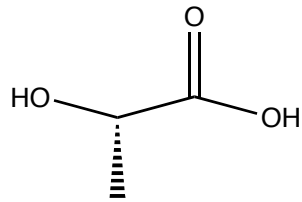
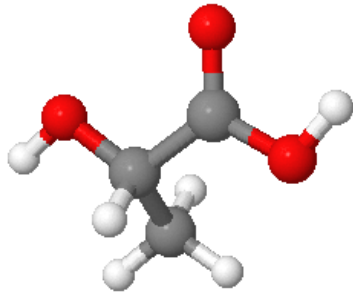
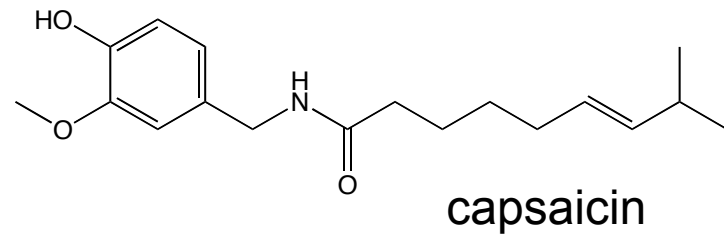
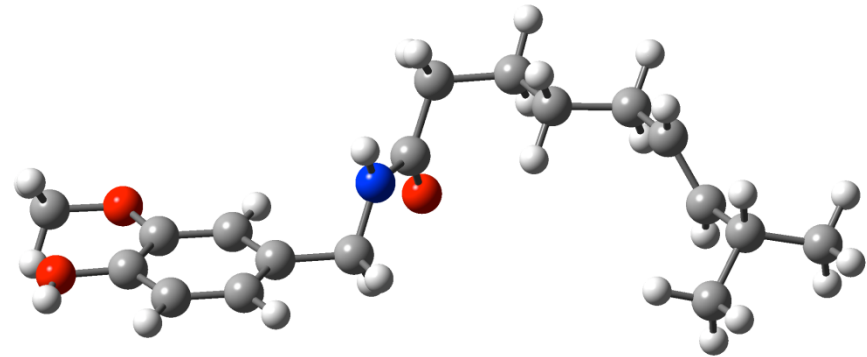


3-D world

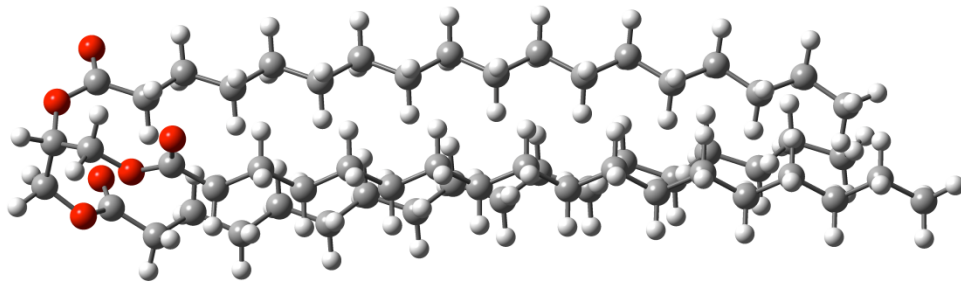
L-lactic acid



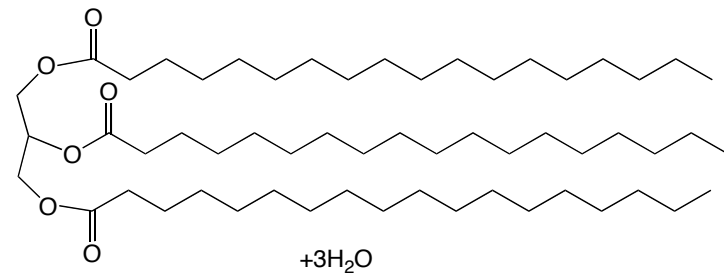
Carbon makes 4 bonds
Nitrogen makes 3 bonds
Oxygen makes 2 bonds
HO same as OH
Lines/wedges indicate bonds
#H bonded to C = 4 - #bonds (lines)



capsaicin



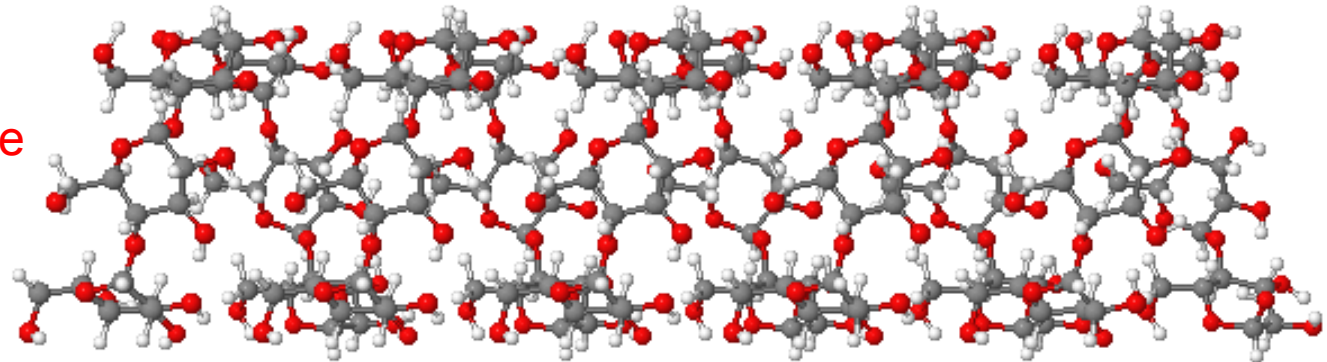
triglyceride



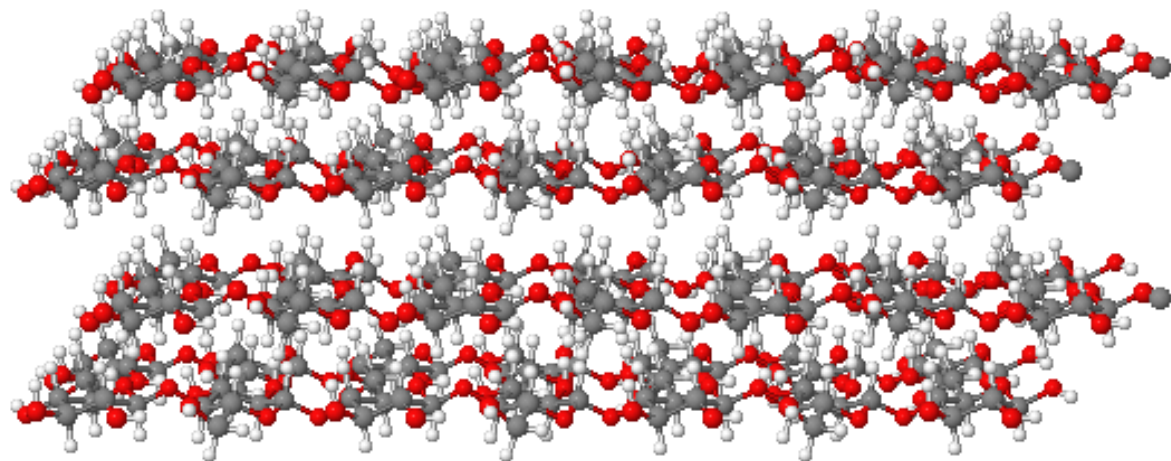
+3H₂O

3-D world contd.

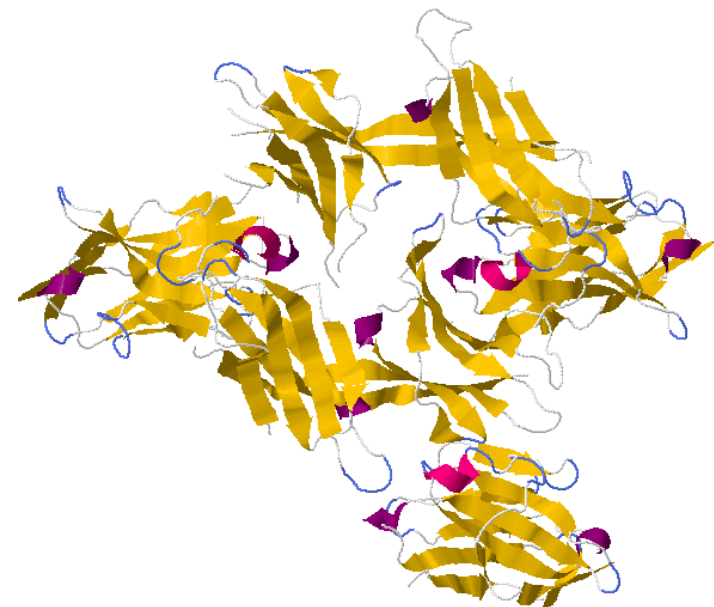
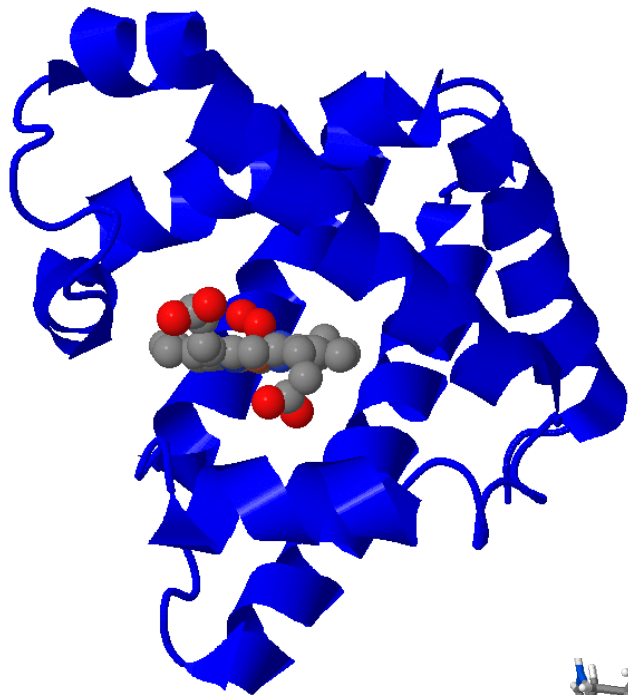
amylose (starch):
soluble in water,
digestible by people



cellulose (a fiber):
not soluble in water,
not digestible by
people, main
component in plant
cell walls,
approximately 1/3
of all plant matter

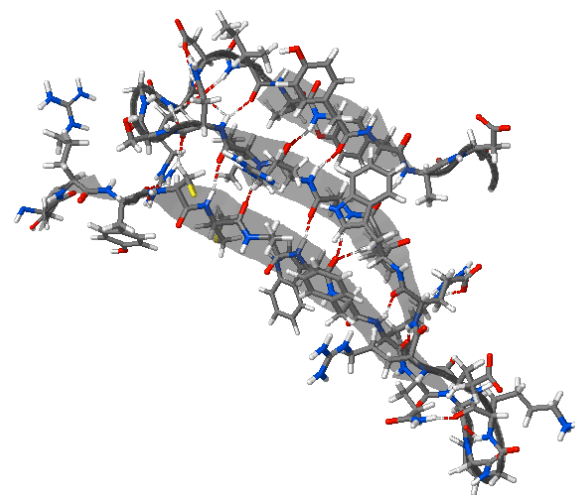
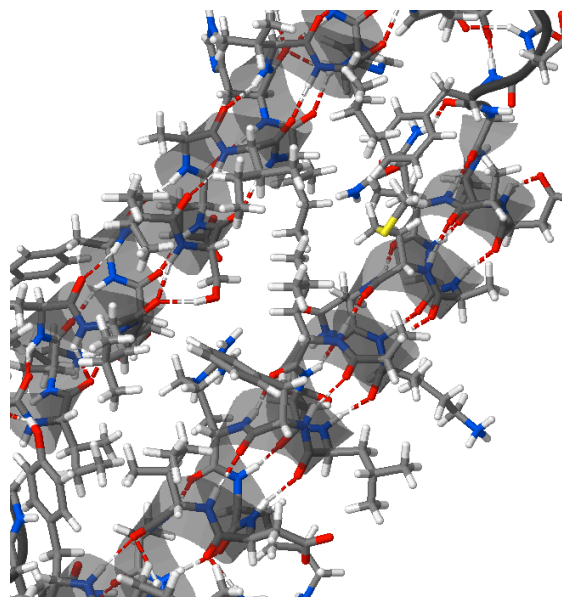


3-D World contd.



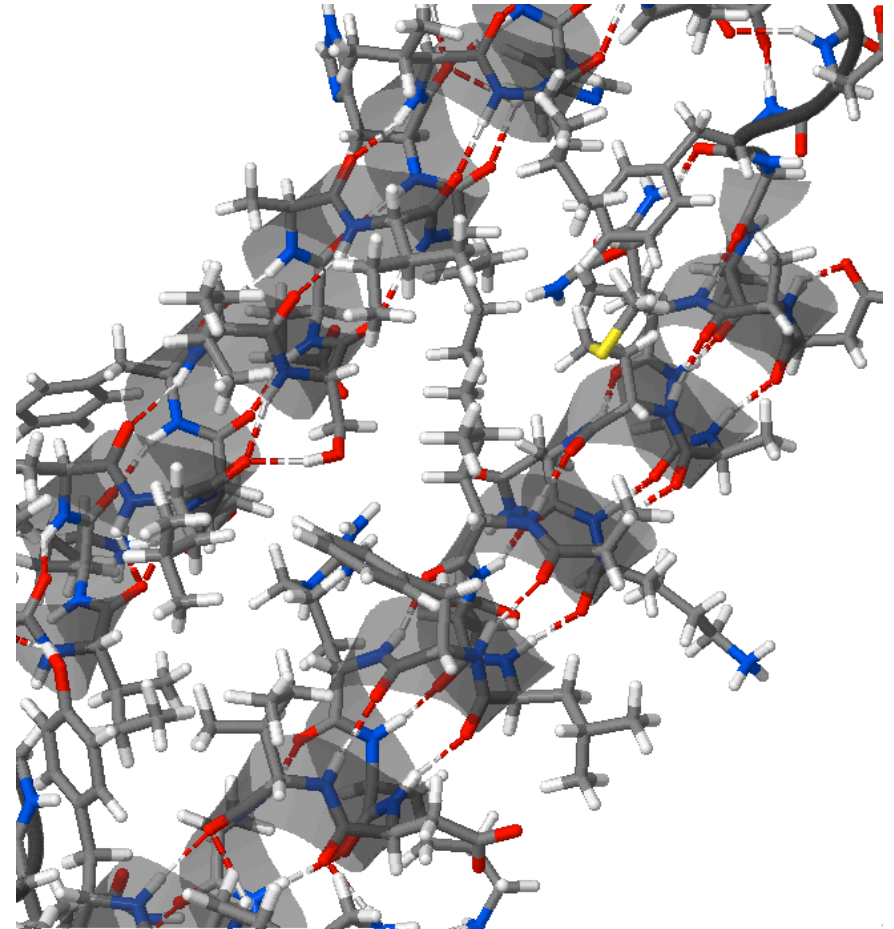
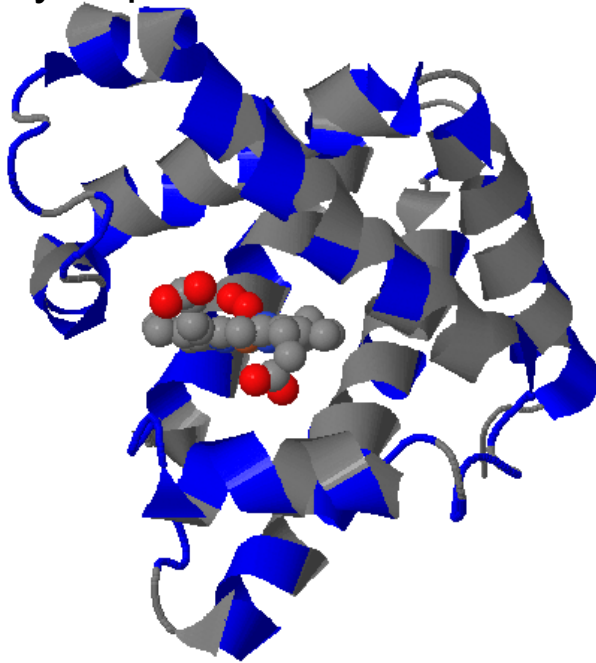
Hydrogen-bonding
in beta-sheet

Hydrogen-bonding
in alpha helix



3-D World contd.

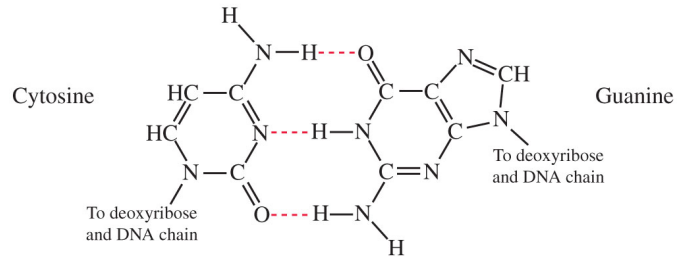
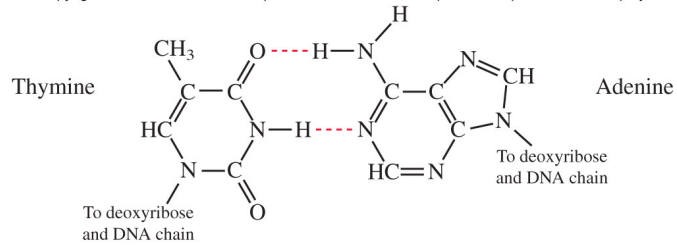
Hydrophobic in grey
Hydrophilic in blue



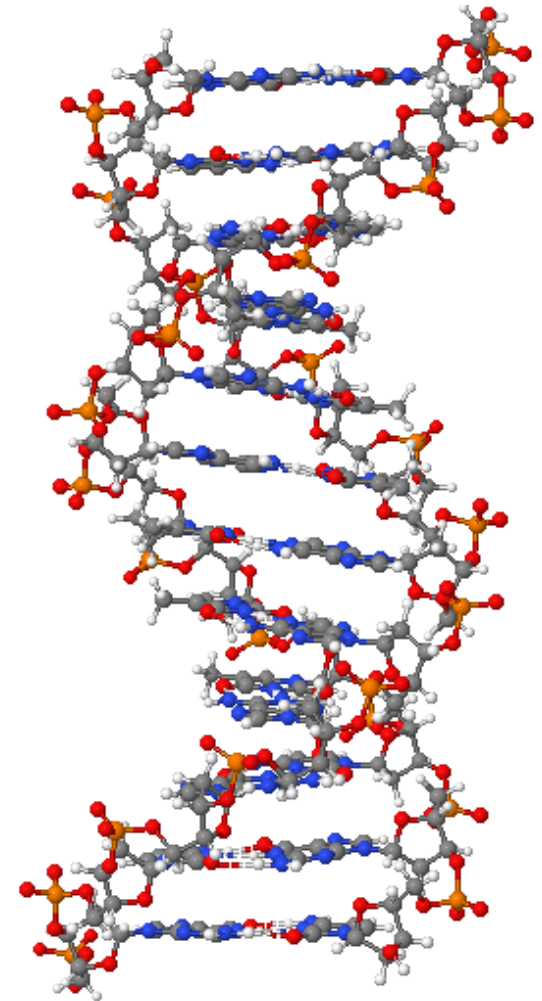
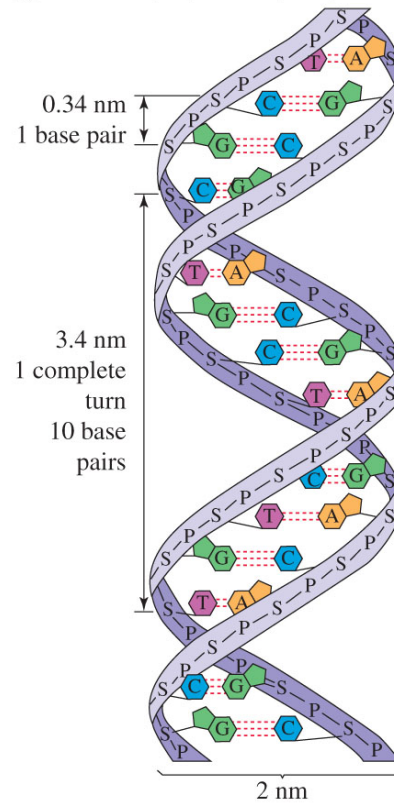
Hydrophobic side chains are on the inside
Hydrophobic interactions contribute to folding
Non-polar \leftrightarrow non-polar
polar \leftrightarrow polar

3-D World contd.

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Primary?
Secondary?
Tertiary?
Quaternary?

Protein Structure

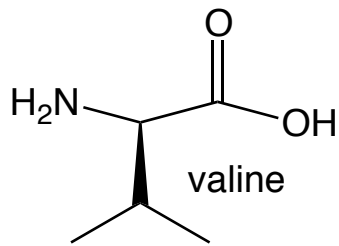
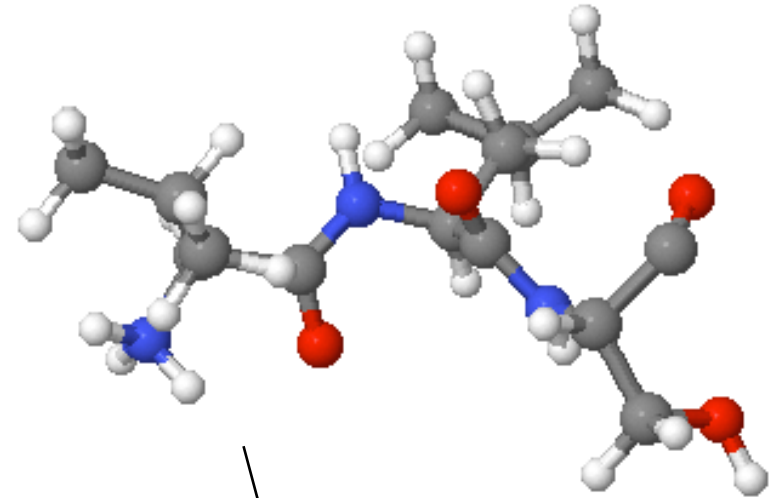
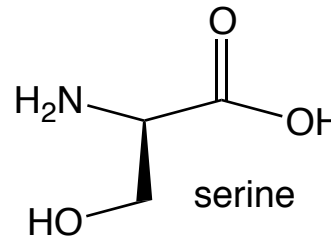
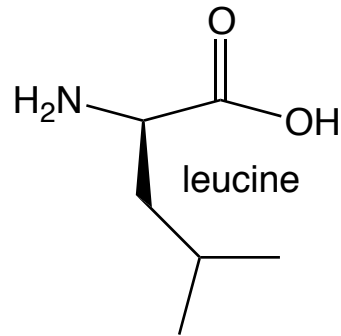
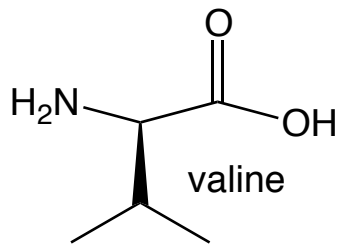
Myoglobin amino acid sequence: primary structure

VAL LEU SER GLU GLY GLU TRP GLN LEU
VAL LEU HIS VAL TRP ALA LYS VAL GLU
ALA ASP VAL ALA GLY HIS GLY GLN ASP
ILE LEU ILE ARG LEU PHE LYS SER HIS
PRO GLU THR LEU GLU LYS PHE ASP
ARG PHE LYS HIS LEU LYS THR GLU ALA
GLU MET LYS ALA SER GLU ASP LEU LYS
LYS HIS GLY VAL THR VAL LEU THR ALA
LEU GLY ALA ILE LEU LYS LYS LYS GLY
HIS HIS GLU ALA GLU LEU LYS PRO LEU
ALA GLN SER HIS ALA THR LYS HIS LYS
ILE PRO ILE LYS TYR LEU GLU PHE ILE
SER GLU ALA ILE ILE HIS VAL LEU HIS
SER ARG HIS PRO GLY ASP PHE GLY
ALA ASP ALA GLN GLY ALA MET ASN LYS
ALA LEU GLU LEU PHE ARG LYS ASP ILE
ALA ALA LYS TYR LYS GLU LEU GLY TYR
GLN GLY

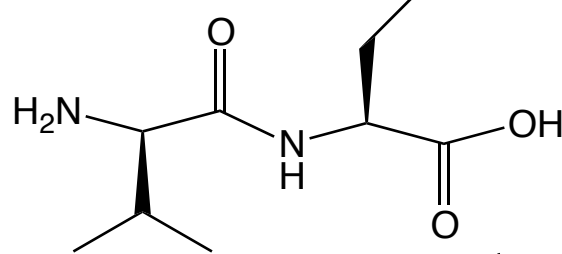
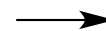
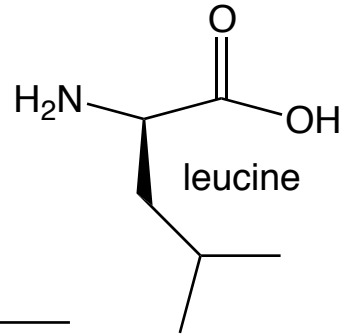
Looking at start: VAL LEU SER

Protein Structure

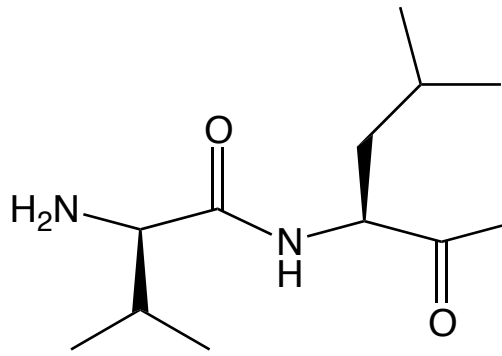
Looking at start: VAL LEU SER



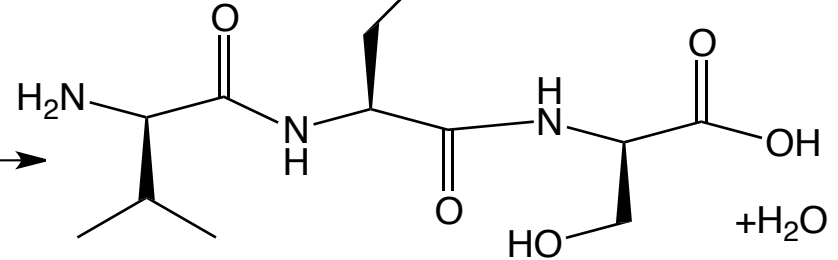
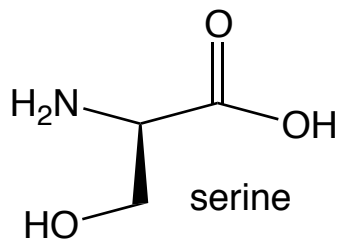
+



+H₂O



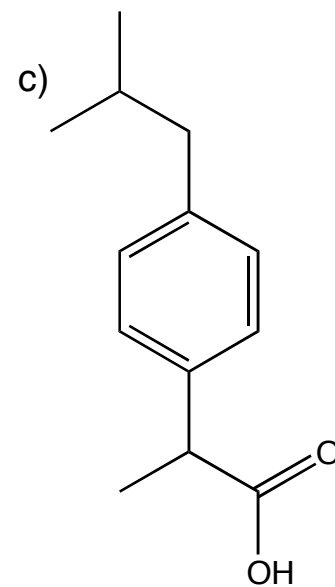
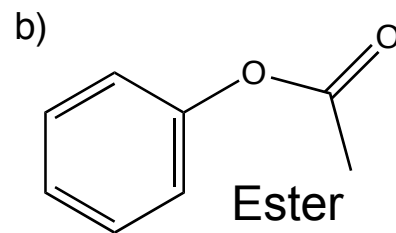
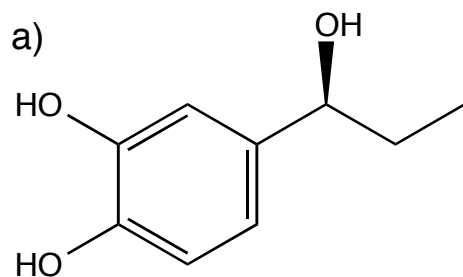
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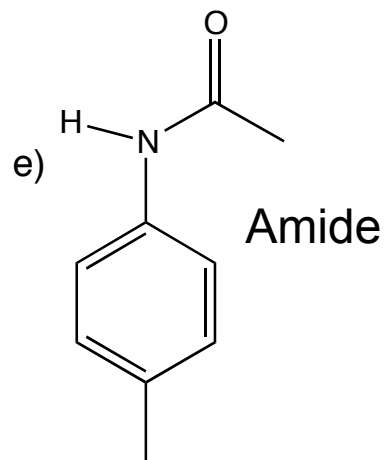
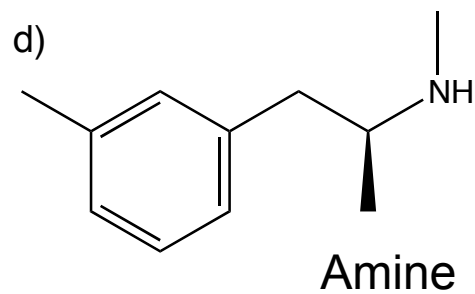
+H₂O

Functional groups

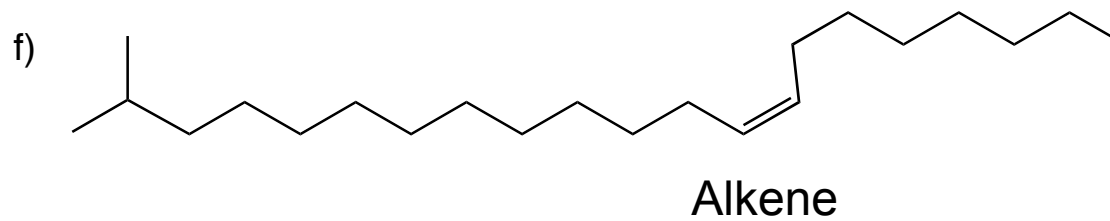
Alcohol



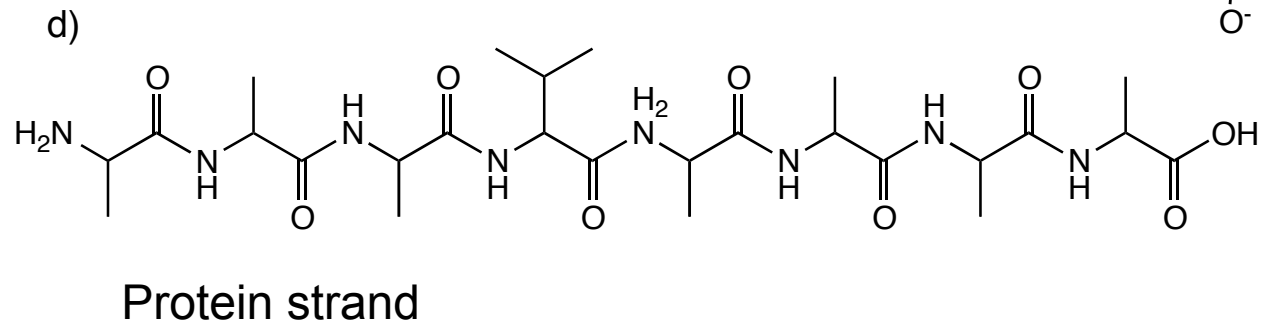
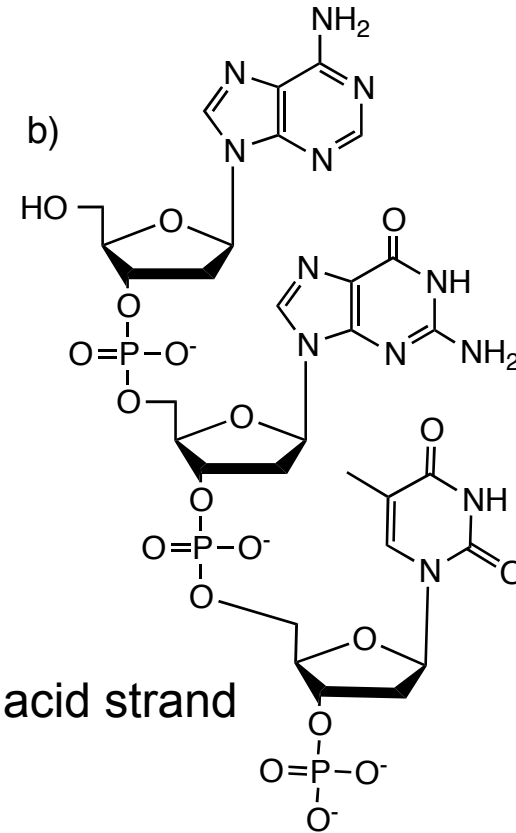
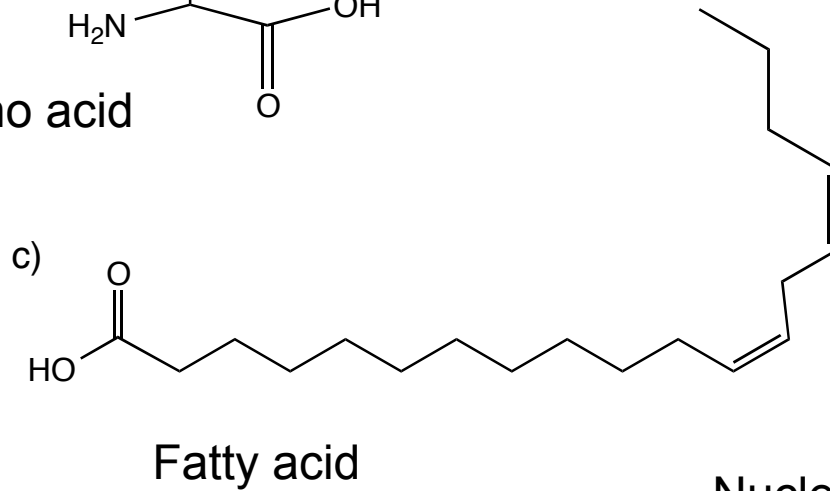
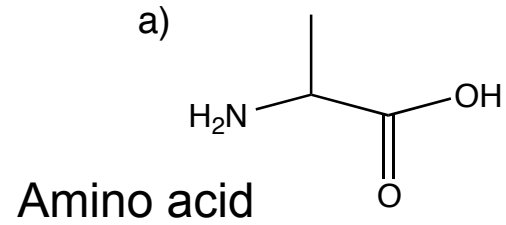
Aromatic



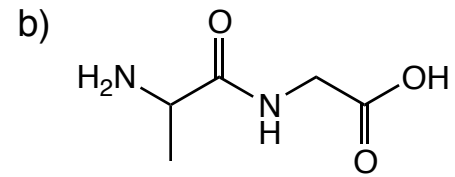
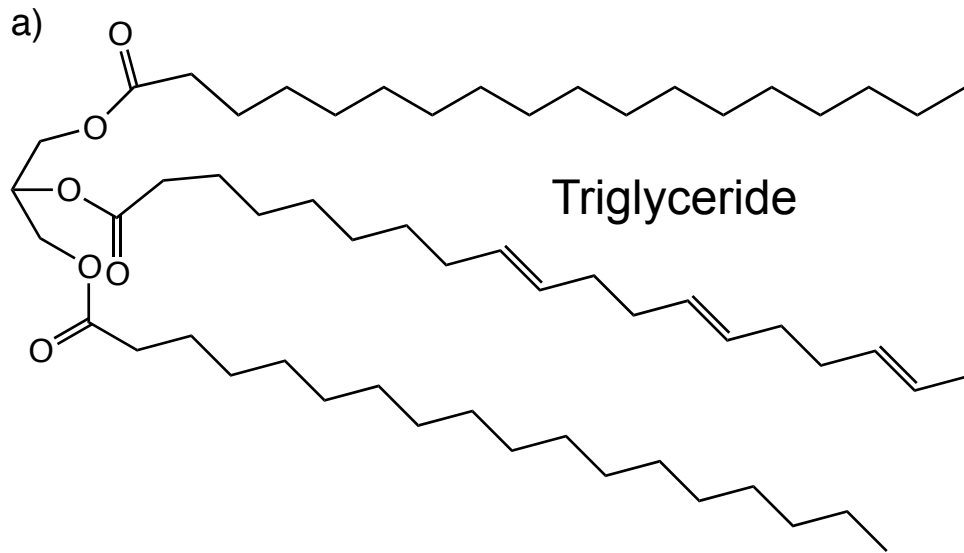
Carboxylic acid



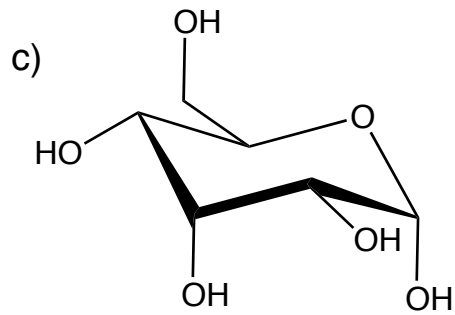
Bio molecules



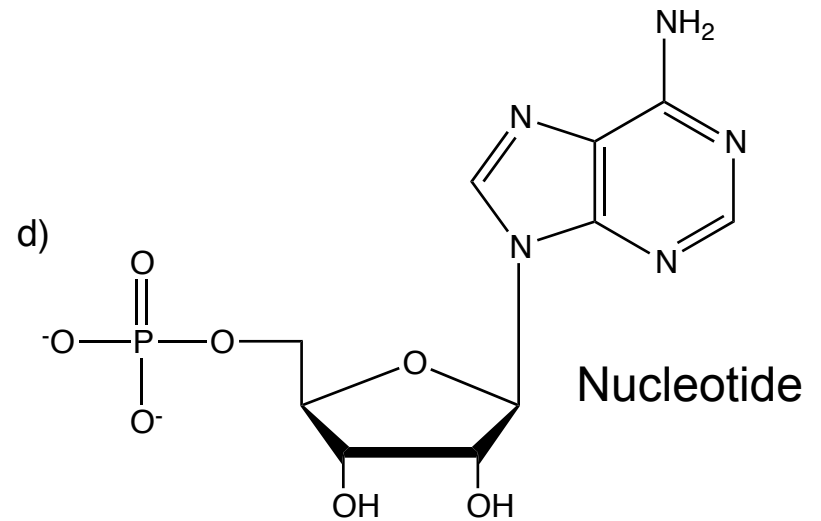
Bio molecules contd.



Dipeptide

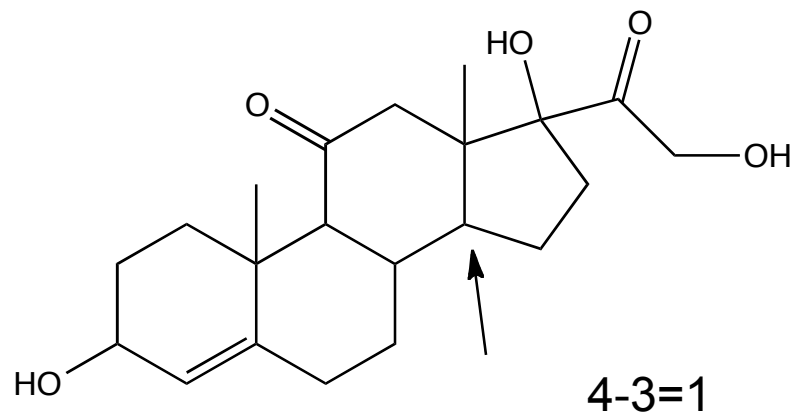


Sugar

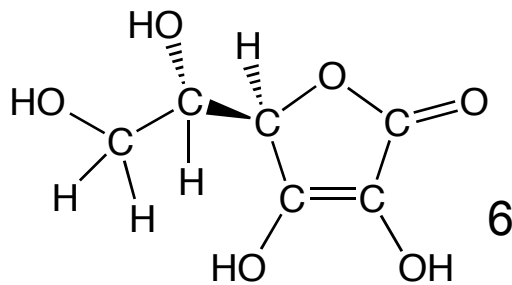


Other Q's

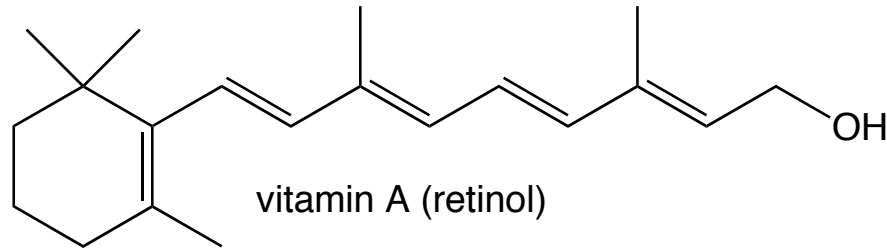
H's



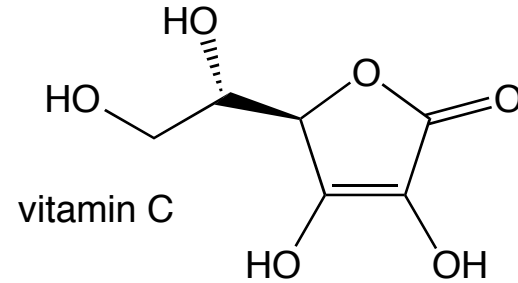
O's



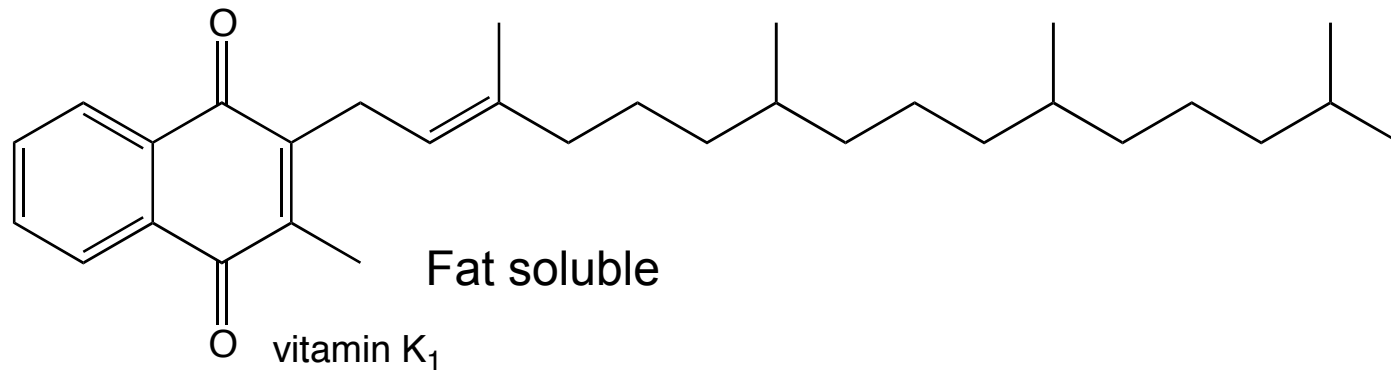
Fat Soluble? Water Soluble?



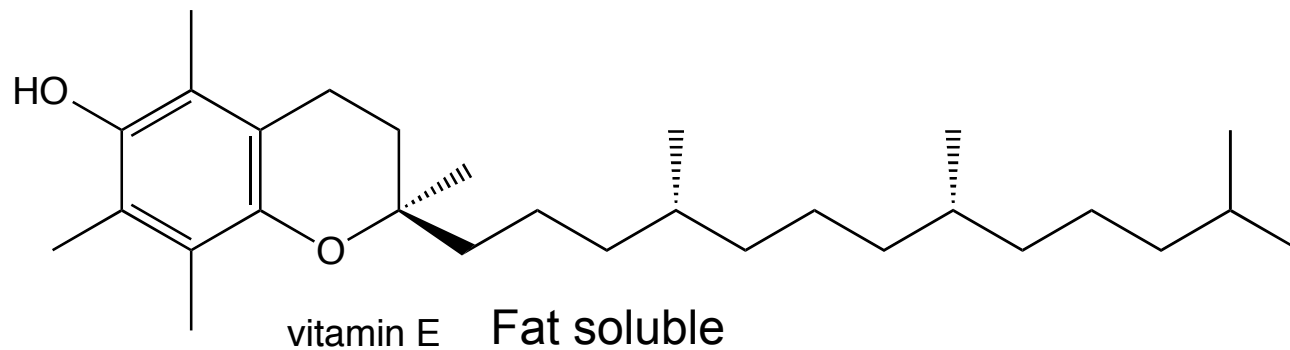
Fat soluble



Water soluble



Fat soluble



Fat soluble

Polymers

Natural fibers are made from what?

Proteins (wool (alpha-helix), silk (beta-sheet))

Cellulose (cotton, flax, hemp, jute (rayon))

Synthetic polymers are made from what?

Polyesters (PET) (alcohol+carboxylic acid)

Polyamides (Nylon) (amine+carboxylic acid)

Polyolefins (polyethylene, polypropylene, polystyrene, (C=C)
polyvinylchloride (PVC), polyisoprene (rubber/latex))

Summary

We' ve learned what

alcohols (hydroxyl)
carboxylic acids
esters
aromatic rings (phenyl)
amines
amides
are & look like (Table 9.2 p. 383)

We' ve learned about

starch/amylose
cellulose
fats/fatty acids/triglycerides
Hydrogen bonding
primary/secondary/tertiary/quaternary structure of proteins
alpha helices and beta sheets
enzymes & receptor sites & oxygen carriers
mRNA, tRNA, replication, transcription, protein synthesis

We've seen

the condensation reaction
where hydrogen bonding shapes structure (proteins, starch/amylose, DNA)

We' ve learned what

sugars
fats
proteins
DNA
are & look like

We' ve learned that

carbon makes 4 bonds
nitrogen makes 3 bonds
oxygen makes 2 bonds
like dissolves like