Medical biology is a field of human biology that has practical applications in medicine, health care and laboratory diagnostics.

Human Biology is the study of human beings and populations from a biological point of view.

Biology is the science that studies all living things and their environments.

- All living things called living organisms.
- All living organisms have levels of organization. Figure 1.illustrates that **atoms** join together to form the **molecules** that make up a cell. "The field of biology that studies the composition, structure and interactions of cellular molecules such as nucleic acids and proteins called **molecular biology**". A **cell** is the smallest structural and functional unit of an organism. The science that studies the microscopic appearance of cells is known as **cytology**. Human is multicellular organism because they are composed of many different types of cells, each group of similar cells that perform a particular function called **tissue**. Several types of tissues make up an **organ,** and each organ belongs to an **organ system.** The organs of an organ system are work together to accomplish a common purpose. The science that studies the microanatomy of cells, tissues, and organs as seen through a microscope and examines the correlation between structure and function is known as **histology**. Organisms**,** such as humans, are a collection of organ systems.

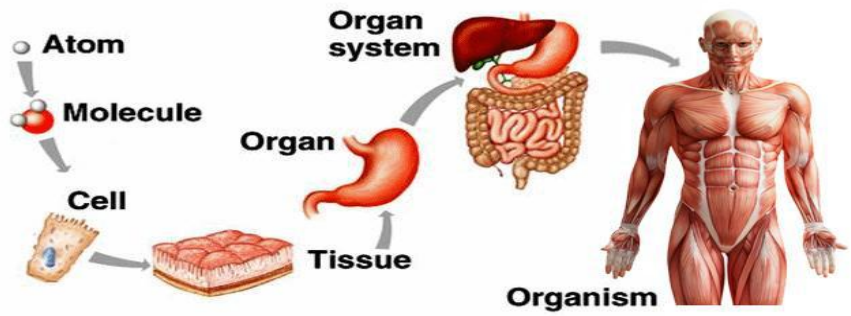

Figure1: level of human organization

The first level of organization to the human is the cell.

- **Cell** is a smallest basic structural and functional unit of all living organisms that maintain proper homeostasis.
- Cells are divided to **two** types:

1. **Prokaryotic cells** are cells that do not have a true nucleus or membrane-bound organelles. Figure2. Characterized as :

- unicellular " is an organism that consists of a single cell"

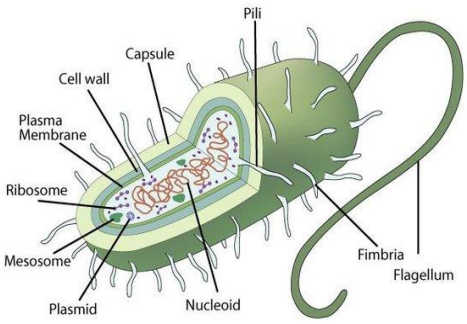

Figure 2: prokaryotic cell

- Small size (1-5 µm).
- Have cell wall outside the cell membrane.
- Lack a nuclear envelope separating the genetic material (DNA) from other cellular constituents.
- Have no histon (specific basic proteins) bound to their DNA.
- Have no organelles except ribosome.
- Prokaryotic cells divide by binary fission.
- Include: bacteria and cyano-bacteria.

2. **Eukaryotic cells** are cells that contain a nucleus and organelles, and are enclosed by a plasma membrane. Organisms that have eukaryotic cells include protozoa, fungi, plants and animals. Figure3. Characterized by:
   - Larger than prokaryotic cells (10-100 µm).
   - Multicellular organism.
   - Have distinct nucleus surrounded by nuclear envelope.
   - Histones are associated with the genetic material.
   - Numerous membrane-limited organelles are found in the cytoplasm.
   - Eukaryotic cells divided by **mitosis & meiosis**.

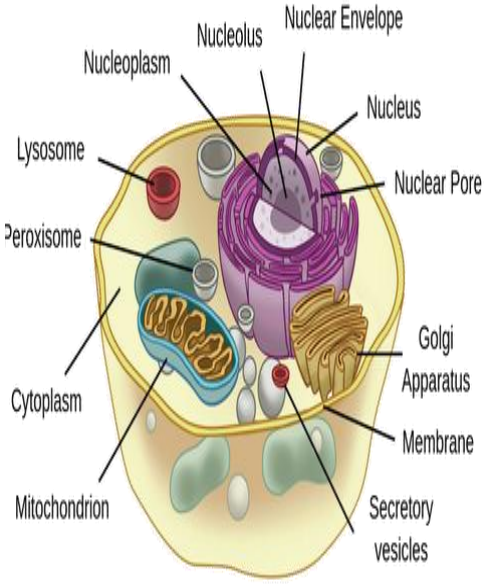

Figure3: eukaryotic cell

❖ **Internal Structure of human Cells (cell components)**

Certain structural feature common to all human cells but there are some different between cells according to cell type and cell function.

In general the basic human cell components are:

1. Plasma membrane (plasmalemma, cell membrane).
2. Cytoplasm: that includes cytosol, cell organelles and inclusions.
3. Nucleus.

References

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