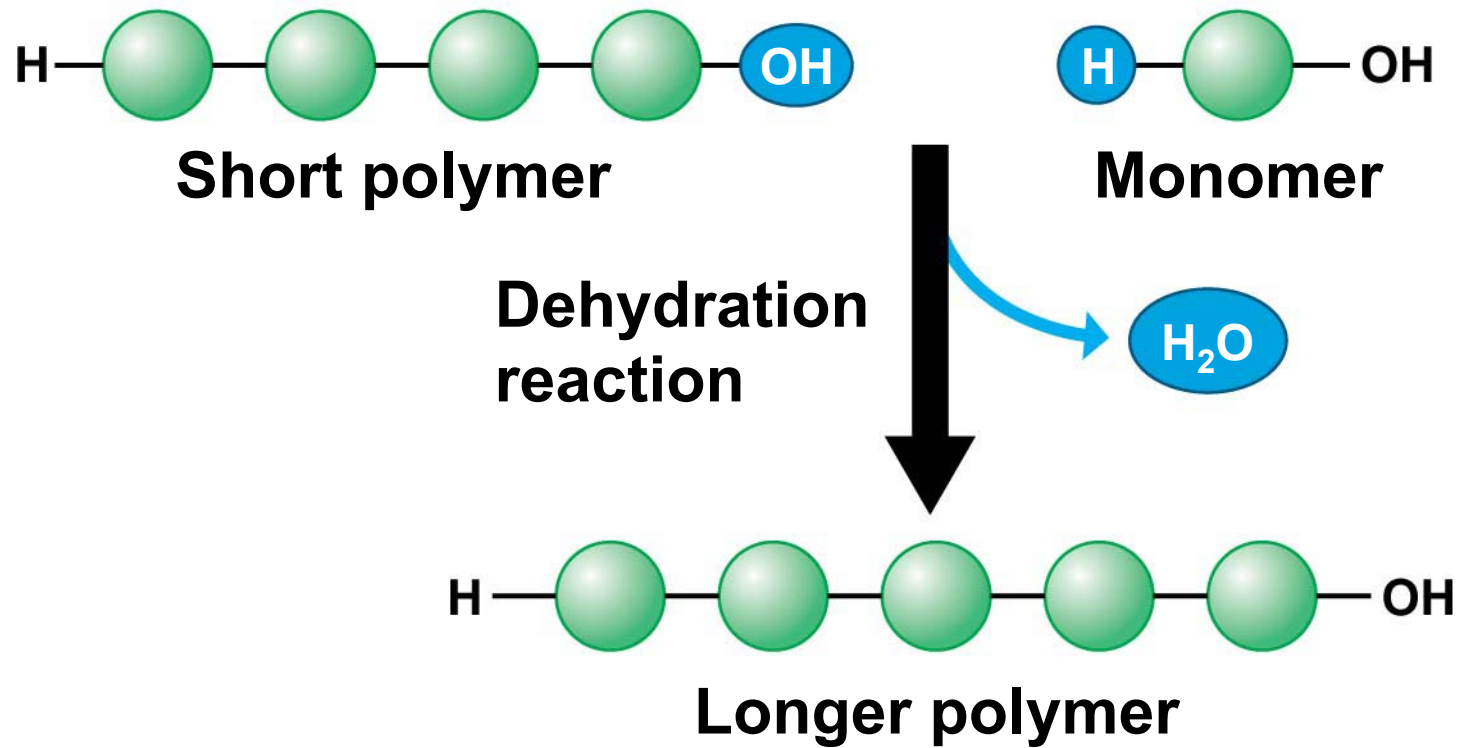


The Molecules of Life

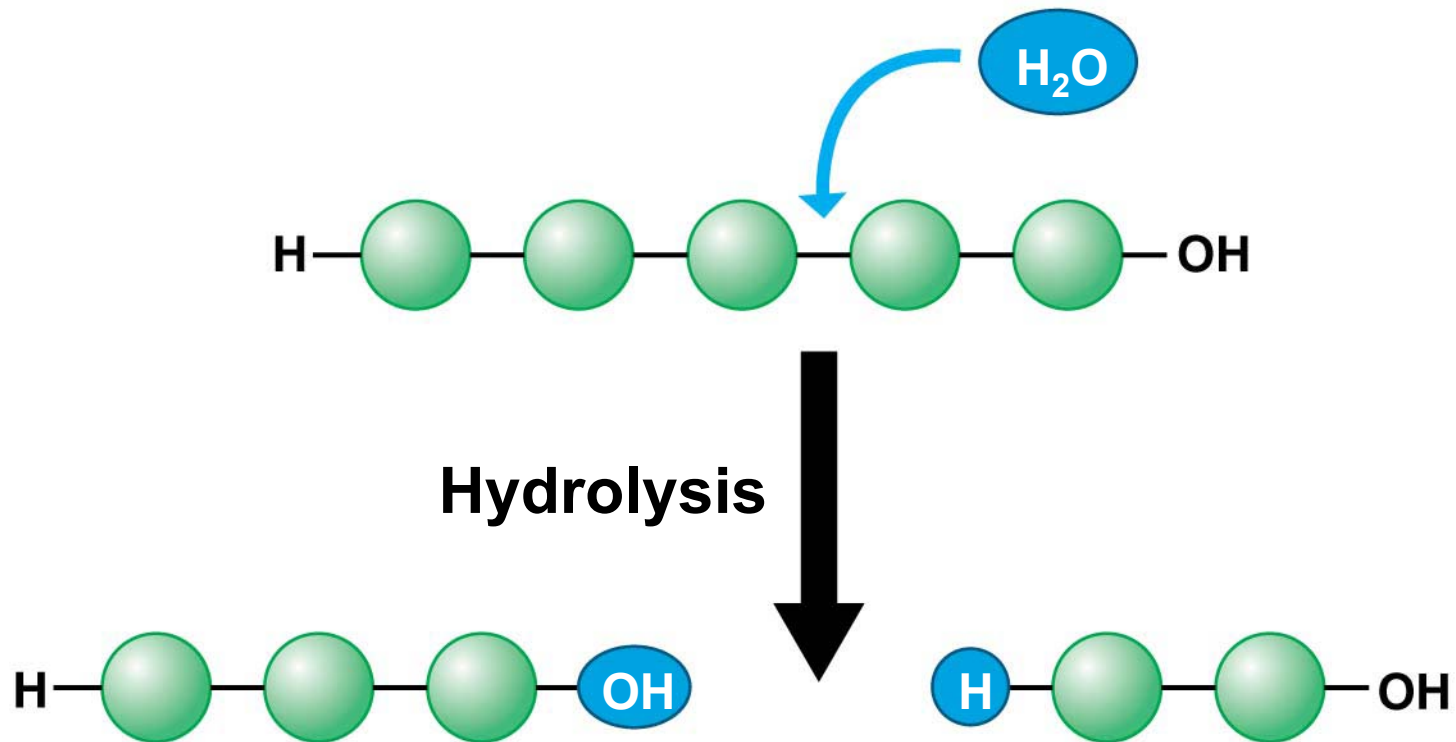
Chapter 3

Figure 3.4-1



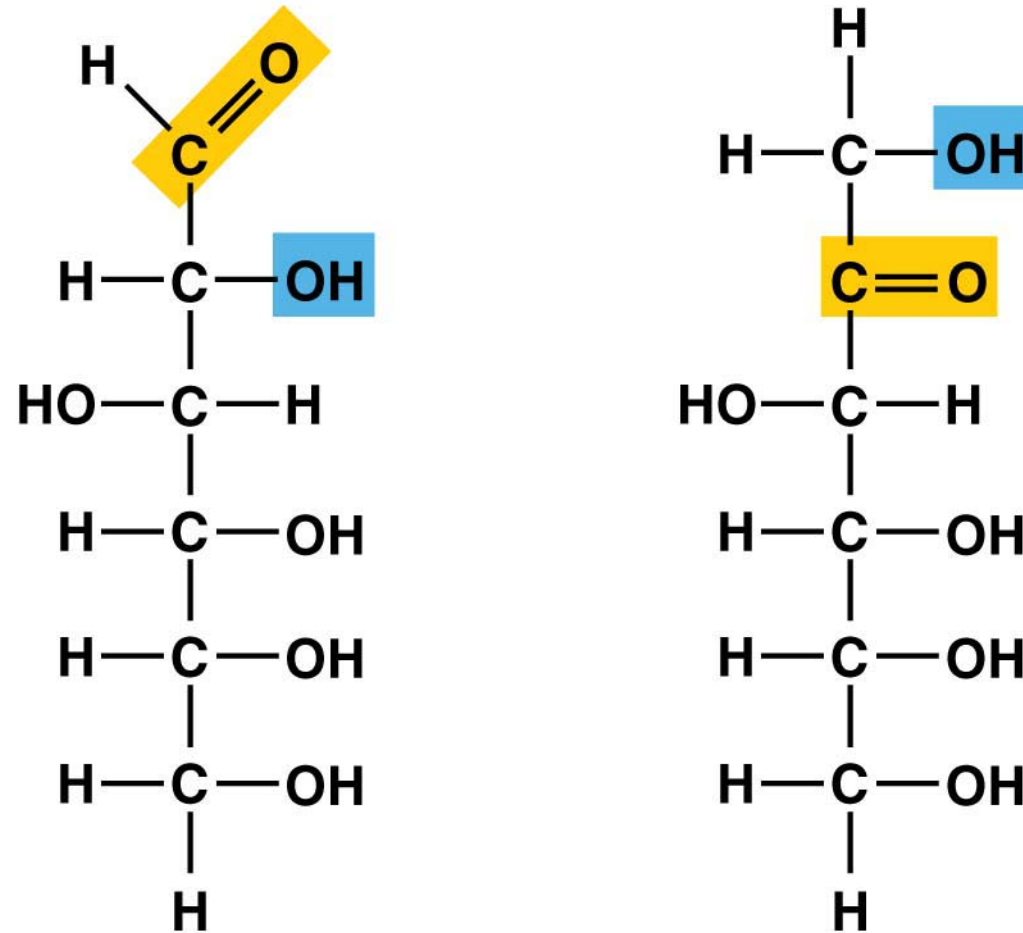
(a) Building a polymer chain

Figure 3.4-2



(b) Breaking a polymer chain

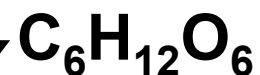
Figure 3.5-1



Glucose



Fructose

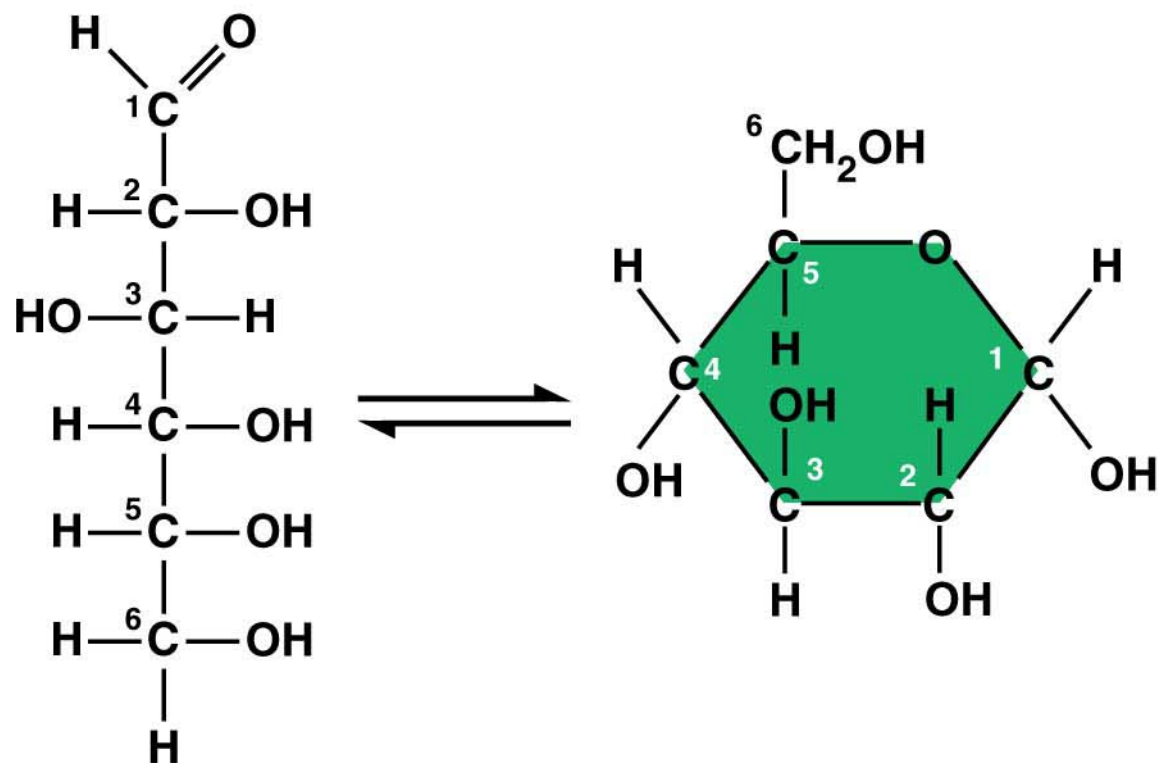


Isomers
(same formula, different arrangements)

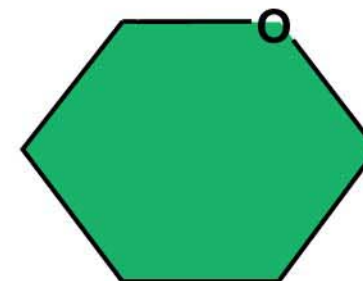
Figure 3.5-2



Figure 3.6



(a) Linear and ring structures



(b) Abbreviated ring structure

Figure 3.7-1

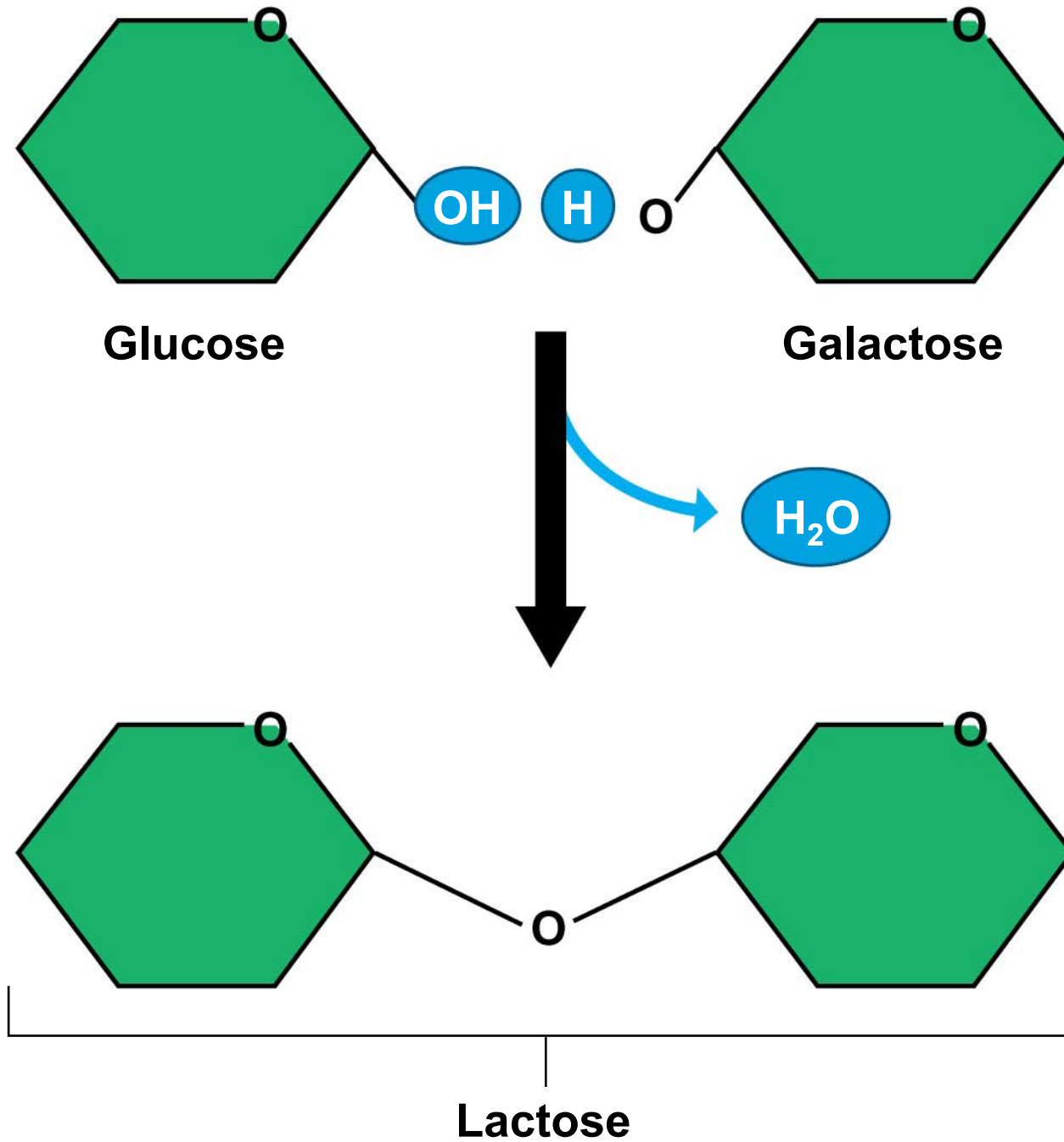


Figure 3.8

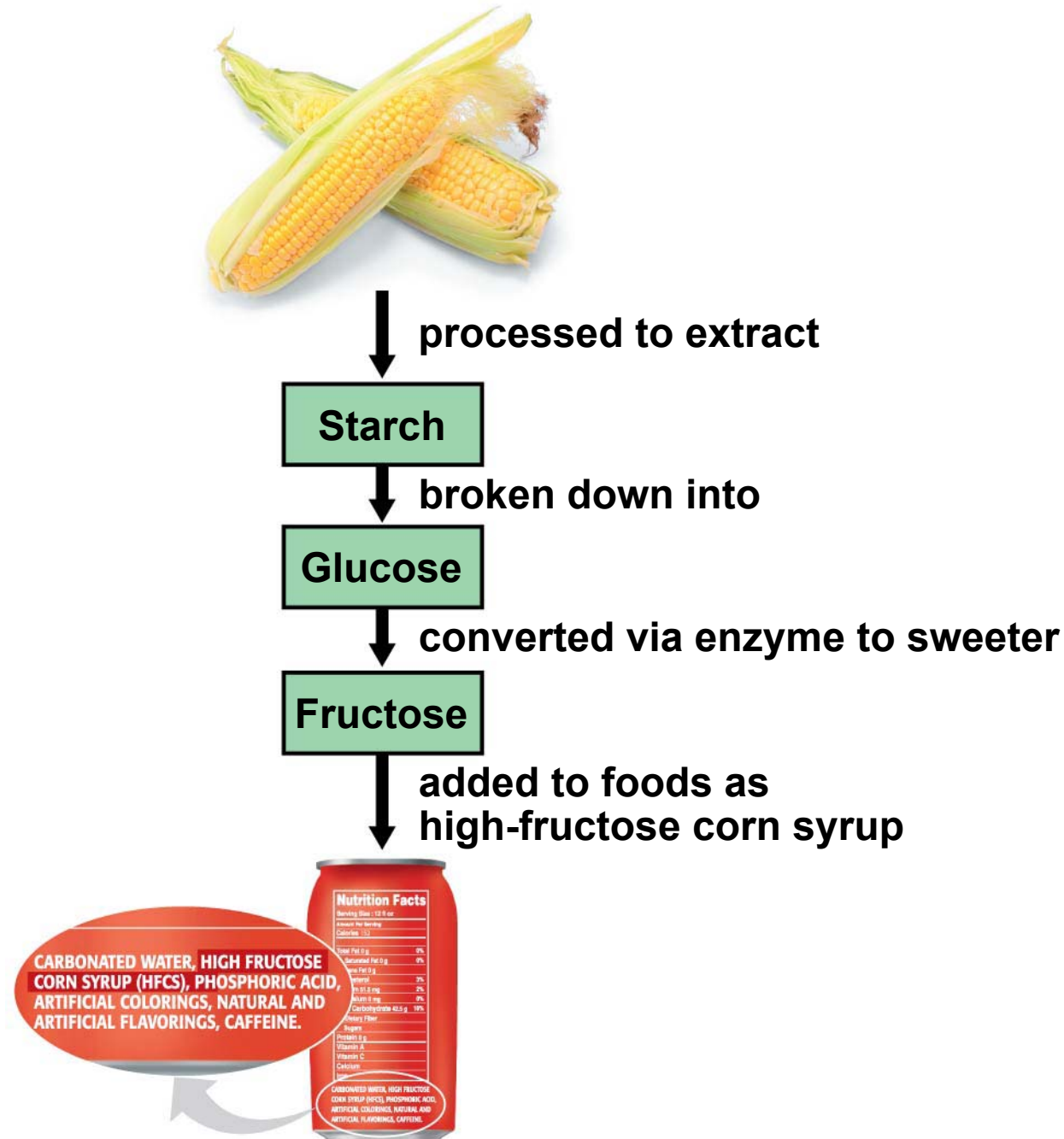


Figure 3.10

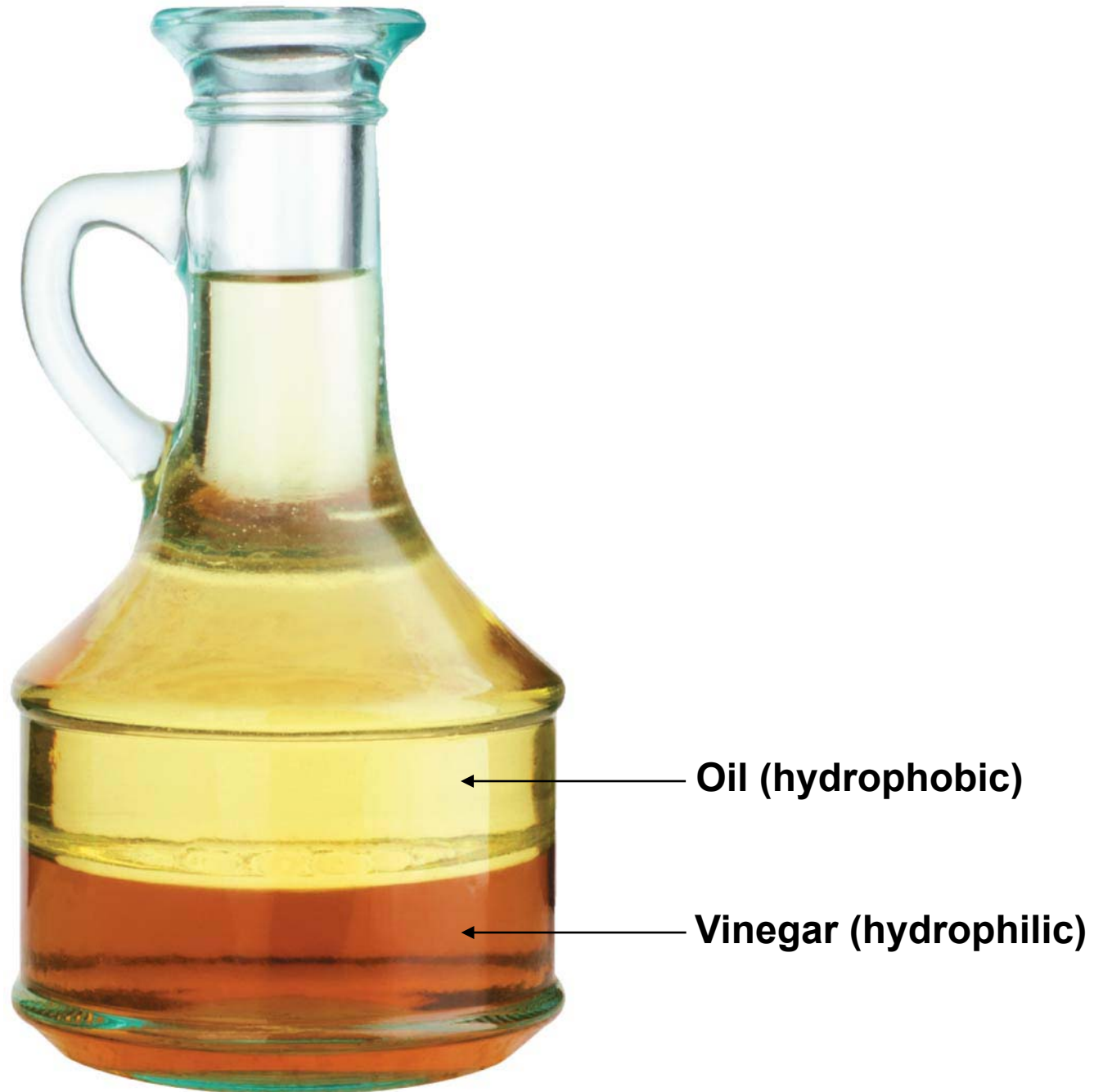
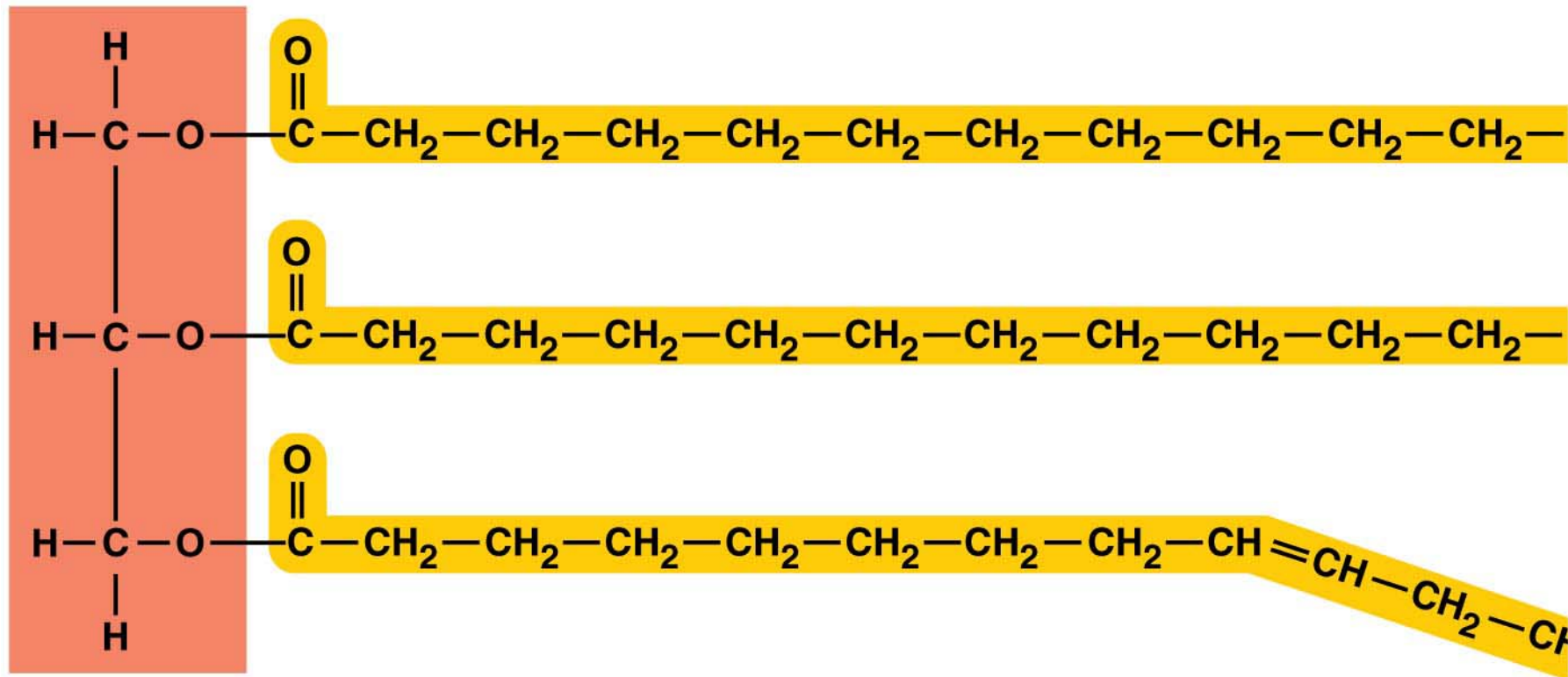


Figure 3.11-2



(b) A fat molecule with a glycerol “head” and three energy-rich hydrocarbon fatty acid “tails”

Figure 3.12-1

Saturated Fats

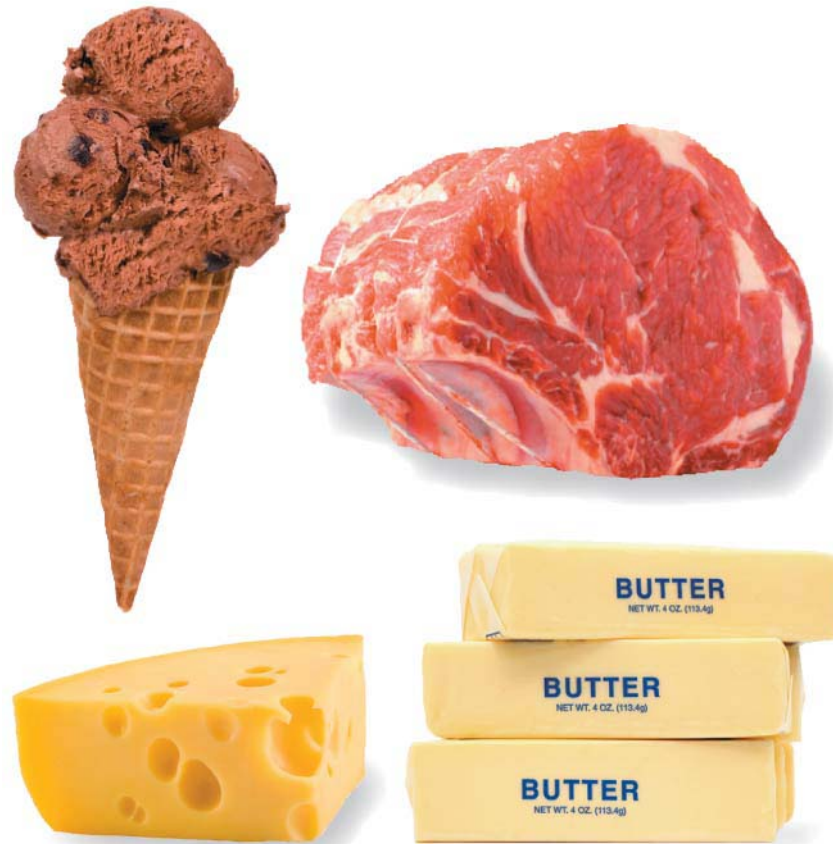


Figure 3.12-2

Unsaturated Fats



Margarine



INGREDIENTS: SOYBEAN OIL, FULLY HYDROGENATED COTTONSEED OIL, PARTIALLY HYDROGENATED COTTONSEED AND SOYBEAN OILS, MONO AND DIGLYCERIDES, TBHO AND CITRIC ACID (ANTIOXIDANTS).



Plant oils

Trans fats

Omega-3 fats

TRANS FATS IN YOUR FOOD

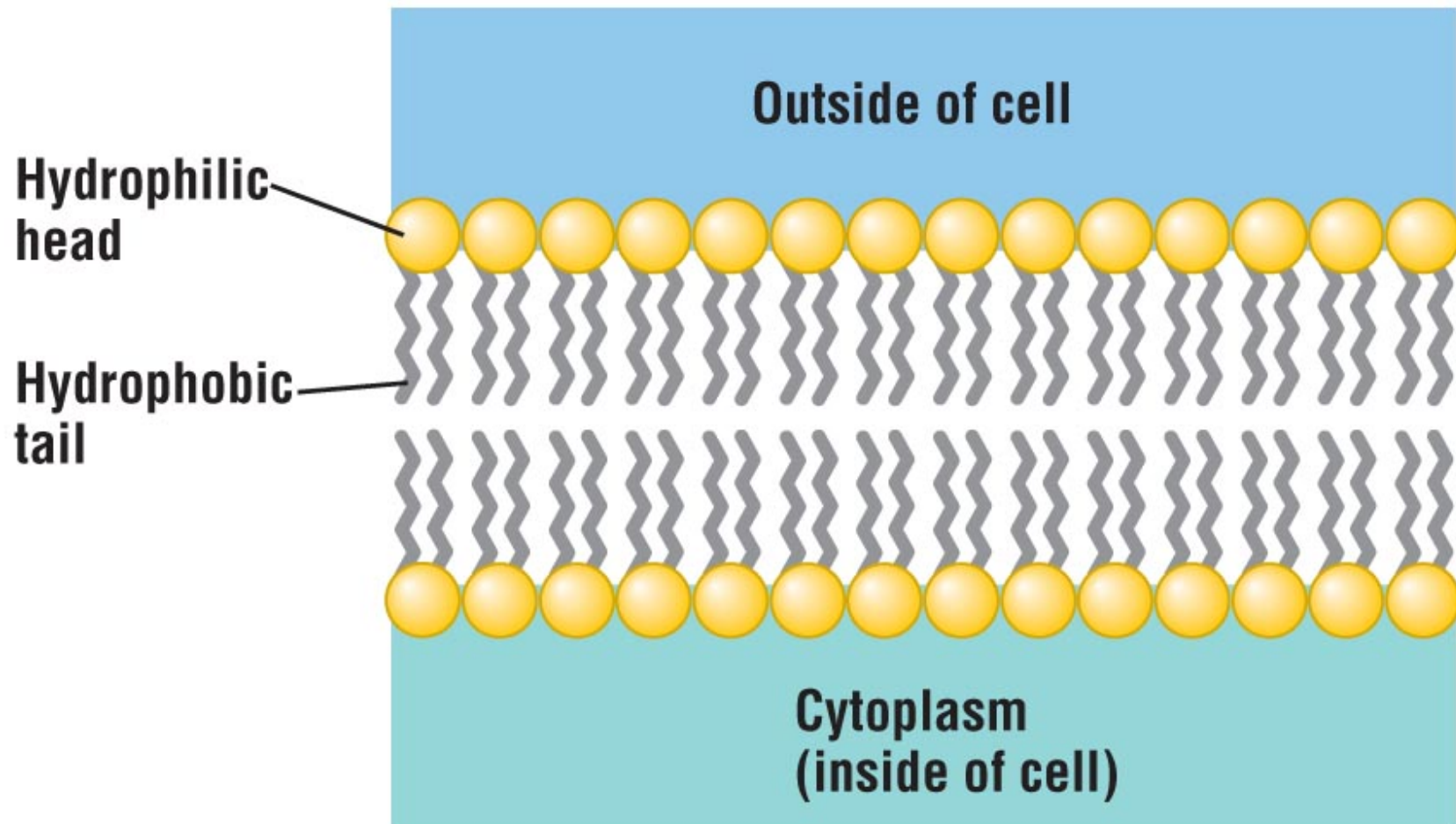
(Source: Mayo Clinic)

Baked goods. Most cakes, cookies, pie crusts and crackers contain shortening, which is usually made from partially hydrogenated vegetable oil. Ready-made frosting is another source of trans fat.

Snacks. Potato, corn and tortilla chips often contain trans fat. And while popcorn can be a healthy snack, many types of packaged or microwave popcorn use trans fat to help cook or flavor the popcorn.

Fried food. Foods that require deep frying - french fries, doughnuts and fried chicken - can contain trans fat from the oil used in the cooking process.

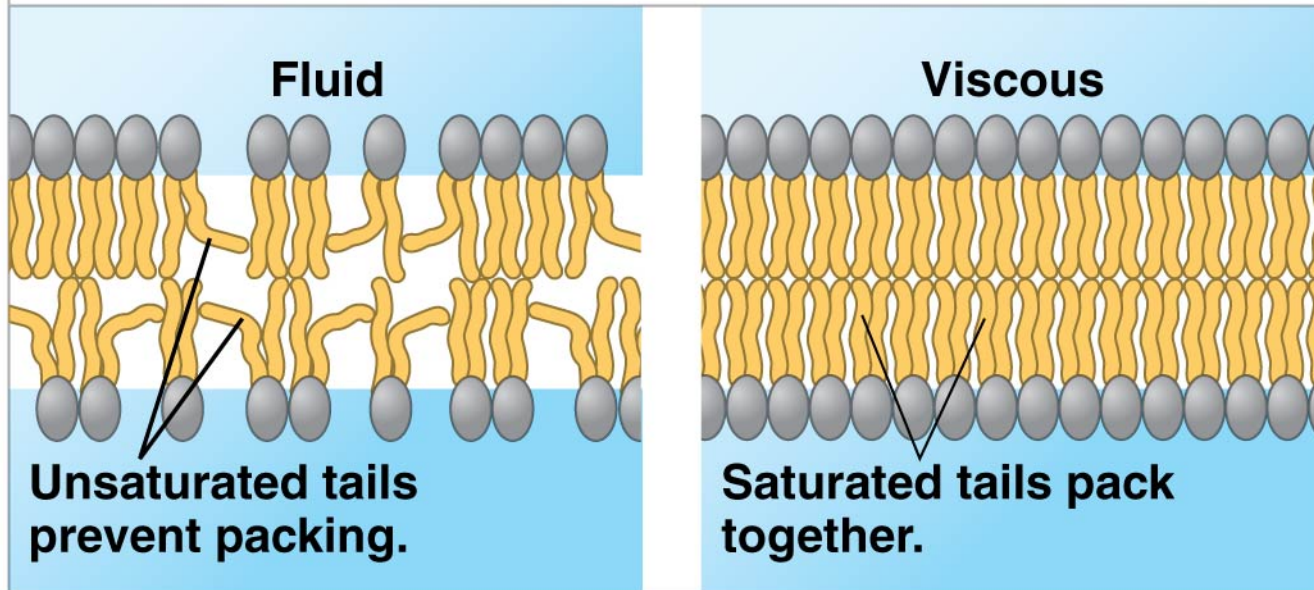
Refrigerator dough. Products such as canned biscuits and cinnamon rolls often contain trans fat, as do frozen pizza crusts.



(a) Phospholipid bilayer of membrane.

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(a) Unsaturated versus saturated hydrocarbon tails



(b) Cholesterol within the animal cell membrane

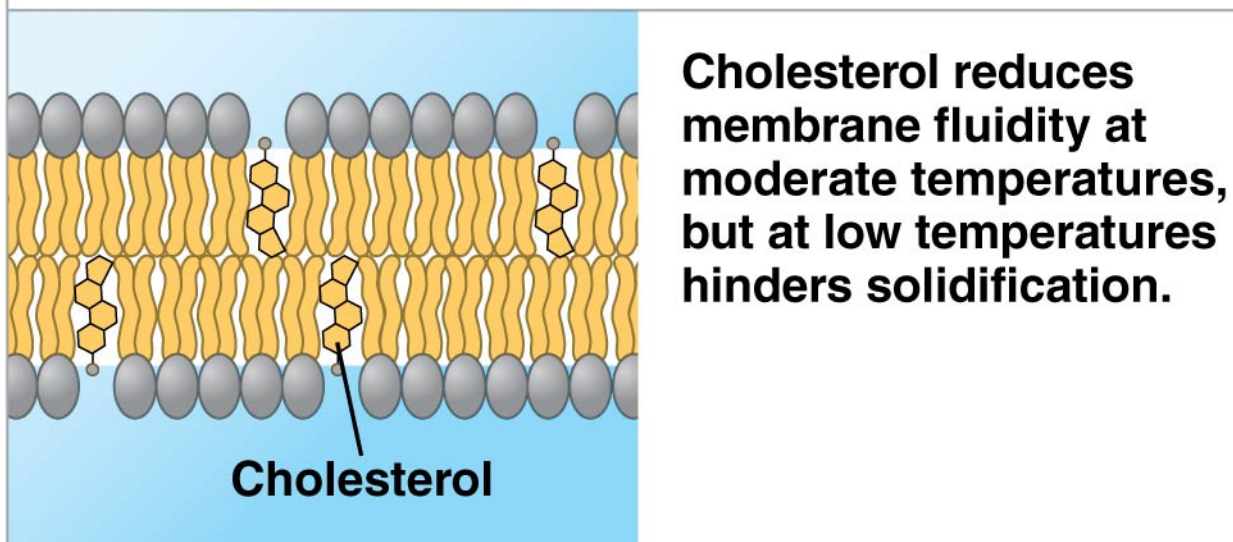


Figure 3.13

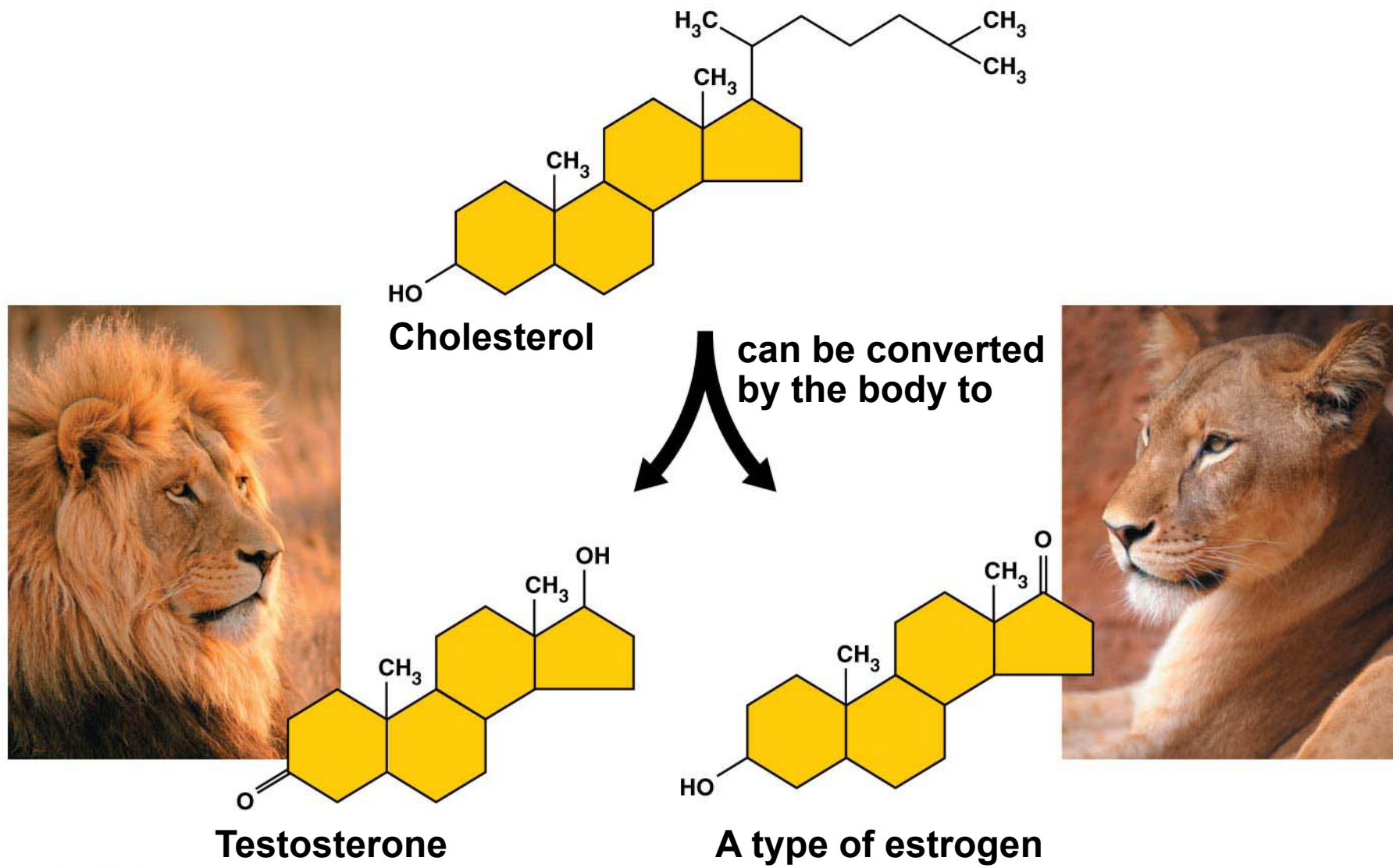
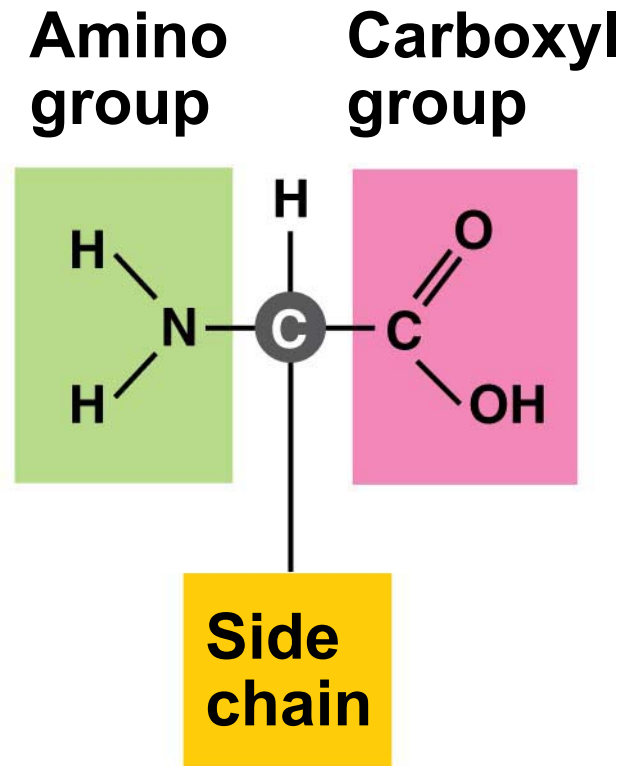
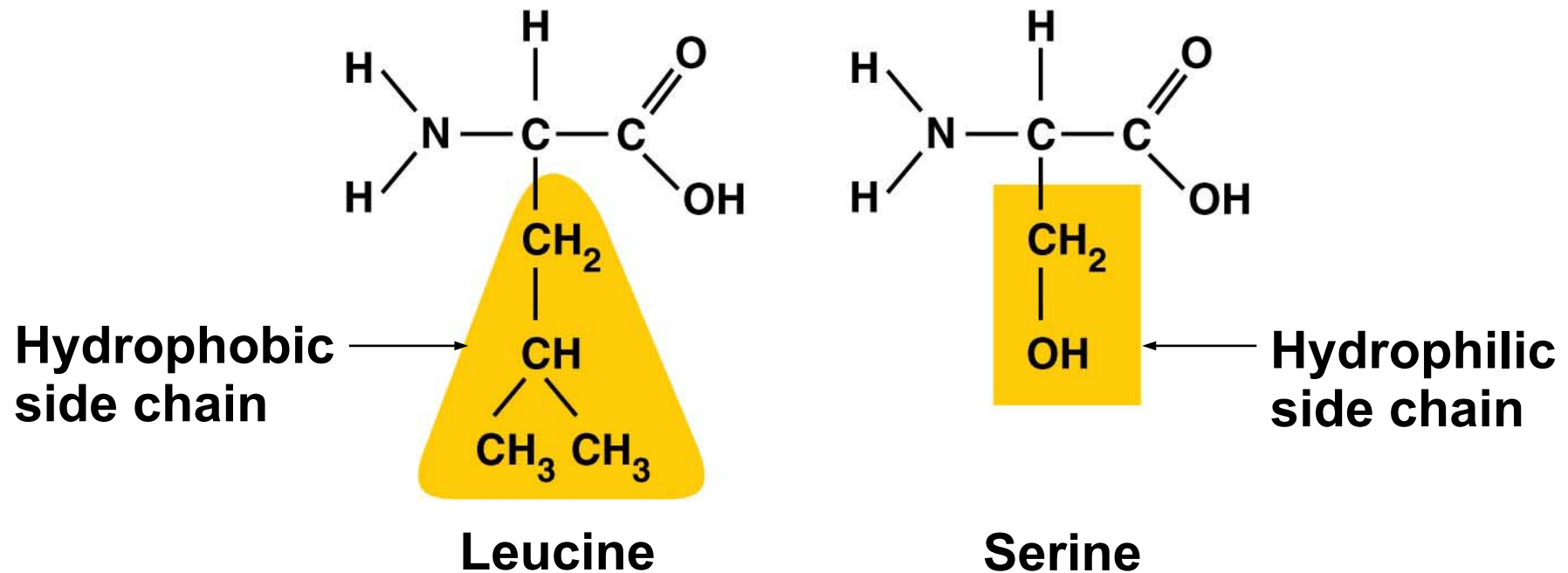


Figure 3.16-1



(a) The general structure of an amino acid

Figure 3.16-2



(b) Examples of amino acids with hydrophobic and hydrophilic side chains

Figure 3.17-s2

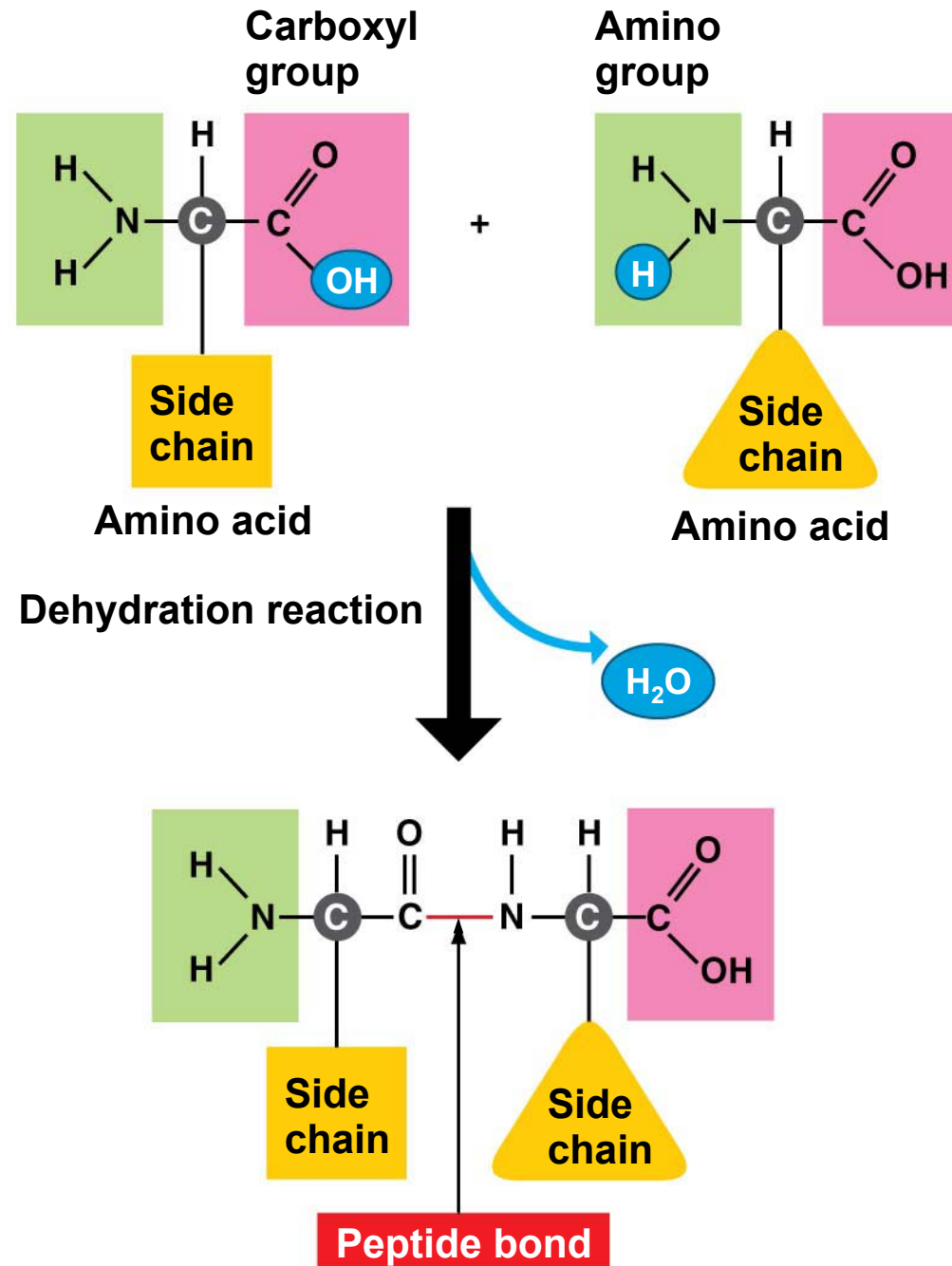


Figure 3.18-1

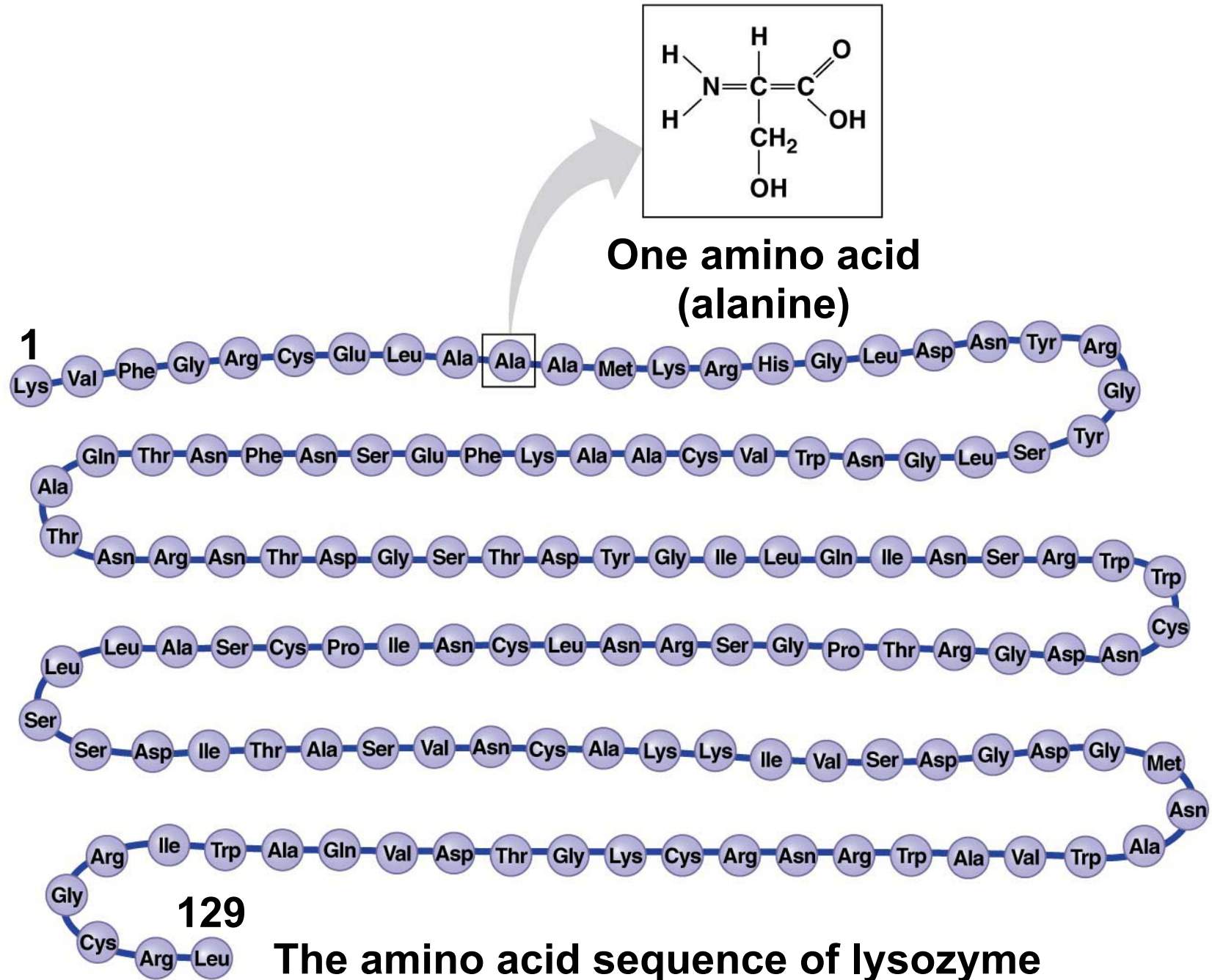
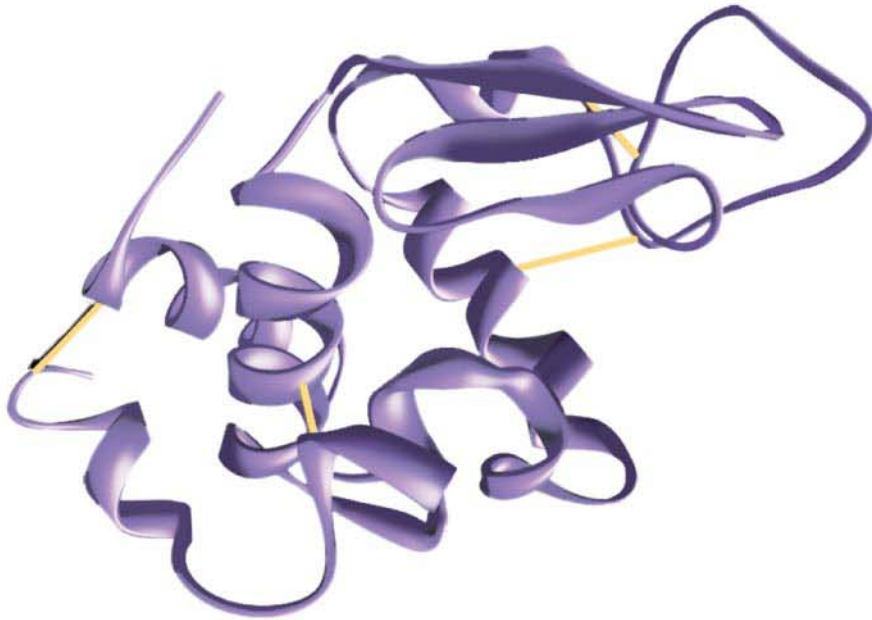
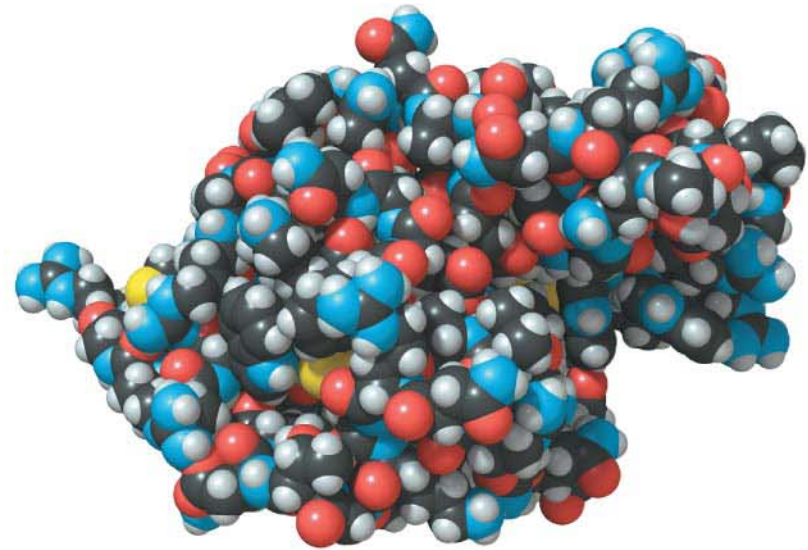


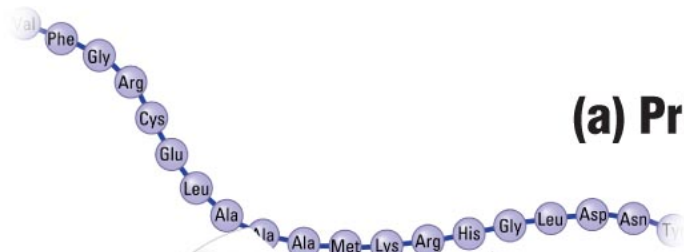
Figure 3.18-2



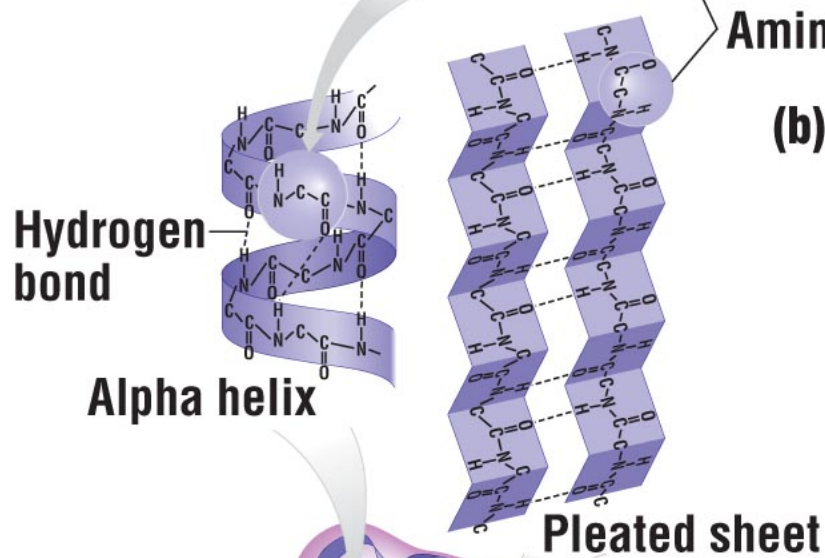
Here you can see how the polypeptide folds into a compact shape.



This model allows you to see the details of the protein's structure.

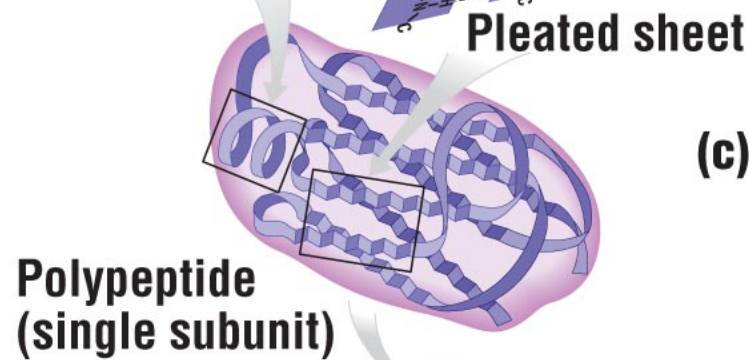


(a) Primary structure.

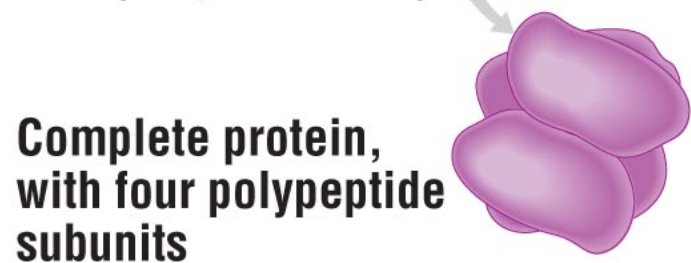


Amino acids

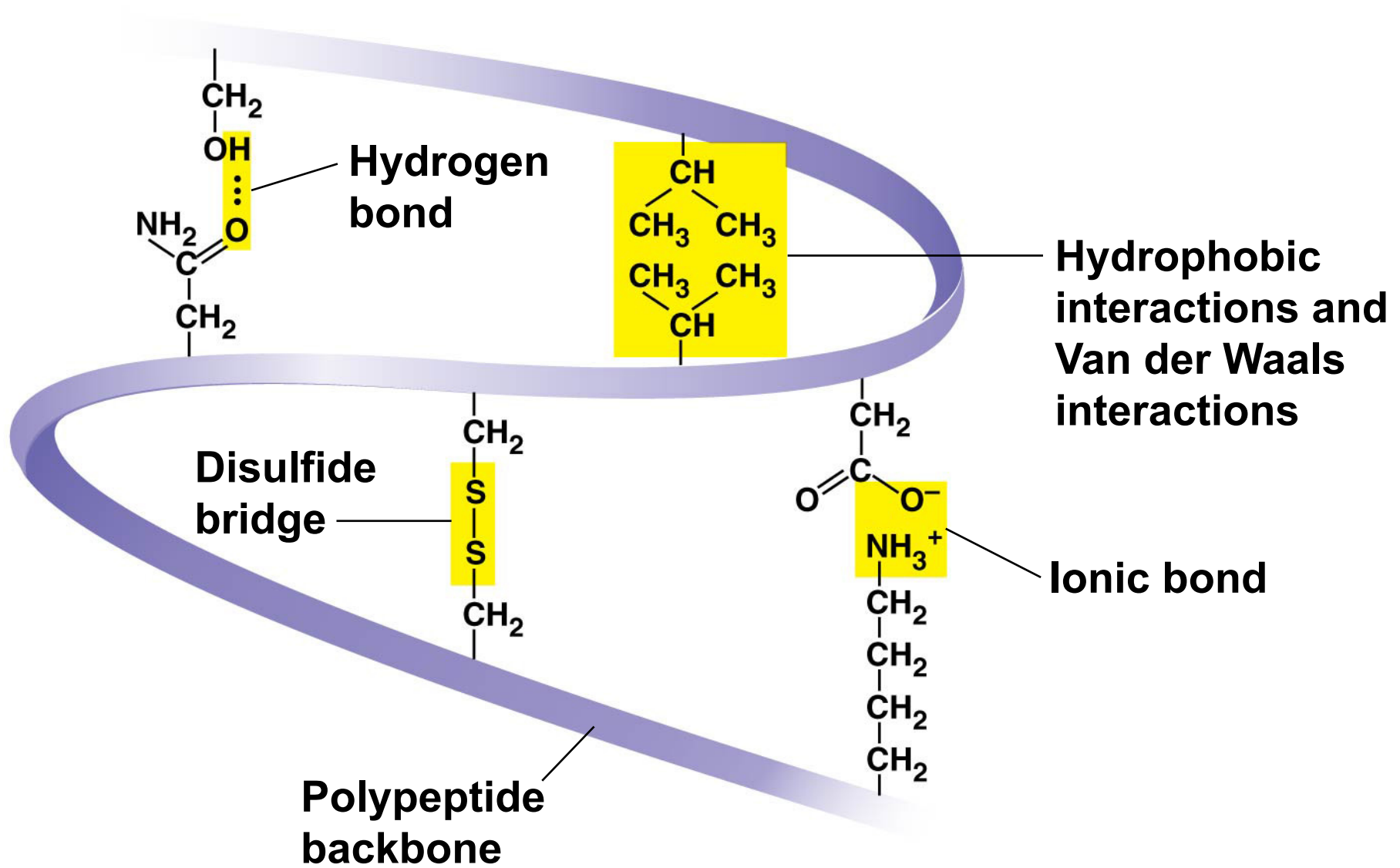
(b) Secondary structure.

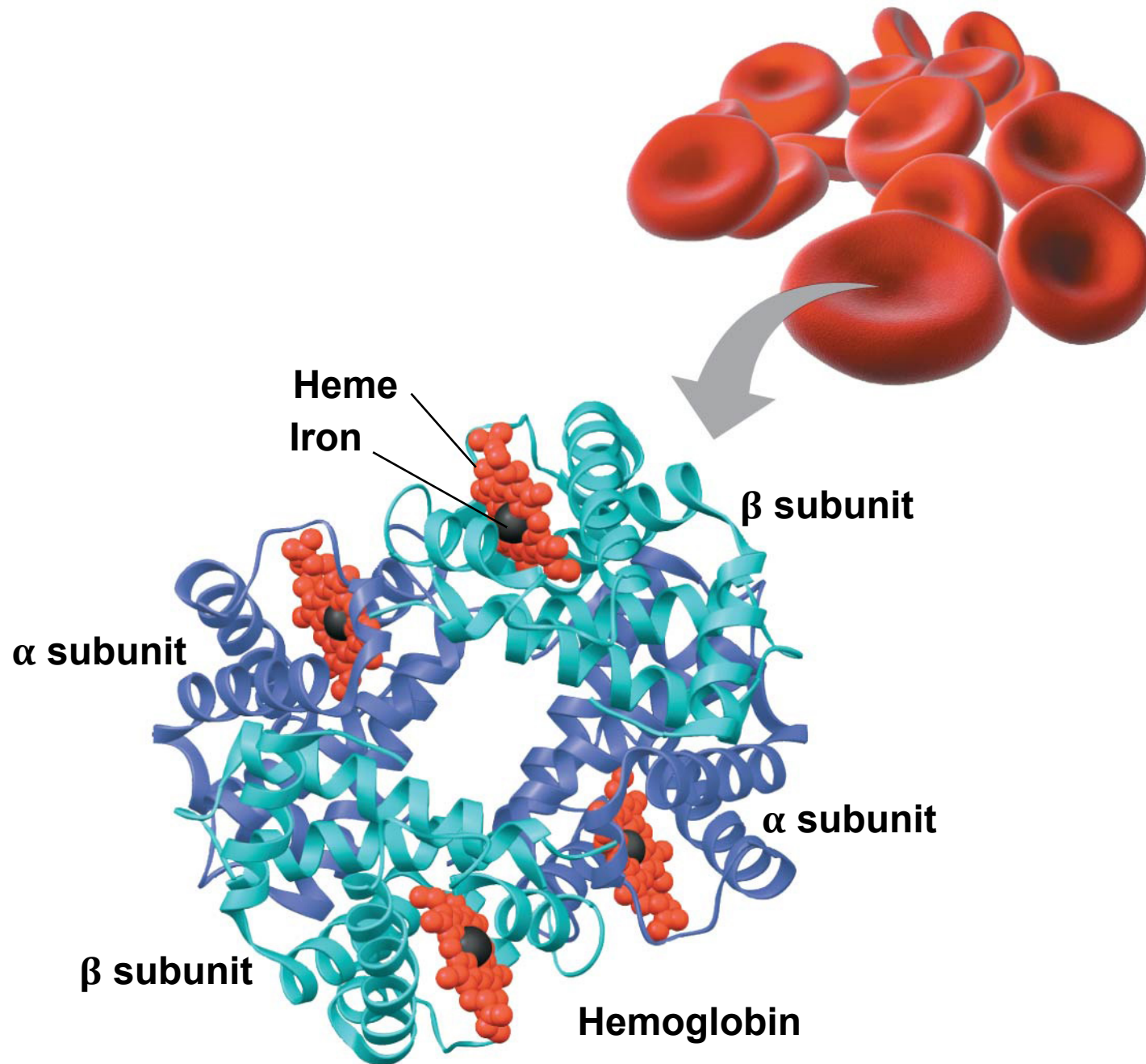



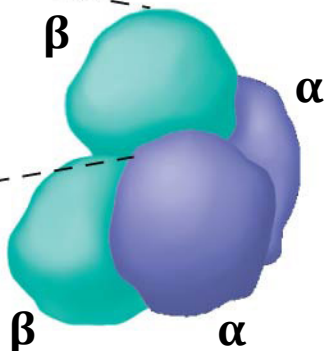
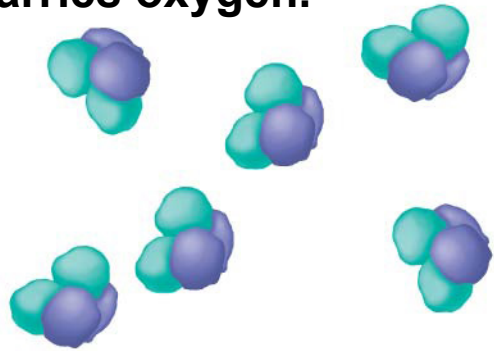
(c) Tertiary structure.

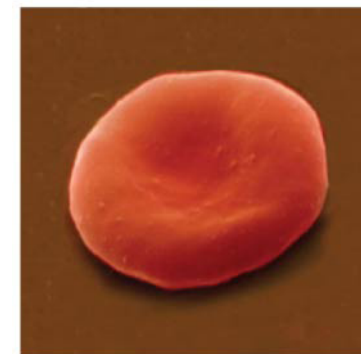


(d) Quaternary structure.

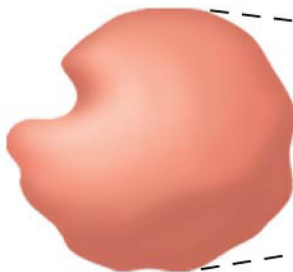
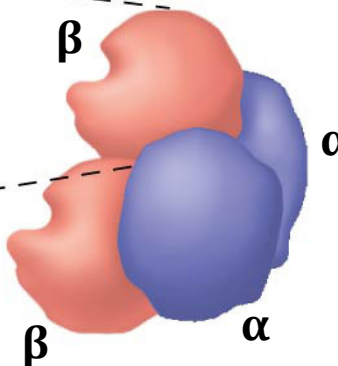
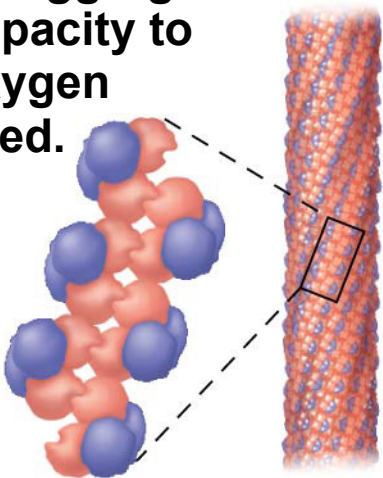




	Primary Structure	Secondary and Tertiary Structures	Quaternary Structure	Function
Normal	<ol style="list-style-type: none"> 1 Val 2 His 3 Leu 4 Thr 5 Pro 6 Glu 7 Glu 	<p>Normal β subunit</p> 	<p>Normal hemoglobin</p> 	<p>Proteins do not associate with one another; each carries oxygen.</p> 



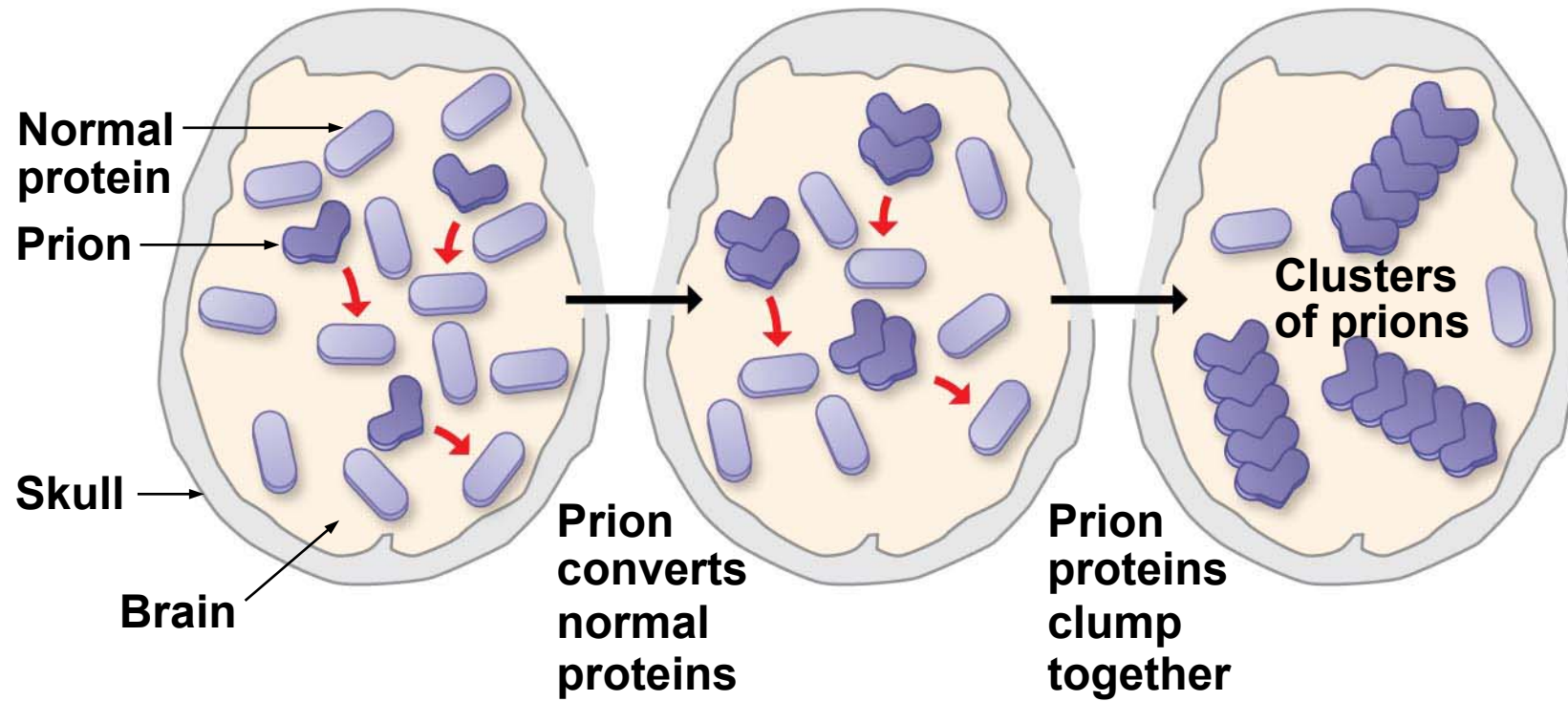
5 μ m

	Primary Structure	Secondary and Tertiary Structures	Quaternary Structure	Function
Sickle-cell	1 Val 2 His 3 Leu 4 Thr 5 Pro 6 Val 7 Glu	Sickle-cell β subunit 	Sickle-cell hemoglobin 	Proteins aggregate into a fiber; capacity to carry oxygen is reduced. 



5 μ m

Figure 3.20



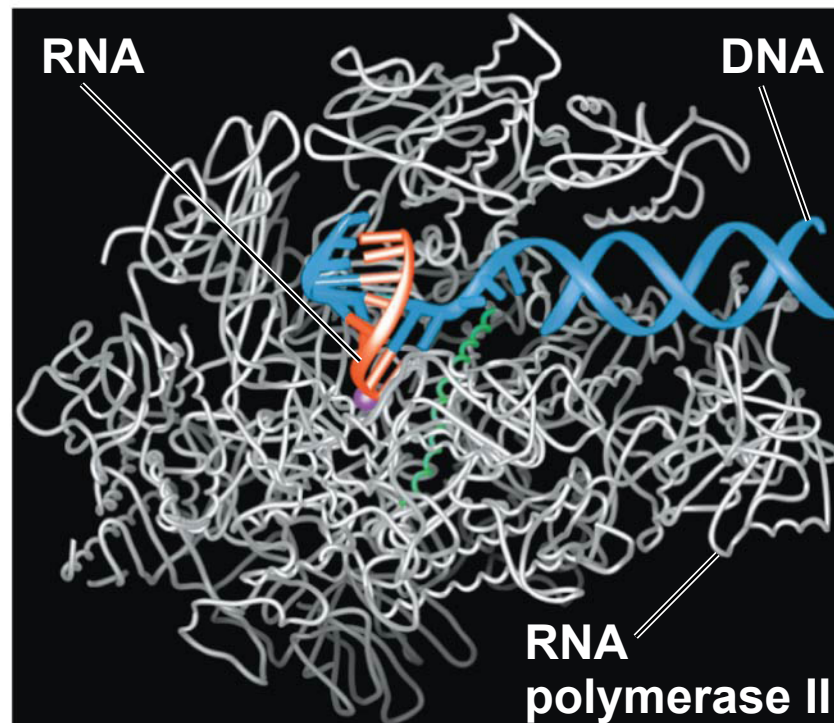
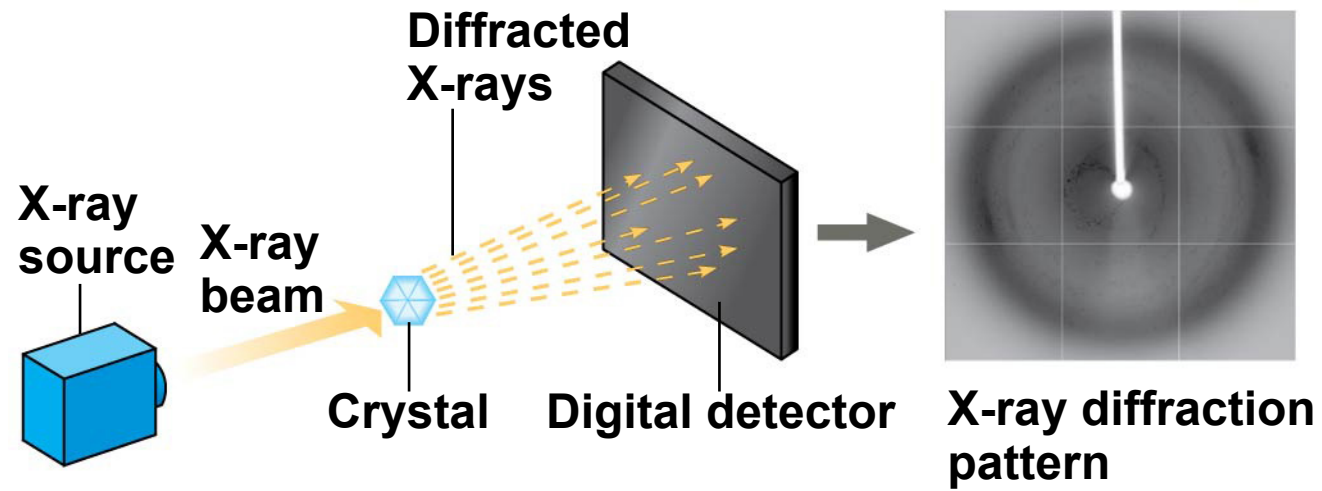
Bovine spongiform encephalopathy (BSE)

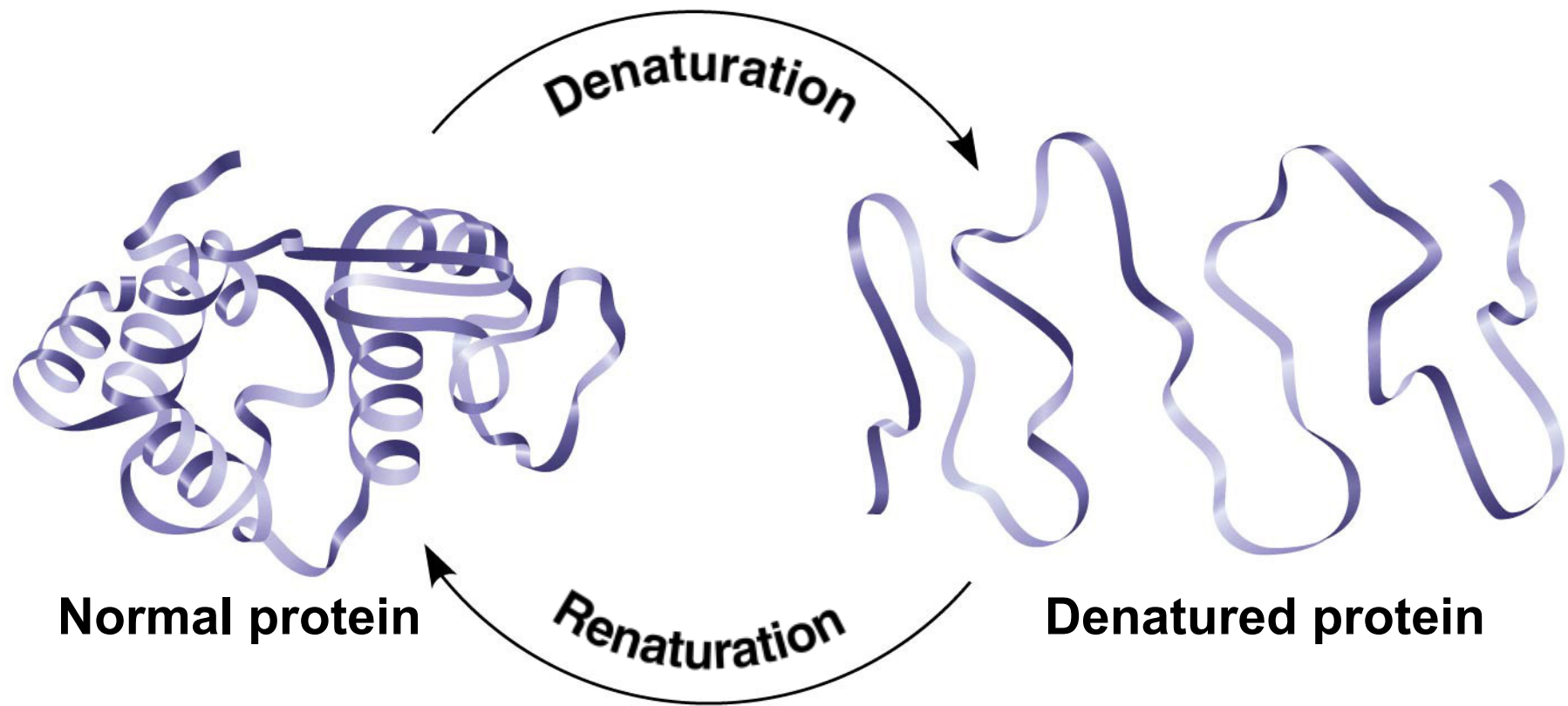


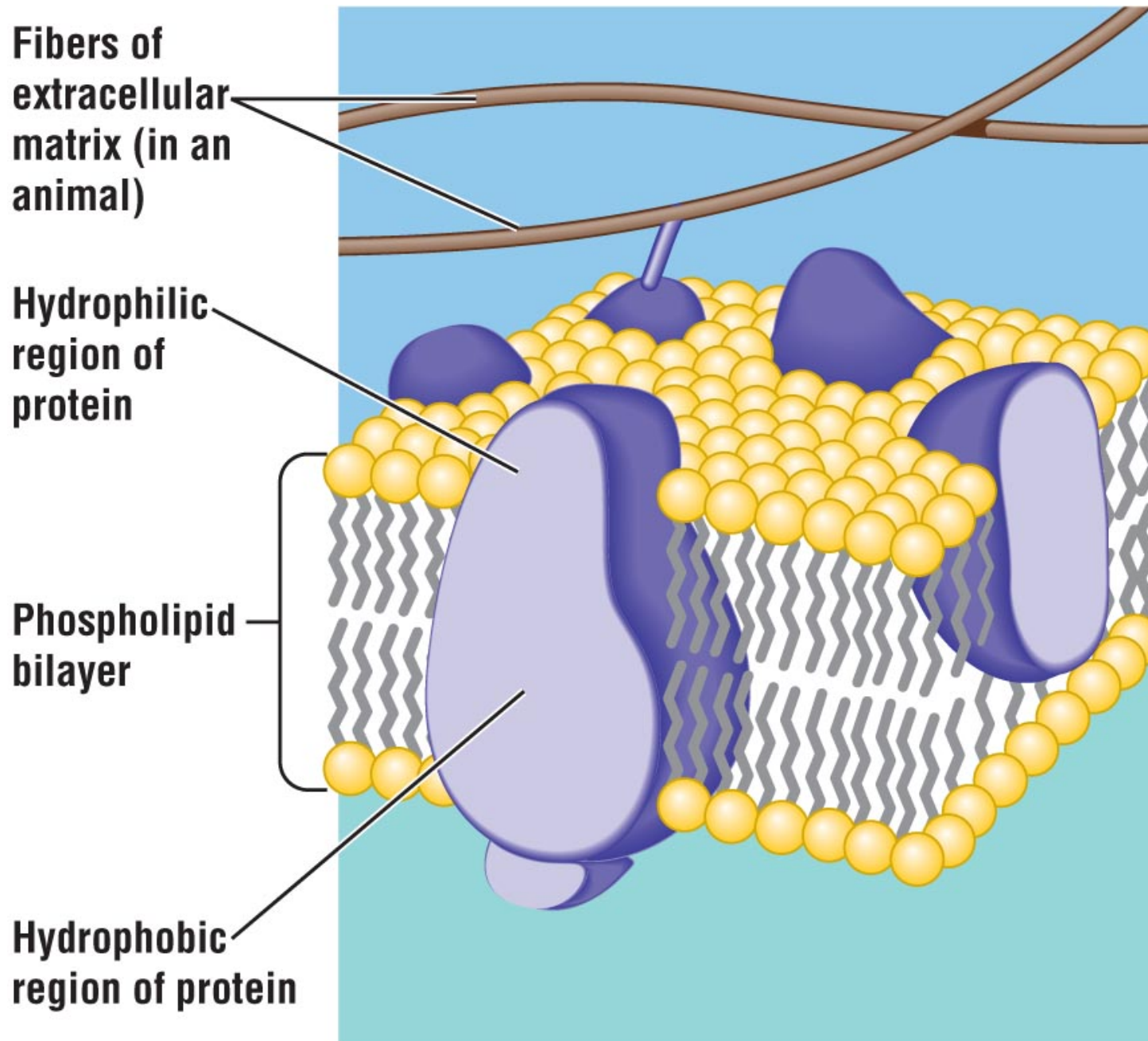
Kuru



Fatal weight loss in deer, elk, and moose







(b) Fluid mosaic model of membrane.

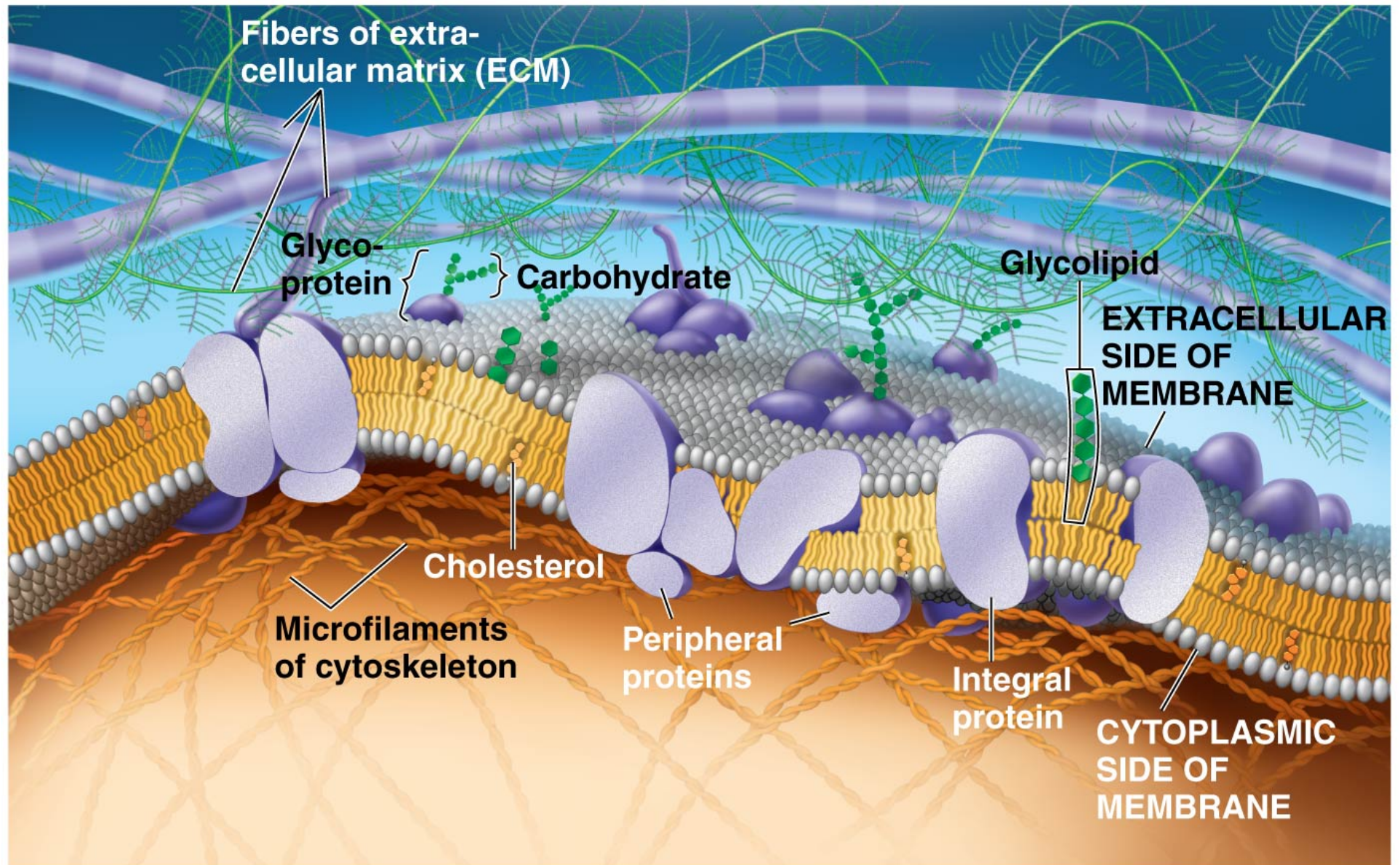
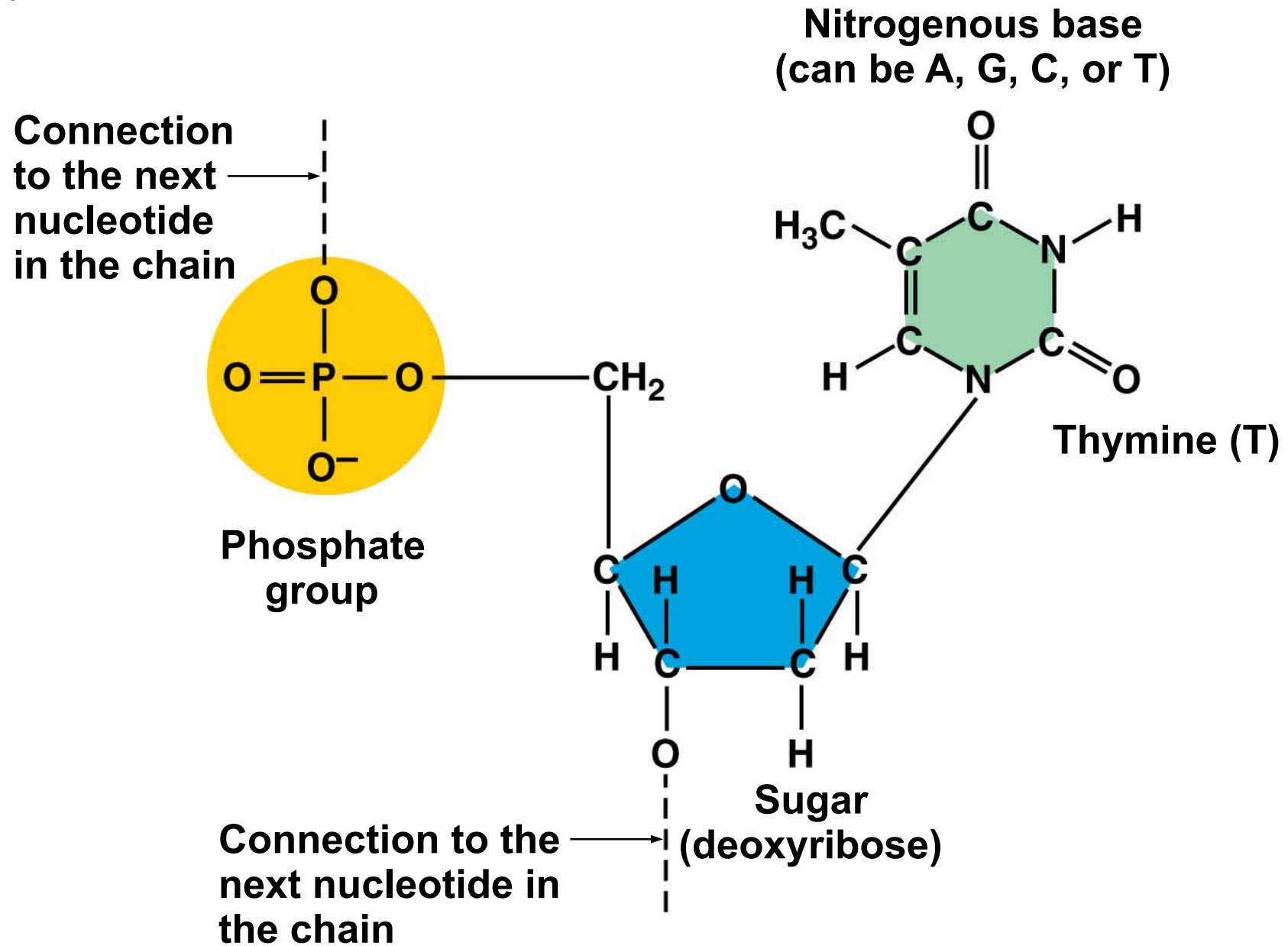
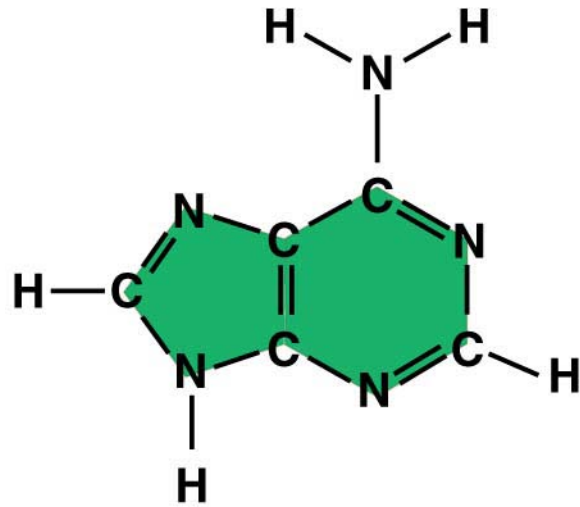


Figure 3.22-1

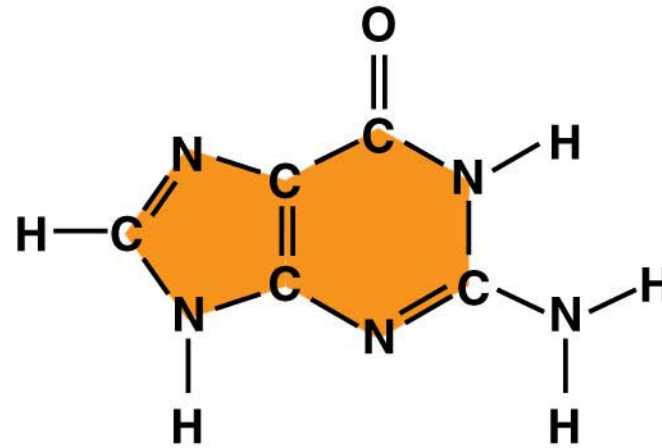


(a) Atomic structure

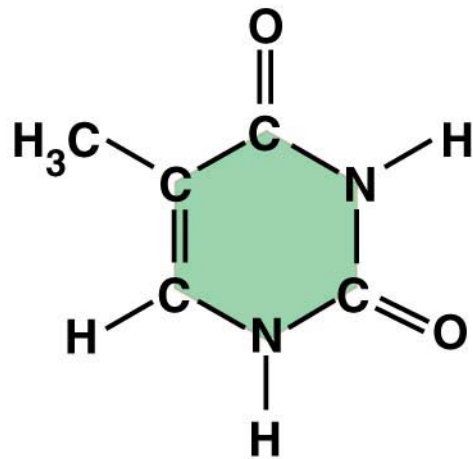
Figure 3.23-1



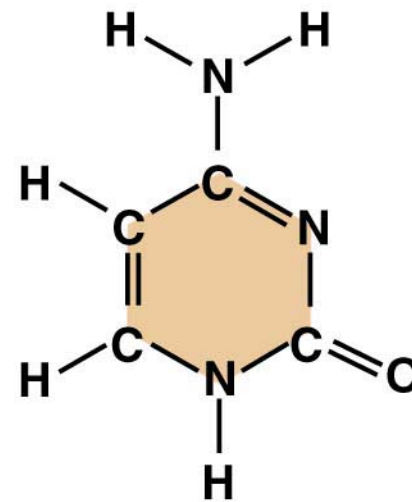
Adenine (A)



Guanine (G)



Thymine (T)



Cytosine (C)

Figure 3.25

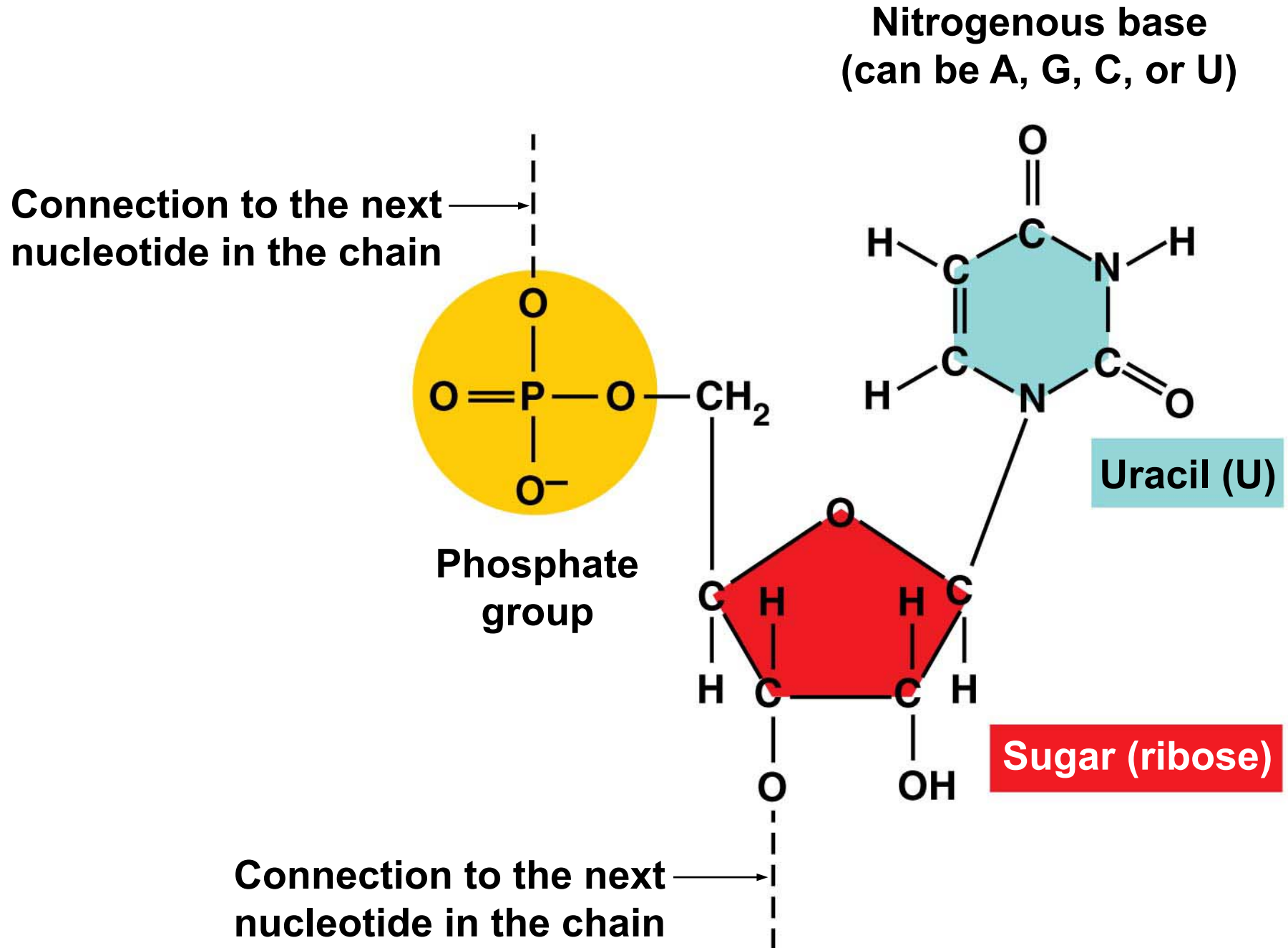
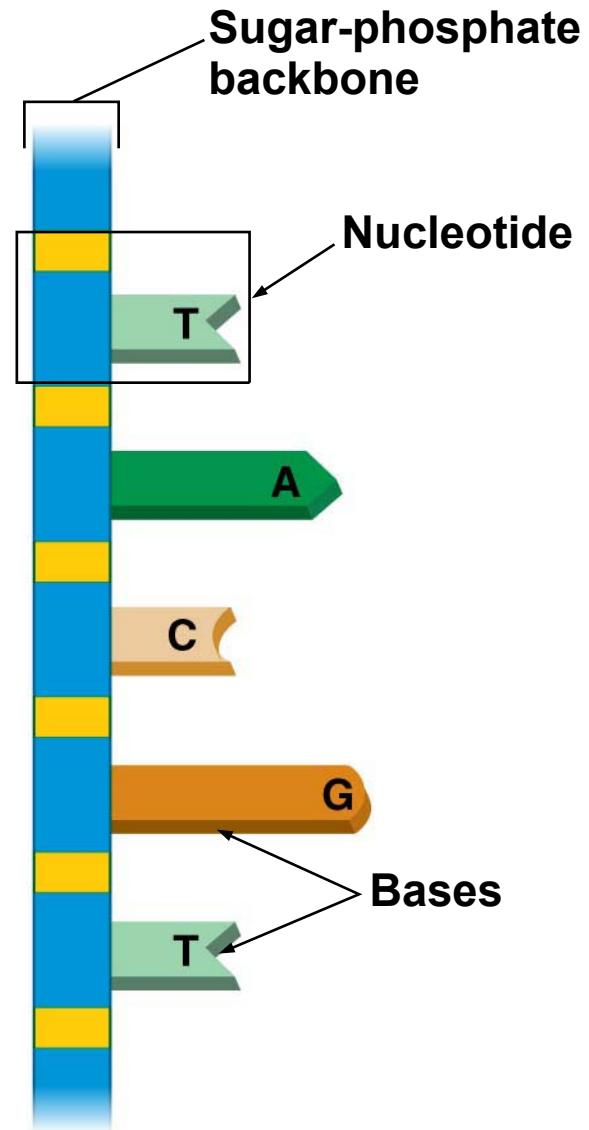
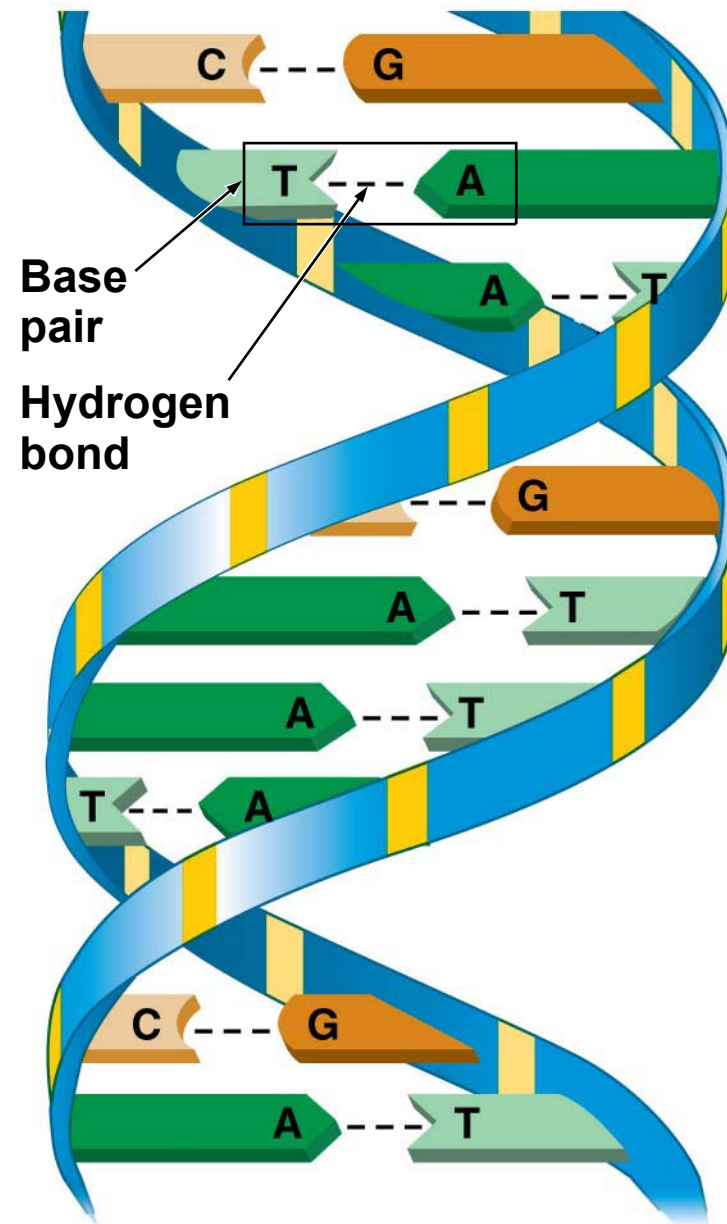


Figure 3.24



**(a) DNA strand
(polynucleotide)**

Figure 3.24



**(b) Double helix
(two polynucleotide strands)**