Lecture 15 – Membrane Proteins I

Lipid bilayer – composed of lipids with hydrophobic tails in contact with each other and hydrophilic heads in contact with solvents. Membrane lipids are amphipathic.
These are formed spontaneously.
A lipid molecule has 2 tails, a detergent molecule has one tail, the former of which forms micelles.
Properties –
Sheet-like structures – thickness varies depending on where they are found. For example, if you have a bacterial bilayer, they are quite thin. If you look at a mammalian membrane, they are quite thick. This causes problems because if you wanted to express a mammalian membrane protein in E.coli, the mammalian membrane protein will not fit into the E.coli membrane because they are optimized at different thicknesses.
The most lipid rich bilayer is myelin (4 times lipid to protein) – myelin is responsible for protecting the nerve cells from anything external. Mitochondrial internal membrane responsible for oxidative phosphorylation – the protein composition is high in the inner membrane which to accommodate them, is folded into cisternae structures – this is because the function of the inner membrane is to produce as much ATP when the body needs it.
The lipid is not static, they are actually quite fluid-like. Just like a water-soluble protein is soluble in water, a membrane protein is soluble in the lipids, where the lipids are free to move in the bilayer.
Membrane is asymmetric with different properties. For example, if the membrane protein has been glycosylated, the carbohydrates will always be on the outside the membrane.
6. membranes are fluid.
Lipid rafts

2. Globular and Fibrous Proteins

lipid-linked membrane proteins -

Lecture 16 – Membrane Proteins II