Assignment: Call Me By My Organelle

Learning objectives:

4.1 Describe the structure and functions of the animal cell.
5.1 Describe and recognize examples of the major types of human tissues.

Consider reviewing the following topics:

- Review the internal organization of the cell, specifically the organelles making up the endomembrane system, mitochondria, and cytoskeleton..
- **Specifically: You should review the "4. Cell: internal organization" lecture notes, pages 66 to 84 in your textbook, and my video lectures on the topic. If you need some practice, I highly recommend completing the worksheet "Inside the cell" on Google Classroom. Additionally, if you need more clarification, read this article called "Cellular organelles and structure".**

A. Introduction:

Recall that the most important relationship in biology occurs between structure and function. Cells come in many different shapes and sizes, and their shapes are inextricably linked with their function. Along with their shape, the types of organelles that exist within the boundaries of a cell also dictate their function. This relationship is so correlative that it's possible to predict the types of organelles and how predominant they are based on a cell's function.

B. Identifying the organelles and their functions:

Collect the cards with the names of organelles (green cards) from the bag and lay them down on the table. You have the following 5 major organelles in the bag: **nucleus (unilobed and multilobed), ER (normal and extensive versions, predominantly smooth and predominantly rough), vesicles, Golgi apparatus, and mitochondria.** Match the organelles in the bag with their corresponding green card. Next, collect the organelle function cards (red cards) and match them with the correct organelle.

C. Identify the cell types and populate them with organelles:

Also in the bag, you have 6 types of cells devoid of any organelles. Firstly, you will identify each in the table on the opposite side of this page. In the second column, you have the generalized functions of each of these cells **[this second page will be given to you on the day of the case study]**. Based on their functions, you will then predict the types of organelles and how predominant they are **relative to the other cells.** For example, given the limited number of mitochondria you are given, you should distribute them according to each cell's level of activity relative to each other. The cells in this activity are proportional in size to each other.

Keep in mind a few rules when populating the cells with organelles:

1. Each nucleus has an associated endoplasmic reticulum
2. Each endoplasmic reticulum has an associated Golgi
3. Lysosomes and mitochondria are limited in number, so place more in cells that are more in need of each of these organelles
4. Lysosomes, peroxisomes, and phagosomes are all represented by the same organelle: 🍪
5. Place all organelles in your bag on the cells provided.

D. Identify the cell types based on their shapes: Identify the following cell types based on their shape: cardiac myocyte, enterocyte, erythrocyte, neutrophil, pancreatic acinar cell, theca cell.

Cell type	Label
Cardiac myocyte	
Enterocyte	
Erythrocyte	
Neutrophil	
Pancreatic acinar cell	
Theca cell