

Answer on Question #54671 – Biology – Cell Biology

Question:

Why would it be hard for a phospholipid to move from one side of the membrane to the other?

Answer:

Cell membrane is formed as a bilayer of phospholipids: polar heads contacts with water solutions while hydrophobic tails (fatty acids) of two layers contact with each other forming hydrophobic interactions. Each region can interact with molecules of similar properties only. Any hydrophilic molecule (i.e., water) cannot penetrate into hydrophobic core of fatty acids: hydrophobic interactions are based on the exclusion of all hydrophilic substances from the contact. That's why hydrophilic polar heads of phospholipids from one layer (ethanolamine, serine, choline, inositol) cannot pass through the hydrophobic interactions to move into another layer. But such crosses ("flip-flops") are possible, they occur spontaneously in the bilayer (one cross in several hours). Furthermore, cell contains enzymes (flippases) that increase the rate of such crosses though detailed mechanism is unknown.

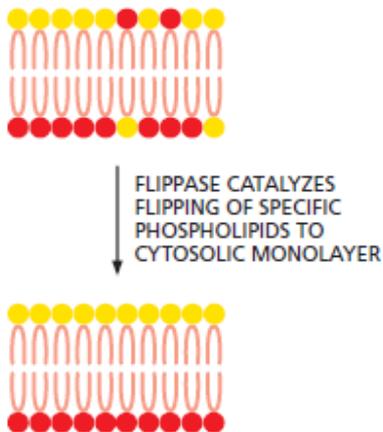


Figure from "Molecular Biology Of The Cell", Bruce Alberts et al., 2015.