SB1a Test: Cell Structure and Function Study Guide

1) Convert sugar into energy - **mitochondria**
2) Make proteins for just the cell they are located within - **ribosomes**
3) Make cell parts more efficient by increasing the available space for work to take place within a cell - **folded membranes**
4) Package and distribute proteins - **golgi**
5) Contains digestive enzymes to help break down cell wastes - **lysosomes**
6) Act like little UPS trucks as they deliver the packages (proteins) - **golgi**
7) Uses sunlight to produce sugars (food) for plant cells - **chloroplasts**
8) Energetic cells need a lot of these to make ATP - **mitochondria**
9) Act like little garbage trucks to move around, pick up cell waste, and get rid of it - **lysosomes**
10) Stores wastes, nutrients, and water - **vacuole**
11) Encloses the nucleus like an envelope - **nuclear membrane**
12) Site of photosynthesis - **chloroplast**
13) Rigid outermost layer in plant cells - **cell wall**
14) Larger storage organelle in plant cells than in animal cells - **vacuole**
15) "Intracellular highway" because it is used for transporting proteins from the ribosomes - **Endoplasmic reticulum (ER)**
16) The “brains” of the cell, that directs cell activities and contains genetic material called chromosomes made of DNA - **nucleus**
17) Allow ribosomes and genetic material to move through the nuclear membrane - **nuclear pores**
18) Make proteins to be transported outside of the cell they are produced within - **ribosomes on ER**
19) The framework that anchors organelles within the cytoplasm - **cytoskeleton**
20) Works with the cell wall to maintain turgor pressure within plant cells - **vacuole**
21) Cells that do not have nuclei (plural version of nucleus) – **prokaryotes**
22) Cells that have nuclei, organelles such as chloroplasts, and cell walls made of cellulose – **eukaryotes**
23) Chloroplasts and mitochondria both convert this – **energy**
24) Regulates what enters and exits the cell – **cell membrane**
25) Bacteria cells for example – **prokaryotic cells**
26) Animal cells lacks these – **chloroplasts and cell walls**
27) Two types of eukaryotic cells are – **plant and animal cells**
28) These digest molecules and dead cellular organelles – **lysosomes**
29) Help move spindle fibers to move chromosomes during cell division (like a puppet) – **centrioles**
30) Helps a plant cell maintain turgor pressure with the cell wall - **vacuole**
SB1bc Macromolecules and Enzymes

1. Since enzymes are proteins they are made of .......what?
   Amino acids joined by peptide bonds

2. The energy needed to start a chemical reaction is called?
   Activation Energy (E\textsubscript{A})

3. How do enzymes increase the rate or speed of a chemical reaction?
   By lowering the Activation Energy (E\textsubscript{A})

4. Where do the enzyme and substrate “fit” together?
   Active Site

5. How can you change the function of enzymes?
   By adding acids or bases, changing the temperature, or increasing the enzyme concentration

6. Draw a picture of (A) a substrate, (B) an ES complex, and (C) the products.

7. Give two examples of disaccharide substrates being catalyzed (broken down) in a chemical reaction with the help of an enzyme
   Sucrose -> glucose and fructose
   Lactose --> glucose and galactose

8. What does the lock and key analogy describe?
   That a particular enzyme interacts with a specific type of substrate molecule

9. Name some enzymes
   amylase, protease, sucrase, lactase, catalase

10. Describe the pH scale
    Acid - Has a pH less than 7 (7 is neutral e.g. water)
    Base or Alkali - Has a pH more than 7
11. **What are the substrate and enzyme involved in PKU?**

Phenylketonuria (commonly known as PKU) is an inherited disorder that increases the levels of a substance called **phenylalanine** in the blood. Phenylalanine is a building block of **proteins** called an **amino acid** that is obtained through the diet. It is found in all proteins and in some artificial sweeteners. PKU occurs because the affected individual lacks the enzyme phenylalanine hydroxylase. If PKU is not treated, phenylalanine (substrate) can build up to harmful levels in the body, causing intellectual disability and other serious health problems.

12. **Describe two primary functions of lipids.**

Store energy and insulate

13. **What are some examples of lipids?**

Wax, fats, oils, and cholesterol

14. **What are the monomers of nucleic acids?**

Nucleotides

15. **What are lipids made of?**

Fatty acids

16. **Which macromolecule stores genetic information?**

Nucleic acids such as DNA

17. **What are some examples of carbohydrates?**

Polysaccharides and glucose

18. **What are the subunits of fats?**

Fatty acids

19. **Lipids may be tested using the brown paper bag test resulting in a translucent spotting effect. What foods would show a positive test?**

Greasy foods like French fries or potato chips

20. **Long chains of amino acids are linked by peptide bonds to form what macromolecule?**

Protein

21. **What is the primary structural component of the human body?**

Protein

22. **Describe enzymes.**

“Reusable” proteins that **put together** or **break down substrates** to form products