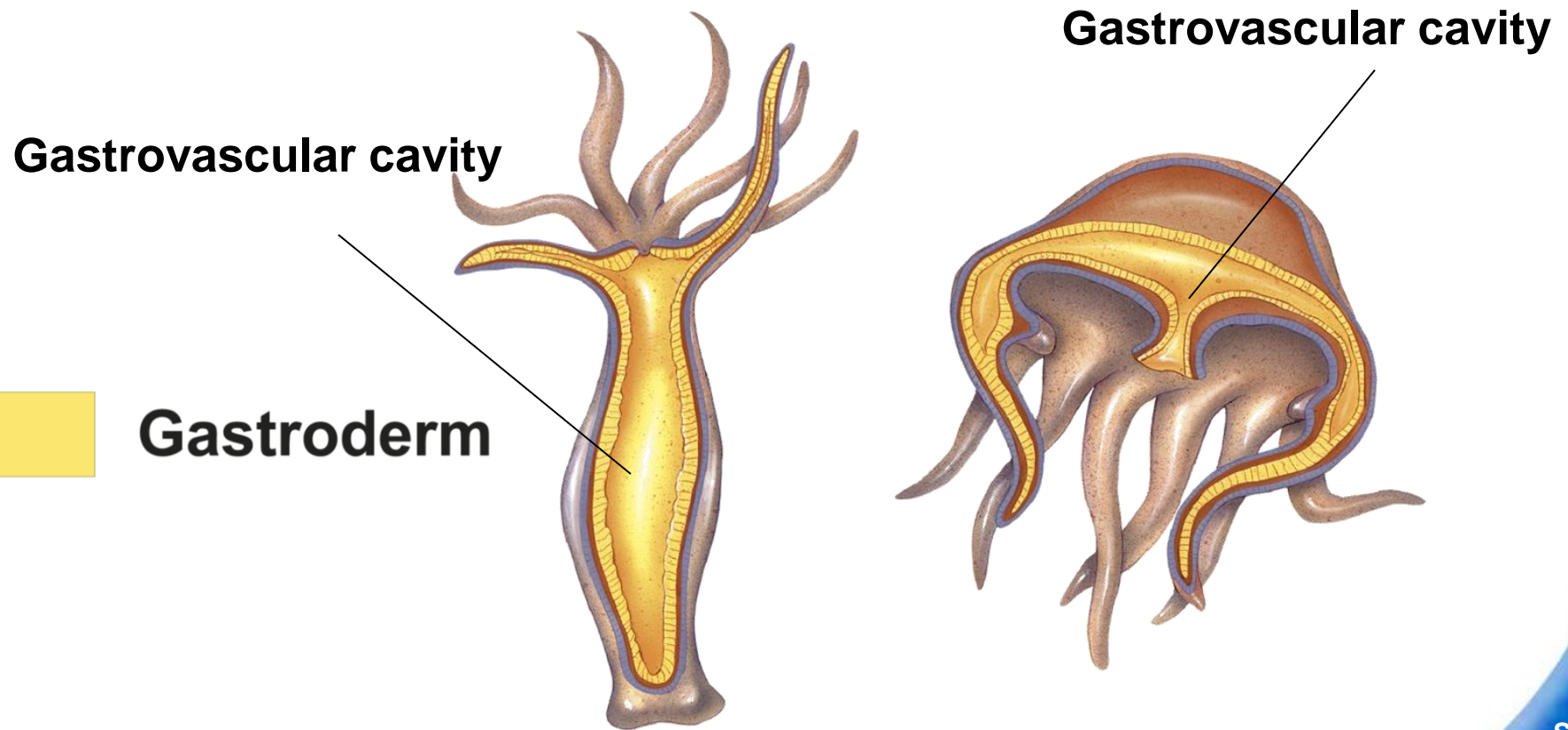




Cnidarian polyps and medusas each have a body wall that surrounds an **internal space called a gastrovascular cavity.**



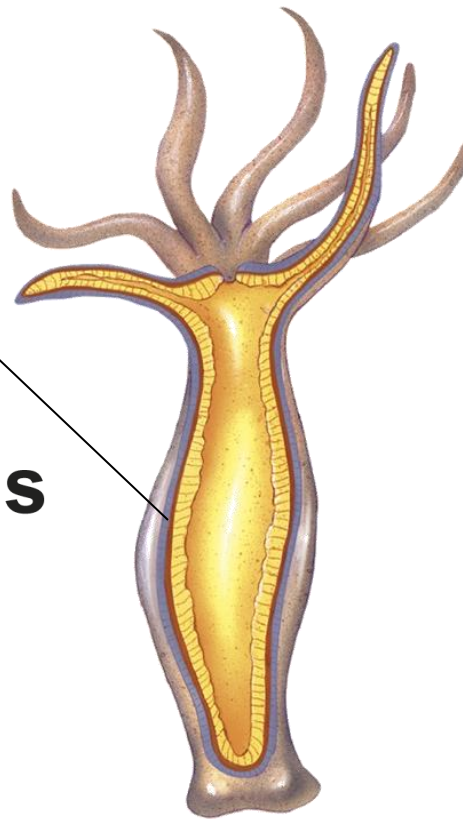
The **gastroderm** is the inner lining of the **gastrovascular cavity**, where digestion takes place.



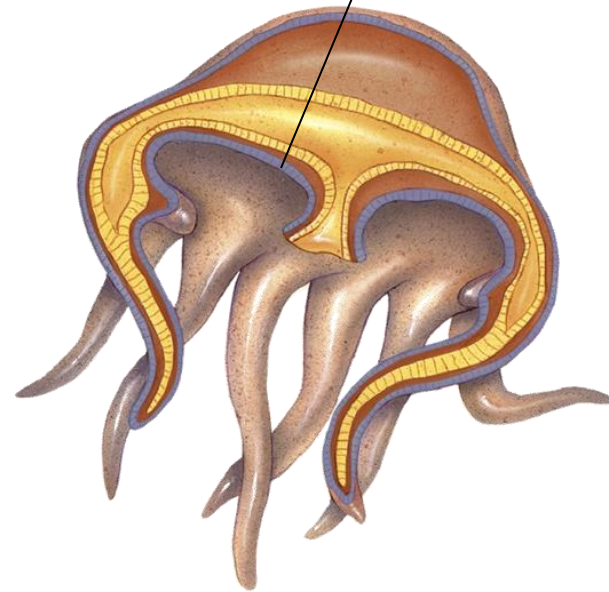
The epidermis is the outer layer of cells.

Epidermis

Epidermis

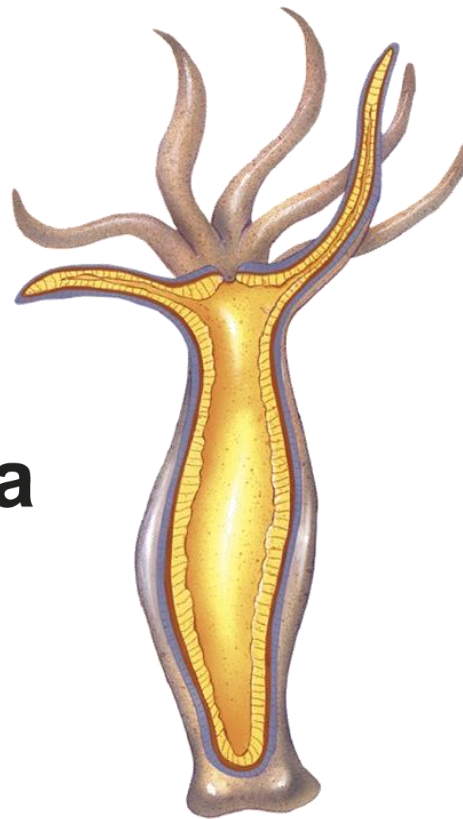


Epidermis

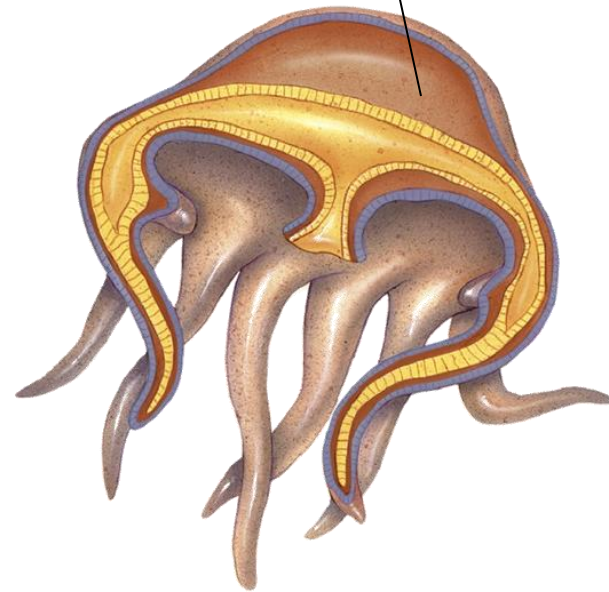


The **mesoglea** is a layer that lies between the epidermis and gastroderm.

 **Mesoglea**



**Mesoglea**





## Feeding

A cnidarian pulls its food through its mouth and into its **gastrovascular cavity**, a digestive chamber with one opening.

Food enters and wastes leave the body through that same opening.

The digestion that occurs in the gastrovascular cavity is extracellular, meaning that it takes place outside of cells.

Partially digested food is absorbed by the gastroderm.

Digestion is completed intracellularly, within cells in the gastroderm.

Any materials that cannot be digested are passed out of the body through the mouth.

## Respiration, Circulation, and Excretion

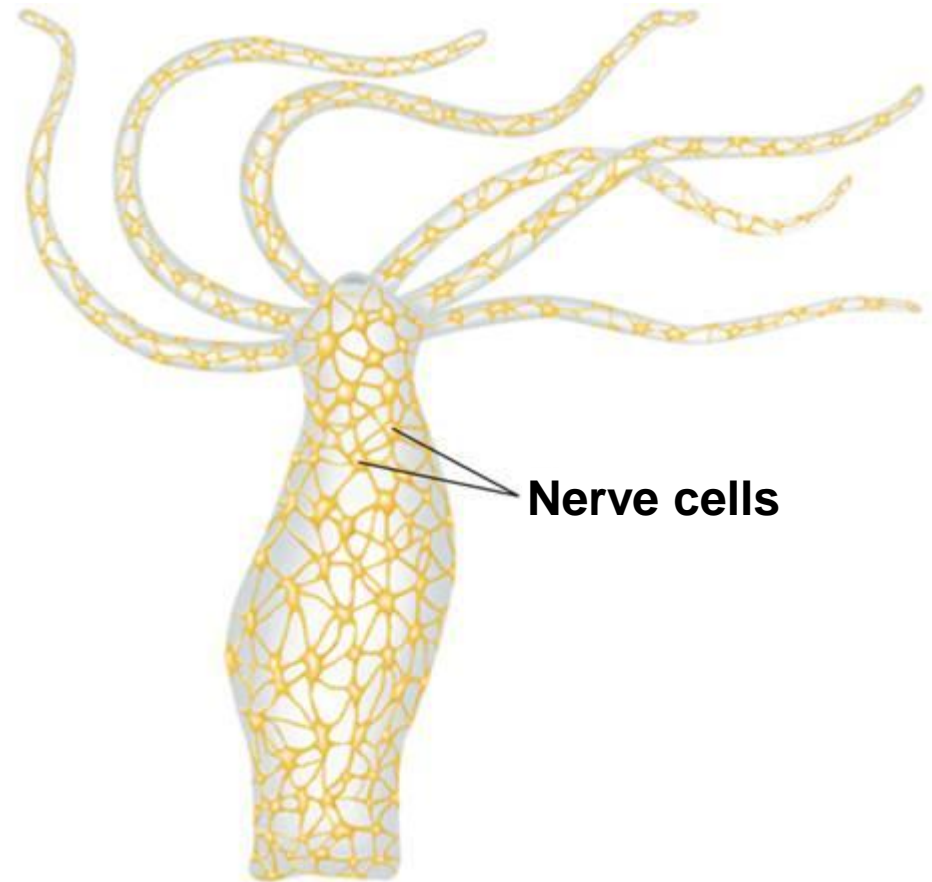
Following digestion, nutrients are usually transported throughout the body by diffusion.

Cnidarians respire and eliminate the wastes of cellular metabolism by diffusion through their body walls.

## Response

Cnidarians gather information from their environment using specialized sensory cells.

Both polyps and medusas have a **nerve net**, a loosely organized network of nerve cells.



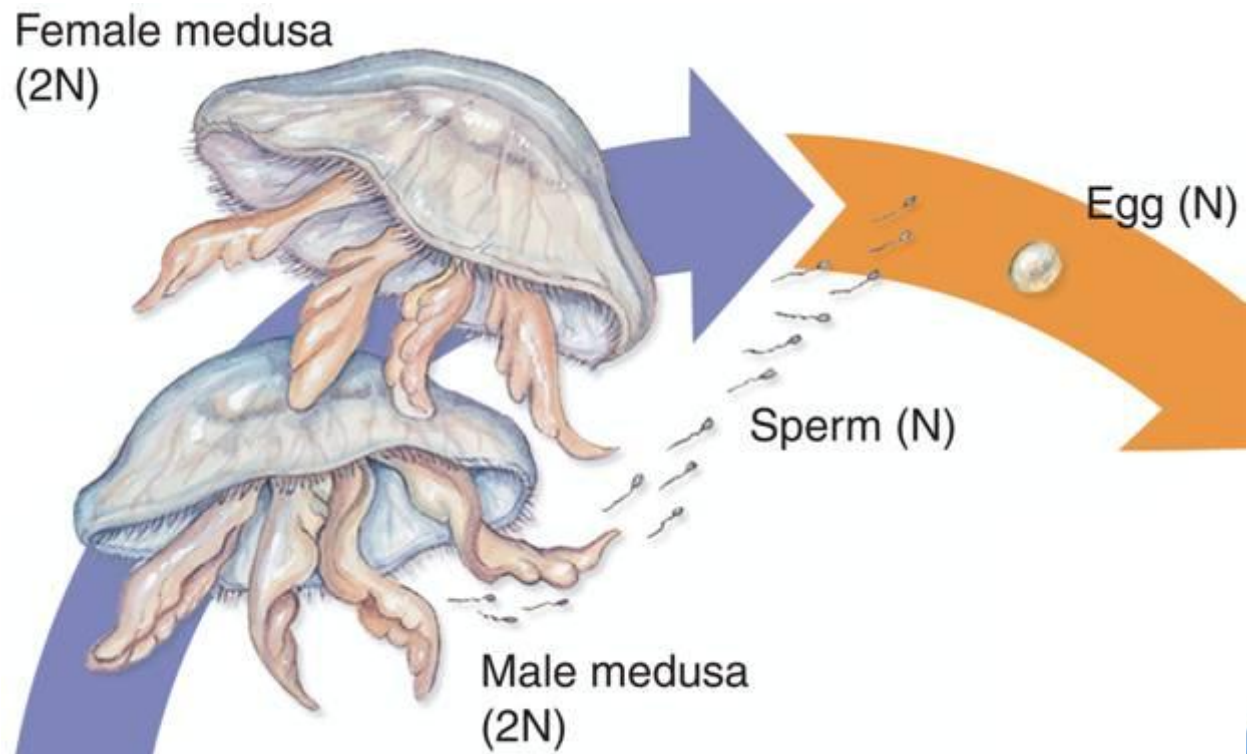
## Reproduction

Most cnidarians reproduce both sexually and asexually.

Polyps can reproduce asexually by budding.

In most cnidarians, sexual reproduction takes place with external fertilization. **External fertilization** takes place outside the female's body.

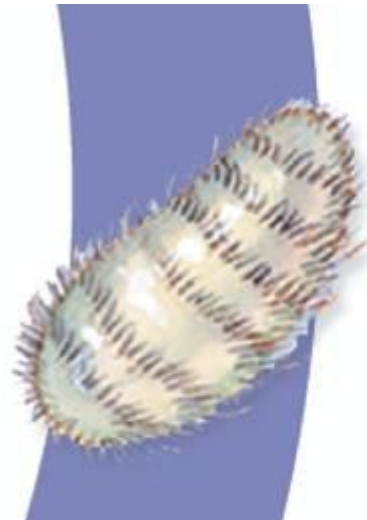
In the life cycle of *Aurelia*, a common jellyfish, the female releases eggs into the water, and the male releases sperm.





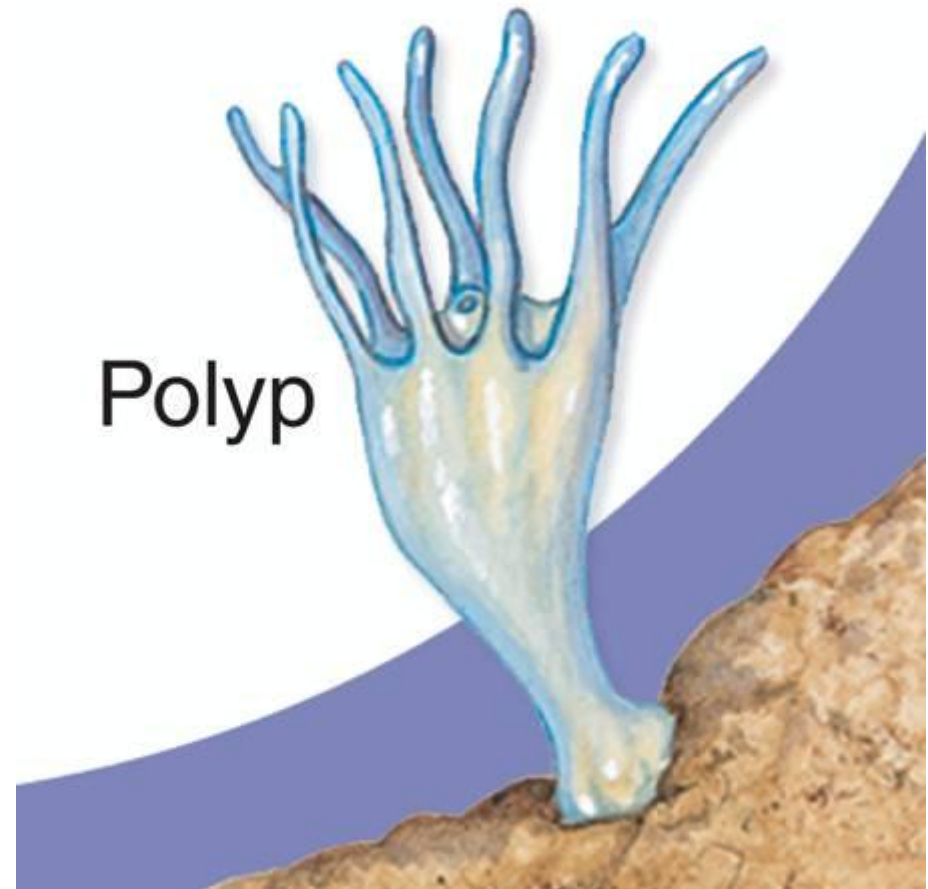
Fertilization occurs in open water.

Each **zygote** grows into a free-swimming larva.

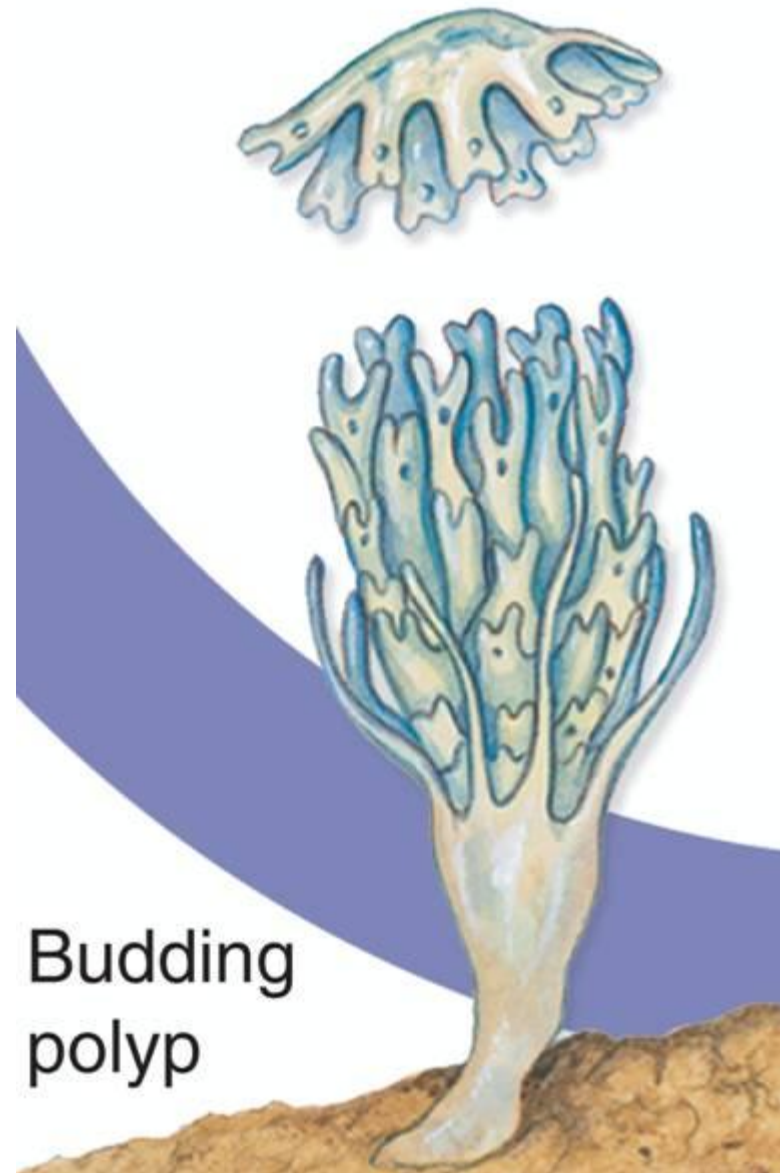


Swimming  
larva

The larva eventually attaches to a hard surface and develops into a polyp.



The **polyp** eventually buds and releases young **medusas** that begin the cycle again.





**What are the three groups of cnidarians?**

## Groups of Cnidarians



**Cnidarians include:**

- **jellyfishes**
- **hydras and their relatives**
- **sea anemones and corals**

## Jellyfishes

The Class Scyphozoa contains the jellyfishes.

Jellyfishes live their lives primarily as medusas.

The polyp form of jellyfishes is restricted to a small larval stage, and no elaborate colonies ever form.

Jellyfishes reproduce sexually.

## Hydras and Their Relatives

The **Class Hydrozoa** contains **hydras** and related animals.

The **polyps** of most hydrozoans grow in **branching colonies** that can extend more than a meter.

Within the colony, polyps are specialized to perform different functions.



## Sea Anemones and Corals

The **Class Anthozoa** contains **sea anemones and corals**, animals that have only the polyp stage in their life cycle.

Anthozoans all have a central body surrounded by tentacles.

## 26-3 Section QUIZ

Continue to:

**Section QUIZ**

- or -

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## 26-3 Section QUIZ

**1** The characteristic that defines the cnidarians is

- a. bilateral symmetry.
- b. stinging cells.
- c. a gastrovascular cavity.
- d. cephalization.

**2** Which of the following statements is generally true of polyps and medusas?

- a. Polyps are sessile, and medusas are motile.
- b. Polyps are motile, and medusas are sessile.
- c. Both polyps and medusas are sessile.
- d. Both polyps and medusas are motile.

## 26-3 Section QUIZ

3 During the life cycle of *Aurelia*, the zygote grows into a free-swimming

a. polyp.

b. larva.

c. medusa.

d. gemmule.