

Cnidaria

Hydra, Jellyfish, Coral, & Sea Anemones



Phylum Cnidaria

Some examples of Cnidaria are:

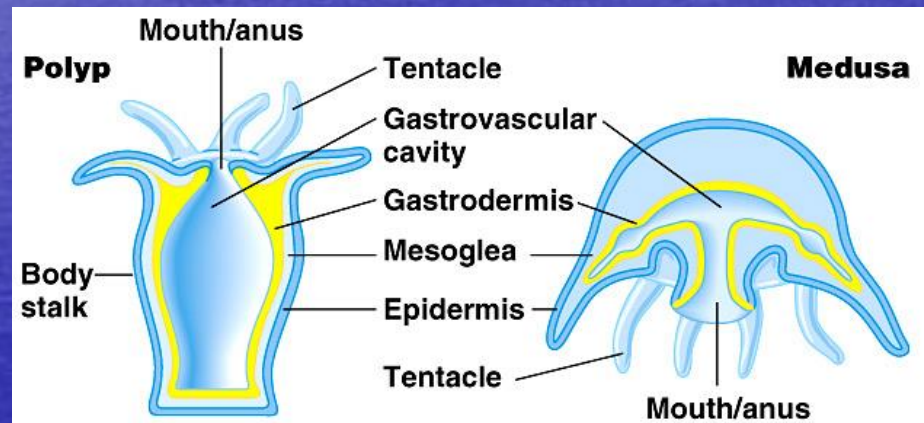
- **Sea anemones and Corals-** *Anthozoa*
- **Hydra-** *Hydrozoa*
- **Jelly fish-** *Scyphozoa*
- **Ctenophores-** non stinging Cnidarians:
 - **Comb Jelly**

Anatomy

A. **Polymorphism**- Cnidarians have more than one body form:

1. **Polyp**

2. **Medusa**



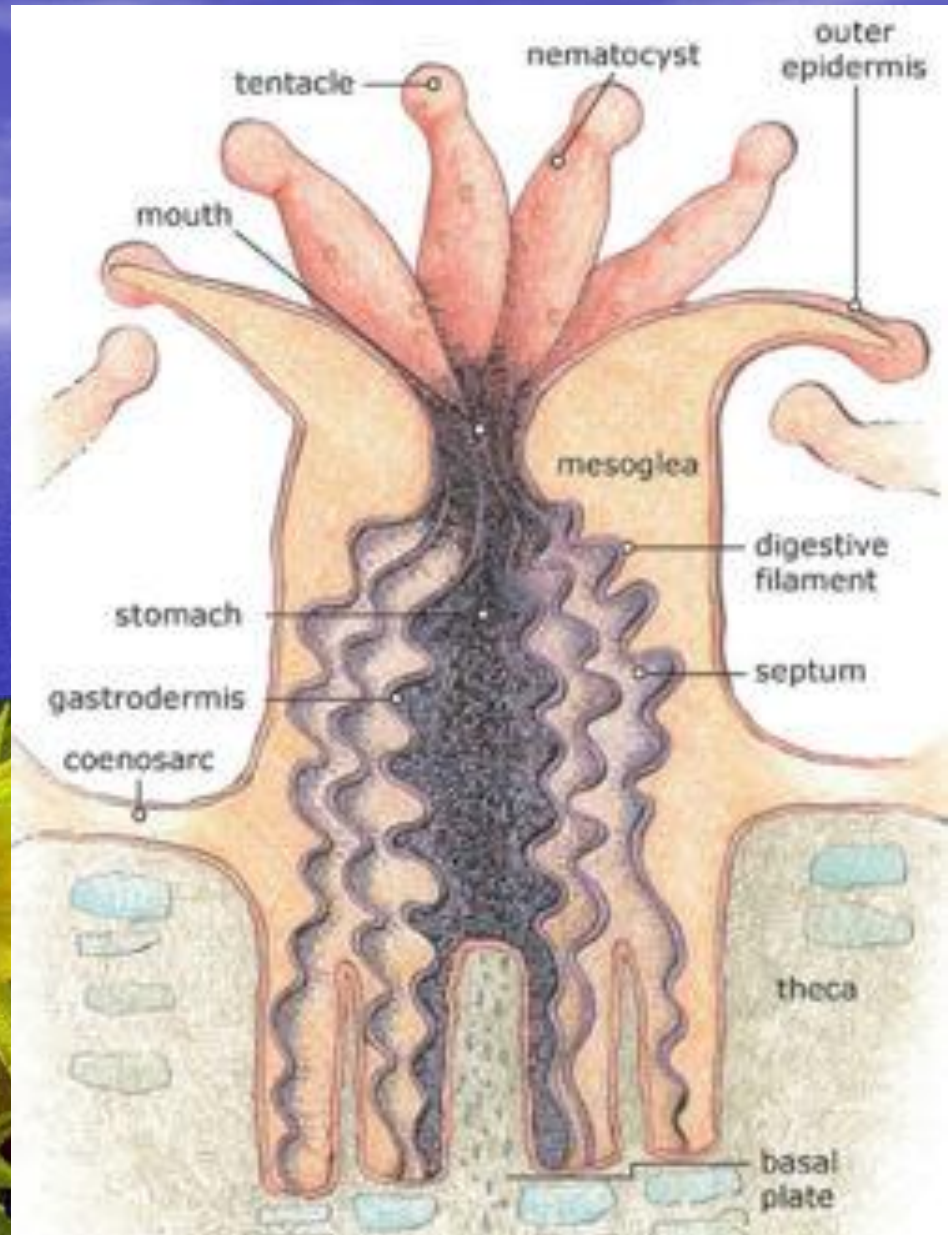
(a) Sea anemone: a polyp



(b) Jelly: a medusa

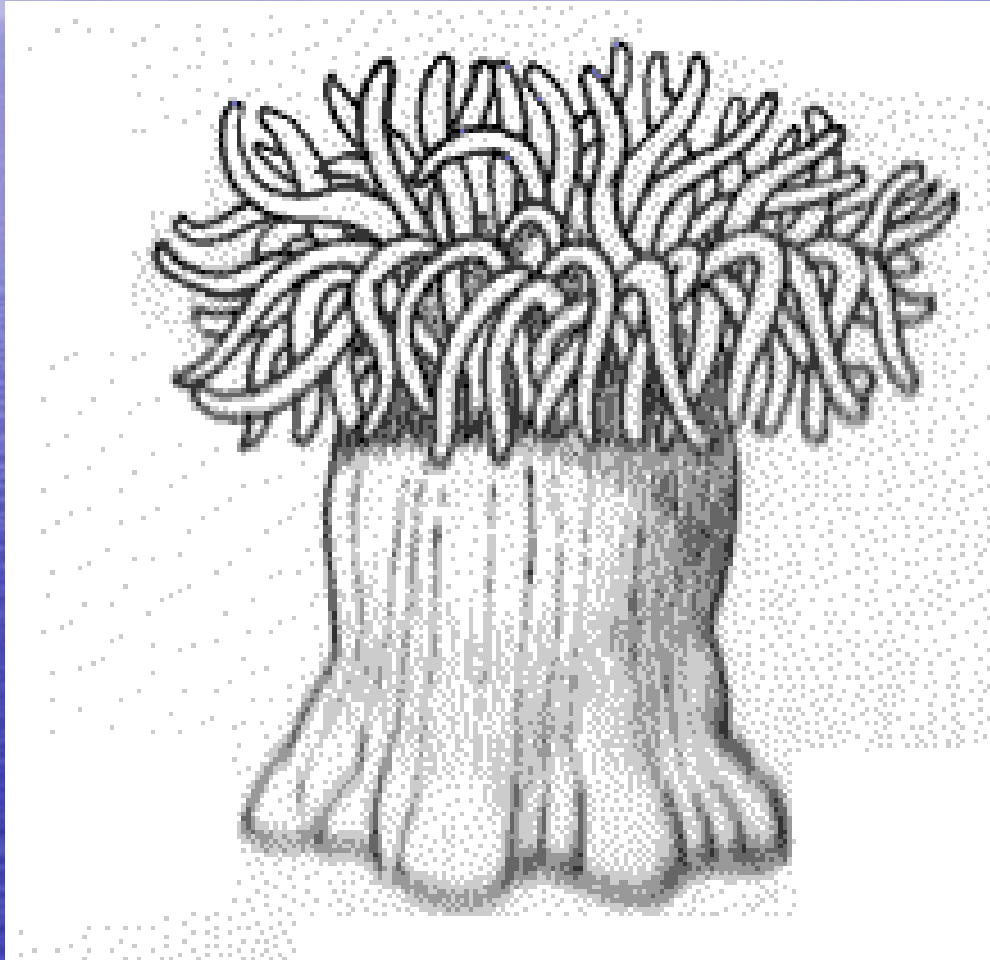
Polyp Form

- Tube with tentacles around the mouth
- Sessile



Coral polyp

Polyp (sea anemone)

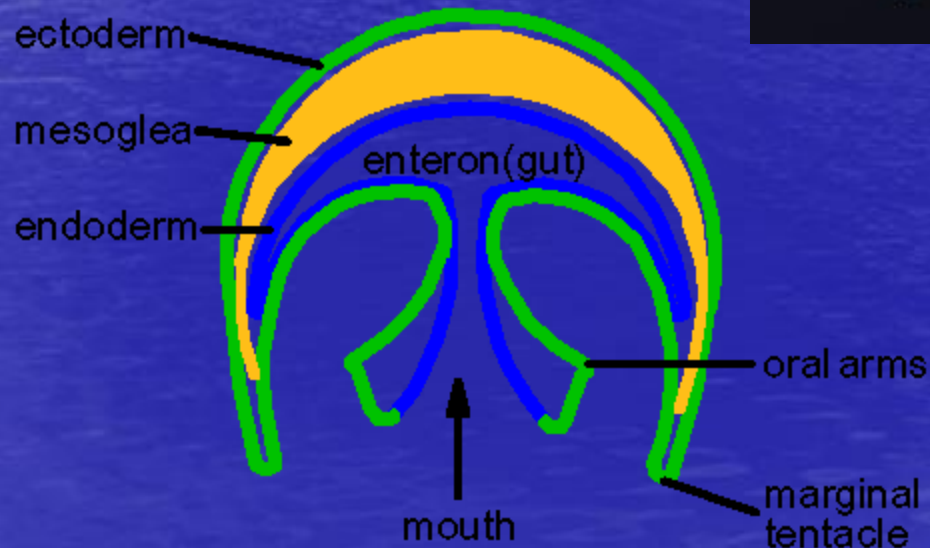


Polyp (Hydra)



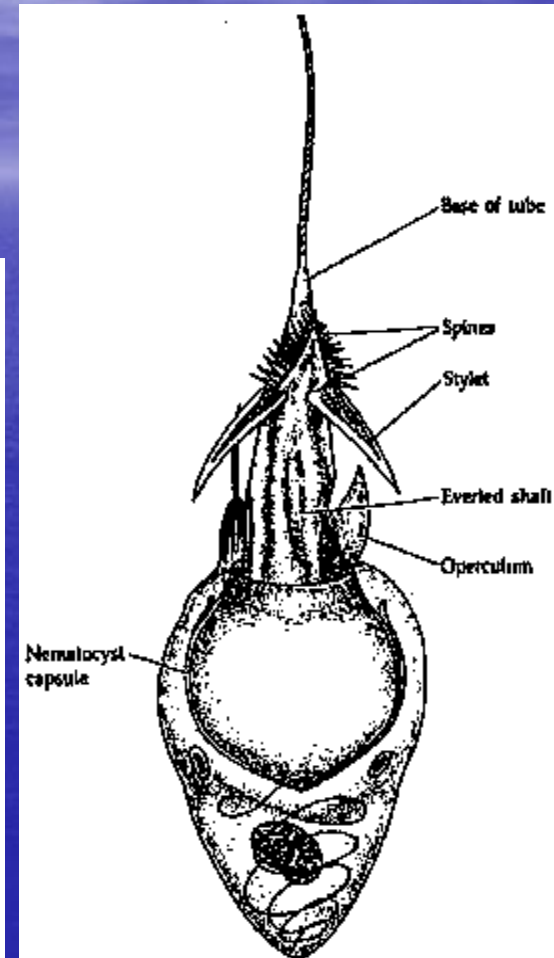
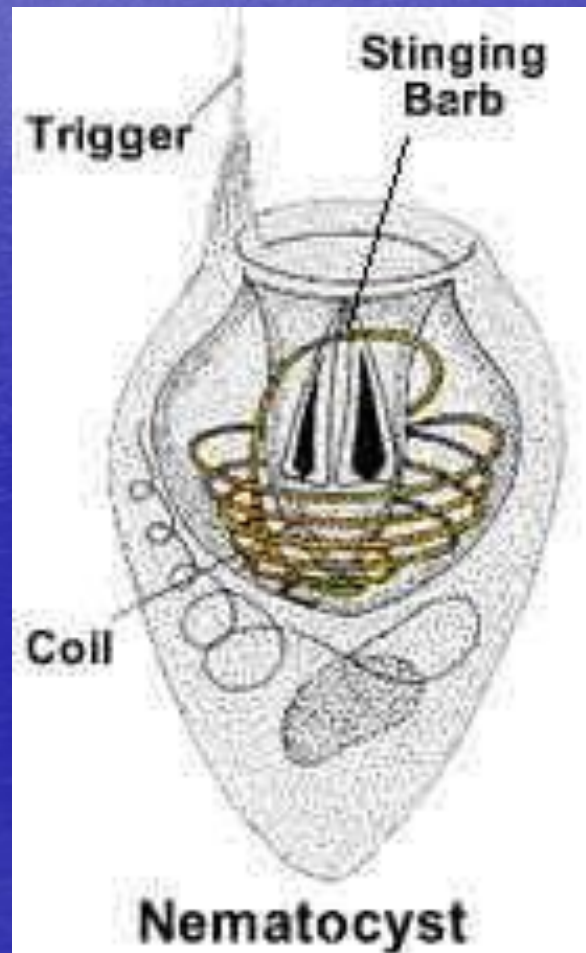
Medusa Form

- Umbrella shape
- Tentacles around mouth
- Motile, Free-swimming



Tentacles

- Have **nematocysts** (stinging cells)
- Coiled thread discharges like a harpoon
- Contains **neurotoxin**
- Paralyzes prey



**Discharged
nematocyst**

Level of Organization

A. Cnidarians have tissues

B. No organs

C. Most Cnidarians have
Radial Symmetry

Radial Symmetry

Radial

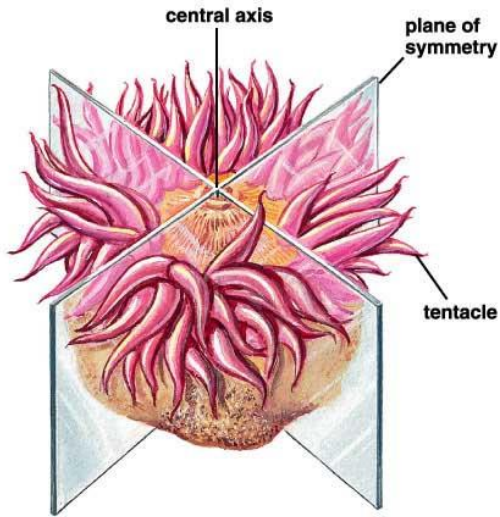


Compass jellyfish

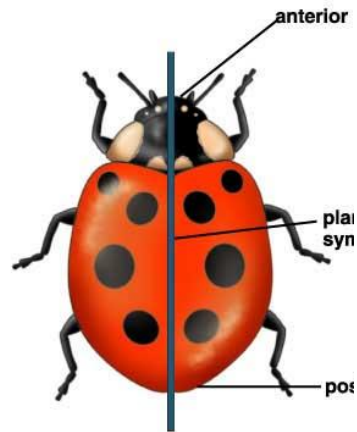
Kingdom Animalia – Cnidaria

General body forms

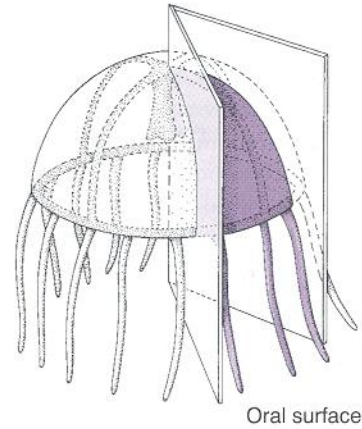
(a) Radial symmetry



(b) Bilateral symmetry



Medusa
Aboral surface



Polyp
Oral surface

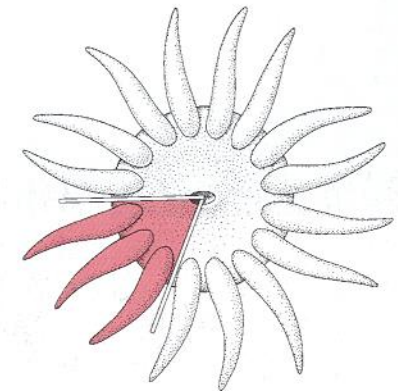
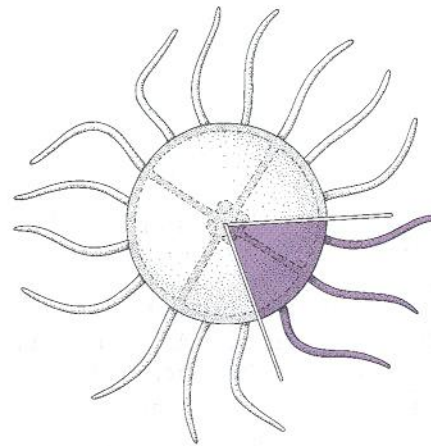
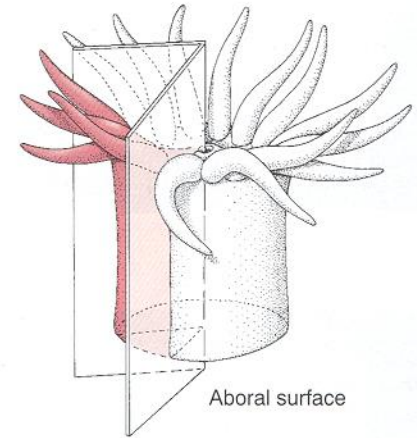
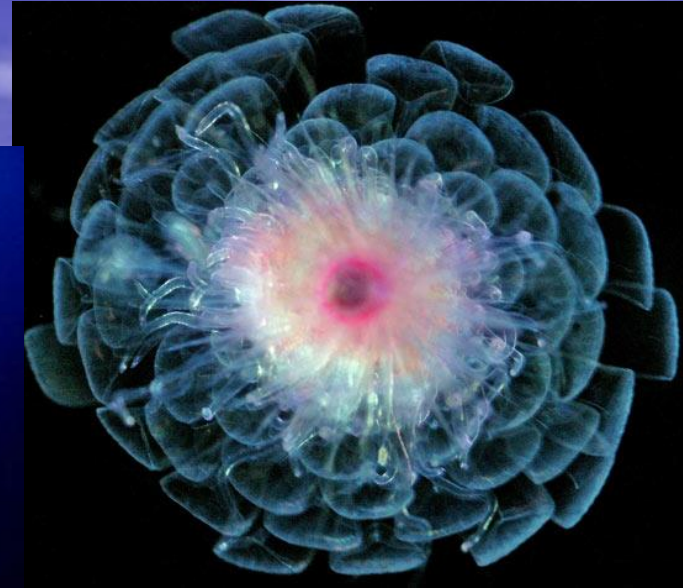


FIGURE 6.5 The flower-like appearance of many cnidarians is a consequence of their radial symmetry. In both the medusa and polyp, tentacles are arranged and repeated around a central axis that runs through the mouth.

Habitat

Aquatic:

1. Most Marine
2. Few fresh-water



Feeding



A. Carnivores

(predators)

B. Process of feeding

1. Tentacles sting prey with

nematocysts

2. Tentacles grab prey

3. Prey pulled into mouth

Lion's mane eats
another jelly

Process of feeding

4. Prey stuffed into **gastro-vascular cavity** (GVC)*
5. GVC makes **enzymes**, extra-cellular digestion
6. Undigested food back out mouth

*incomplete digestive tract (no anus)

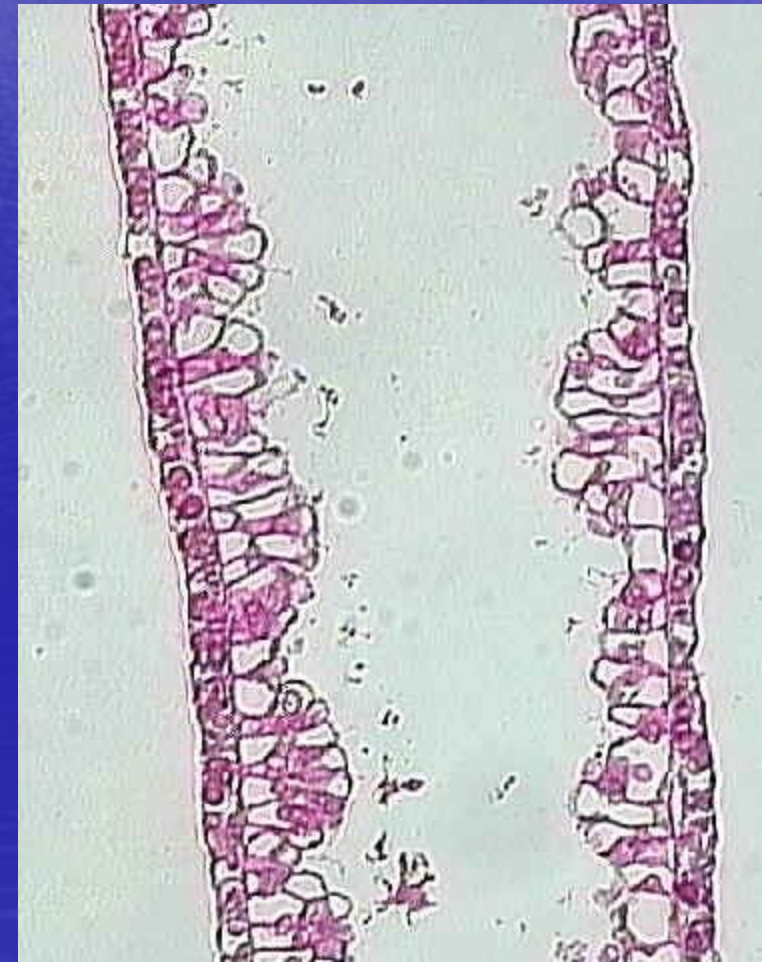
Lion's mane jellyfish eating

<http://www.youtube.com/watch?v=0Mv00Cv-r-Q>



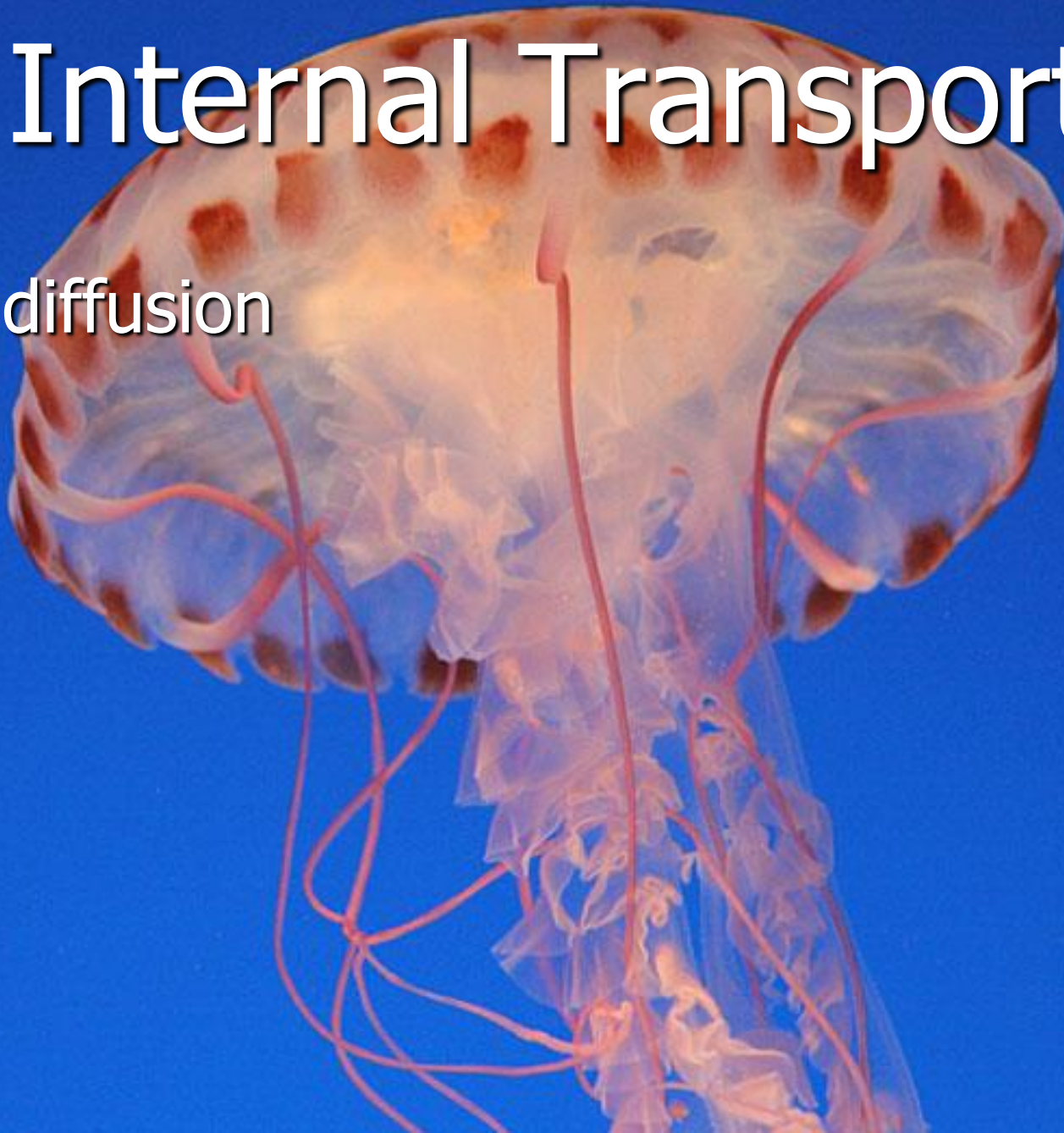
Respiration

- Via diffusion
- Body is two cell layers thick



Internal Transport

- Via diffusion



Excretion

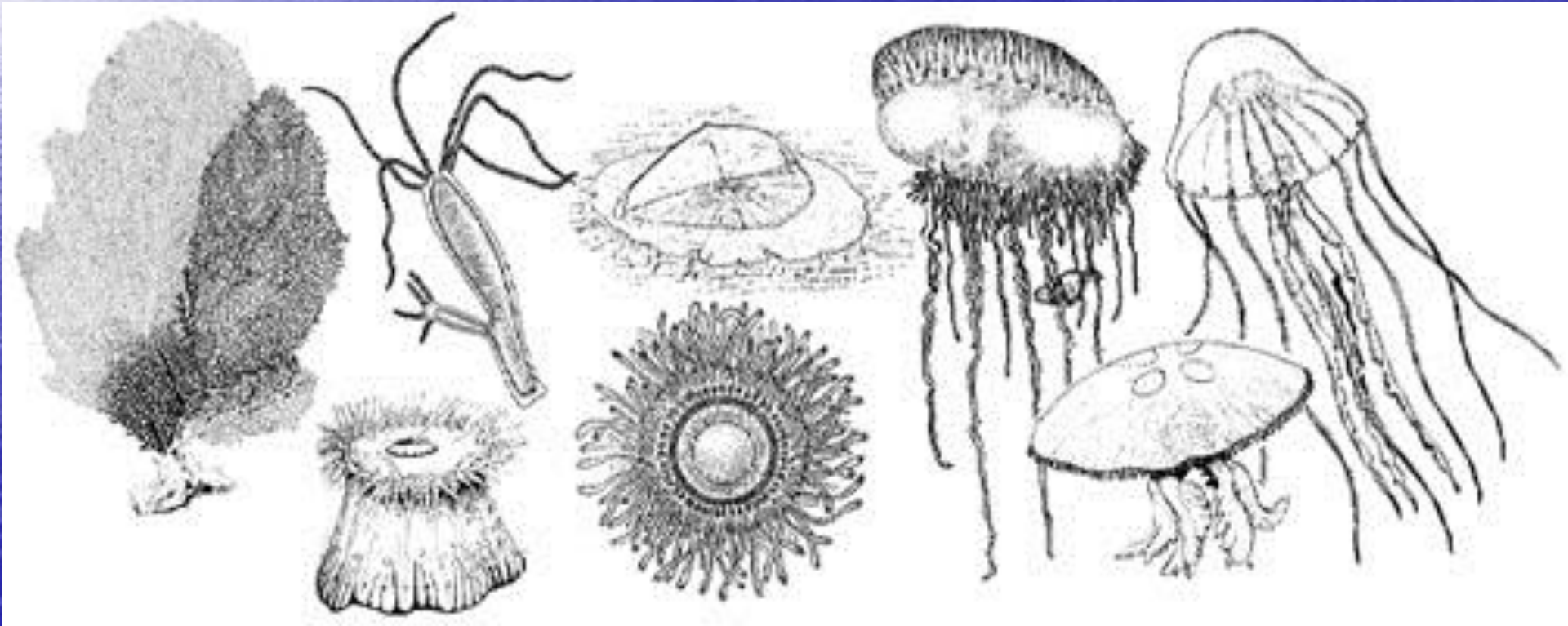


- Via diffusion

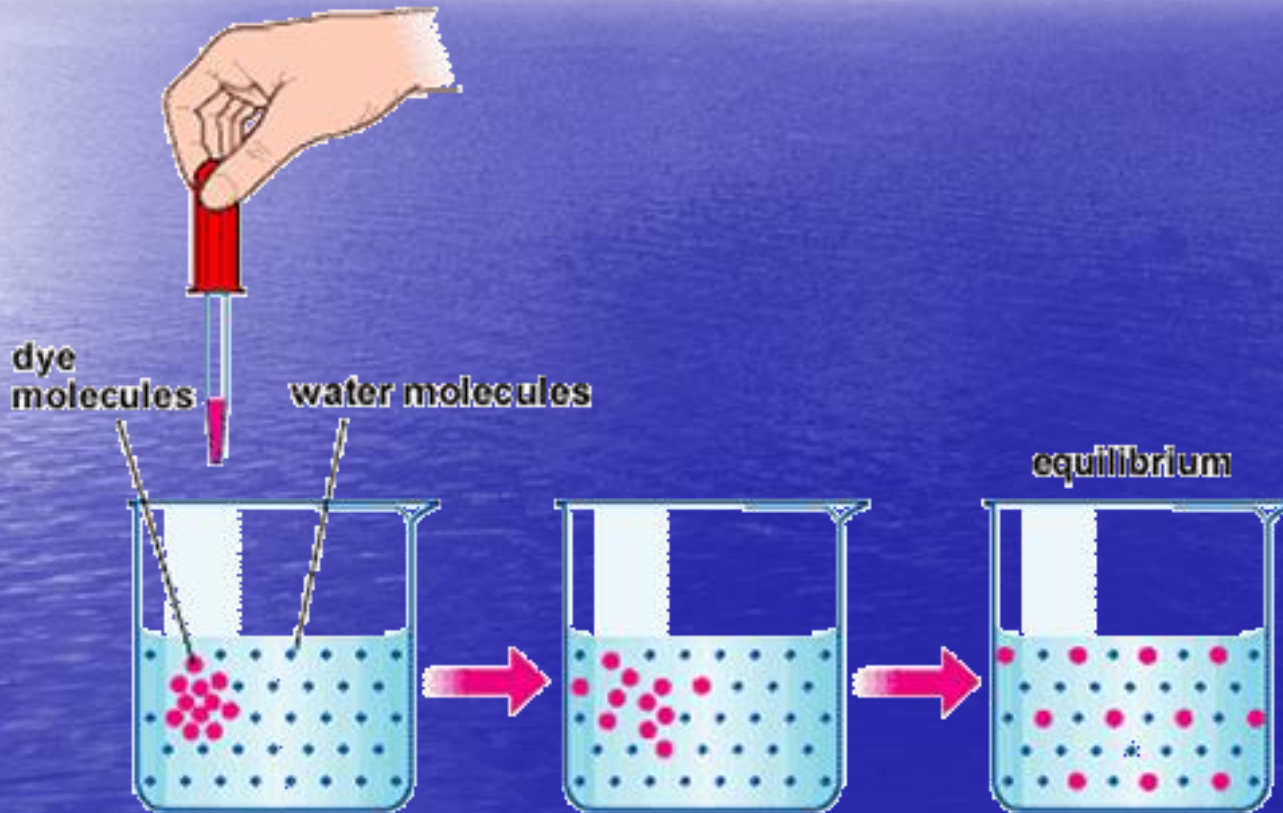
Response

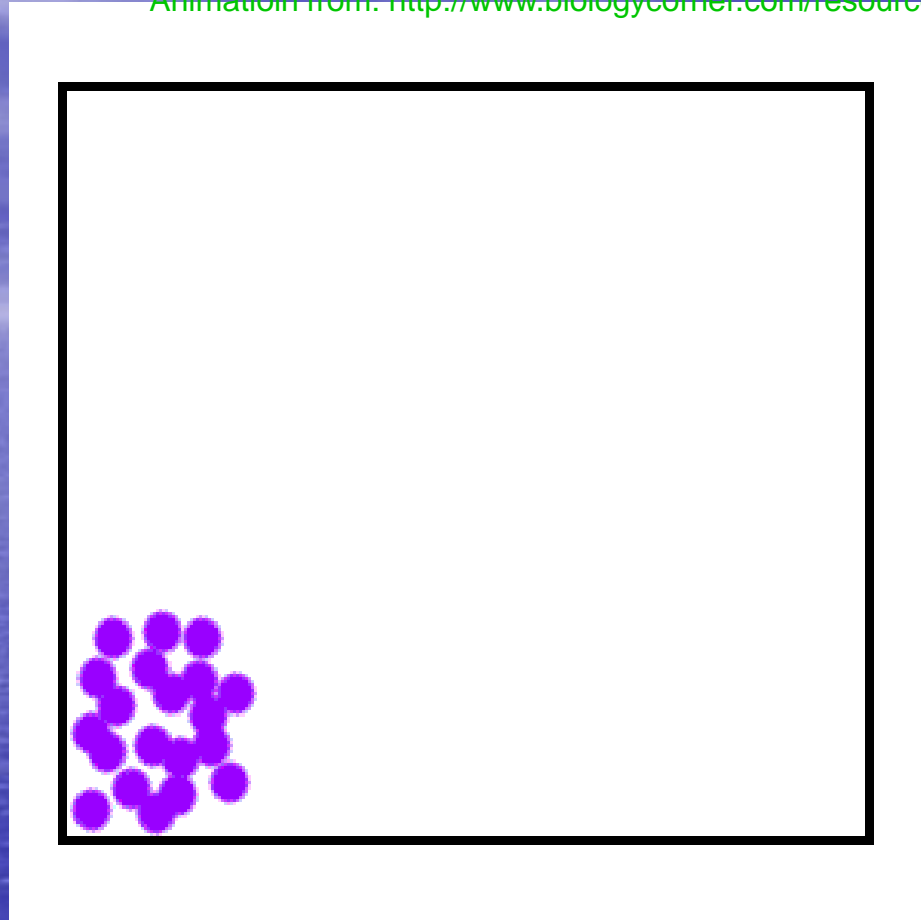
A. No nervous system

B. Nerve net around mouth



Diffusion



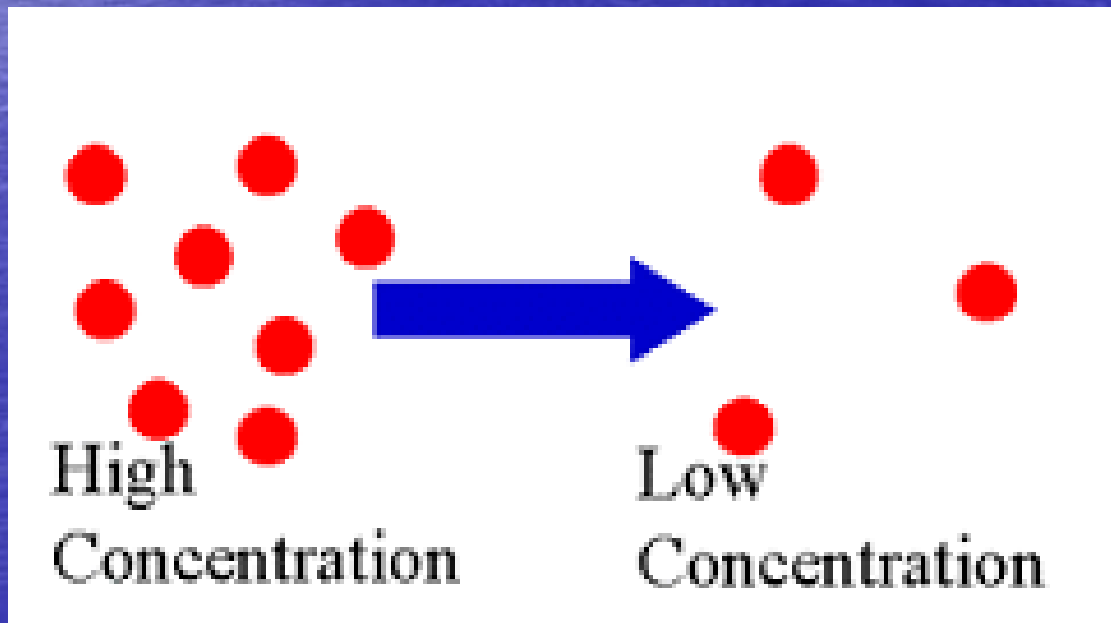


Molecules move

FROM "where there's A LOT"
to "where there's NOT"

DIFFUSION across a space

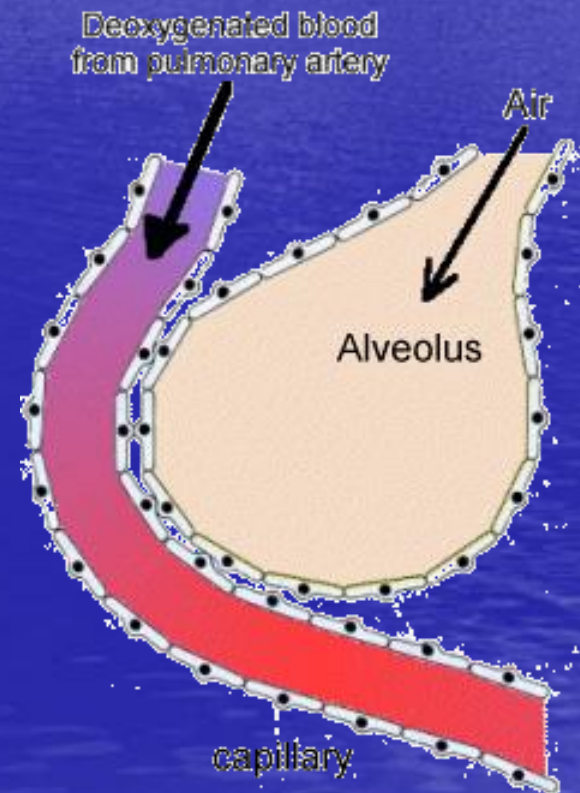
Happens anytime there is a DIFFERENCE in concentration in one place compared to another
= Concentration gradient



CELL EXAMPLE:

DIFFUSION automatically moves oxygen from **HIGHER** concentration (in lungs) to a **LOWER** concentration (in blood)

CO₂ automatically moves from where there is a **HIGHER** concentration (in blood) to where there is a lower concentration (in lungs)



Locomotion

- A. **Medusa-** *motile*, free-swimming
- B. **Polyps-** *sessile*, attached to hard substrate

Exceptions:

1. Hydra tumbles on tentacles
2. Sea anemones glide on pedal disc

Reproduction



1. **Asexual**

budding

2. **Sexual**

- a. Medusae release sperm & eggs

- b. Larvae are free-swimming

Ecological Role

- Predators and prey

Jellyfish are prey to include tunas, sharks, swordfish and some species of salmon. Sea turtles also like to eat jellyfish.

- A. Neurotoxins in medical research

- B. Coral – jewelry, building, reefs

Coral reefs - habitat for many

- great biodiversity

- protect coastline

- E. Symbiosis with other organisms

Class Anthozoa: Sea Anemones



Sea Anemones (with sea urchins)



Sea Anemones Clown fish with sea anemone



Clown fish & eggs with sea anemone



Clown fish with sea anemone



Giant Sea Anemone



Rosy Sea Anemone



Class Anthozoa: Corals



Brain Coral



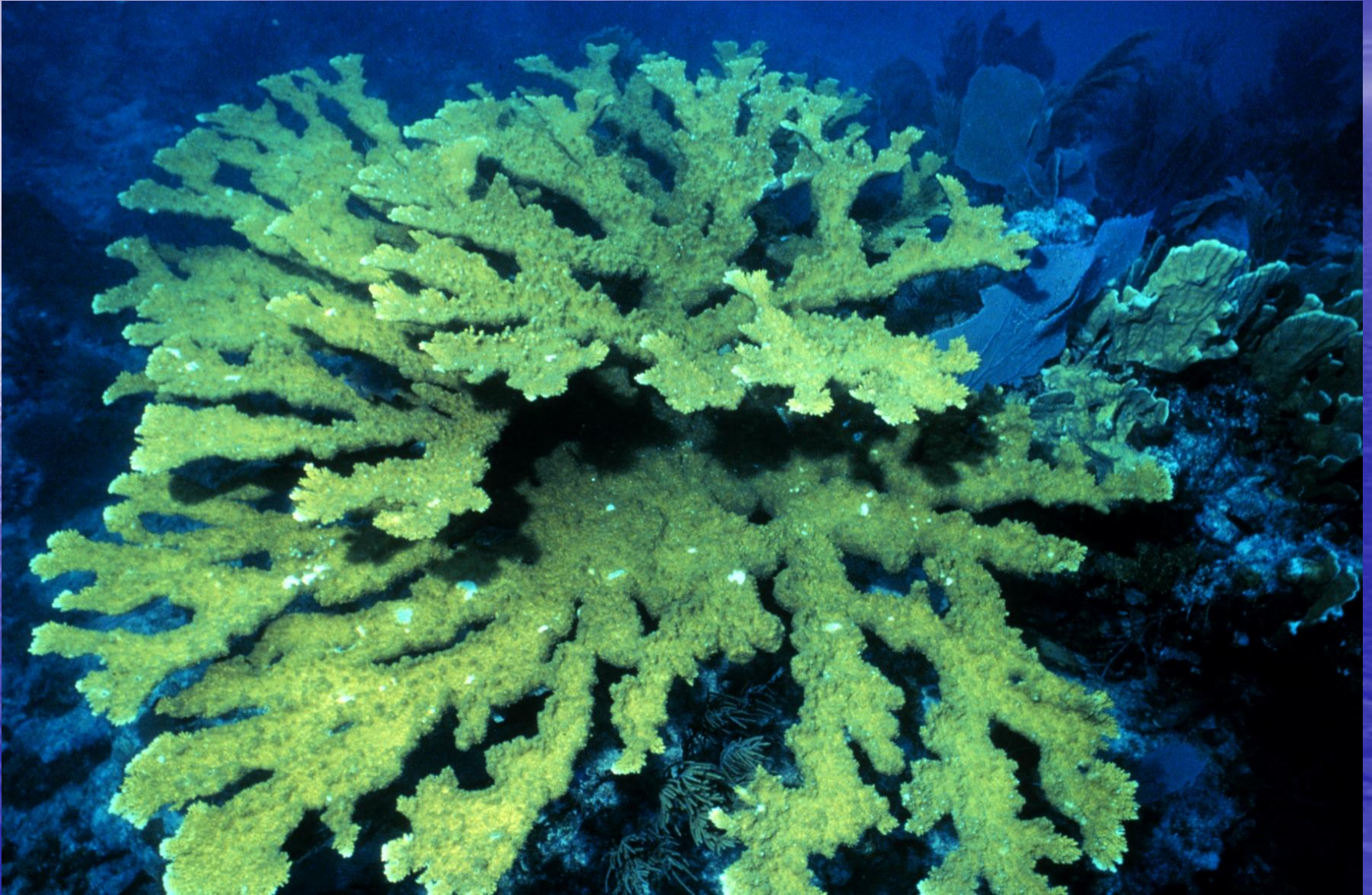
Coral



Colt Coral



Elkhorn Coral



Cabbage Coral



Flower Coral



Feather Coral



Gorgonian Fan Coral



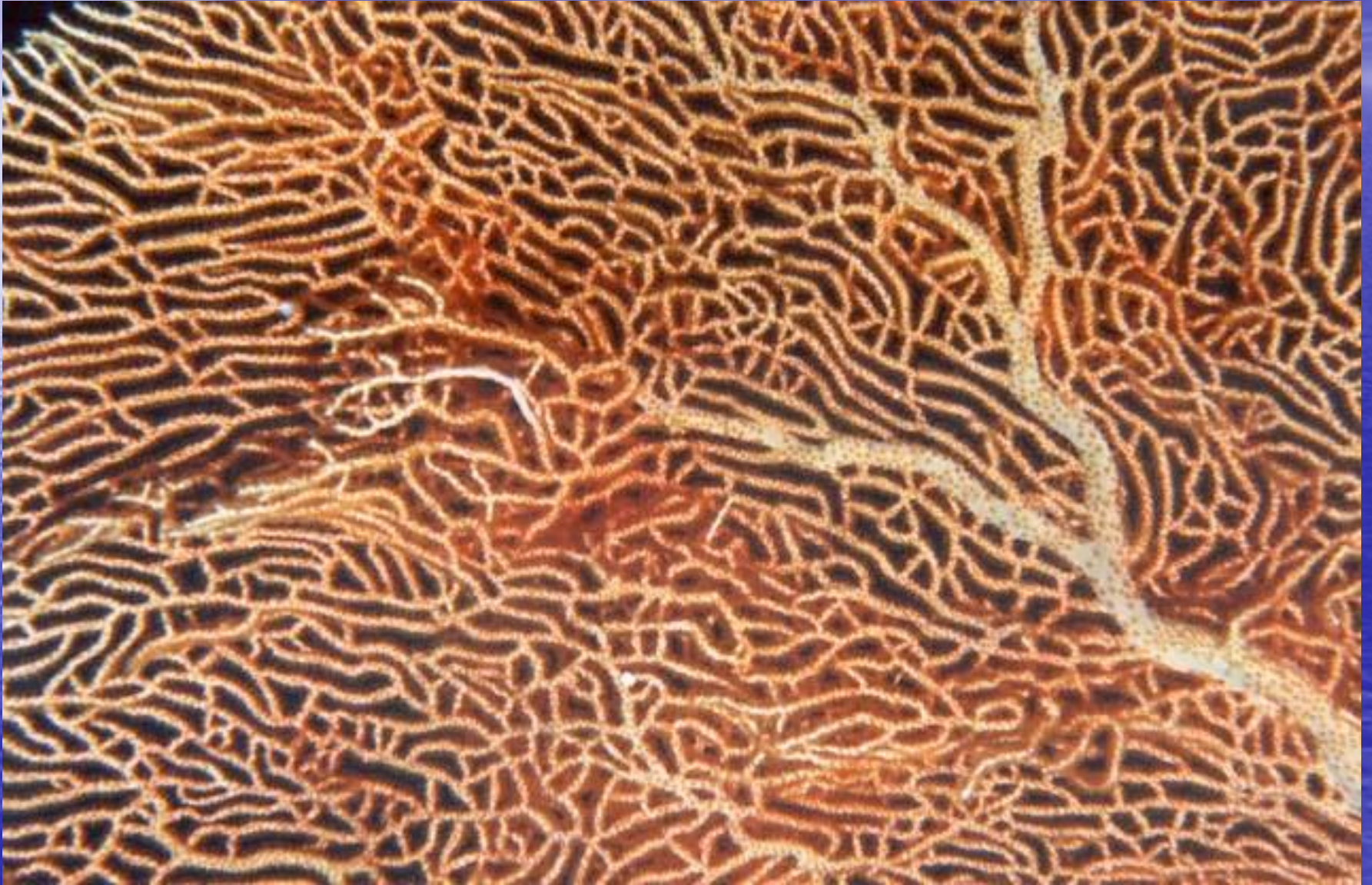
Lamellina Coral



Sun Coral



Subergorgia Coral



Soft Coral



Sea Pen



Sea Fan



Sea Plume



Class Hydrozoa: Green Hydra



Hydra



Brown Hydra with buds



Brown Hydra eating



Hydra eating Daphnia

- Hydra eats Daphnia



Class Scyphozoa: True Jellyfish



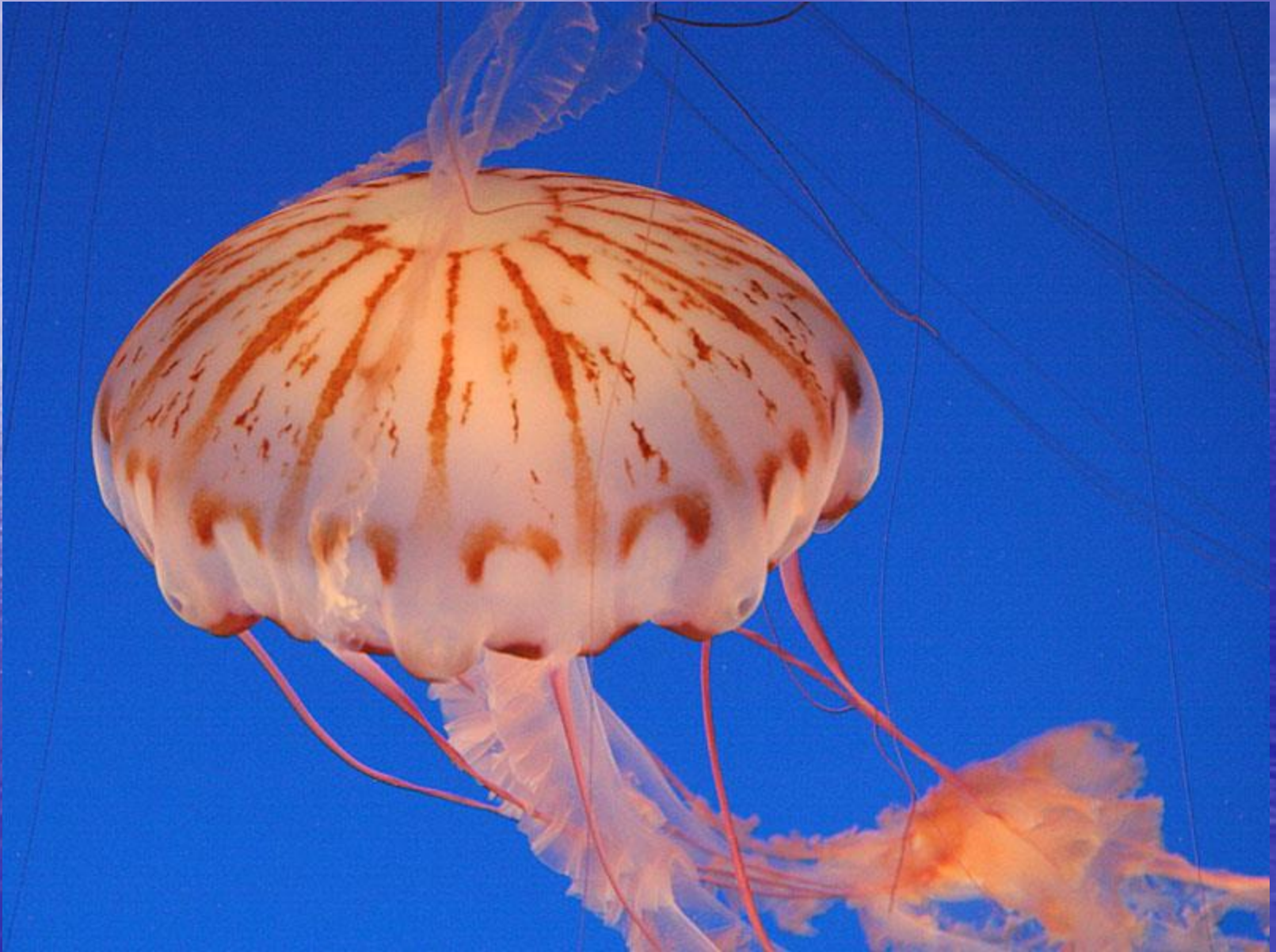
Fried egg jelly



CDD

Freshwater jellyfish (*Craspedacusta sowerbyi*)

Jellyfish



Jellyfish



Red-eyed medusa

Jellyfish



Jellyfish



Jellyfish



Lion's mane

Jellyfish



Purple lion's mane

Upside down Jelly fish



Upside down Jelly fish



Sea Nettle



Jelly and diver



Giant Jelly off Coast of Japan



Beached Jelly fish





Jelly fish Humor

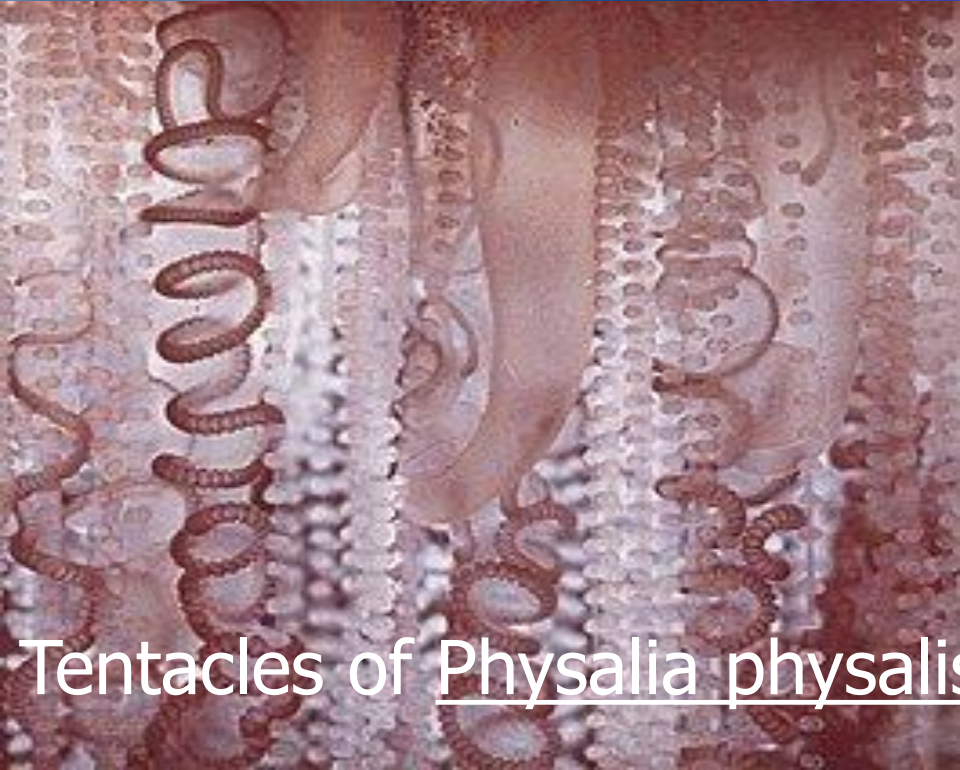


"No kidding Frank, she had legs from here to about thirty fathoms!"



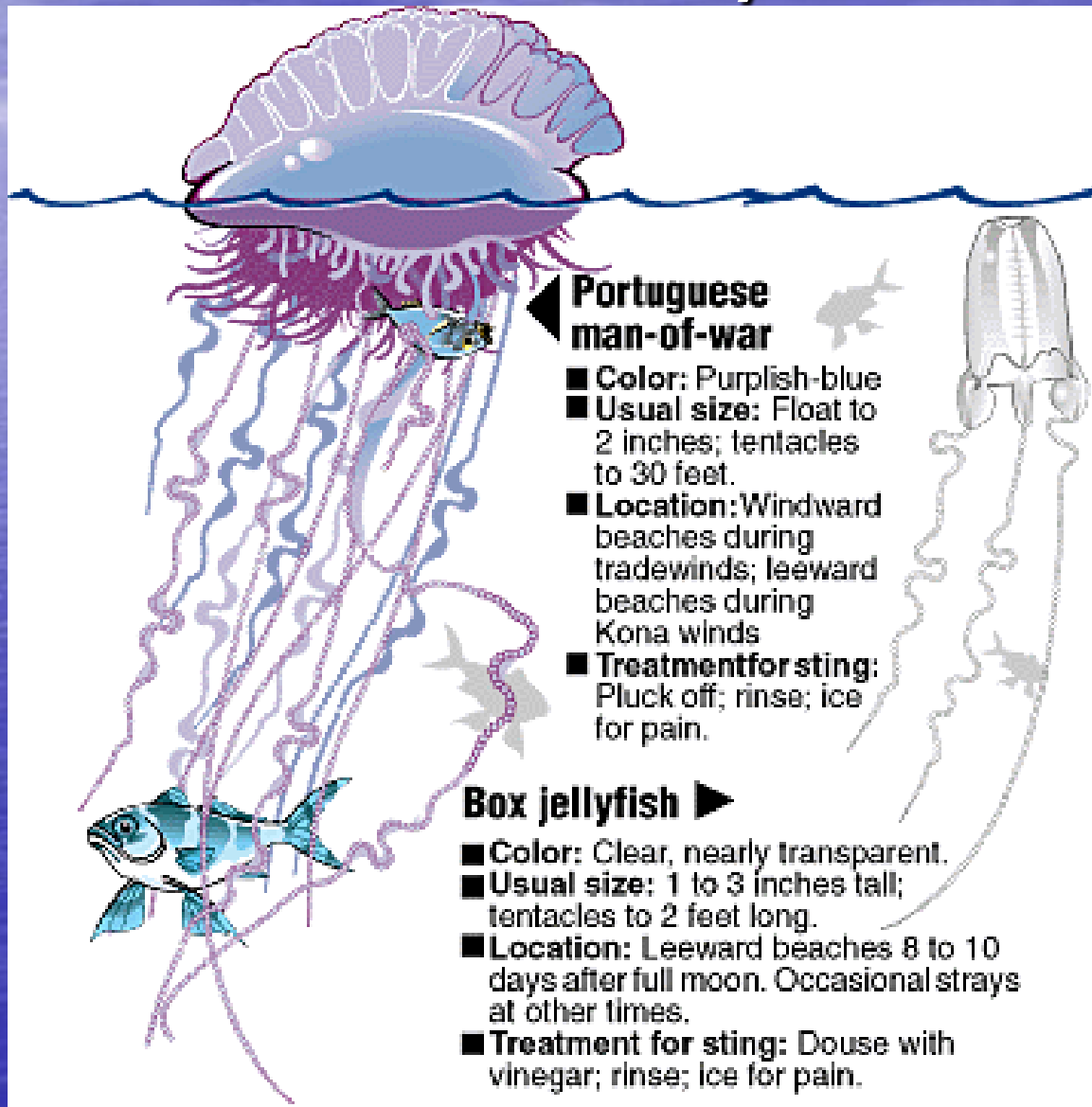
Portuguese
Man O' War
(a Hydrozoan),
NOT a true
jelly fish

Portuguese Man 0' War



Tentacles of Physalia physalis

Portuguese Man o' War vs. Box Jelly fish



Portuguese man-of-war

- **Color:** Purplish-blue
- **Usual size:** Float to 2 inches; tentacles to 30 feet.
- **Location:** Windward beaches during tradewinds; leeward beaches during Kona winds
- **Treatment for sting:** Pluck off; rinse; ice for pain.

Box jellyfish

- **Color:** Clear, nearly transparent.
- **Usual size:** 1 to 3 inches tall; tentacles to 2 feet long.
- **Location:** Leeward beaches 8 to 10 days after full moon. Occasional strays at other times.
- **Treatment for sting:** Douse with vinegar; rinse; ice for pain.

Class Cubozoa: Box Jellyfish



Chironex fleckeri the Box jelly fish



- http://www.documentaryon.com/watch.php?id=395&documentary_name=Jellyfish%20Invasion