

## Lab 6

**Biology:** The science that deals with life.

### Characteristics of life:

Living things show 4 Characteristics that the non-living do not display.

1- **Metabolic processes:** The total of all chemical reaction within an organism. For example Nutrient up take, processing, and waste elimination.

2- **Generative processes:** Action that increase the size of an individual organism (growth), or increase the number of individual in population (reproduction).

3- **Responsive processes:** Those abilities to react to external and internal change in the environment, for example irritability individual adaptation, and evolution.

4- **Control processes:** Mechanisms that ensure that an organism will carry out all metabolic activities in the proper sequences (coordination) and the proper amount.

### Scientific Name

Binomial nomenclature In the 1750s, Carl Linnaeus developed the system of binomial nomenclature (a two-part naming system) that we use today to name and classify living things used to name and identify organisms based on their genus and species names. This naming system is important

because it allows scientists to keep an organized list of species and it allows them to track their numbers in an ecosystem. The study of classification is also known as Taxonomy.

- The genus is always written first.
- The genus is always capitalized.
- The species is always written second.
- The genus and species must be italicized (underlined if hand-written).

Ex. *Fasciola hepatica*

## **Classification**

Biological classification is the scientific procedure that involves the arrangement of the organisms in a hierarchical series of groups and sub-groups on the basis of their similarities and dissimilarities.

\*Classifying organisms makes it easier to study & learn about them.

\*living things are classified into five main groups. Each main group is called a Kingdom.

The 5 Kingdom are:

1-Monera Kingdom

2-Protista Kingdom

3- Fungi kingdom

4- Plant Kingdom

5- Animal Kingdom

# Kingdom: Monera

## Characteristics of Monera

- The Monerans are unicellular prokaryotic organisms.
- The cell wall is made up of peptidoglycan and is rigid.
- Asexual Reproduction through binary fission.
- Flagella serves as the locomotory organ.
- It lacks mitochondria, lysosomes, Golgi bodies, endoplasmic reticulum, and nuclear membrane.
- These are environmental decomposers and mineralizers.

## Classification of Monera

Monera are classified into three groups, which are the **archaeobacteria**, **eubacteria**, and **cyanobacteria**.

### Archaeobacteria

- These are some of the oldest bacteria discovered in hard environments such as hot springs, salty places, and marshy locations.
- The structure of the cell wall differs from that of other bacteria, allowing it to thrive in hard environments.
- They feed themselves in an autotrophic manner.
- Their nucleotide sequences of tRNA and rRNA are unique.

### Eubacteria

- They are referred to as “true bacteria” since they are found in nature.
- Because they are composed primarily of peptidoglycans, they have a rigid cell wall.
- It moves by using flagella to push itself.
- They may be split into two kinds, namely gram-positive bacteria and gram-negative bacteria. have main three shapes **cocci**, **Spirillum** and **Bacilli**

**Example : Rhizobium and clostridium**

## **Cyanobacteria**

- They are blue-green algae
- They are photosynthetic in nature.
- They are commonly seen in water.
- They also play a part in nitrogen fixation.

Example :, **Nostoc** , **Spirulina**

## **Kingdom: Protista**

- 1- Most of the protista are unicellular.
- 2- Some of protista make their own food & others obtain their food from plants, animals, or dead organic matter.
- 3- They have a true nucleus. (Eukaryotic).
- 4- The protista kingdom is divided into eight phylum. Three of this phylum is simple algae, four are different groups of Protozoa, and one phylum consists of species of slim molds.

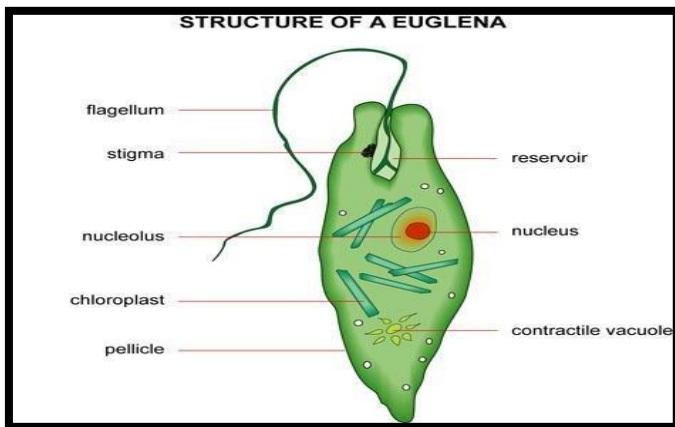
### **The phylum of Protista Kingdom:**

- 1- Euglenophyta → **Euglena**
- 2- Chrysophyta (golden algae) → **Diatoms**
- 3- Pyrophyta → **Ceratium**
- 4- Sarcodina → **Amoeba**
- 5- Ciliophora (Ciliates) → **Paramecium**
- 6- Mastoigophora → **Trichomonas** , **Trypansoma**
- 7- Sporozoa → **Plasmodium**
- 8- Myxomycota (Slime Molds) → **Physarum**

Some examples about Protista:

**Euglena:**

- 1- Are unicellular, live in water
- 2- When present in large amount they may color the water green.
- 3- Euglena have tail called a flagellum
- 4- The shape of Euglena may change sometimes as it swims
- 5- Euglena responds to light by swimming towards it because it has the stigma.
- 6- Euglena has chloroplast and can make its own food.(autotrophic)
- 7- Euglena reproduces a sexually through cell division.
- 8- Euglena lack cell wall and can move about.



## Paramecium:

- 1- Paramecium is a Sporozoa with two nucleuses, large nucleus controls cell activities and small nucleus is involved in reproduction.
- 2- Ciliated do not have cell wall, but they have cell membrane.
- 3- Cilia of Paramecium are short, hair like parts on the out side of the cell.
- 4- Cilia are useful for swimming & in obtaining food.

