

A Brief Discussion about Cytology

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DESCRIPTION

Cells are a basic unit of life and element of the structure, development, and lifespan of all living organisms. A cell is composed of a nucleus and a cytoplasm and is covered by a cell wall (cytoplasm). The nucleus controls and regulates cell activities. The cytoplasm contains permanent structures (organelles) and temporary structures (inclusions). The cell forms a structure which is most suitable for the cell function. The constitution of Elementary cell wall forms the structural formation like lamellated formation, which has no loose ends and folds into vesicles, cisterns and tubes. The membrane contains 60% protein, 32% phospholipids, and 8% lipids. Phospholipids have a hydrophilic head made of glycerophosphate and two hydrophobic tails made of two fatty acids. Therefore, phospholipids always form a bilipid layer. The bilipid layer has bile lipid-related membrane proteins.

It has three types of membrane proteins:

Peripheral (located on the surface of the membrane)

- Semi-integrated (part of it is built into it)
- Integrated (transmembrane protein).

Transmembrane protein is divided into structural receptor proteins, transport proteins, and enzymes according to function. Proteins can move and roll, thereby changing the surface and function of the membrane. The basic membrane structure of different cells has different characteristics because they contain different proteins. The cell membrane consists of 3 layers:

- Intermediate layer
- Basic (outer) membrane glycocalyx.
- The sub membrane (inner) layer contains microtubules and filaments that participate in cell movement.

The glycocalyx is formed by carbohydrate chains protruding from the outer surface and is connected to membrane lipids and proteins.

The glycocalyx restricts the penetration of water into the cell, adjusts the pH value in the cell, and adsorbs phagocytosed substances. Its glycoproteins are cell receptors and molecules recognized by foreign cells. The thickness, chemical composition, and function of glycocalyx are different in several cells.

The cell membrane forms special organelles such as cilia (microtubule-based hair-like organelles) and microvilli (nonmotile finger-like protrusions from the apical surface of epithelial cells) on the free surface. Microvilli increase the absorption area. They have a micro duct inside, surrounded by actin filaments that can inhale various substances. They can form striped edges in the small intestine. Cilia are produced in the center of the cell and can move. They have a microtubule axis with a matrix (modified central body) inside. On the surface of the substrate, there are cells that transport substances. The basal cell membrane forms deep folds and clusters of mitochondria between them.

The cell membrane forms 3 groups of cell connections:

- 1) Mechanical connections that firmly connect the cells (lock-type connections, finger connections, simple connections through glycocalyx, desmosomes, and hemidesmosomes)
- 2) Block ions the isolated connection with molecular penetration is formed by binding the integrins of adjacent cells (fixed connection, ribbon coupling)
- 3) Two types of chemical information gaps:
 - There are integrated proteins that form interstitial channels and small molecules in Nexus, Ions penetrate it.
 - Synapse, which is a connection between neurons with the one-way transmission. Tumor cells do not have any special structures on the cell surface.

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