

Biology 20
CYTOLOGY

CYTOLOGY =

Review of the Cell Theory:

- a) Cells are:
- b) Cells arise from:
 - Asexual =>
 - Sexual =>
- c) Cells are surrounded:
- d) Cells can:
- e) Cells have:

2 types of cells:

prokaryotic: the most abundant single-celled organism (Figs. 3.4, 3.6 & 3.7)
nucleoid

2 groups:

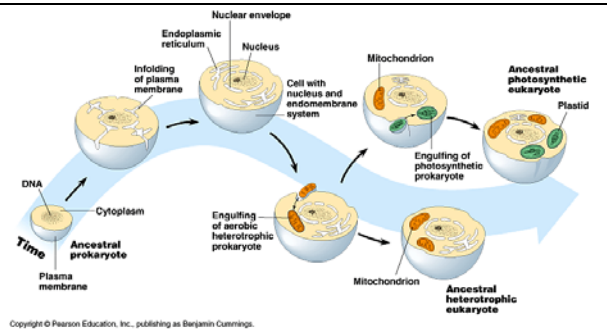
eukaryotic (Figs. 3.9 & 3.10):

4 groups

CELLULAR EVOLUTION: (pp. 57)

a) Autogeneous Model:

b) Endosymbiotic Model (Fig. 3.19):



COMPONENTS OF THE CELL:

Cell or Plasma membrane: (p. 62, Fig. 4.3)

Components of plasma membrane:

Fluid Mosaic Model - 1972 Singer & Nicholson

Fluid portion: - bilayer exists in a liquid phase

1. Phospholipids (Figs. 4.2 & 4.3):

composed of: **hydrophilic head:**
hydrophobic tails:

Amphipathic:

2. Cholesterol (Fig. 4.3):

Mosaic (Fig. 4.3):

3. Proteins = 2 types that differ in structure & function (2 arrangements)

integral proteins:

peripheral proteins:

Membrane protein functions (p. 62; fig. 5.13)

1. Transport proteins (Fig. 5.13C):

uniport:

symport:

antiport:

2. Ion channels (Fig. 5.13C)

3. Enzymes (Fig. 5.13A):

4. Receptor site (Fig 5.13B):

5. Cytoskeleton attachment:

6. Cell adhesion (p. 66; Fig. 4.19):

tight junctions:

desmosomes:

gap junctions:

4. Carbohydrates: (p. 80; Fig. 5.12)

glycoproteins:

glycolipids:

Crucial functions:

Membrane permeability:

Size:

charge:

lipid solubility:

carrier proteins:

Membrane transport: (pp. 82 - 85; Figs. 5.15 - 5.19)

simple diffusion: (Fig. 4.4 & 4.9)

facilitated diffusion (Fig. 4.9):

Osmosis (Figs. 4.5 – 4.7):

Hypertonic	Isotonic	Hypotonic

filtration:

active transport (Fig. 4.10)

Large molecules (Fig. 4.12 & 4.13)

Endocytosis:

phagocytosis:

pinocytosis:

receptor mediated endocytosis:

Exocytosis (Fig. 4.12):

Cytoplasm:

cytosol:

Nucleus (Fig. 3.12)

nuclear envelope:

Endomembrane system: many membranes of the eukaryotic cell (Fig. 3.11)
(Nuclear envelope/ER/Golgi/vesicles/lysosome and cell (plasma) membrane)

Endoplasmic reticulum: interconnect network of membrane vesicles (Fig. 3.13)

Rough ER:

Smooth ER:

Golgi complex (apparatus):Fig. 3.14)

Functions:

Lysosome (Fig. 3.15):

Functions:

Vacuoles (pp. 61 - 62; Figs. 4.11B & 4.13):

Food vacuoles:

Contractile vacuoles:

Central vacuoles (mature plant cells):

Peroxisomes:

Mitochondria (Fig. 3.17)

Function:

Chloroplasts (Fig. 3.18)

Function:

Cytoskeleton (Fig. 4.3)

Functions:

- microfilament:

- intermediate filament:

- microtubule:

Actin & myosin

Disrupted cytoskeleton

Cilia & flagella (Fig. 4.15 A & B)

Cilium (singular) and Cilia (plural):

Flagellum (singular) and Flagella (plural):