

## The cell biology

BY

**Dr. Emam Atiyah**

**First stage**

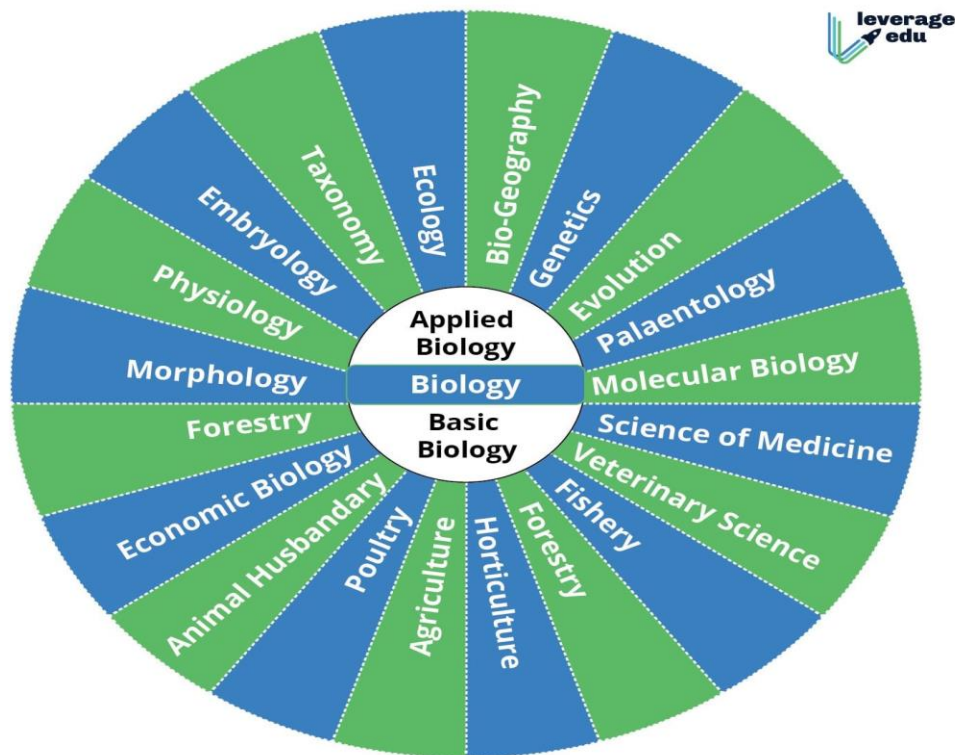
**2021-2022**

Biology: - the study of living things and their vital processes.

**The field deals with all the physicochemical aspects of life.**

The modern tendency toward cross-disciplinary research and the unification of scientific knowledge and investigation from different fields has resulted in significant overlap of the field of biology with other scientific disciplines.

Modern principles of other fields chemistry, medicine, and physics, for example, are integrated with those of biology in areas such as **biochemistry**, **biomedicine**, and **biophysics**.



Biology is divided into separate branches for the convenience of study:-

1. Study of plants (botany)
2. Animals (zoology)
3. In the study of the structure of organisms (morphology) from that of function (physiology)

All living things share in common certain biological phenomena, for example, **various means of reproduction, cell division, and the transmission of genetic material.**

**Q1/ indicate using True or False**

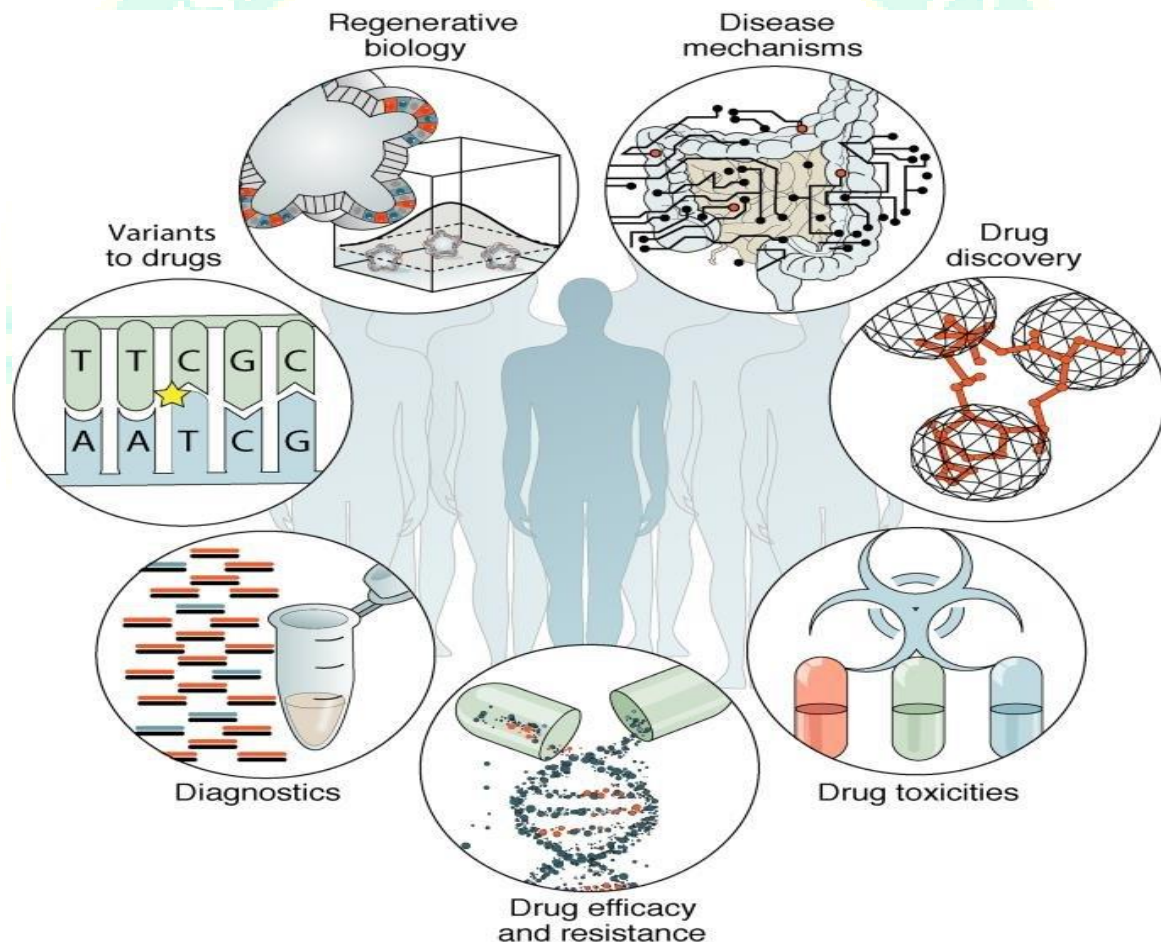
1. **Biology is divided into separate branches for the convenience of study ( )**
2. **The science that studies animals is called botany ( )**

**Q2/ Select the best answer:**

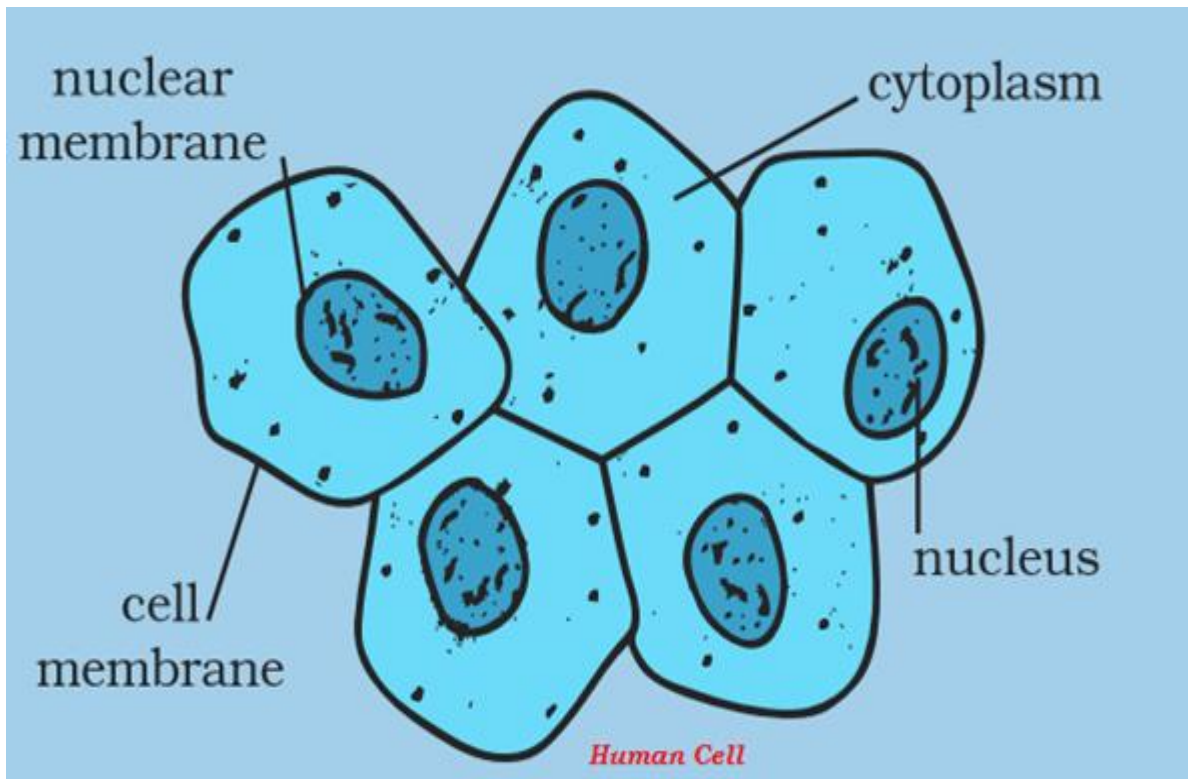
- **Biology is divided into separate branches for the convenience of study such as:**
- a. **Botany**
  - b. **Zoology**
  - c. **Morphology and physiology**
  - d. **All of the above**

Cell biology: - is the study of cells the fundamental units of structure and function in living organisms.

Cells were first **observed** in the 17th century, when the compound **microscope** was invented. Before that time, the individual organism was studied as a whole in a field known as organismic biology; that area of research remains an important component of the biological sciences.



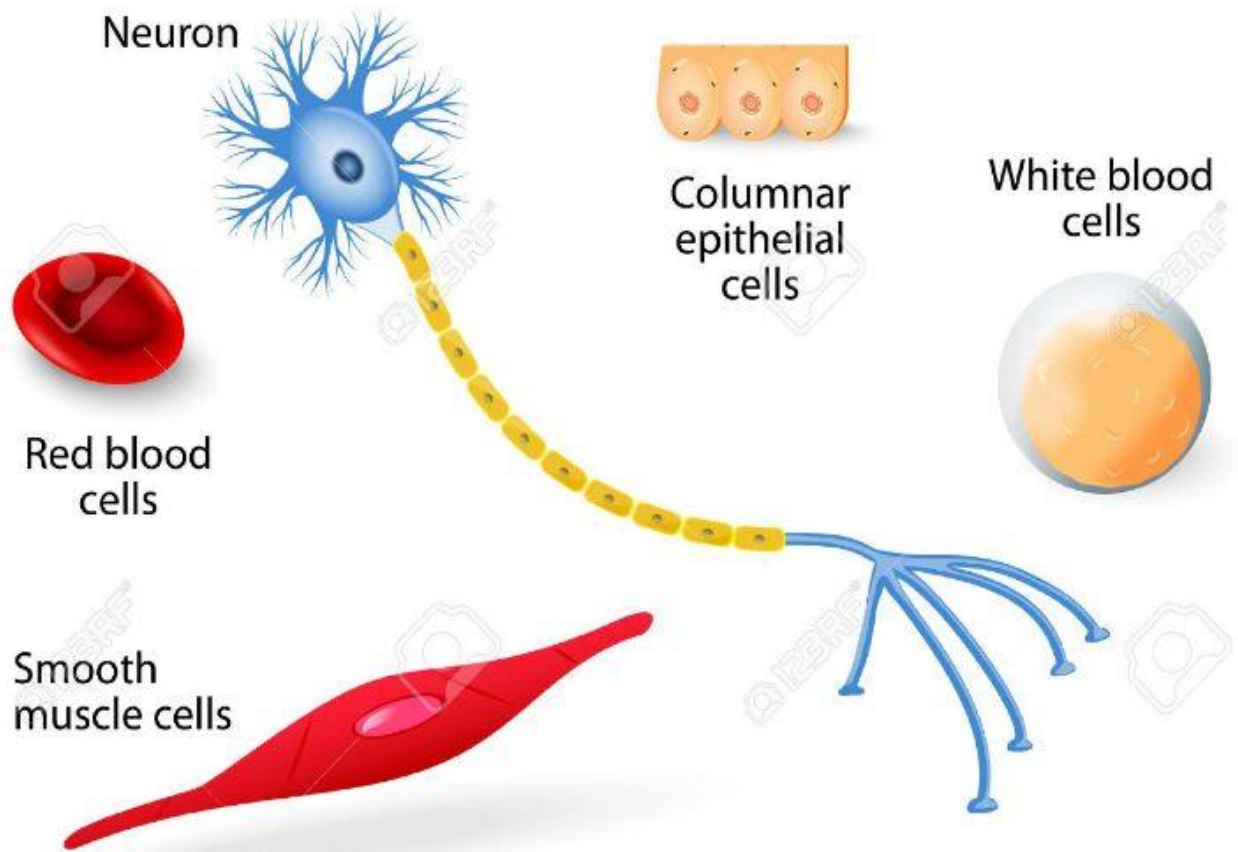
The Human Cell will have a profound impact on biology and medicine



## Human cell consist of:-

1. Cell membrane.
2. Cytoplasm.
3. Nuclear membrane.
4. Nucleus.

# HUMAN CELLS



Human Cells Types Include Blood Cell Muscle Cell Neuron, and Epithelial Cell.

There are two general categories of cells: **prokaryotes** and **eukaryotes**.

Prokaryotes lack any of the intracellular organelles and structures that are characteristic of eukaryotic cells.

Most of the functions of organelles, such as mitochondria and the Golgi apparatus, are taken over by the prokaryotic plasma membrane.

Eukaryotes are about 10 times the size of a prokaryote and can be as much as 1000 times greater in volume.

The major and extremely significant difference between prokaryotes and eukaryotes is that eukaryotic cells contain membrane-bounded compartments in which specific metabolic activities take place, and have small specialized structures called organelles that are dedicated to performing certain specific functions. Most important among these is the presence of a nucleus, a membrane-delineated compartment that houses the eukaryotic cell's DNA.

# Prokaryotic & Eukaryotic *Cells*

## Prokaryotes

- No nucleus
- Small and simple
- No organelles
- Very abundant
- Unicellular
- All are bacteria

## Both

- Have ribosomes
- Have DNA
- Have cytoplasm
- Have a cell membrane
- Some have flagella

## Eukaryotes

- Have nucleus
- Have organelles
- Have a cytoskeleton
- Can be multicellular or unicellular
- Some have a cilia



**Q/What are the characteristics (properties) of prokaryotic cells?**

1. No nucleus.
2. Small and simple.
3. No organelles.
4. Very abundant.
5. Unicellular.
6. All are bacteria.

**Q/What are the characteristics (properties) of eukaryotes cells?**

1. Have nucleus.
2. Have organelles.
3. Have a cytoskeleton.
4. Can be multicellular or unicellular.
5. Some have a cilia.

**Q/What are the common characteristics between prokaryotic & eukaryotic cells?**

1. Have ribosome.
2. Have DNA.
3. Have cytoplasm.
4. Have a cell membrane.
5. Some have flagella.

**OR**

**Q/What is the difference between prokaryotic & eukaryotic cells?**

<b>prokaryotic cells</b>	<b>Eukaryotes cells</b>
<b>1. No nucleus</b>	<b>1. Have nucleus.</b>
<b>2. Small and simple</b>	<b>2. Have organelles.</b>
<b>3. No organelles</b>	<b>3. Have a cytoskeleton</b>
<b>4. Very abundant.</b>	<b>4. Can be multicellular or unicellular.</b>
<b>5. Unicellular.</b>	<b>5. Some have a cilia</b>
<b>6. All are bacteria.</b>	