

Plasma Membrane

by Sophia



WHAT'S COVERED

In this lesson, you will learn how to determine the characteristics of the plasma membrane. Specifically, this lesson will cover:

1. Plasma Membrane Characteristics

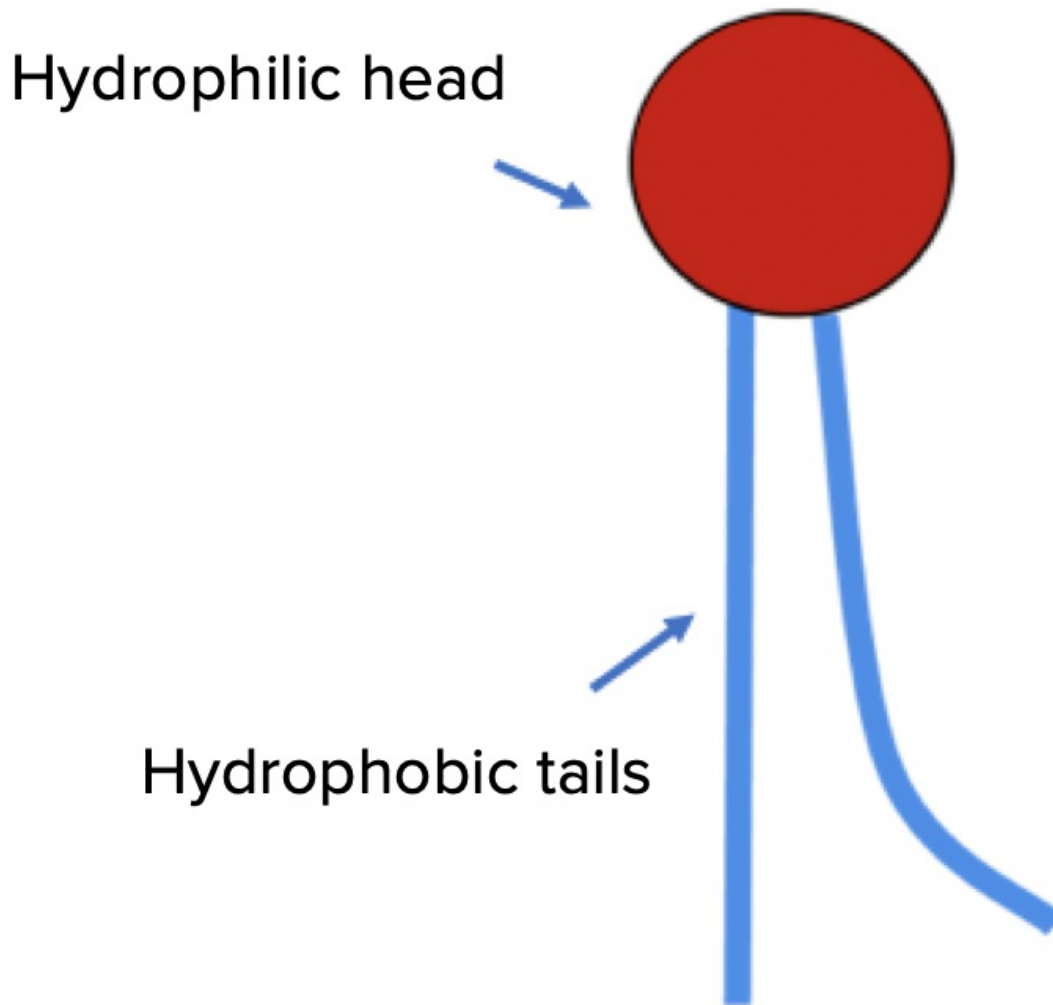
The **plasma membrane** is the outermost layer of a cell and has two main characteristics:

- Selectively permeable
- Composed of a lipid bilayer

Plasma membranes are **selectively permeable**, which means that they can control what goes into and what comes out of a cell.

Another characteristic of the plasma membrane is that it is composed of a **lipid bilayer**. The prefix bi means two, so this lipid bilayer is a double layer of lipids that makes up the plasma membrane. The specific lipid is a **phospholipid**.

Phospholipid



Phospholipids are the main lipid composing this lipid bilayer of plasma membranes. They are made of a hydrophilic head and two hydrophobic tails. The word hydrophilic means that they're attracted to water, while the word hydrophobic means that they're repelled by water. So the heads will face out towards the inside of the cell, or towards the cytoplasm. The tails will face inward, towards each other, away from where that water is.



TERMS TO KNOW

Plasma Membrane

The outermost layer of a cell and is made up of a phospholipid bilayer, which controls what enters and exits the cell.

Selectively Permeable

A feature of the plasma membrane that allows it to regulate what crosses through it.

Lipid Bilayer

A membrane created by two layers of phospholipids.

Phospholipid

A lipid made of a hydrophilic (water-attracting) head and a hydrophobic (water-repelling) tail which make up the plasma membrane.

2. Plasma Membrane Structure

Plasma membranes have a very fluid quality; they're not rigid at all, and they're actually very, very thin.

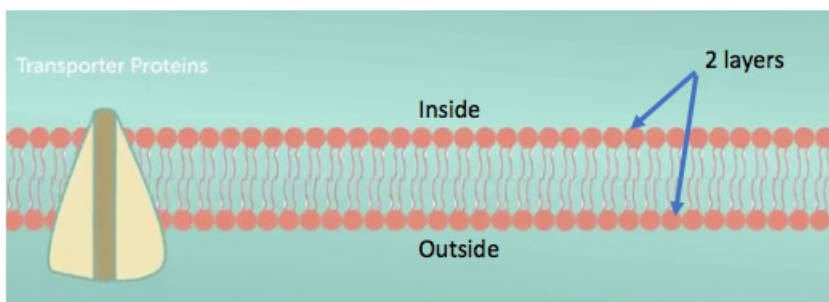


DID YOU KNOW

To equal the thickness of one piece of paper, you would have to stack about 1,000 plasma membranes on top of each other. That should give you an idea of about how thin they actually are.

The plasma membrane, as mentioned previously, is composed of phospholipids. But it also includes other molecules, like cholesterol.

Also, the plasma membrane is embedded with several different proteins. These proteins might be enzymes, channels, transporter proteins (proteins that transport a molecule from the outside of the cell to the inside of the cell), receptors for signaling molecules (such as hormones) or they could be recognition proteins that help identify what type of cell it is.



The selective permeability of a plasma membrane allows some substances, such as oxygen, carbon dioxide, water, and very small non-polar molecules, to cross through the plasma membrane on their own. However, some molecules that are larger or hydrophilic (water-attracting) are not able to cross through this membrane on their own.

For example, hydrophilic (water-attracting) molecules will be repelled by the plasma membrane's hydrophobic (water-repelling) phospholipid tails before they get halfway across the plasma membrane. They need to take advantage of the proteins that are embedded in the membrane, such as transporter proteins. A transporter protein would be able to allow a molecule, such as sodium, which wouldn't be able to cross through the plasma membrane on its own, to get either into or out of the membrane.

Again, there are various proteins that are embedded in the plasma membrane, and all of them have different roles.



SUMMARY

In this lesson, you saw an example of a **plasma membrane's structure**. You learned about the two major characteristics of the plasma membrane: It is **selectively permeable** and it has a **lipid bilayer** with two layers of phospholipids. Phospholipids have hydrophilic heads, facing the towards the cytoplasm of the cell, and hydrophobic tails, facing inward towards each other and away from water.

Keep up the learning and have a great day!

Source: THIS WORK IS ADAPTED FROM SOPHIA AUTHOR AMANDA SODERLIND



ATTRIBUTIONS

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