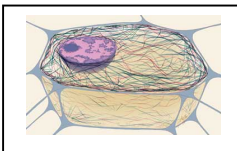


Cytoskeleton

Function: helps cell maintain shape and size



- ✓ network of protein filaments
- ✓ **Not** surrounded by membranes
- ✓ forms a dense network that covers the cell
- ✓ **made up of microfilaments and microtubules**

Microfilaments

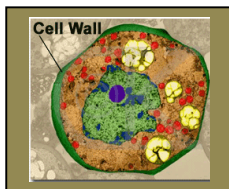
- ✓ **smallest strands** that support the cytoskeleton by a flexible framework
- ✓ made of the protein actin
- ✓ contribute to cell movement
- ✓ play a role in contraction of muscle cells

Microtubules

- ✓ **largest strands** that support cytoskeleton to maintain cell shape
- ✓ hollow structures made of proteins called **tubulins**
- ✓ important in cell division by forming **spindle fibers** that assist in division of chromosomes
 - after cell division, spindle fibers are disassembled, microtubules resume task of providing cell support

Cell Wall

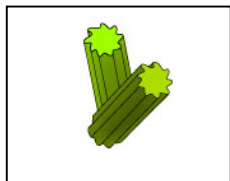
Function: support and protect the plant



- ✓ found in plants, algae, fungi and some prokaryotes
- ✓ lies outside of cell membrane
- ✓ is rigid and contains **long chains of cellulose** (complex carbohydrate)
- ✓ porous to allow water, oxygen, carbon dioxide, and certain other substances to pass through easily

Centrioles

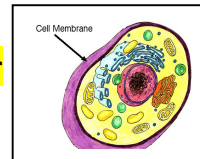
Function: helps organize cell division (animal cells only)



- ✓ formed from **tubulins**
- ✓ located near nucleus
- ✓ move to poles to act as anchoring points for spindle fibers during **cell division**

Cell Membrane

Also known as: Plasma membrane
Phospholipid bilayer
Fluid Mosaic Model

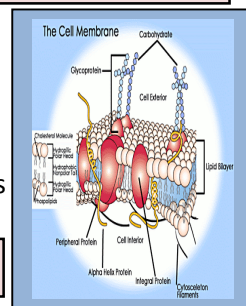


Function: 1. selects what goes in and out of cell
2. provides protection and support

- ★ cells cannot survive if isolated from its environment
- ★ all cells must take in nutrients and other materials, and must dispose of waste
- ✓ thin flexible barrier that is **selectively permeable** (chooses what goes in and out)
- ✓ made of proteins, lipids, carbohydrates and steroids
- ✓ double layered sheet is in almost all cell membranes
 - heads are **hydrophilic** (water loving)
 - tails are **hydrophobic** (water fearing)

2 Types of Proteins (located in cell membrane)

1. **Peripheral**- located both on **interior** and **exterior** surface
2. **Integral**- embedded in the **bilayer** and can form channels or pores so substances can pass

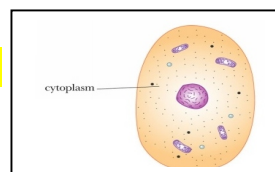


Fluid Mosaic Model

- ✓ scientists use it to describe **cell membrane**
- ✓ lipid bilayer behaves more like a **fluid** than solid
- ✓ membrane's lipids move laterally with the bilayer causing the pattern or shape to continuously change
- ✓ **Integral proteins** embedded into layer have carbohydrate molecules attached to them
 - molecules can bind to one side of membrane and carry to the other side of membrane
 - proteins exposed to cell's exterior surface may have carbohydrates attached to them
 - may hold carbohydrates attached together or act as sites where viruses or chemical messengers such as hormones can attach

Cytoplasm

Function: chemical reactions (site of cellular metabolism)



- ✓ is the distance from cell membrane to the nucleus
- ✓ made up of **cytosol** (jelly-like substance made mostly of water), organelles that float throughout it, and **inclusions** (nutrients, enzymes)