**General Biology 1 – BSC 2010**

**Unit 2: Chapters 4 and 5. Due on day of Exam 2**

**No late assignments collected.**

**Exam 2: Chapters 4 and 5**

**Videos: Related YouTube videos to help complete the worksheets**

**Cell Structure Part 1 (Chapter 4):** [**https://youtu.be/Lq74zpx8Ewc**](https://youtu.be/Lq74zpx8Ewc)

**Cell Structure Part 2 (Chapter 4):** [**https://youtu.be/V33p4pGa79s**](https://youtu.be/V33p4pGa79s)

**Cell Membranes, Passive and Active Transport (Chapter 5):** [**https://youtu.be/RqtQfSDEKIM**](https://youtu.be/RqtQfSDEKIM)

**Chapter 4: Cell Structure**

* Define **Cell Theory**
* **Cell Size Restrictions**: Explain surface area to volume ratio,
* Define Light microscope and what it is used for. What does resolution refer to in regards to images seen under a microscope?
* Define electron microscope (both SEM, TEM), and what it is used for
* Define and provide examples of: **Eukaryotes** and **Prokaryotes**

**Cell Structures: Know all of the cell structures and organelles!**

* Know structure, function ***in addition to*** other key point below:

Define and discuss features of the following cellular structures and organelles

**Prokaryotes: Draw a prokaryotic cell with the following structures. Define each structure**

* Plasma Membrane:
* Cytoplasm, nucleoid, ribosomes, cell wall, flagella, capsule

**Eukaryotes**:

* Why is Compartmentalization important for eukaryotic cells?
* **Define**: Nucleus: nucleolus, nuclear envelope, chromosomes, chromatin
* What is the **Cytoplasm**?
* What are Ribosomes made of?
* What is the function of ribosomes?
* What is the Endomembrane System?
* Describe the order and direction things move through this endomembrane system
  1. (Hint: use the following terms in your answer: Golgi, Plasma membrane, ER, Transport vesicles and lysosomes)
* Define **Phagocytosis,** what are some reasons cells perform phagocytosis?
* Define: Vacuoles, give an example
* Draw a **Mitochondrion** and label the following: cristae, matrix, membranes
* What is the function of the mitochondria? Why does the mitochondria have 2 membranes?
* **Define**: Chloroplasts, thylakoids, grana, stroma
* What is **Endosymbiosis**? What organelles formed by this process?
* **Cytoskeleton**: what is it? List the 3 types of fibers and their basic function.
* Describe the eukaryotic Flagella and the arrangement of microtubules that form it.
* Describe the Cell walls in plants, protists, and fungi.
* Define the extracellular matrix (ECM), and the following terms: glycoproteins, collagen, integrins
* What is MHC? Why is it an important component of our cells?
* Define the 3 Categories of Cell Connections:
  1. Tight Junctions
  2. Anchoring Junction (desmosome)
  3. Communication Junctions (gap and plasmodesmata)

**Chapter 5: Membranes**

* **Draw a Phospholipids**: structure (glycerol + 2 fatty acids), ***label the*** hydrophobic/hydrophilic regions
* **Define: Fluid Mosaic Model of cell membranes**
* What is membrane fluidity and how it is maintained by cells, and why is this important?
* How do Saturated Fatty acids and Unsaturated relate to membrane fluidity?
* Define: **Membrane proteins**: functions, **peripheral**, **integral** (**transmembrane domain** which are hydrophobic), **pores**
* Define **Concentration Gradient**
* **Passive Movement** and provide 2 examples:
  + Define**: Diffusion**
  + True of false, Facilitated Diffusion requires energy? Explain.
  + Define the following terms related to facilitated diffusion
    - **Channel** **Proteins**
    - **Carrier Proteins**:
    - *Example*: glucose and amino acids, bind to carrier protein-> it changes shape-> glucose enters the cell
  + Define **Osmosis**:
  + Is osmosis an example of active or passive transport?
  + Define the following and explain what would happen if a cell was placed each type of solution:
    - **Hypertonic**
    - **Hypotonic**
    - **Isotonic**
  + What are **Aquaporins?**
  + **How doe cells maintain Osmotic Balance?**
* ***Define ACTIVE*** **Movement**: (use the terms: energy, concentration gradient)
  + Define the following transporters involved in active transport
    - Uniport
    - Symport
    - Antiport
  + Is the Sodium/Potassium Pump active or passive transport? Is the Na/Ka pump and example of a uniporter, symporter or antiporter?
  + List the steps involved in one cycle of the Na/Ka pump

* + What is Coupled Transport?
  + Explain how the Sodium/Potassium Pump couples with the Glucose-Sodium Symporter to get glucose into the cell.
* **Bulk Transport:**
  + **Define: Endocytosis**
    1. **Phagocytosis**:
    2. **Pinocytosis**:
    3. **Receptor Mediated Endocytosis**:
  + **Define Exocytosis**