Eukaryotic Cell and Organelle Review

Honors Human Anatomy and Physiology

It is estimated that the average adult human has around 37 trillion cells. A trillion is a big number! Just to give you some perspective, if you were to go back in time 100 trillion seconds ago you would be going back 31,709.8 years!

So imagine that each cell has to maintain homeostasis, obtain nutrients, eliminate wastes, communicate with other cells, defend itself against pathogens and repair itself if it is able. How is this possible? Each cell is equipped with cell parts, **organelles**, which have a role in the physiology of homeostasis.

You have been taught organelles and their functions many times in your career as a student, most recently when you mastered Biology. The goal of this assignment is to have you review the anatomy and physiology of organelles found in the human cell in order to have a working foundation for understanding the human body. Be detailed and specific (do not use overly simplistic analogies or generalizations). It will not help you to know “the mitochondria is known as the power house of the cell” when in reality the mitochondria has the ability to metabolize carbohydrates into ATP using oxygen (aerobic respiration).

Know the anatomy (shape/structure/what it is made from) and physiology (how does it work) of the following organelles:

- Nucleus (nuclear membrane, nucleoli (nucleolus), nuclear pores, nucleoplasm)
- Chromatin (histones, chromosomes)
- Cytoplasm (cytosol, organelles, inclusions)
- Mitochondria
- Ribosomes
- Endoplasmic Reticulum (rough ER, smooth ER, transport vesicles)
- Golgi Apparatus (secretory vesicles)
- Lysosomes
- Peroxisomes (remember these from the liver lab?)
- Cytoskeleton (intermediate filaments, microfilaments, microtubules)
- Centrioles
- Cilia
- Flagella
- Plasma Membrane (Microvilli, phospholipid bilayer, channel proteins, carrier proteins, solute pumps)

Mr. Burghardt will cover very little of this in class. It is up to you to rediscover the cell organelles and their functions.

Over →
ASSIGNMENT:

1) Navigate to Mr. Burghardt’s Anatomy/Physiology website (http://phsmrb.weebly.com/anatomyphysiology.html).

2) Scroll down, in the right side column locate and click the link for Bozeman Anatomy/Physiology Review Videos.

3) Locate Unit 3 Cells and Tissues.

4) Take notes (handwritten or open a Google Docs) on the organelles listed on the other side of this paper as you watch these videos:
   - A tour of the cell
   - Cellular Organelles
   - Compartmentalization

There is some overlap in these videos.

5) Use your textbook (chapter 3) to add to the notes you have just completed from the videos.

6) Be prepared for a quiz covering the anatomy and physiology of these organelles. You will also be required to know about protein synthesis (transcription and translation) and cell reproduction (mitosis and meiosis). You can review these topics from Mr. B’s website by going to the Bozeman Biology Review Video link. You textbook also covers these review topics.

   - Protein Synthesis is located in section 3.11
     - Transcription and Translation
   - Cell Reproduction is located in section 3.10
     - Meiosis
     - Phases of Meiosis
     - Mitosis
     - Phases of Mitosis