



# Department of biology

## (General Zoology)

### Lab2

#### Stage -1-

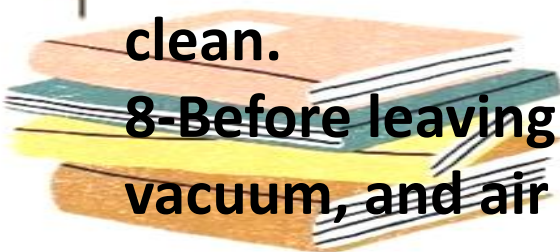
## Animal cell

By

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# **Laboratory safety and security Guidelines**

- 1- Lab coats should be worn at all times. Personal belongings i.e. coats, jackets, bags should not be brought to the laboratory.**
- 2-Approved eye protection and face shields must be worn at all times in the laboratory.**
- 3-Contact lenses should not be used in the laboratory.**
- 4-Eating, drinking and smoking are prohibited in all laboratories.**
- 5-Chemicals should not be smelled or tasted.**
- 6-They should not be touched without wearing gloves, they must be weighed and transferred with appropriate materials.**
- 7-Before leaving the laboratory, make sure your work area is clean.**
- 8-Before leaving the laboratory, ensure that all gas, water, vacuum, and air valves and lights are completely turned off.**



## Why do we study biology?

Studying biology is important for several reasons, as it provides insights into the natural world and the living organisms within it. Here are some key reasons why we study biology:

- ✓ **Understanding Life:** Biology is the scientific study of living organisms and life processes. By studying biology, we gain a deeper understanding of the fundamental principles that govern life, from the molecular and cellular levels to ecosystems and beyond.
- ✓ **Medical Advancements:** Biology plays a crucial role in medicine and healthcare. Understanding the human body, diseases, genetics, and other biological aspects is essential for the development of medical treatments, drugs, and therapies.
- ✓ **Environmental Awareness:** Biology helps us understand the interactions between living organisms and their environments. This knowledge is crucial for addressing environmental issues, such as climate change, conservation, and biodiversity.
- ✓ **Genetic Engineering and Biotechnology:** Advances in biology have led to breakthroughs in genetic engineering and biotechnology. These technologies have applications in medicine, agriculture, and industry, contributing to the development of new treatments, genetically modified organisms, and various products.
- ✓ **Evolutionary Insights:** The study of biology provides insights into the processes of evolution and the diversity of life on Earth. Understanding evolution is fundamental to comprehending the relationships between different species and how life has changed over time.
- ✓ **Ecological Balance:** Biology helps us understand the delicate balance within ecosystems. Studying the interactions between organisms, their habitats, and the environment is crucial for maintaining ecological balance and addressing issues like habitat loss and species extinction.
- ✓ **Personal Health and Wellness:** Biology education promotes health awareness and a better understanding of personal well-being. It helps individuals make informed decisions about nutrition, exercise, and lifestyle choices.

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- ✓ **Biological Research:** Research in biology contributes to scientific knowledge and drives technological innovations. This research can lead to discoveries that impact various fields, from agriculture to energy.
  - ✓ **Global Challenges:** Many global challenges, such as disease outbreaks, food security, and environmental sustainability, require a strong foundation in biology for effective solutions.
  - ✓ **Curiosity and Exploration:** Biology satisfies human curiosity about the natural world and life itself. Studying biology allows individuals to explore the wonders of nature, fostering a sense of awe and appreciation for the complexity and diversity of living organisms.





### The Cell

The cell is the basic structural, functional, and biological unit of all known organisms. A cell is the smallest unit of life. Cells are often called the "building blocks of life".

An animal cell is a type of eukaryotic cell that constitutes the basic structural and functional unit of animal tissues and organs. Eukaryotic cells, including animal cells, are characterized by having a true nucleus enclosed in a membrane. Animal cells share some common features with plant cells, but they also have distinctive characteristics.

**Here are the main components of a typical animal cell:**

#### **1. Plasma membrane**

- Present in all cells
- Surrounds the cell, providing a boundary between the cell's internal environment and the external environment
- semi-permeable
- made up of phospholipids, proteins, carbohydrates and Cholesterol.

#### **2. Cytoplasm**

- Semi fluid matrix fills the cell and
- Houses various organelles such as mitochondria, Golgi apparatus, etc.
- It is the site for many cellular activities and chemical reactions

#### **3. Nucleus**

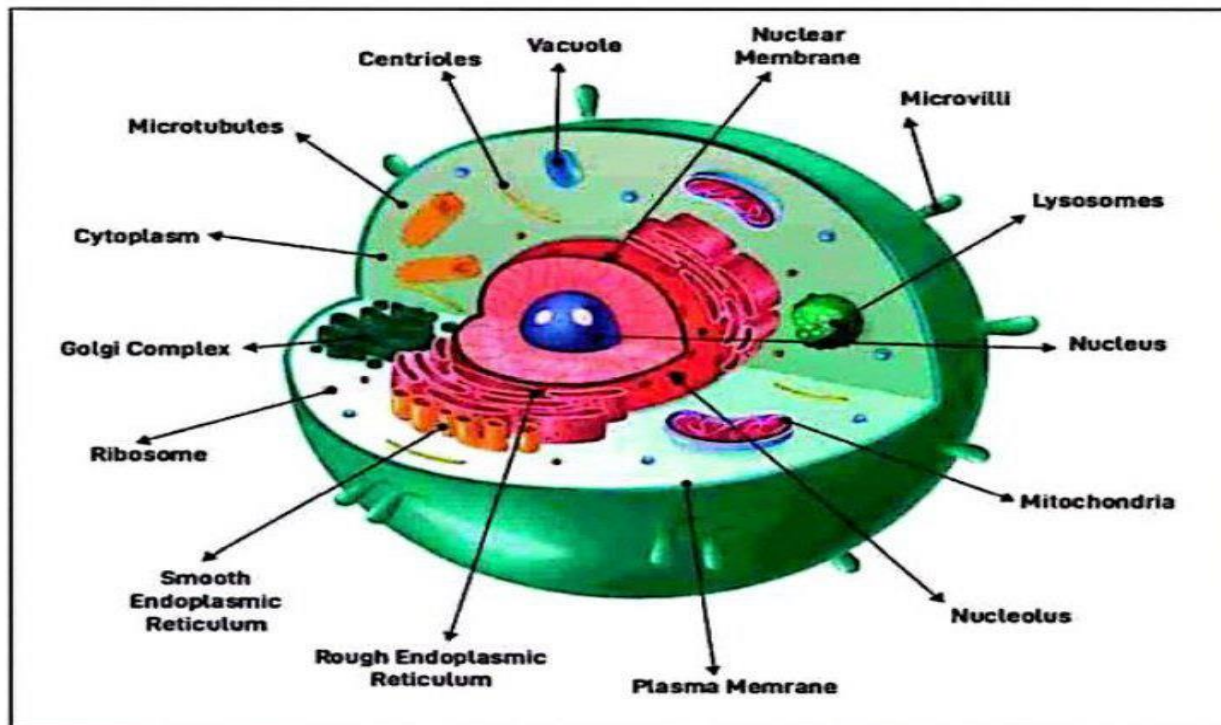
- The nucleus is the control center of the cell.
- It has double layer **nuclear membrane** with nuclear pores.
- It has transparent granular matrix called **nucleoplasm**,

- It has **chromatin network** composed of **DNA** (which is the genetic material that determines the cell's structure and function) and **histone proteins**.
- It also has a spherical body called **Nucleolus**.

#### 4. Organelles

Organelles are specialized structures within a cell that perform specific functions, contributing to the overall functioning and survival of the cell, such as:

- Mitochondria
- Golgi apparatus
- Lysosomes
- Endoplasmic reticulum (smooth and rough)
- Ribosomes
- Vacuoles





*Thank You*