

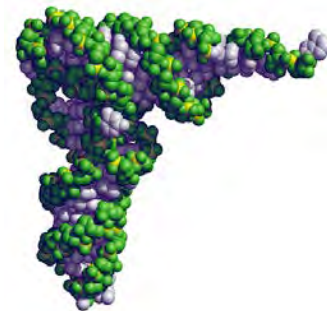
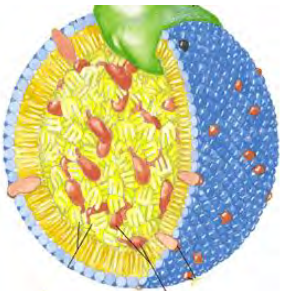


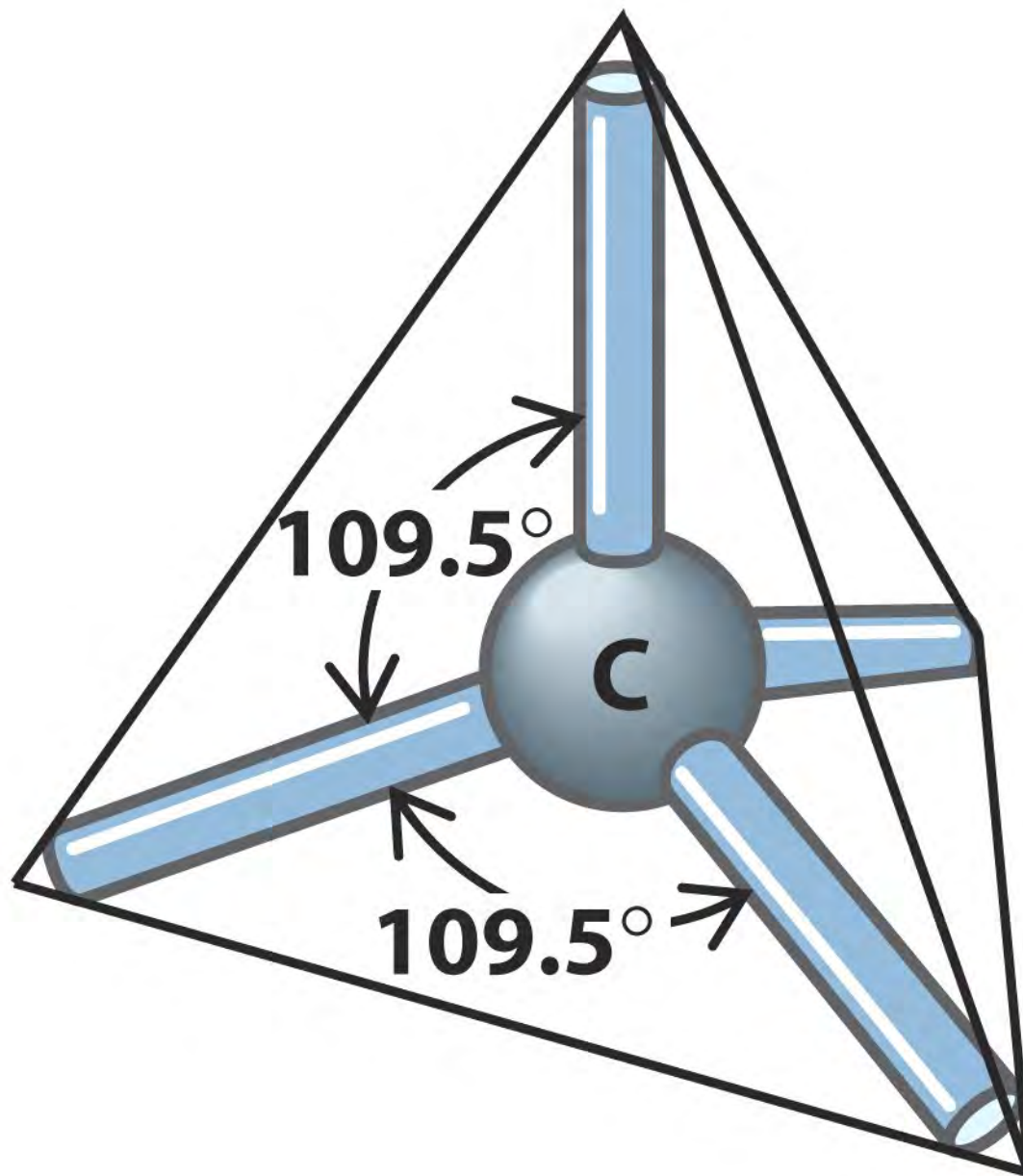
BIOCHEMISTRY REVIEW

Overview of Biomolecules

Chapter 1

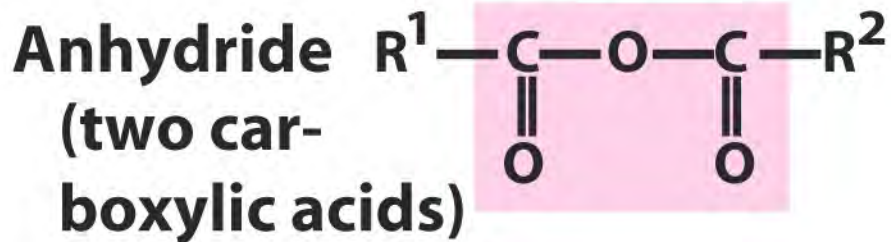
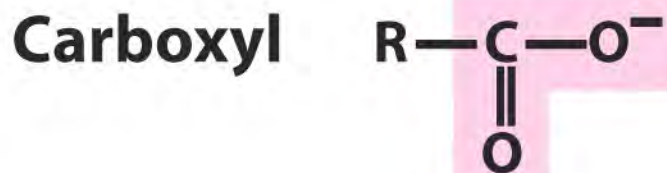
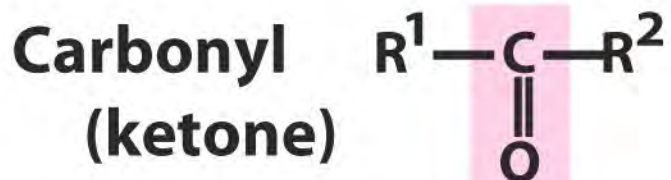
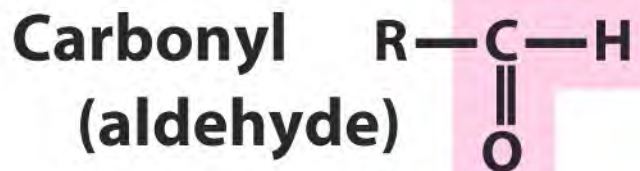
Introduction to Biomolecules



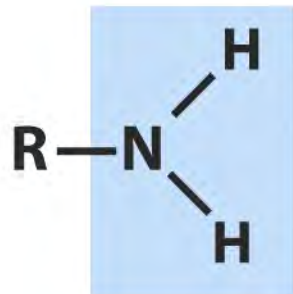


1 H																	2 He
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba		72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra		<p>Lanthanides Actinides</p>														

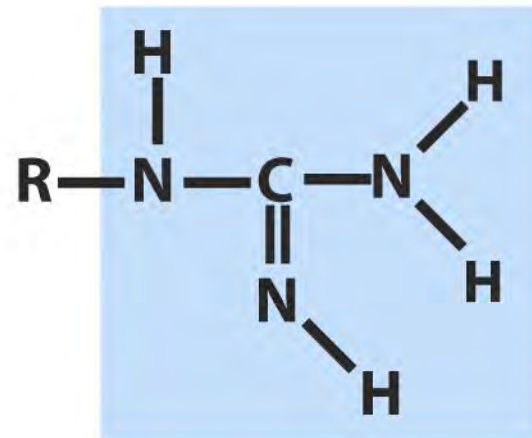
 Bulk elements
 Trace elements



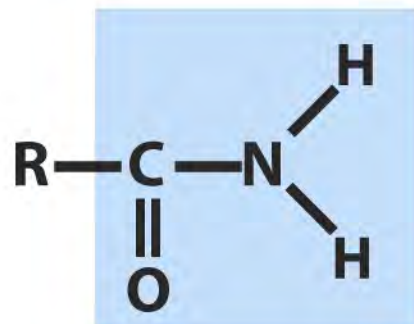
Amino



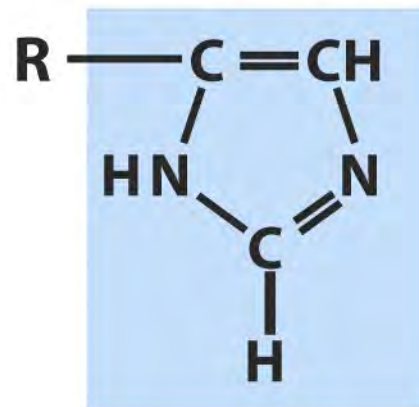
Guanidino



Amido



Imidazole



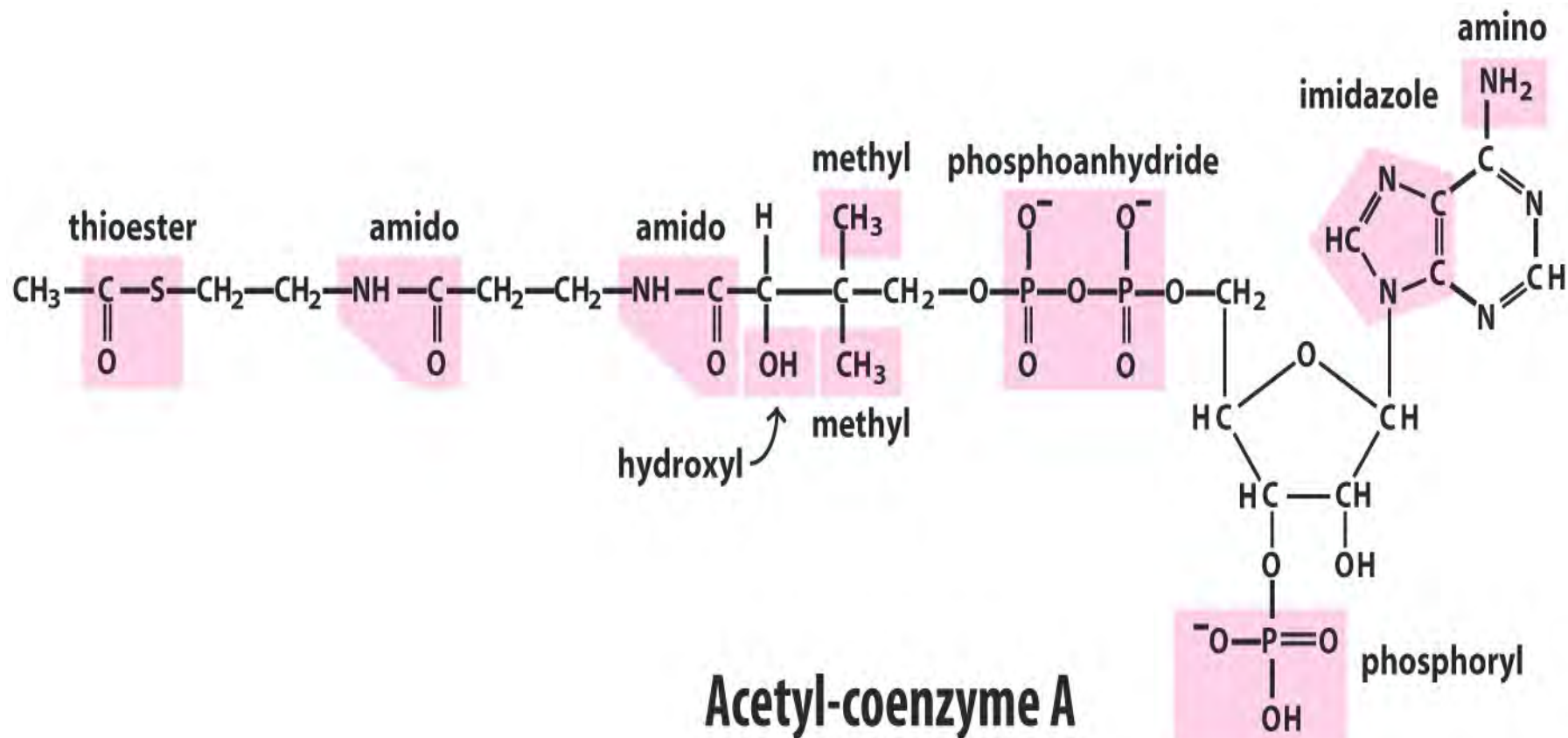


TABLE 2-5 Four Types of Noncovalent (“Weak”) Interactions among Biomolecules in Aqueous Solvent

Hydrogen bonds

Between neutral groups



Between peptide bonds



Ionic interactions

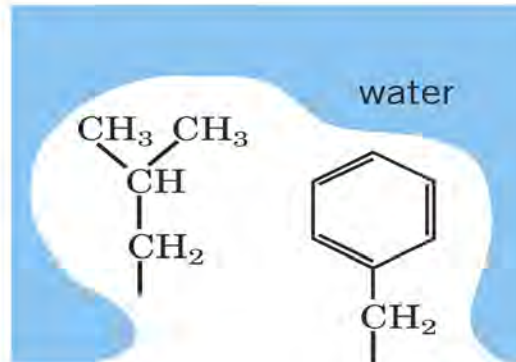
Attraction



Repulsion

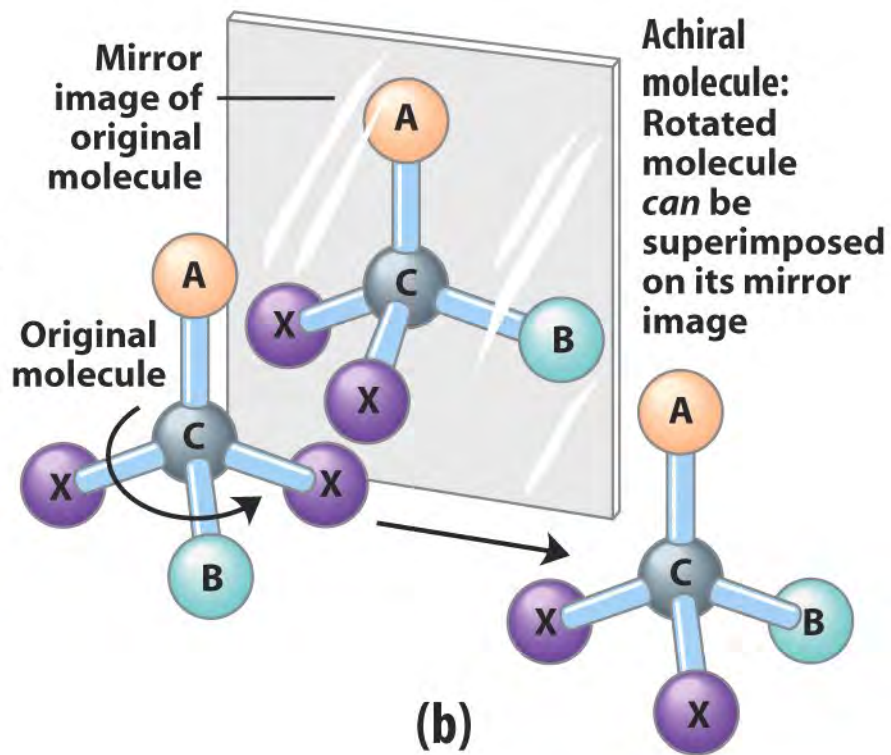
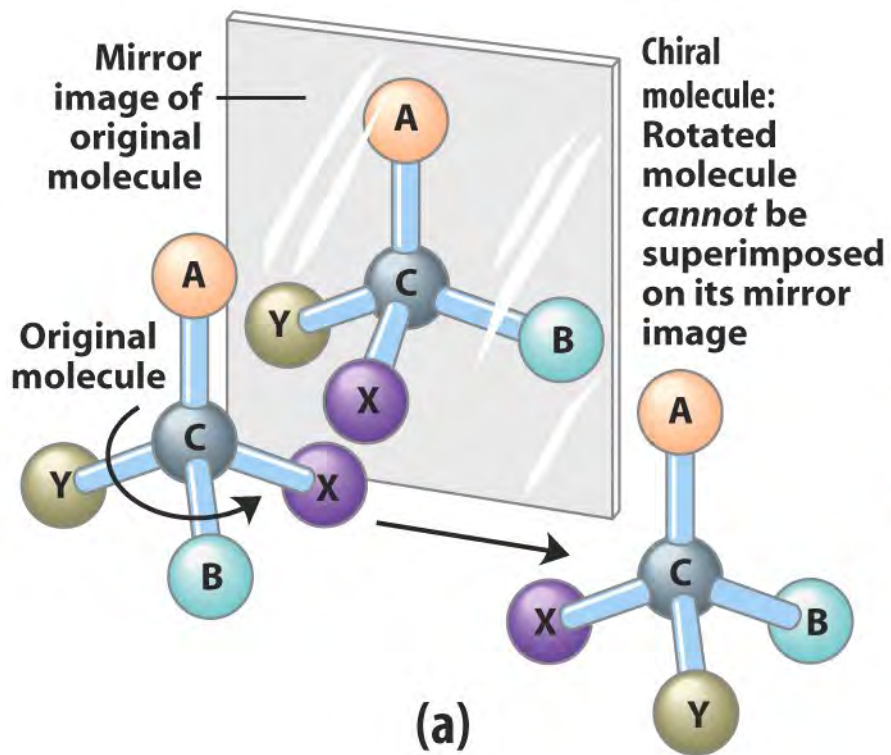


Hydrophobic interactions



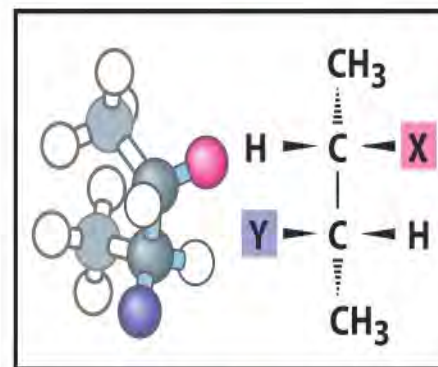
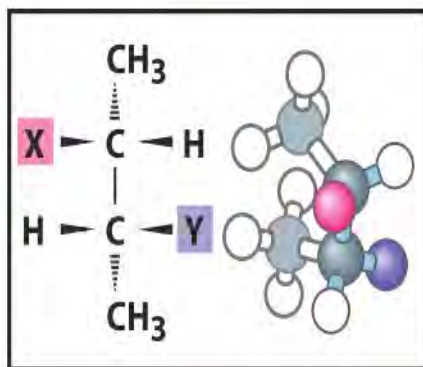
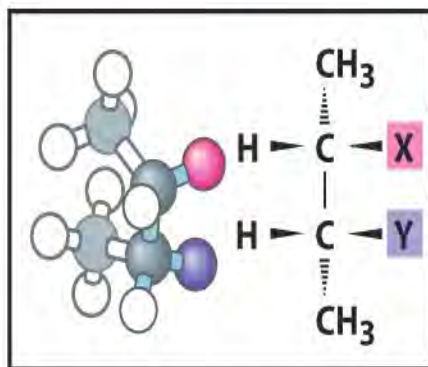
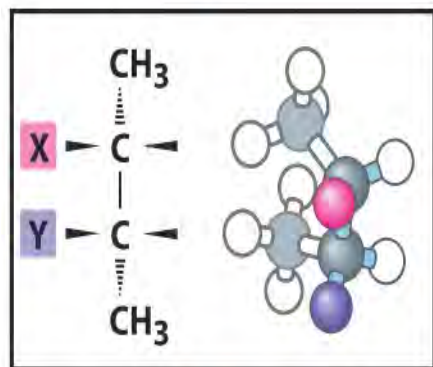
van der Waals interactions

Any two atoms in close proximity



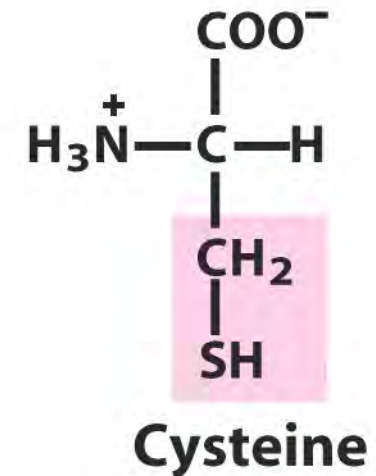
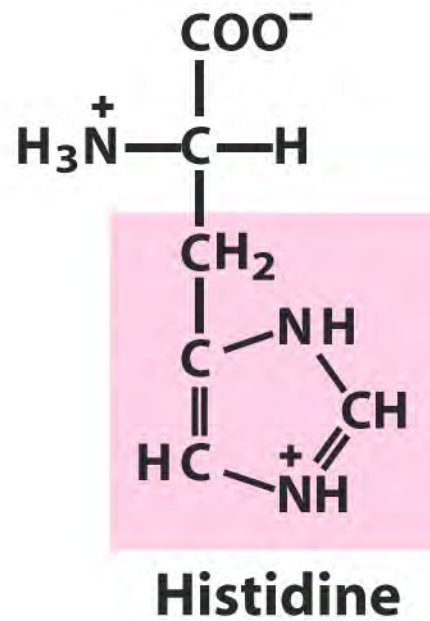
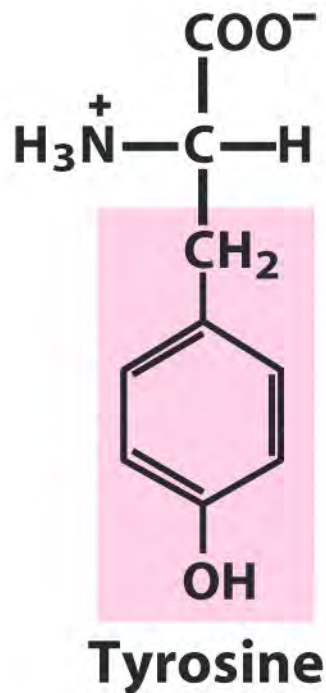
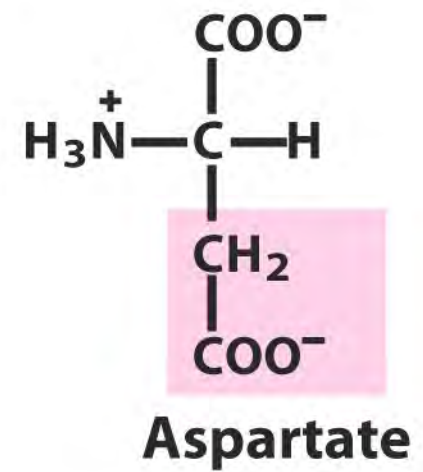
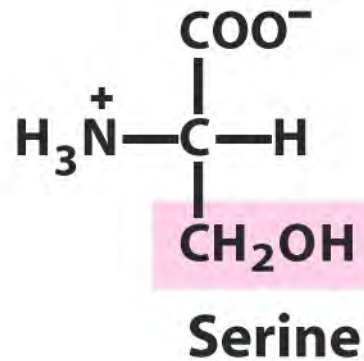
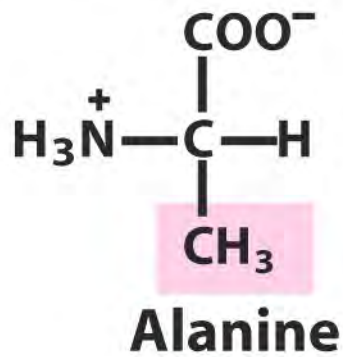
Enantiomers (mirror images)

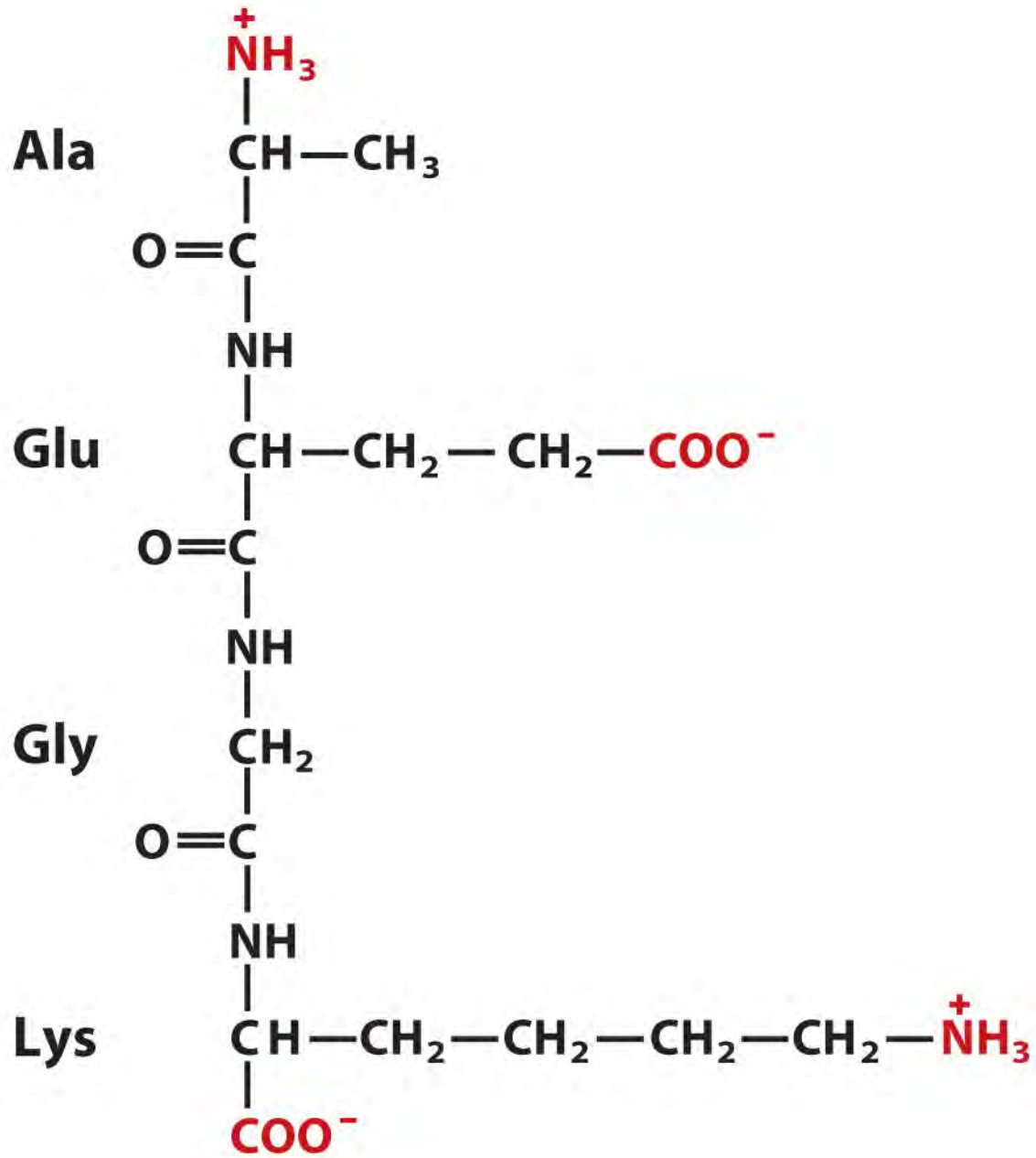
Enantiomers (mirror images)

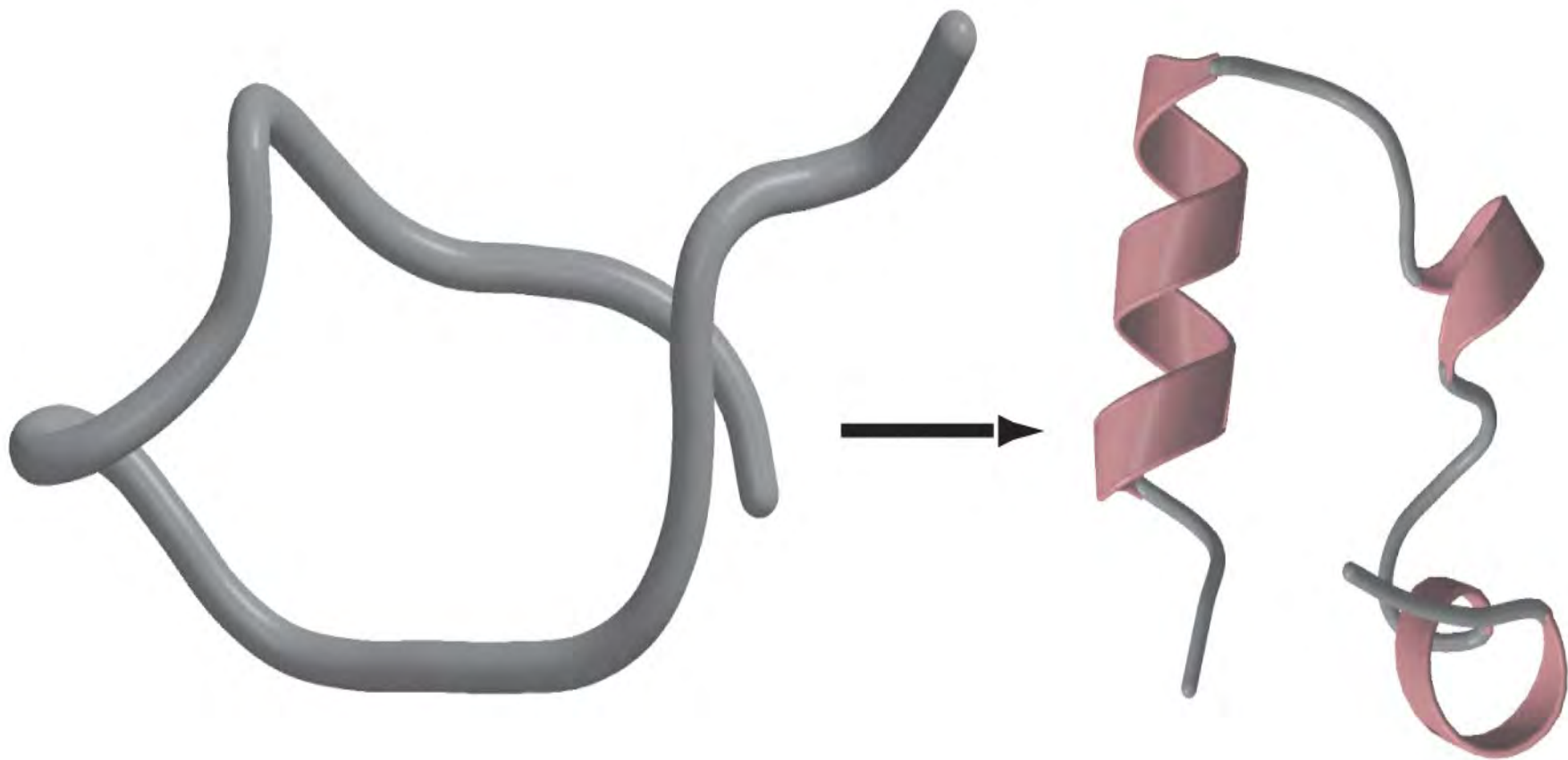


Diastereomers (non-mirror images)

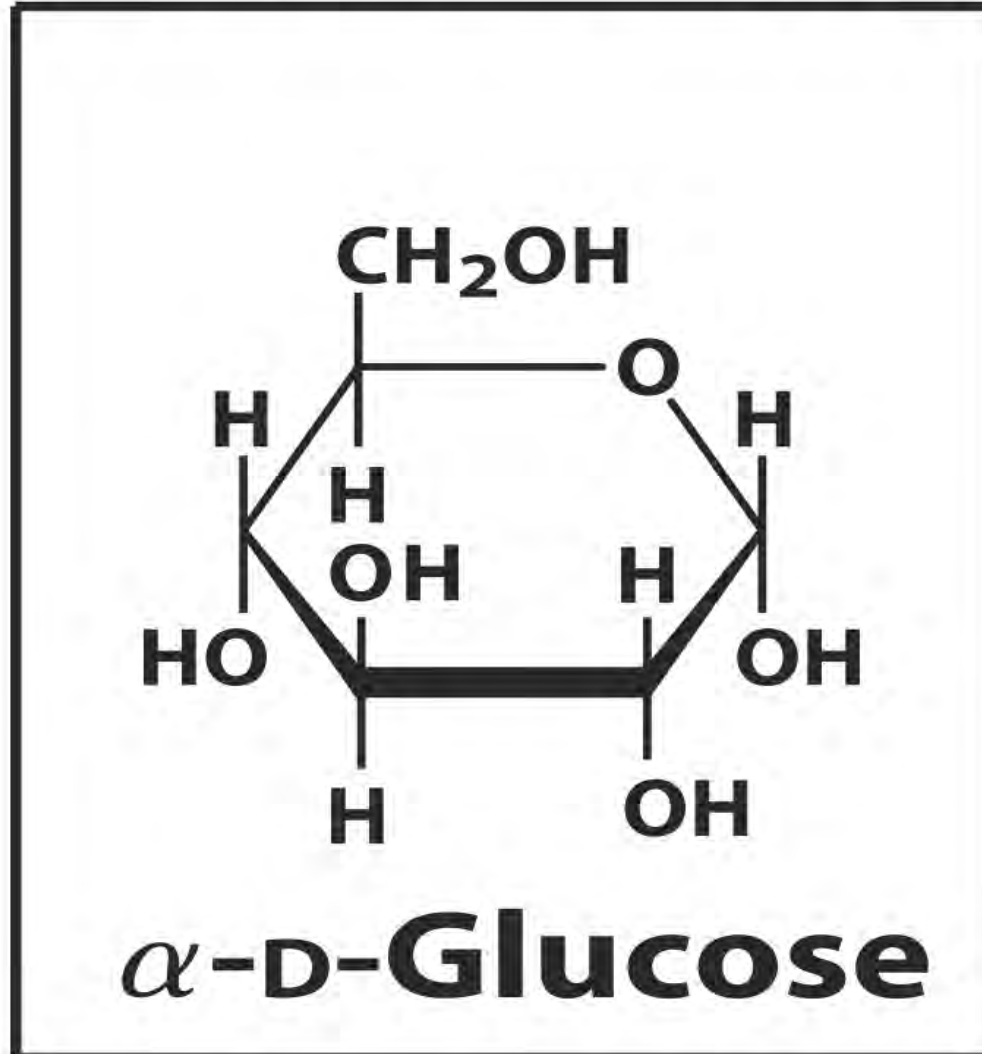
(a) Some of the amino acids of proteins

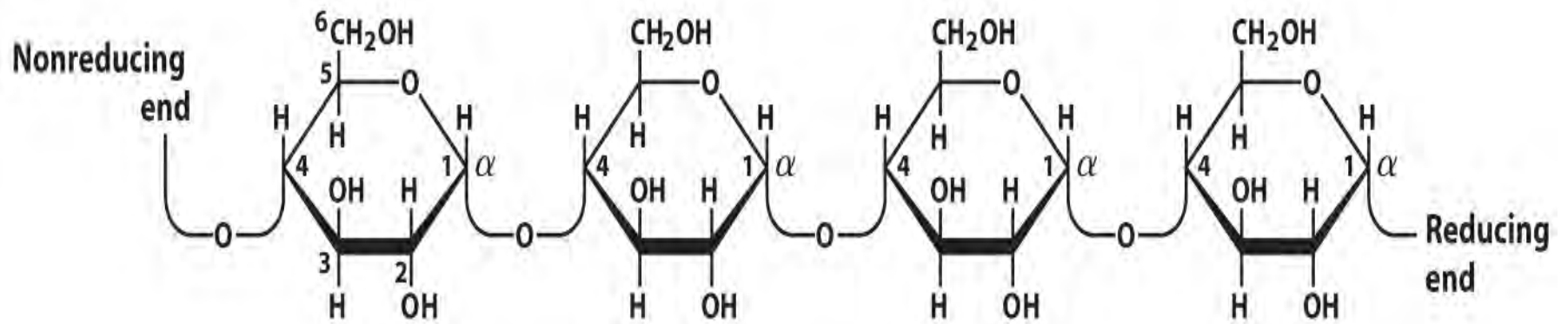




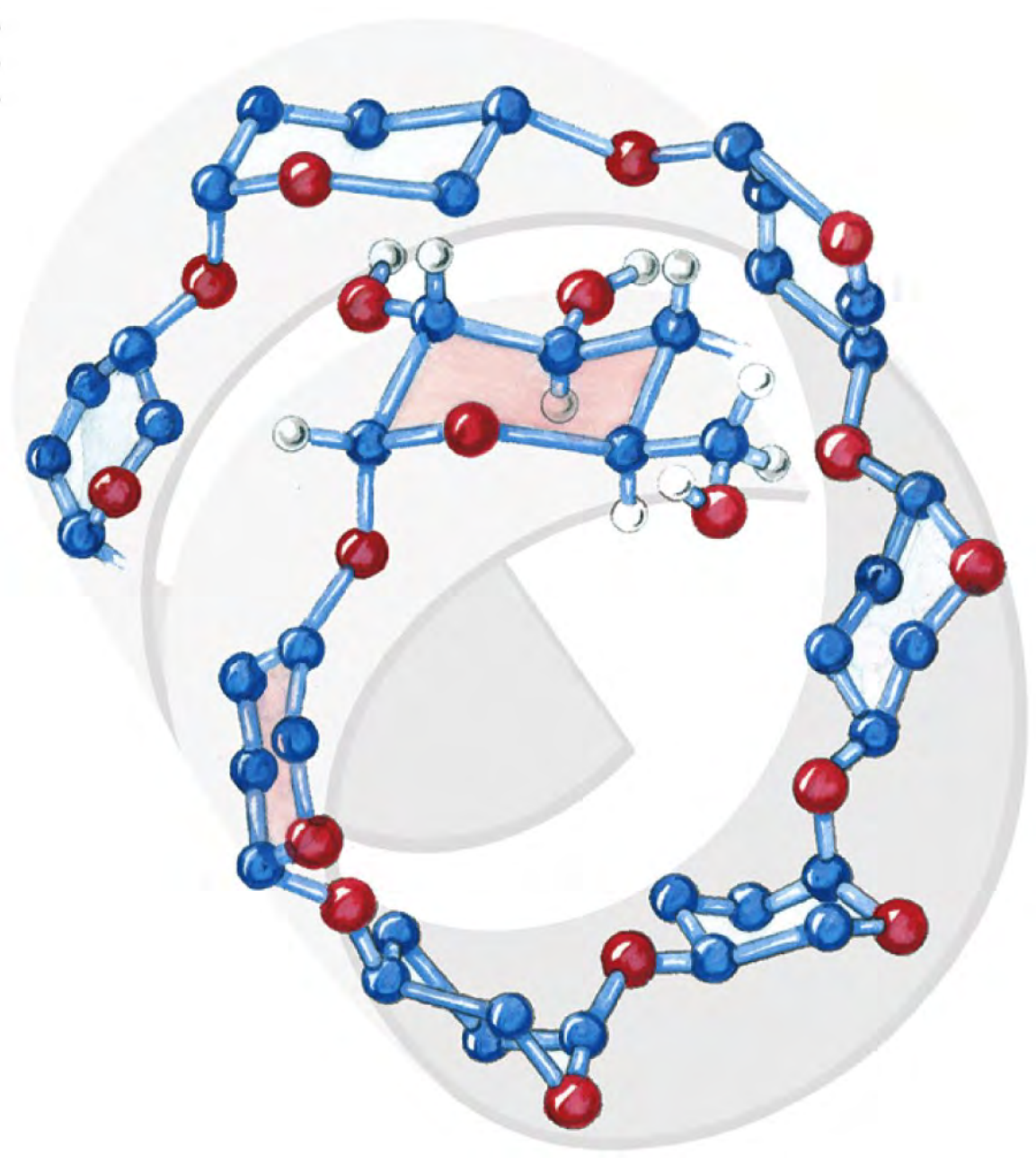


The parent sugar

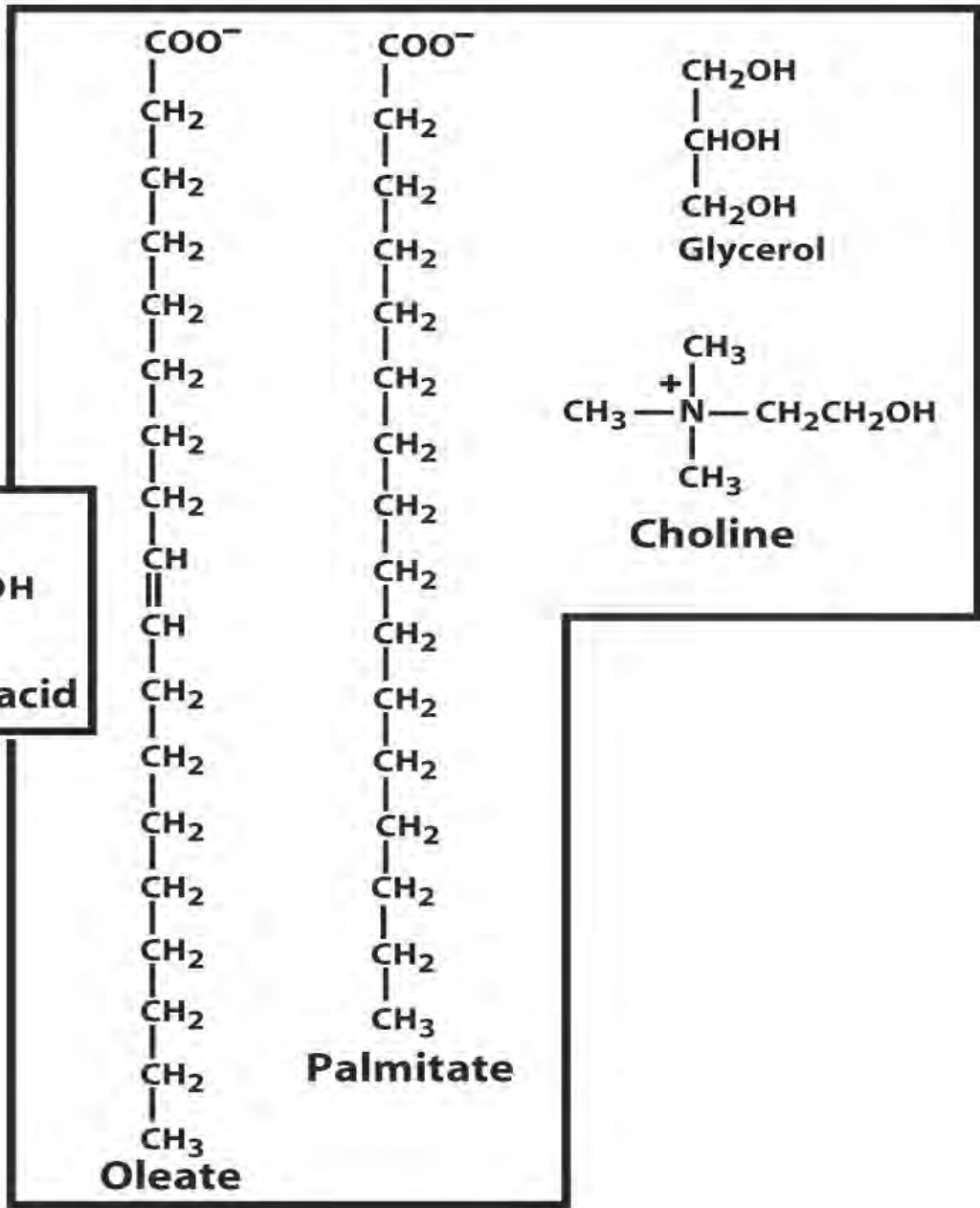
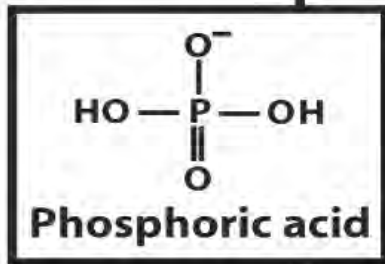




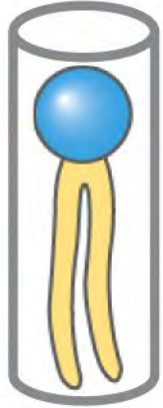
amylose



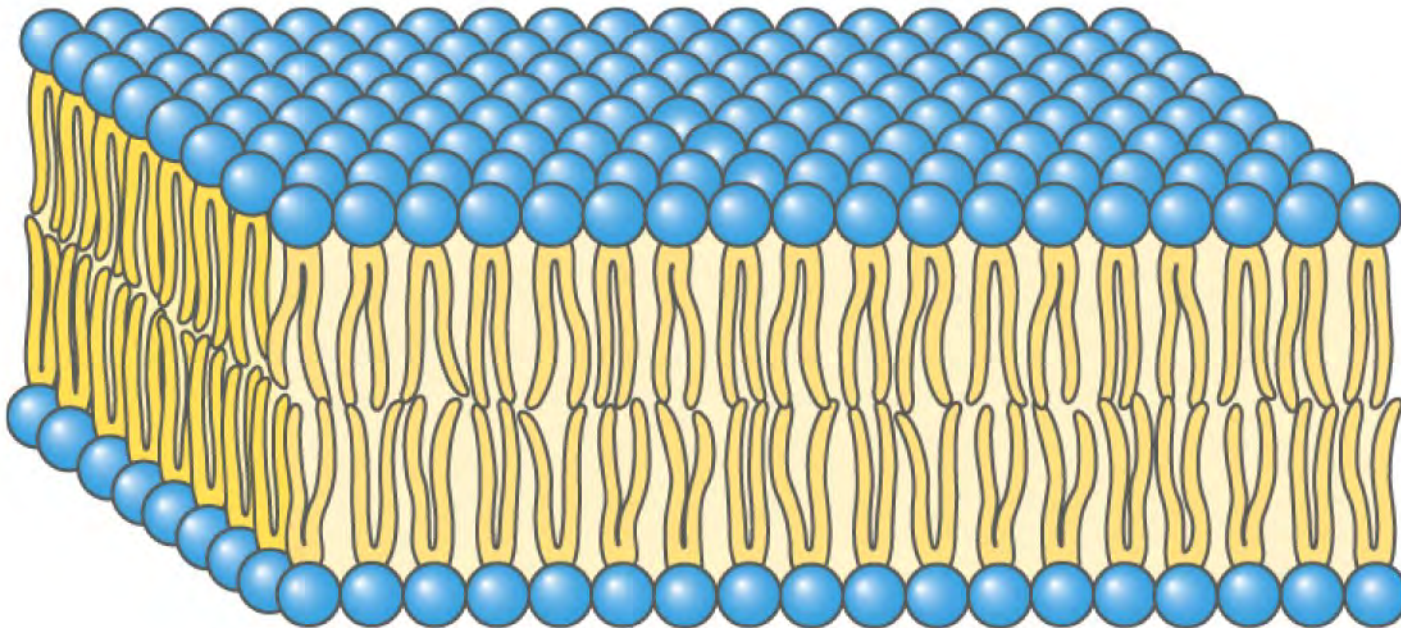
Some components of lipids

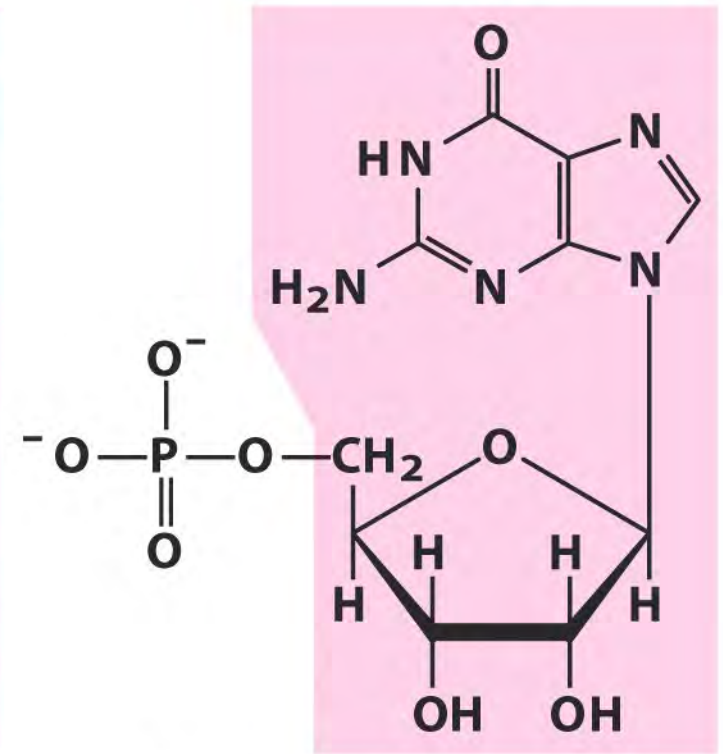
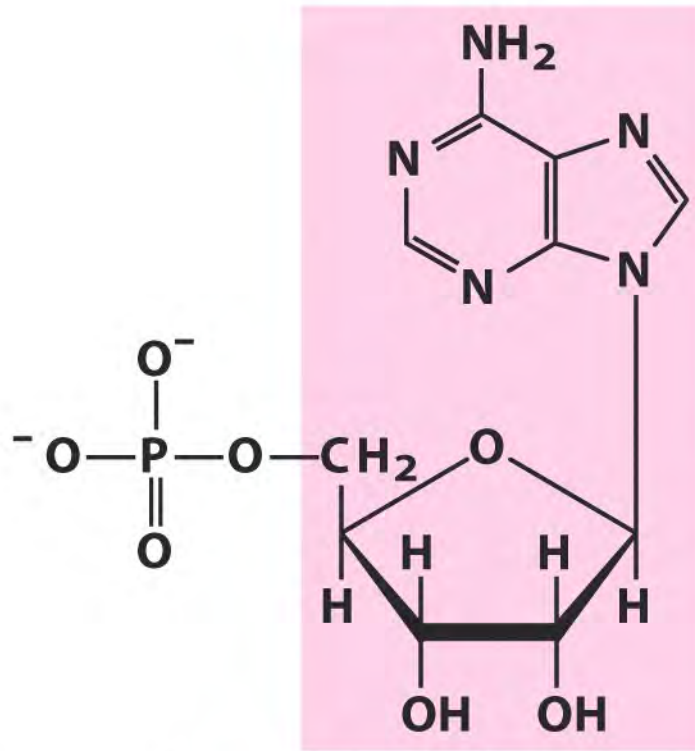


(b) Bilayer



**Individual units are cylindrical
(cross section of head equals that
of side chain)**





Nucleotide: Adenylate (adenosine 5'-monophosphate)

Symbols: A, AMP

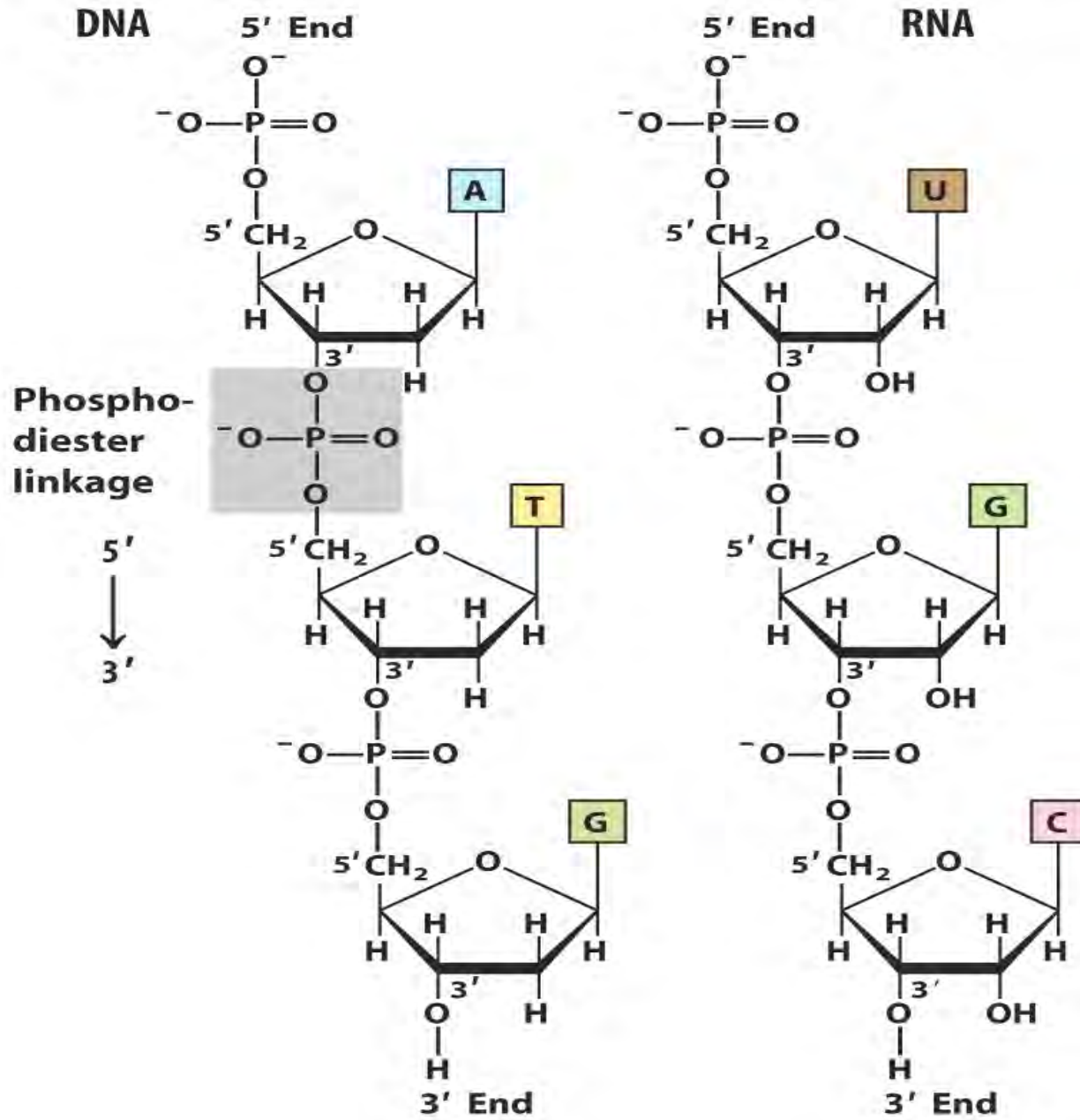
Nucleoside: Adenosine

Nucleotide: Guanylate (guanosine 5'-monophosphate)

Symbols: G, GMP

Nucleoside: Guanosine

(b) Ribonucleotides



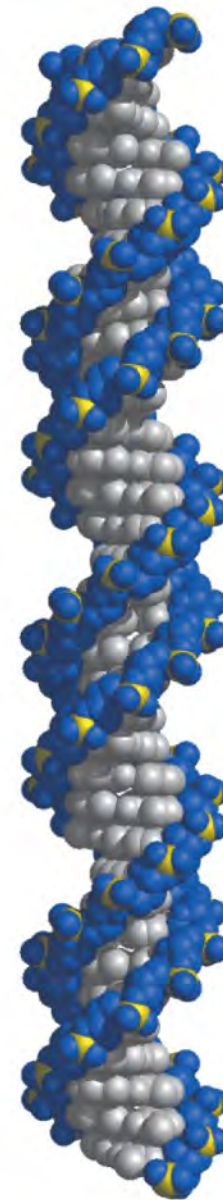
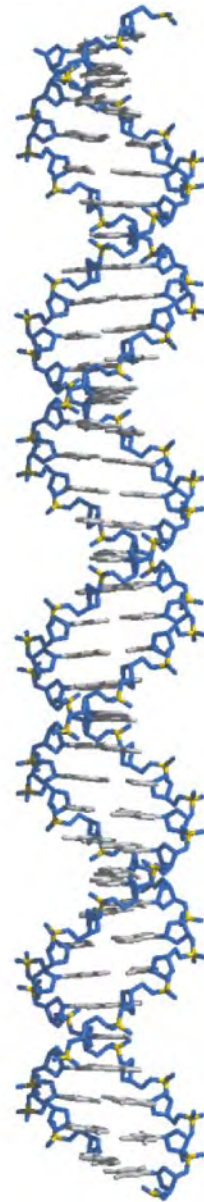
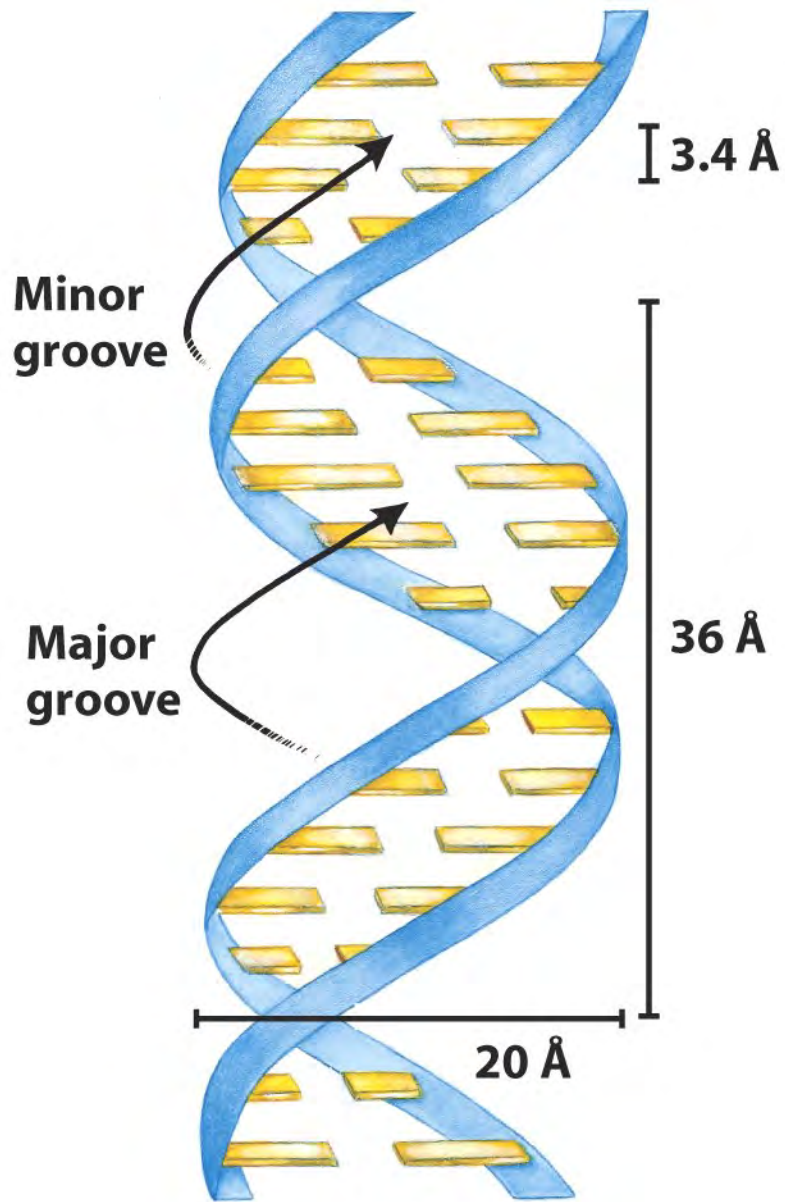


TABLE 1-2 Molecular Components of an *E. coli* Cell

	<i>Percentage of total weight of cell</i>	<i>Approximate number of different molecular species</i>
Water	70	1
Proteins	15	3,000
Nucleic acids		
DNA	1	1
RNA	6	>3,000
Polysaccharides	3	5
Lipids	2	20
Monomeric subunits and intermediates	2	500
Inorganic ions	1	20