NAME _____

DATE _____

Introduction to Hydra

Hydra is a freshwater member of the Phylum Cnidaria, which includes mostly marine organisms such as jellyfish and sea anemones. In these activities, you will investigate Hydra as an example of a simple animal.

Observing a Living Hydra

1. Using a dropper, transfer a *Hydra* to the well of a concavity slide. Add enough water to fill the concavity. Place the slide onto the stage of a stereomicroscope and observe the *Hydra* for a few minutes. Do you observe anything to indicate that the *Hydra* is alive?

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2. The *Hydra*'s body consists of a column with arms (tentacles) at one end. How many tentacles are there? _____ Compare this number with the number other groups observe on their specimens. Do most of the *Hydra* have the same number of tentacles? _____

3. With the end of a dissecting needle, gently touch one of the tentacles. Describe what happens.

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4. Use the blunt end of the dissecting needle's handle to tap on the dissecting scope's stage. Describe what happens.

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5. Use a dropper to add a *Daphnia* (or brine shrimp) to the concavity. Observe what happens and describe below.

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6. Place a *Hydra* on a microscope slide. With a sharp scalpel or razor blade, cut off part of a tentacle. Remove the *Hydra* from the slide. Add a drop of water over the tentacle if needed. Then add a coverslip and observe under low power (100×) and high power (400×). Notice the small, round cells that give a bumpy appearance to the tentacle. These are the stinging cells or cnidoblasts, which are characteristic of organisms in this phylum. Use the iris diaphragm of your microscope to reduce light and increase contrast to make the stinging cells more visible before proceeding.
7. Now add a drop of acetic acid to one edge of the coverslip. While watching under the microscope, touch a piece of bibulous (absorbent) paper to the opposite edge of the coverslip. This will draw the acid under the glass.

Describe what happens.

8. How might this relate to your observations recorded under Question 5?

9. Most animals exhibit either radial or bilateral symmetry. Animals with bilateral symmetry can be divided along the body axis into more or less identical left and right sides. Radial symmetry is similar to that of a wheel or jellyfish. The body can be divided along many different planes, so there are no distinct left and right sides. Does *Hydra* have radial or bilateral symmetry?

10. List two or more animal characteristics that you have observed in *Hydra*.

Observing a Stained Longitudinal Section of a Hydra

Place the slide on the stage of the microscope and observe first at low power then at high power. Identify the following parts of the *Hydra*'s body:

Epidermis. The outer tissue layer, which, in cnidarians such as *Hydra*, consists of several cell types. The most prevalent are epitheliomuscular cells. The epidermis is derived from the ectoderm, a primary tissue layer of the embryo.

Gastrodermis. This inner tissue layer of *Hydra* and other cnidarians contains both glandular and absorptive cells. The gastrodermis is derived from the endoderm, a second primary tissue layer of the embryo.

Mesoglea. This layer of gel between the epidermis and gastrodermis is typical of cnidarians. Although the mesoglea layer is thin in *Hydra*, it is greatly expanded in jellyfish, where it comprises the "jelly."

Gastrovascular cavity. This main body cavity of cnidarians contains food after capture and during digestion.

If a cross section of a tentacle is included on the prepared slide, look for cnidocytes. These cells contain the nematocysts (stinging capsules).

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