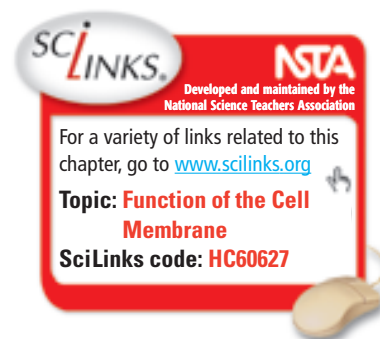


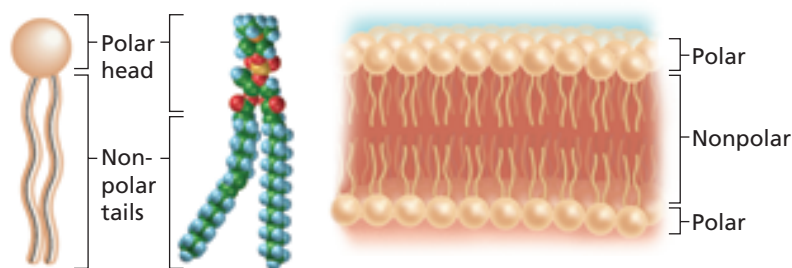
## Other Important Lipids

*Compound saponifiable lipids* play an important role in biochemical processes. These lipids are structurally similar to triglycerides in that at least one fatty acid is bonded to the central glycerol or glycerol-like unit. These molecules may also have phosphate groups, sugar units, or nitrogen-containing groups. Phospholipids, shown in **Figure 6**, are compound saponifiable lipids and are the main structural component of cell membranes. Phospholipids are arranged in a *bilayer*, or double layer, at the surface of the cell. As **Figure 6** shows, the hydrophilic heads of the phospholipids are on the outside surfaces of the bilayer. The heads are in contact with water-containing solutions inside of the cell and surrounding the cell. The hydrophobic tails point toward the interior of the membrane, away from water-containing solutions. The cell membrane forms a boundary between the cell and its external environment. Only certain substances may pass through the cell membrane. This enables the cell to maintain a stable internal environment.

*Nonsaponifiable lipids* are nonpolar compounds that do not form soap. They include *steroids*, many *vitamins*, and *bile acids*. *Cholesterol* is a steroid present in animal cell membranes and is a precursor of many hormones.



**FIGURE 6**



A phospholipid's "head" is polar, and its two fatty "tails" are nonpolar.

Phospholipids are arranged in a bilayer, with the hydrophilic heads pointing outward and the hydrophobic tails pointing inward.

## SECTION REVIEW

1. Describe two functions of carbohydrates in living systems.
2. Carbohydrates make up about 2% of the mass of the human body, yet we need about 1 tsp of glucose every 15 min to maintain energy for our cells. Where does all of this glucose come from?
3. What is the difference between saponifiable and nonsaponifiable lipids?

## Critical Thinking

4. **ANALYZING RELATIONSHIPS** Glucose is soluble in water. Why is cellulose, which is made up of glucose, insoluble in water?
5. **EVALUATING IDEAS** Carbohydrates make up about 90% of the mass of cotton. Why don't humans include cotton in their diet?