

**Cells and Membranes**

I. Introduction

A. What is a cell?

Cell theory – 4 postulates

Brief history of cells

van Leeuwenhoek

Pasteur

Schleiden & Schwann

B. Common features of cells

Prokaryotic cells

Eukaryotic cells

II. Eukaryotic Cells

A. Four domains of cells

Plasma membrane

Cytoplasm

Functions

Cell wall

Nucleus

B. Plasma Membrane

Structure

Phospholipid bilayer

Hydrophobic

Hydrophilic

Integrated proteins, sterols, carbohydrates

Fluid mosaic model

C. Membrane-bound organelles: internal compartments

Nucleus

Mitochondria

Endoplasmic reticulum

Chloroplasts

Golgi apparatus

Central vacuole

Cytomembrane system (endomembrane system)

D. Other organelles

Ribosomes

Centrioles

E. Cell wall

Only in plants and fungi

F. Cytoskeleton

Microfilaments

Intermediate filaments

Microtubules

G. Cilia & flagella

Flagella

Structure

Cilia

BIO 102 General Biology  
Lecture Outline

III. Prokaryotic Cells

A. Cell "coverings"

Plasma membrane

Capsule / glycocalyx

Cell wall

B. Cytoplasm

C. Appendages

Flagella

Pili

Fimbriae

IV. Cell Membranes

Plasma membrane = semi-permeable barrier

A. Movement across the membrane

Diffusion

Osmosis

Tonicity:

Isotonic

Hypotonic

Hypertonic

Plasmolysis

Hydrostatic pressure / turgor pressure

B. Membrane transport processes

Diffusion / osmosis

Active transport

Passive transport

Bulk transport

C. Passive transport

Channels / pores

No energy required

D. Active transport

Carriers / pumps

Requires energy

E. Bulk transport

Exocytosis

Endocytosis

Phagocytosis

Pinocytosis

Processing of endocytosed material

Endosomes

Lysosomes