Summary

Although lipids can form gigantic structures, these aggregations are not chemically macromolecules because the individual units are not linked by covalent bonds. Fats and oils are triglycerides, composed of three fatty acids covalently bonded to a glycerol molecule by ester linkages. Saturated fatty acids have a hydrocarbon chain with no double bonds. The hydrocarbon chains of unsaturated fatty acids have one or more double bonds that bend the chain, making close packing less possible. Phospholipids have a hydrophobic hydrocarbon "tail" and a hydrophilic phosphate "head." In water, the interactions of the hydrophobic tails and hydrophilic heads of phospholipids generate a phospholipid bilayer that is two molecules thick. The head groups are directed outward, where they interact with the surrounding water. The tails are packed together in the interior of the bilayer. Carotenoids trap light energy in green plants. Carotene can be split to form vitamin A, a lipid vitamin. Some steroids, such as testosterone, function as hormones. Cholesterol is synthesized by the liver and has a role in cell membranes, as well as in the digestion of fats. Vitamins are substances that are required for normal functioning, but must be acquired from the diet.