Jonathan Quang 10/14/2014

Biology

Homework #7

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| Organelle | Is it present in prokaryotes? | Is it present in plant cells? | Is it present in animal cells? | Function/Description |
| Cell wall | Yes | Yes | No | The cell wall is the hard outer layer of certain cells that protect and support the cell. They can be made out of chitin, cellulose, peptidoglycan, and etc. |
| Cilia | No | Not in most | Yes | Small structures on the cell surface that move the cell through fluid, move fluid past the cell, and/or act as sensory organs. |
| Flagella | Yes | Not in most | Yes | A tail or whip like structure that moves the cell through fluid by actually spinning or lashing around. |
| Plasma Membrane | Yes | Yes | Yes | The border of the cell that isolates the cell contents from the environment, regulates substances coming and leaving the cell, and allows for intercellular communication. |
| Chromosomes | Yes, but there is only one circular chromosome with no proteins | Yes, this cell contains many chromosomes that are linear with proteins. | Yes, this cell contains many chromosomes that are linear with proteins | Contains and controls the use of DNA. |
| Nucleus | No | Yes | Yes | A spherical organelle that contains the chromosomes and nucleoli |
| Nuclear envelope | No | Yes | Yes | Encloses the nucleus while regulating movement of materials into and out of the nucleus. |
| Nucleolus | No | Yes | Yes | Synthesizes ribosomes. |
| Ribosomes | Yes | Yes | Yes | The site of protein synthesis |
| Mitochondria | No | Yes | Yes | Produces energy for aerobic metabolism/makes it more efficient. |
| Chloroplasts | No | Yes | No | The site of photosynthesis where carbon dioxide, water, and light form glucose and oxygen. |
| Endoplasmic reticulum | No | Yes | Yes | This comes in two varieties. The rough ER is folded and studded with ribosomes and usually deals with protein synthesis. The smooth ER has a tube shape. It lacks these and usually synthesizes fats and steroid hormones. |
| Golgi Apparatus | No | Yes | Yes | Modifies, sorts, and packages proteins and lipids. Vesicles from the rough ER fuse with the receiving side of this organelle. They are modified, then bud off as vesicles. |
| Lysosomes | No | Not in most | Yes | The lysosome functions as the digester of the organelles. It contains digestive enzymes that digests food and worn-out organelles. |
| Plastids | No | Yes | No | Stores food and pigments. Some organelles are actually modified versions of ordinary plastids. |
| Central vacuole | No | Yes | No | Contains water and waste. It also provides tugor pressure to support the cell. In plants, if there is not enough water, the plant will wither because its cells cannot maintain the correct presure. |
| Cytoskeletons | Yes | Yes | Yes | Shapes and supports the cell. It also positions and moves cell parts. It appears to be a bunch of fibers "behind" the phospholipid bilayer. |
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2a) All eukaryotic cells have a nucleus (and everything contained in it), genetic material, a plasma membrane, ribosomes, cytoplasm, cytoskeletons, mitochondria, endoplasmic reticulum, and golgi bodies.  
2b) Plant cells tend to have chloroplasts, a cell wall, enlarged vacuoles, and tend to be multi cellular. Animal cells tend to have centrioles, no cell walls or enlarged vacuoles, get energy from outside molecules, and also tend to be multicellular. Protists tend to be unicellular organisms.  
2c) The function of the flagellum and cilia are to move liquid past the surface of the cell. Mobile cells tend to utilize the flagellum to move around, such as sperm cells. Immobile cells tend to use cilia to move liquids, such as mucus, past the cell.  
2di)The cell membrane tends to act like the border patrol of the city. It surrounds the city and monitors what comes and goes.  
2dii)Cytoplasm is the swampy land of the city that contains all the buildings of the city as well as a few natural resources. The cytoplasm in a cell contains the interior organelles and nutrients.  
2diii)The cytoskeleton acts like the earth the swampy land resides on. It provides shape to the cell.  
2div)Centrosomes are the makers of steel girders in the city. Centrosomes in cells produce microtubules which are needed to give certain things shape.  
2dv)The nucleoplasm is where the city's leaders live. It holds the hereditary material and structures of the cell.  
2dvi) The endoplasmic reticulum are the railroads of the city that transport materials where they need to go. The smooth ER tends to act like a factory and warehouse where enzymes involved in the creation of lipids are manufactured, produces detoxication enzymes, and ions are stored. The rough ER transports and packages proteins within the cell.  
2dvii) Ribosomes are the workers of a factory. They assemble amino acids into proteins and sends it to the ER. The ER then pinches off the protein and sends it to the golgi apparatus.  
2dviii)The Golgi apparatus is similar to the post office of the city. It processes proteins, packages them, and sends it out of the cell.  
2dix) Lysosomes are the waste treatment and recycling centers of the cell. They assist with cell digestion, produce enzymes that break down food molecules and broken organelles, and turns cell waste into building material that is sent back into the cytoplasm.  
2dx) The nucleus and the nucleolus are basically the leaders of the cell. The nucleus stores the DNA, sets up how the cell should behave, what organelles to make, where they should go, etc. The nucleolus produces ribosomal RNA, which combines with proteins to form the basic units of ribosomes  
2dxi) Mitochondria are the power plants of the cell. They are used in aerobic cellular respiration to get more energy per molecule broken down.  
2e) If a cell is selectively permeable, that means the cell controls whether or not to let certain molecules in or out of the cell.

3,1)phospholipids, receptor, recognition, enzymes attachment, transport  
3,2) selectively permeable, diffusion, osmosis, aquaporins, active transport  
3,3)chanel, carrier, simple, lipids  
3,4) desmososomes, tight junctions, gap junctions, plasodesmata  
3,5) simple diffusion, simple diffusion, facilitated diffusion, facilitated diffusion  
3,6) endocytosis, yes, pinocytosis, phagocytosis, vesicles

4,1) The plasma membrane of *Paramecium* is only 1% as permeable to water because it has less pores to allow for select molecules to come through. Human red blood cells are more permeable because they have more pores, which are necessary because blood cells much carry many molecules.  
4,3) Plasma is likely to be isotonic to red blood cells because if plasma was hypotonic or hypertonic, the cell would burst/shrivel respectively. This would not be ideal for red blood cells.  
4,4) The insulating cells would have more abundant lipids because lipids are already used as a form of insulation in the body and a way to separate a cell from its environment.