Introduction to Zoology & the Protozoans

- **Taxonomy** is the study of categorizing & organizing all living things, based on their similarities & differences.

- All living organisms are uniquely identified by name using a “taxonomic hierarchy”. This hierarchy groups organisms together, the largest group the “Domain” down to the smallest group the “species”.

  - **Domains** are groups that have little in common.
  - **Species** are groups that have the most in common and can successfully mate.

**Taxonomic Hierarchy:**

```
Domain –
  Kingdom –
    Phylum –
      Class –
        Order –
          Family –
            Genus –
              Species –
                Common Name
```

→ **All living organisms, from bacteria to humans** (*Homo sapiens*) **have a defining characteristic in common. Which, is we must be made out of cells. (FYI, this is a piece of the cell theory!)*

→ **There are 2 Main Types of cells found in all living organisms:** *(1 & 2 are now used as Domains in taxonomy)*

  1. **Eukaryotic Cell** (with nucleus)
  2. **Prokaryotic Cell** (without nucleus) *only found in Monerans*

→ **5 Kingdoms for all living things:**

  - **Monera** (bacteria & blue-green algae)
  - **Protista** (*protozoa* & protophyta)
  - **Fungi** (Yeast, mushrooms, slime molds, etc.)
  - **Metaphyta** (plantae or plant)
  - **Metazoa** (**animalia** or **animal**)

This Course will focus on Kingdoms Protista & Metazoa(Animal).
Kingdom - Protista

Taxonomy of protozoans (slides)

- **Domain** – Eukaryote
  - **Kingdom** – Protista
    - **Phylum** – Euglenozoa
      - **Genus** – Euglena
        - **Species** – viridis
          - Common Name = euglena
    - **Phylum** – Kinetoplastida
      - **Genus** – Trypanosoma
        - **Species** – gambiense
          - Common Name = trypanosome
    - **Phylum** – Rhizopoda
      - **Genus** – Amoeba
        - **Species** – proteus
          - Common Name = Amoeba
    - **Phylum** – Ciliophora
      - **Genus** – Paramecium
        - **Species** – caudatum
          - Common Name = paramecium

Protozoan Characteristics:

- Habitat - All aquatic environments.
- Coelom – Not applicable.
- Symmetry / Body Plan – Acellular mode of existence.
- Cellular Organization - Unicellular with organelles.
  - Cell membrane
  - Nucleus
  - Vacuole
  - Mitochondria
  - Ribosome
o **Types of Reproduction:**

1. Asexual -
   a. Binary Fission *(mitosis)*
   c. Budding

2. Sexual -
   a. Conjugation *(gamete exchange)*.

o **Digestion:** 2 main types/ways of obtaining nutrition.

   1. **Autotrophic** - (photosynthesis, chloroplasts)
   2. **Heterotrophic** – (must eat or consume food to survive)
      * Include, **Phagocytosis** *(engulf food through forming a food vacuole)*
      and **Saprozoic** *(absorb nutrition across cell membrane)*

o **Circulation:** The organisms use cytoplasm & osmotic pressure to move nutrients & oxygen around.

o **Nervous system** – no centralized nervous system, but organisms have simple sensory devices like eyespot

o **Key characteristics / special adoptions / unique feature**

  - **3 Modes of Locomotion:**
    1. **Pseudopodia** (move by streaming cytoplasm)
    2. **Flagella** (move by whip like tail beating)
    3. **Cilia** (move by many small hair like structures beating together)