Phylum Cnidaria - Jellyfish

- about 9,000 species, all aquatic, and mostly marine.

- radial symmetry, acoelomate (remember - a gastrovascular cavity is NOT a body cavity).

- basically consist of a sac, which forms a gastrovascular cavity (gut) which is surrounded by tentacles at the opening to the outside (easy to see how one can get from a “gastrula” to a Cnidarian).

  - there is only one opening, so this functions as mouth and anus. Prey is caught with the tentacles, moved into the gut, digested, and then the remains are expelled.

- two main forms [Fig. 33.5, p. 671]:

  polyps - animal is usually anchored in one place, and the opening is on the opposite side of the anchor (i.e., it usually points up).

  medusa - animal floats (can move actively), opening usually points down (sort of like a bell).

  many species go through both forms during their life cycle, but one form usually predominates.

Basic body plan:

have two layers, an ectoderm and an endoderm. This usually surrounds what is known as the mesoglea.

  Mesoglea - a middle layer of gelatinous (i.e. the “jelly”) material. Can vary widely in thickness depending on the species (e.g., very thick in some jellyfish).

Cnidocytes (Cnidoblasts) [Fig. 33.6, p. 671]:

All Cnidarians are carnivorous (though some corals live together with algae, and thus can photosynthesize for part of their energy).

Tentacles are covered with cnidocytes.

  - consist of coiled thread, which is either sticky, venomous, barbed, or some combination of these.

    - stinging cells are sometimes called nematocysts.

    - when a prey animal comes in contact with a tentacle, the cnidocytes are fired. This usually paralyzes and captures the prey.

    - also used defensively.

      - some predators can eat cnidarians and then use these cells themselves.

      - clown fish have immunity, and live inside some anemones.

Also have:
- a loose network of muscles (though this is not derived from mesoderm like true muscles).

- primitive nerve net, with sensory cells

- other specialized cells that can help with digestion

Can reproduce sexually or asexually. Details vary considerably from class to class, but here’s an overview:

- asexual reproduction is by budding (bud can break off, particularly in such species as hydra)

- sexual reproduction involves release of eggs, sperm, fertilization (from either polyp or medusa). This forms a zygote which develops into a “planula” larva (looks a bit worm like, covered with cilia). Planula will form new polyp, which will either mature into a medusa or stay a polyp.

Four classes you need to know about:

Hydrozoa:

- most alternate between polyp and medusa forms. [Fig. 33.8, p. 673].

- Obelia and Hydra (which doesn’t alternate, and is not typical of Hydrozoans) are two good examples of members of this group.

Scyphozoa:

- medusa stage predominates. Typical jellyfish

- some examples [OVERHEAD, also not in book].

- many are obviously dangerous, and even smaller ones can hurt.

Cubozoa (class is not in book):

- similar to Scyphozoa - but are squarish, with not many species.

- also swim better than the Scyphozoa

- can be deadly.

- an old Sherlock Holmes story “The Lion’s mane” was based on one of these.

Anthozoa:

- sea anemones, corals.

- polyp stage only.

- Coral reefs are one of the most productive habitats on earth, and like rain forests are being destroyed at incredible rates (often due to the build up of hotels and stuff catering to divers!).
- Great barrier reef, Red Sea, Carribean, etc.

- as mentioned, many corals have algae that live inside their bodies.

Phylum Ctenophora - comb jellies (a different phylum!) [Fig., not in book]

Not really discussed in your text, but see p. 667 for a very brief description.

Long time ago, used to be classified with jellyfish.

Basic body plan very similar to Cnidaria, but don’t have cnidocytes.

Only marine. Some are quite pretty, and some aquaria show these off quite well.

Covered with “combs” of cilia, which help animal move.

Tentacles have colloblasts, sticky cells a bit similar to cnidocytes, which stick to prey (small plankton). Tentacles are then drawn into mouth.

Some may have small anal pores, or the first indication of a one way digestive system. But much food is still expelled through the “mouth”.