

Introduction to Biology Notes

Eukaryotic Cells and Tissues:

What is Anatomy?

It is the study of the structure and shape of the body and its parts

What is Physiology?

It is the study of how the body and its parts work and function

Anatomy levels:

Gross anatomy

- Large structures
- Easily observable

for example, The brain, stomach, intestines, lungs, heart

Microscopic anatomy

- structures cannot be seen by the naked eye
- Structures can only be seen with a microscope

for example, cells, tissues, surface epitheliums

Levels of Structural Organisation

Atoms → Molecules → Muscle cell → Muscle Tissue → Organ (blood vessel) → Organ system

Concepts of the Cell

- A cell is the basic structural and functional unit of living organisms
- The activity of an organism depends on the collective activities of its cells
- According to the principle of Complementarity, the biochemical activities of cells are dictated by the relative number of their specific subcellular structures
- Continuity of life has a cellular basis

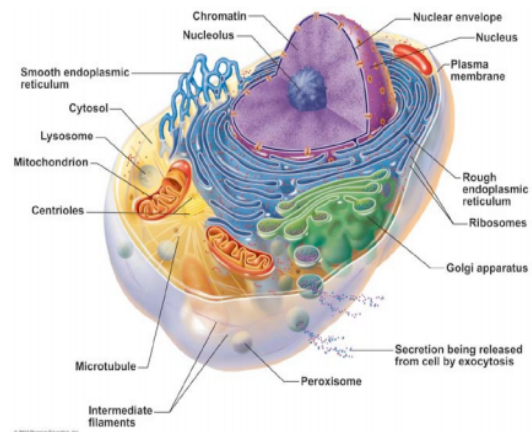
Cell types

- They greatly in shape, size and function.
- Cells are specialised for specific functions

for example, epithelial cells connect body parts,

Anatomy of the Cell

- cells are not all the same.
- They share general structures
- have three main regions, The nucleus, cytoplasm, Plasma membrane



Plasma Membrane: Structure

- contains proteins, cholesterol, glycoproteins
- double phospholipid layer including hydrophilic heads and tails.
- Barrier for cell contents

Plasma Membrane: Function

- Communication between cells
- forms cell junctions for tissues
- provides cell identification
- regulates transport of molecules, active and passive. (Active requires ATP energy.)

Plasma Membrane Specialisations

Membrane Junctions:

Tight Junctions

- Tight junctions which bind cells together into leakproof sheets

Desmosomes

- Anchoring junctions that prevent cells from being pulled apart

Gap Junctions

- allow communication between cells

Microvilli:

- Finger like projections that increase surface area for absorption

