1. Why are lipids not considered to be polymers?

**Polymers are composed of monomers being linked by covalent bonds. But lipids are not made with monomers linked together but are composed of different diverse hydrophobic groups of molecules.**

2. If there was a mutation that led to proton pumps being inserted into the lysosome the wrong direction, which of the following would be **TRUE**.

   a. The pH of the inside of the lumen would decrease. *(pH would increases if proton pump is inserted backwards-become more basic)*

   b. The lysosome would largely be unaffected. *(pH change will affect lysosome)*

   **c. There will be build-up of old organelles and proteins.**

   d. The lysosome would be more efficient at breaking down material.

   Normally, the proton (H+) pump works to fill the lysosome with protons. This creates an acidic environment in the lysosome that favorable to resident lysosome enzymes. If the pump were reversed, then the lysosome would lose acidity. Therefore the enzymes would have reduced activity and be less efficient at breaking down material.

3. Which of the following amino acids is most likely to be found in the interior of an enzyme protein?

**Interior of proteins are usually hydrophobic so we need an amino acid with hydrophobic/nonpolar functional group.**

![Amino Acid Diagram](image)

**Just methyl groups-hydrophobic**

This is the amino acid with most hydrophobic functional group R.
4. A ligand has many hydroxyl groups on it. This ligand most likely
a. binds to and activates a G-protein coupled receptor
b. passes through the plasma membrane to bind to a intracellular receptor
c. form aggregates as it is not very soluble in water
d. increases pH of the cell

(A ligand with many hydroxyl would be too polar/hydrophilic to pass easily through the plasma membrane. So most likely ligand will bind to extracellular site of a receptor which is hydrophilic.)

5. Integral proteins of the cell membrane have all of the following properties except:
   a. often have carbohydrate groups exposed on the extracellular surface
   b. can allow passage of small polar molecules
   c. are deficient in amino acids with side chains that have methyl groups
d. can move laterally in the cell membrane

(integral proteins have a lot of hydrophobic AA to be able to be incorporated into hydrophobic inner leaflet of PM. Amino acids with a lot of methyl -CH3 is hydrophobic.)

6. Penicillin is toxic to certain dividing bacterial cells because it prevents cell wall formation, causing the cells to burst. This indicates that the bacteria live in a (an):

   a. hypotonic medium.
   b. hypertonic medium.
   c. isotonic medium.
   d. medium with higher concentration of sodium than the cell.
   e. Both b and d are correct.

Without the cell wall (gray outline), cell will burst as water keeps going in. Water goes to where are there are more solutes. So inside the cell must have more solutes than the medium (solution).

This shows that this cell is in a medium (solution) that is HYPOTONIC to cell.