Biology 30 - Structure & Function of Cell (Part 1)

CYTOLOGY =
Review cellular basis of life (chapter 1):
  a) Cells are:
  b) Composed of:
  c) Cells arise from:
  d) Cells are surrounded:
  e) Cells transform:
  f) Cells have:

Cell Doctrine:
  •
  •
  •

2 types of cells:
  **prokaryotic**: the most abundant single-celled organism
    - nucleoid:
      - size:
  **eukaryotic**:
    - Size:

Why are cells so small?
  Efficiency:
    o
    o

Surface Area to Volume ratio (SA/V ratio)

**COMPONENTS OF THE CELL:**
Cell or Plasma membrane:

Components of plasma membrane:
  **Fluid Mosaic Model - 1972 Singer & Nicholson**
    - Fluid portion: - bilayer exists in a liquid phase

1. **Phospholipids** (p. Fig. 5.1A & 5.2):
   - composed of: **hydrophilic head**:
   - **hydrophobic tails**:
2. **Cholesterol**

Mosaic:

3. **Proteins** = 2 types that differ in structure & function (2 arrangements)
   - **Integral proteins**:
   - **Peripheral proteins**:

Membrane protein functions)
1. **Transport proteins** ():

2. **Ion channels**

3. **Enzymes**:

4. **Receptor site**:

5. **Cytoskeleton attachment**:

6. **Cell adhesion**:
   - **Tight junctions**:
   - **Anchoring junctions**:
   - **Gap junctions**:

4. **Carbohydrates**:
   - **Glycoproteins**:
   - **Glycolipids**:

   Crucial functions:

**Membrane permeability**:

Size:

charge:

lipid solubility:

carrier/transport proteins:

**Membrane transport**:

- **Simple diffusion**:

- **Facilitated diffusion**:
- **osmosis:**
  - hypertonic:
  - isotonic:
  - hypotonic:

**Cellular concentration → 3% NaCl, 97% H₂O**

Comparing the [beaker] to the [cell]:
- [Beaker]:  __________  __________  __________
- [Cel]:    __________  __________  __________

What happens to animal (i.e. human) cells in each of the above solutions?
- Animal:  __________  __________  __________

Why does water move from a hypotonic to a hypertonic solution?

- **filtration:**

**active transport**

**Bulk Transport (Large molecules)**

**Endocytosis:**
- **phagocytosis:**
- **pinocytosis:**
- **receptor mediated endocytosis:**

**Exocytosis:**
Cytoplasm:
  cytosol:

Nucleus

  Nucleolus:
    Ribosomes:

  nuclear envelope:

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

Endoplasmic reticulum: interconnect network of membrane vesicles
  Rough ER:

  Smooth ER:

Golgi complex (apparatus):
  Functions:

Lysosome:
  Functions:

Vacuoles:
  Food vacuoles:
  Contractile vacuoles:

Peroxisomes:

Mitochondrion/mitochondria:
  Function:

Cytoskeleton

Cilia & flagella:
  Cilium (singular) and Cilia (plural):
  Flagellum (singular) and Flagella (plural):