**You are to turn in your thumb drives for grading of Laboratories 1-3 at the end of this lab.**

You will need to read some background information on the organisms you will view today. We have not discussed any of these in lecture.

 I have also included some references, actually COVID online labs from 2020 where we could not meet in person. This material will help you visualize what you are looking for. It also will provide you with movies that are a poor substitute but still a substitute for specimens that may have not been sent or are in poor condition.

However do not substitute these references for examining in detail the actual specimens. There is a lot of material you have to learn on Cnidarians. You will remember key characteristics and important facts without much confusion if you associate them with the specimens you are being asked to observe.

Instructions:

 **Each pair should**

**Read the background information on Cnidaria in the reference material for the lab.**

**In this lab we will focus on the polymorphisms exhibited by Hydrozoans.**

**Cnidarians have two type of polymorphisms, one somewhat like a frog,** where different stages of the life cycle can look different. There can be a polyp or medusa or both. In fact the different clades of cnidarians are distinguished by whether they can have both or only one and which stage dominates.

There is another type of polymorphism that Hydrozoans can display. Often cnidarians belonging to the clade Hydrozoa form colonies of polyps and these polyps may be polymorphic in morphology and function. Hydrozoans often have medusa and polyps stages. But some only have polyps and some of these may develop into reproductive polyps. So a colony could have some polyps whose sole function is to produce sperm or eggs. Other individuals simply feed and transfer material by “stolon” connections to the rest of the colony.

 **If a medusa is present in the life cycle, it is the stage that produces eggs and sperm, but some colonies do not produce medusae and some polyps take over their function.**

**Activity one**

 **Examine reference COVID material on Hydractinia to develop search images.**

1. Obtain a hermit crab or at least a shell containing a colony of *Hydractinia echinata.* **Identify if you can at least four types of individuals (polymorphisms)**. **Photograph** **the different individuals you see. Graph the colony indicating the position of the various individuals to each other.**

1. **Activity two**

Continue becoming familiar with Hydrozoans by looking at othercolonies. Photograph the different polyps found in these colonies. Characterize the shape of the colony and spacing of feeding (most common) versus other types of polyps or zooids as they are called. Make lists as a class of the other organism found within your colony. Often in the ocean live colonies of organisms form the substrate or “soil and vegetation” we associate with terrestrial ecosystems.

 **Compare the structure of the two colonies available with that of the Hydractinia.**

**Unfortunately the two colonies sent are substitutions for those I requested. Compare then them also to COVID 2022 colonies in your journal.**

1. **Activity three**

Scyphozoans

Your last activity will probably be an examination of a Scyphozoan.

**View material in reference 2020 COVID lab on Scyphozoans**

You will examine the medusa, or the prominent stage in the life cycle of a Scyphozoan. Polyps may also be available. They have a small insignificant polyp.

The upside down jelly is a Scyphozoan. We have several adult specimens. The lab that furnishes them does not identify the species sent.

They have a symbiotic relationship with a dinoflagellate (zooxanthellae) that lives within their tissue, very similar to corals but also filter feed through secondary mouths on phytoplankton By lying upside-down, the mangrove upside down jellyfish exposes its algae to the sun, allowing it to photosynthesize. They release globes connected sometimes by mucous strings that contain algae cells, nematocysts and other ciliated cells that may aid in dispersing the globes. There is some disagreement about the function of these “cassiosomes”, with most scientists feeling that the jellies are building a protective wall around themselves. However since these are produced frequently while the jellies are feeding, some feel they may play a role in supplemental feeding and specimens may take in mucous strings some time after pulse feeding.

**Please examine the specimens we have and see if you can distinguish the secondary mouths on the medusa. Take a photograph and label the Oral cavity and secondary moths.**

Please use caution when handling these animals. Animals should be returned to holding dishes with as little water as possible. Discard water and inform TA if the holding dish is becoming cloudy or contains mucous, so water can be changed.

**If time: Activity 4**

**Observe feeding in sea anemones belonging to the class Anthozoa. Obtain a photograph of a tentacle, discharged nematocysts and symbionts. Identify symbiotic algae and nematocysts on the photograph**.

You should become familiar with polymorphism in colonies of **Hydrozoans**.

By comparing with older movies made by students, you should be able to comment on diversity in Hydrozoan life cycles as well.

You should become familiar with the external anatomy of an upside down jellyfish, a **Scyphozoan.**

If time permits

You should be able to examine the external anatomy and observe feeding in a sea anemone, an **Anthozoan**.