Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period\_\_\_\_\_\_\_

**AP Exam Review: Cells**

1. Living systems require a constant input of energy.
2. How are cells able to remain alive and increase in complexity in accordance with the second law of thermodynamics?
3. Comparing the surface area and volume of cells
4. Why are surface area-to-volume ratios important a cell’s efficiency in obtaining nutrients and eliminating wastes?
5. Structure of the cell membrane
6. The cell membrane is made of five components:

|  |  |
| --- | --- |
| **Component** | **Function** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

1. A closer examination at why phospholipids are awesome:
2. How does the structure of the cell membrane relate to what can easily pass in or out of it?
3. A quick recap of cell walls:

|  |  |
| --- | --- |
| **Organism** | **Notes** |
| Plants |  |
| Prokaryotes (some) |  |
| Fungi |  |
| Protists (some) |  |

1. Transport
2. Some Concentration Basics

|  |  |
| --- | --- |
| **Condition** | **Meaning** |
| Isotonic |  |
| Hypertonic |  |
| Hypotonic |  |

1. Passive transport
2. What is it?
3. Role of membranes
4. Glucose transport
5. Active transport
6. What is it?
7. Role of membranes
8. Na+/K+ pump
9. Bulk transport

|  |  |
| --- | --- |
| **Type of bulk transport** | **Notes** |
|  |  |
|  |  |

1. Organelles
2. Archae and Bacteria generally lack internal membranes and organelles ☹ and often have a cell wall.
3. Eukaryotes are characterized by the presence of internal membranes that partition a cell into specialized regions.
4. Where did the organelles come from?
5. Why have compartments?
6. Some examples

|  |  |
| --- | --- |
| **Membrane-bound organelle** | **What’s inside?** |
| Endoplasmic reticulum | Rough ER: |
| Smooth ER: |
| Mitochondria |  |
| Chloroplasts |  |
| Golgi body |  |
| Nuclear Envelope |  |
| Lysosomes |  |
| Vacuole |  |

1. Cell structures work together to accomplish complex cellular processes. Example: Protein synthesis!
2. Comparing prokaryotic and eukaryotic cell structure

|  |  |  |
| --- | --- | --- |
| **Prokaryote** | **Characteristic** | **Eukaryote** |
|  | Cell wall |  |
|  | Chromosomes |  |
|  | Ribosomes |  |

1. Cell communication
2. A prokaryotic example!
3. Quorum Sensing
4. A eukaryotic example!
5. Epinephrine stimulation of glycogen breakdown in mammals
6. Cells can communicate with one another through direct cell-cell contact.
7. Cells can communicate with one another over short distances.
8. Cells can communicate with one another over large distances.
9. Signal Transduction
10. What are the three types of chemical messengers?
11. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
12. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
13. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
14. Describe the relationship between a chemical messenger and the receptor protein.
15. Describe the process of signal transduction.
16. Describe how signal transduction works in a G-protein linked receptor.
17. What is a signaling cascade (and how are second messengers related to this)?