

Cell membranes are very important structures to cells because they function as a barrier between the components of the cell and the outside environment. The cell membrane is not only responsible for creating a wall between inside and outside the cell, it must also act as a threshold through which select molecules can enter and exit the cell when necessary. The cell membrane is what defines the cell and keeps its components separate from outside cells or organisms.

The cell membrane is composed of a double layer of fat cells called a lipid bilayer in which membrane proteins are embedded. The structure of the lipid bilayer prevents the free passage of most molecules into and out of the cell. We will begin our discussion of the structure of the cell membrane by discussing the structure and properties of the lipid bilayer. We will then go on to discuss the role of membrane-bound proteins, and finally, will discuss membrane transport structures.

Lipid Bilayer Structure

The lipid bilayer is a universal component of all cell membranes. Its role is critical because its structural components provide the barrier that marks the boundaries of a cell. The structure is called a "lipid bilayer" because it is composed of *two* layers of *fat* cells organized in two sheets. The lipid bilayer is typically about five nanometers thick and surrounds all cells providing the cell membrane structure.

Lipids and Phospholipids

The structure of the lipid bilayer explains its function as a barrier. Lipids are fats, like oil, that are insoluble in water. There are two important regions of a lipid that provide

the structure of the lipid bilayer. Each lipid molecule contains a hydrophilic region, also called a polar head region, and a hydrophobic, or nonpolar tail region.