Lecture 2: Membranes

The water molecules have an attraction to each other. This is responsible for important chemical characteristic:

1.) Surface tension: at the top of water, if there is an object placed on the surface, if it is not enough to break the surface tension of the water the object will remain on top of the water.
2.) Phase transition: water becomes shaped in very structured lattices. It is immobilized. If heat is added it becomes liquid. This movement requires energy, more importantly from the liquid you can enter the gas phase. The amount of energy that is needed to break the attraction of the water molecules is responsible for the transition into the gas phase.

You need to know what constitutes polar and nonpolar amino acids, if the nonpolar and polar amino acids are chained together what will be there functional significance? For example I mentioned the motif. If you look at a kind of receptor, even if isolated from different animals, it is likely that these receptors will appear. So a repeated sequence that is very much conserved is a motif. Another example is the channel protein. So certain molecules cannot get through either you have certain hydrophobic characteristics or hydrophilic characteristic. The amino acids that make up this channel you will find them to be as a motif. The polar and non-polar amino acids are responsible for the characteristics of a membrane channel whether they let through ions or other molecules.

Sugars are very important in many different ways. The simplest one is glucose, we know that glucose exists in a 6 carbon ring form. Sugars have a ring structures. One thing we know is that sugar molecules can join together by glycosidic bonds. So through the process of condensation (removal of water) they attach and the two hydroxyl groups will be joined together. The glycosidic bond can occur in many different positions. There are other hydroxyl groups so the joining is not restricted. It could be the reverse, the break-up of the glycosidic bond is called hydrolysis. This happens all the time because a polysaccharide when our body uses them is broken up.

I want to mention a few important dissacharides: glucose is one, and we see the isomer fructose. Galactose is something that we will also see, and also another monosccharide that is important is mannose and galactose that have precise functions in the cell. In disscharides there are some representative ones like maltose that is made up of two glucose linked up together (beta 1,4). Well maltose is the major form of canned sugar, I mention it because our body once it takes it in needs to be able to deal with it. First thing is that they are in a polysscharide form, but once in our mouth they are broke down into smaller and smaller sugars, but a lot of them end up in our upper GI tract. There you have a specific enzyme called maltase that will break up this disaccharide. If we don't have maltase our whole body cannot utilize canned sugar as an energy source. Another example of a disaccharide is sucrose. It is one glucose and one fructose that are joined by 1,4 glycosidic bonds. Sucrose is mainly found in sugar cane, it is the main form that we use to sweeten our food. Unfortunately without sucrase