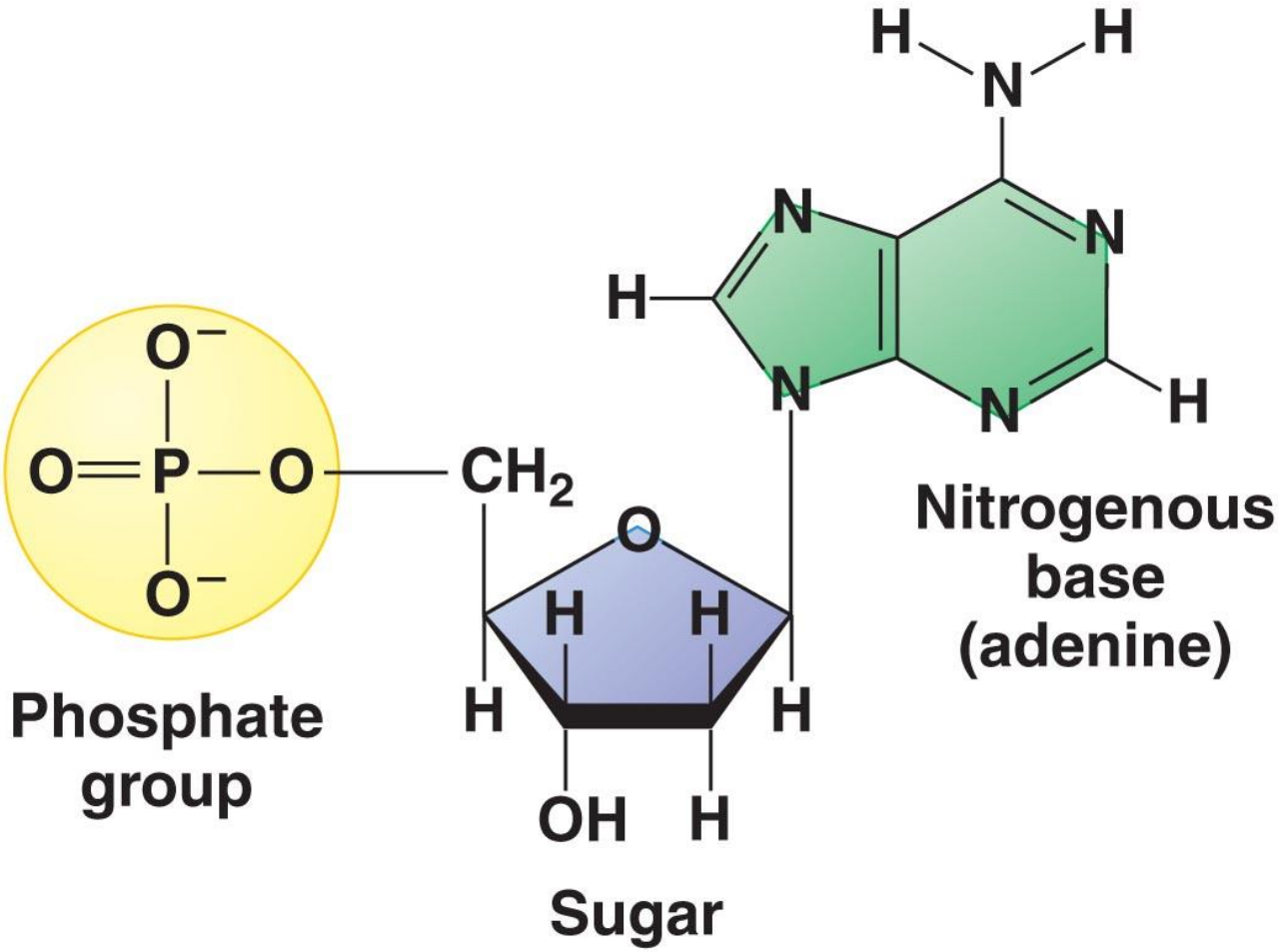
Biomolecule Practice

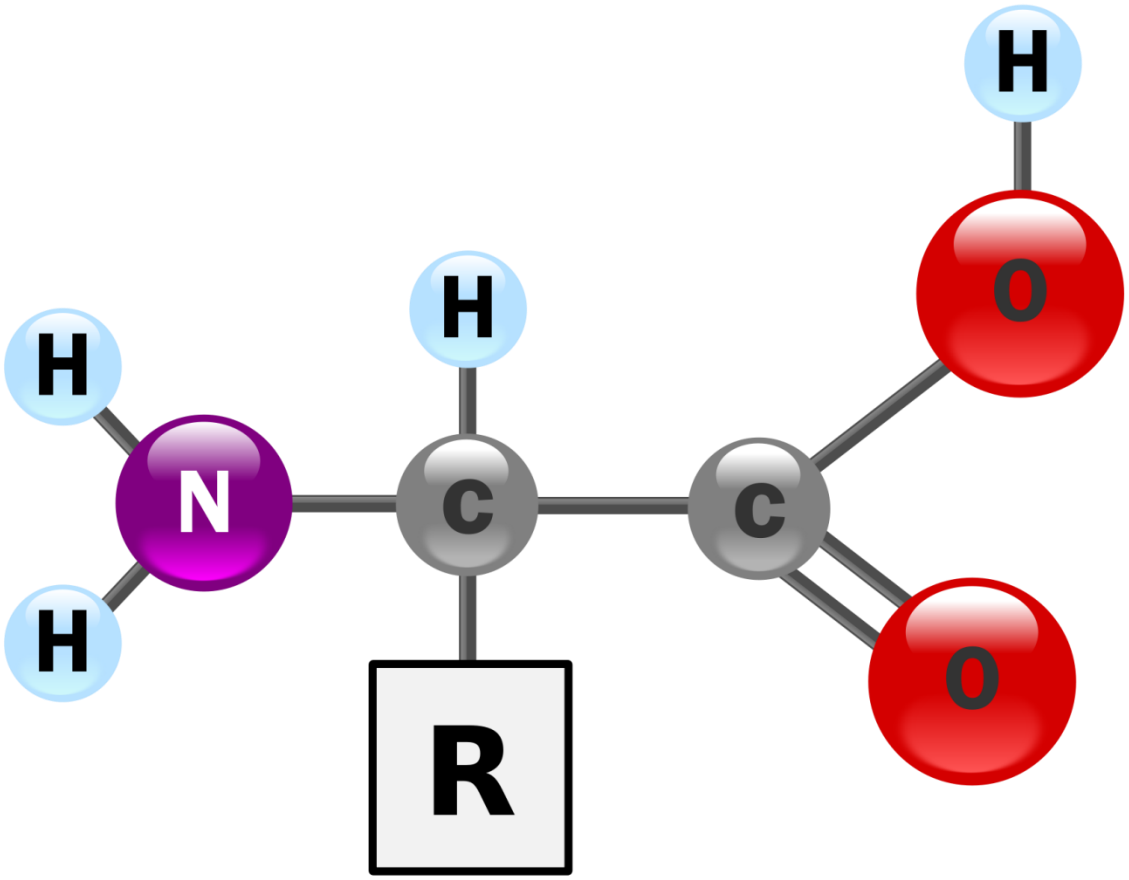
- Write the names of the biomolecules on your white board
- Share your answer with the class when the instructor calls for your responses by show ing your white board.
- Keep track of your score in the bottom left or right hand corner


H
N
H
N
N
H
N
N
H
O⁻
O
P
O
O⁻
CH2
O
H
H
H
H
OH
H
Phosphate group
Sugar
Nitrogenous base (adenine)

Nucleic Acid

- Nucleotide

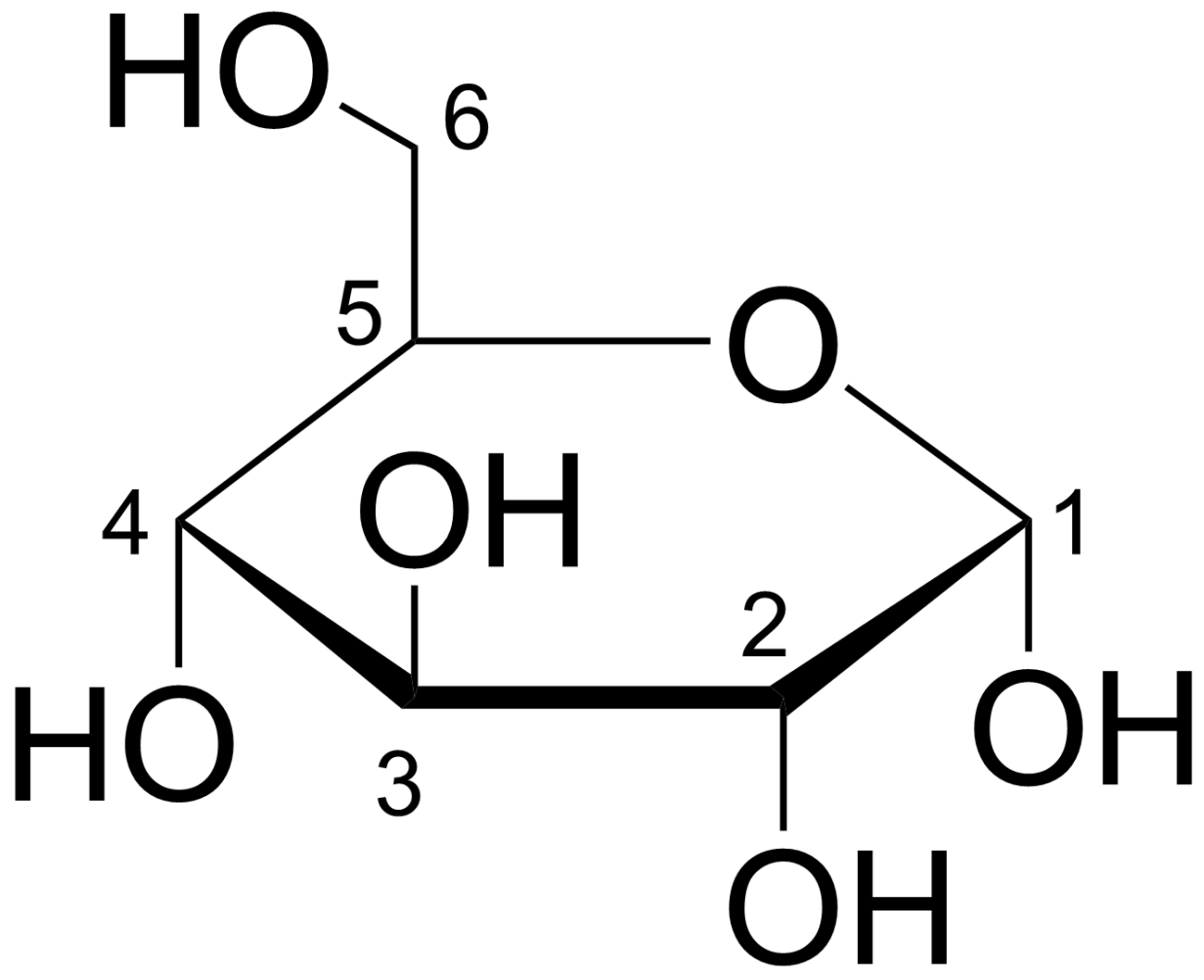
- Clue: Phosphate group and Nitrogen base


H
H
N
H
C
C
O
O
H
R

Protein (Peptide)

- Amino Acid (General Form)

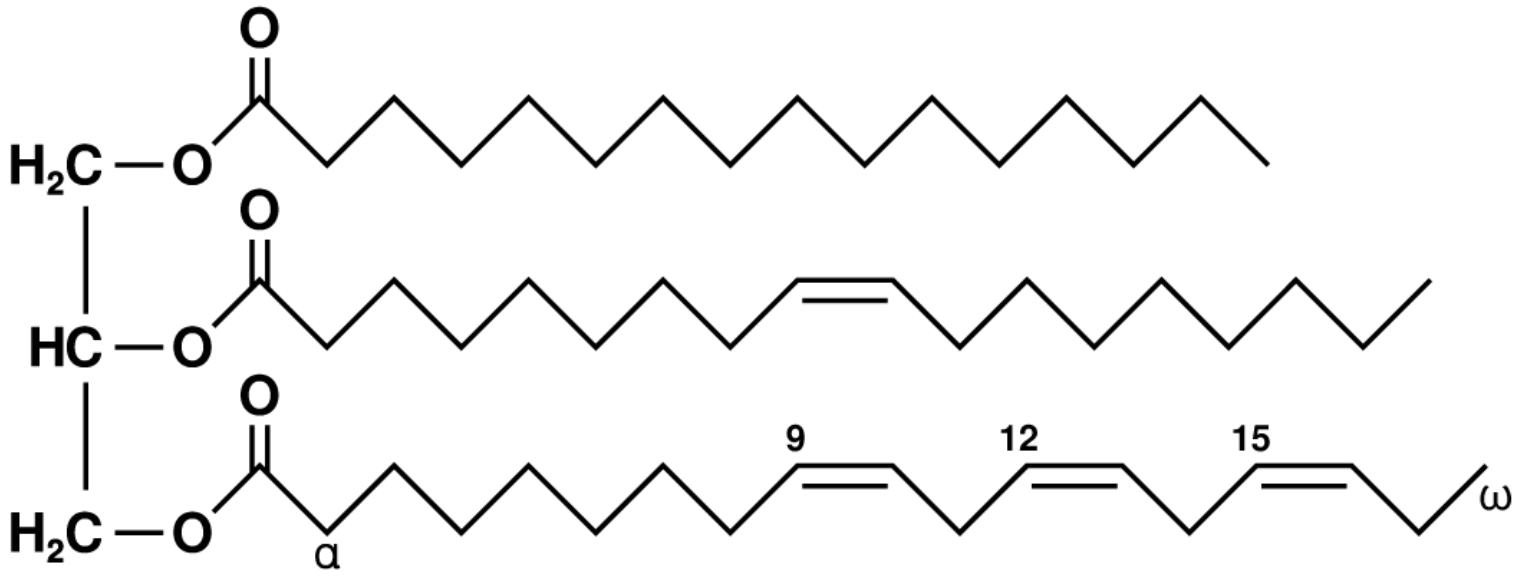
- Clue: R group, $-NH_2$ (amino group)


HO
6
5
O
4
OH
1
2
HO
3
OH
OH

Carbohydrate

- Glucose (Ring)

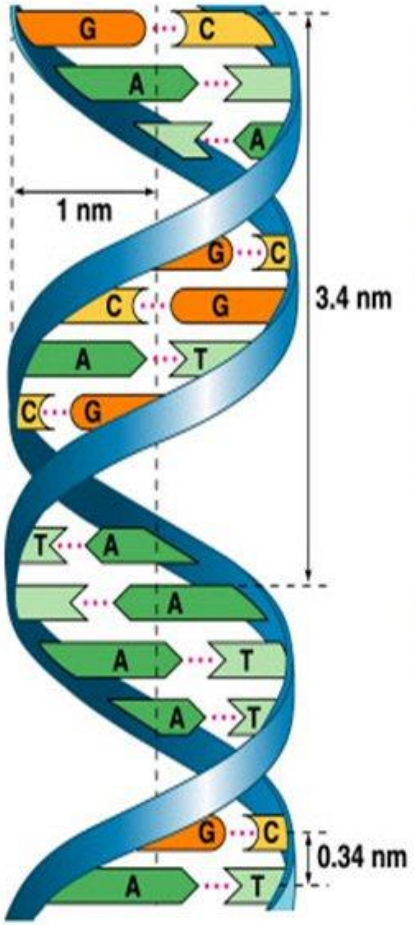
- Clue 1:2:1 Carbon:Hydrogen:Oxygen


O
H2C
O
O
HC
O
O
H2C
O
9
12
15
ω
α

Lipid

- Triglyceride

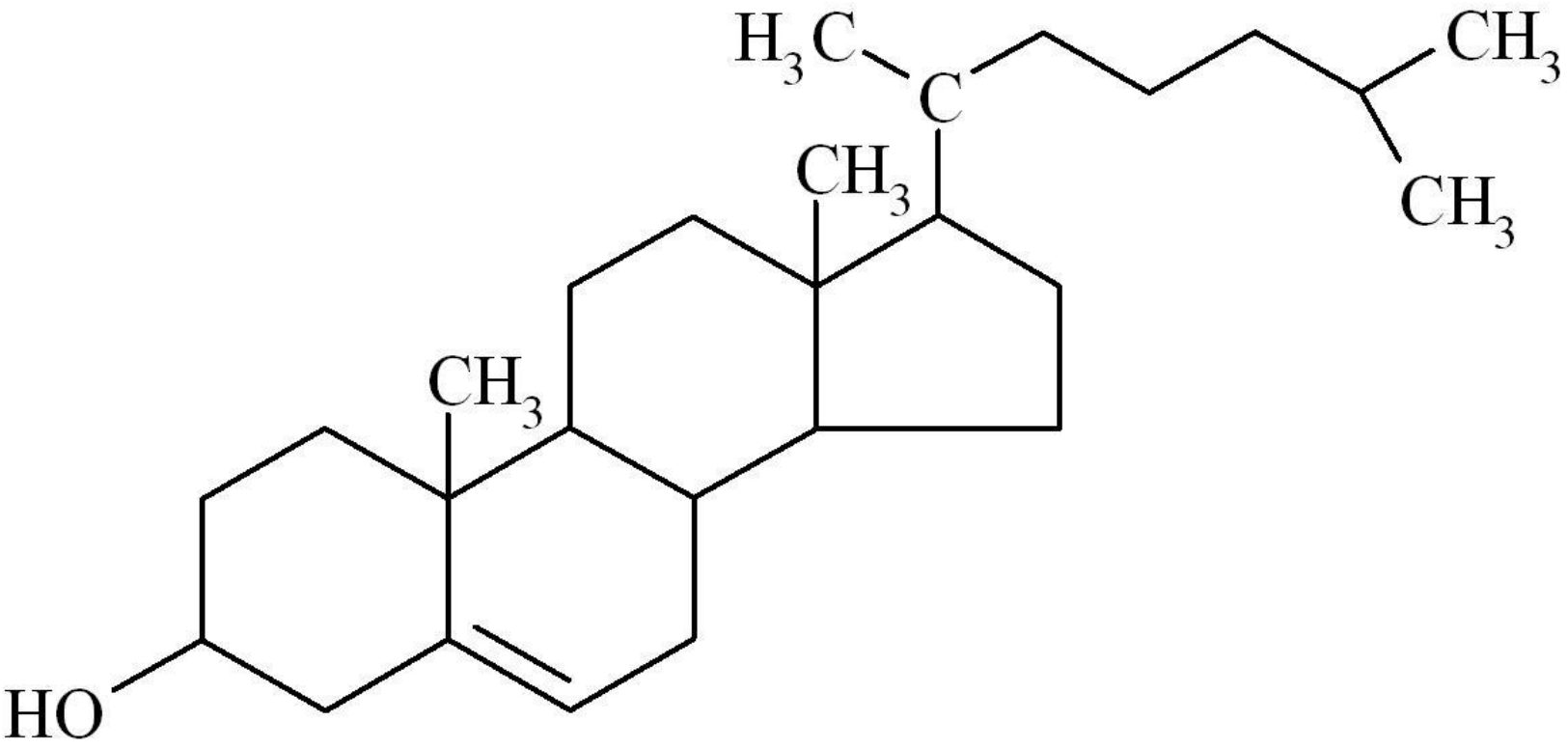
- Clue: Long hydrocarbon chains, Very few oxygens


G
C
A
A
1 nm
G
C
C
G
A
T
C
G
3.4 nm
T
A
A
A
T
A
T
G
C
0.34 nm
A
T

Nucleic Acid

- DNA

- Clue: Double helix structure, A/C/G/T bases inside


H3C
C
CH3
CH3
CH3
CH3
HO

Lipid

- Steroid (Cholesterol)

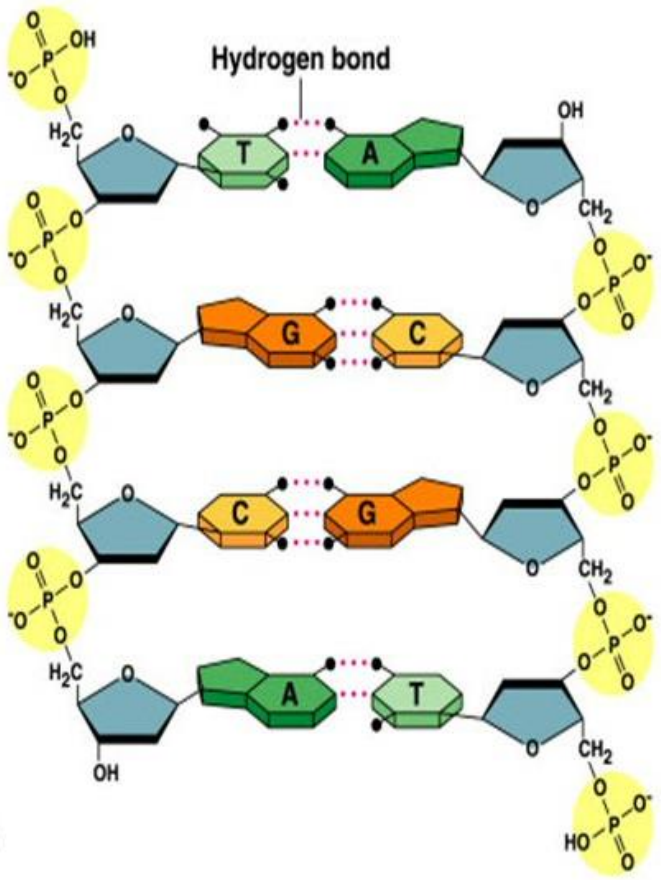
- Clue: 4 fused carbon rings, tons of carbon and very few oxygens


Gly
Thr
Gly
Glu
Ser
Lys
Cys
Pro
Leu
Met
Val
Lys
Val
Leu
Asp
Ala
Val
Arg
Gly
Ser
Pro
Ala
Ile
Asn
Val
Ala
Val
His
Val
Phe
Arg

Protein (PolyPeptide)

- Peptide Chain (Bead Model)

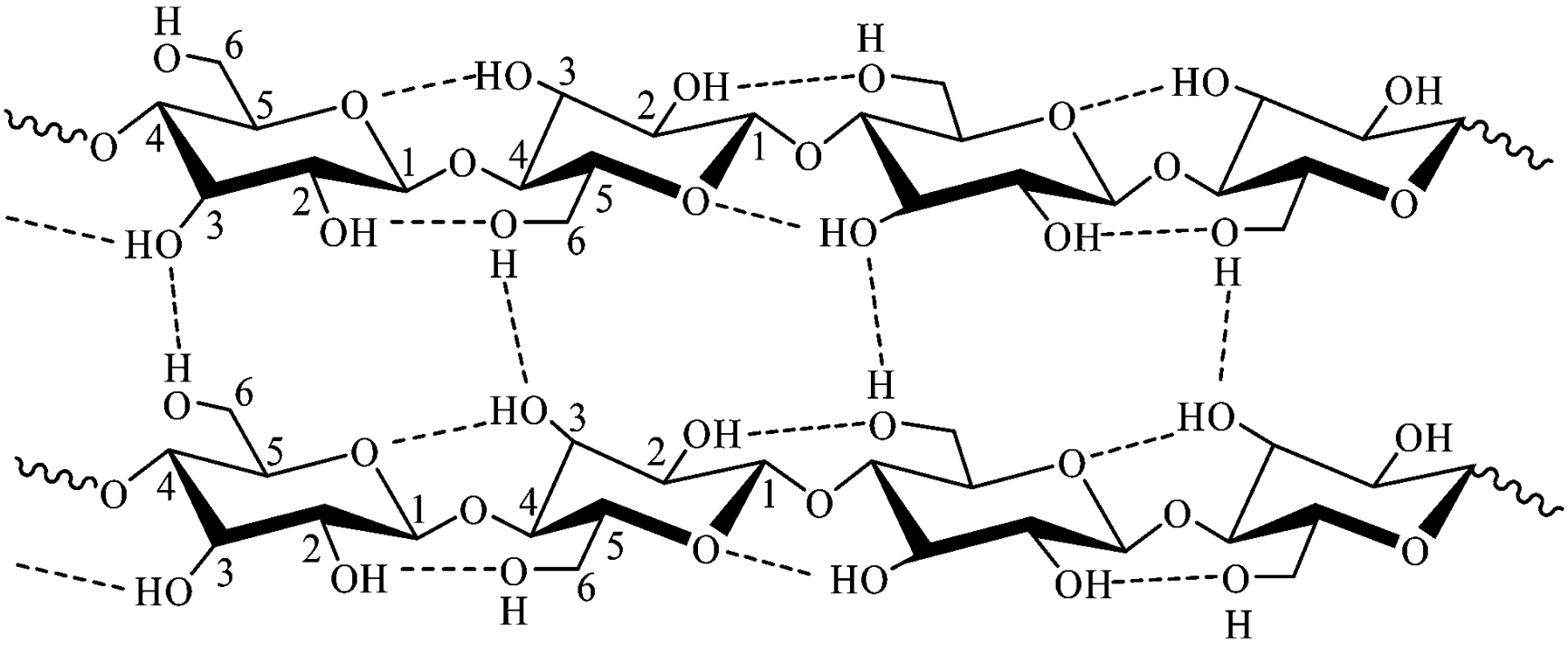
- Clue: Beaded chain, Amino Acid name abbreviations


Hydrogen bond
T
A
G
C
C
G
A
T
OH
HO

Nucleic Acid

- DNA (Atomic level structure)

- Clue: Built with Nucleotides
- Phosphate, sugar, base
- 2 complementary strands, A/C/G/T

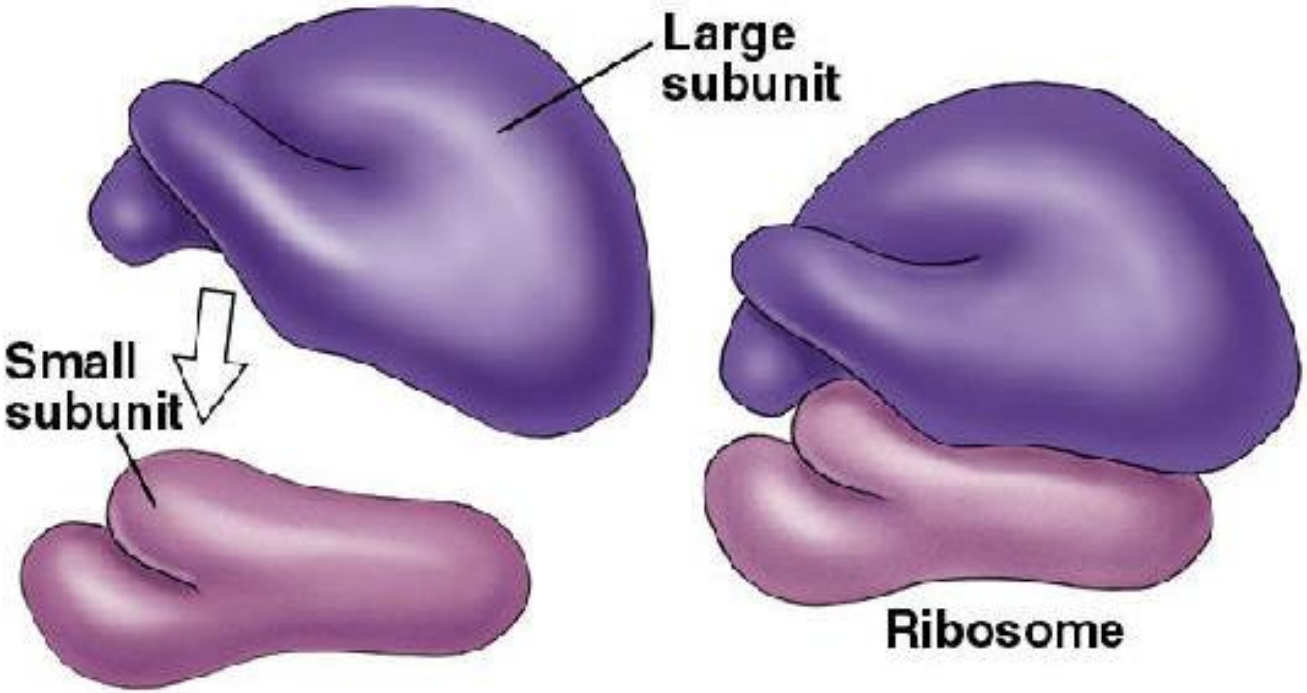

H
O
6
5
O
HO
3
2
OH
H
O
HO
OH
4
1
O
4
1
O
O
O
O
3
2
OH
O
6
5
O
HO
OH
O
H
H
H
H
H
O
6
5
O
HO
3
2
OH
H
O
HO
OH
4
1
O
4
1
O
O
O
O
3
2
OH
O
6
5
O
HO
OH
O
H

Carbohydrate

- Cellulose

- Clue: Glucose “boats”, LOTS of Carbon and oxygens
- 1:2:1 Carbon:Hydrogen:Oxygen

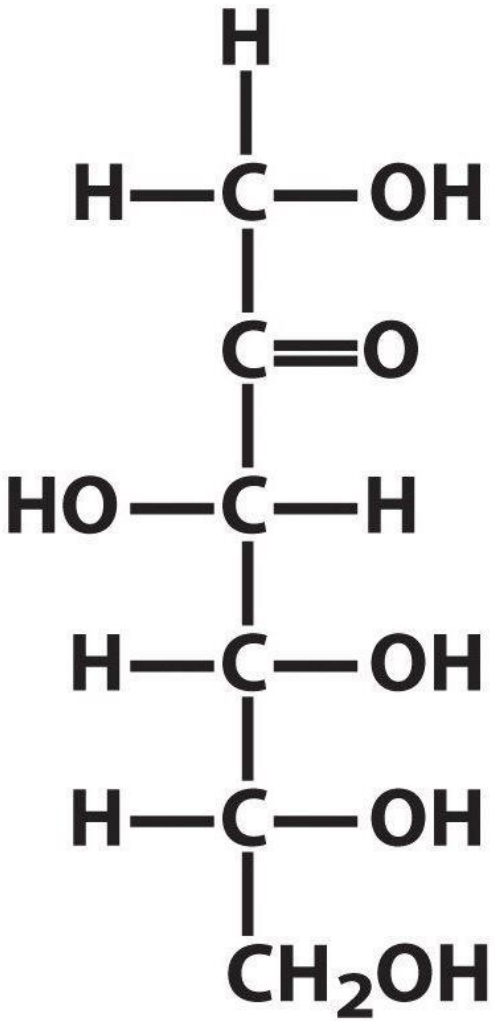
Ribosome



Nucleotide

- Ribosomal RNA (rRNA)

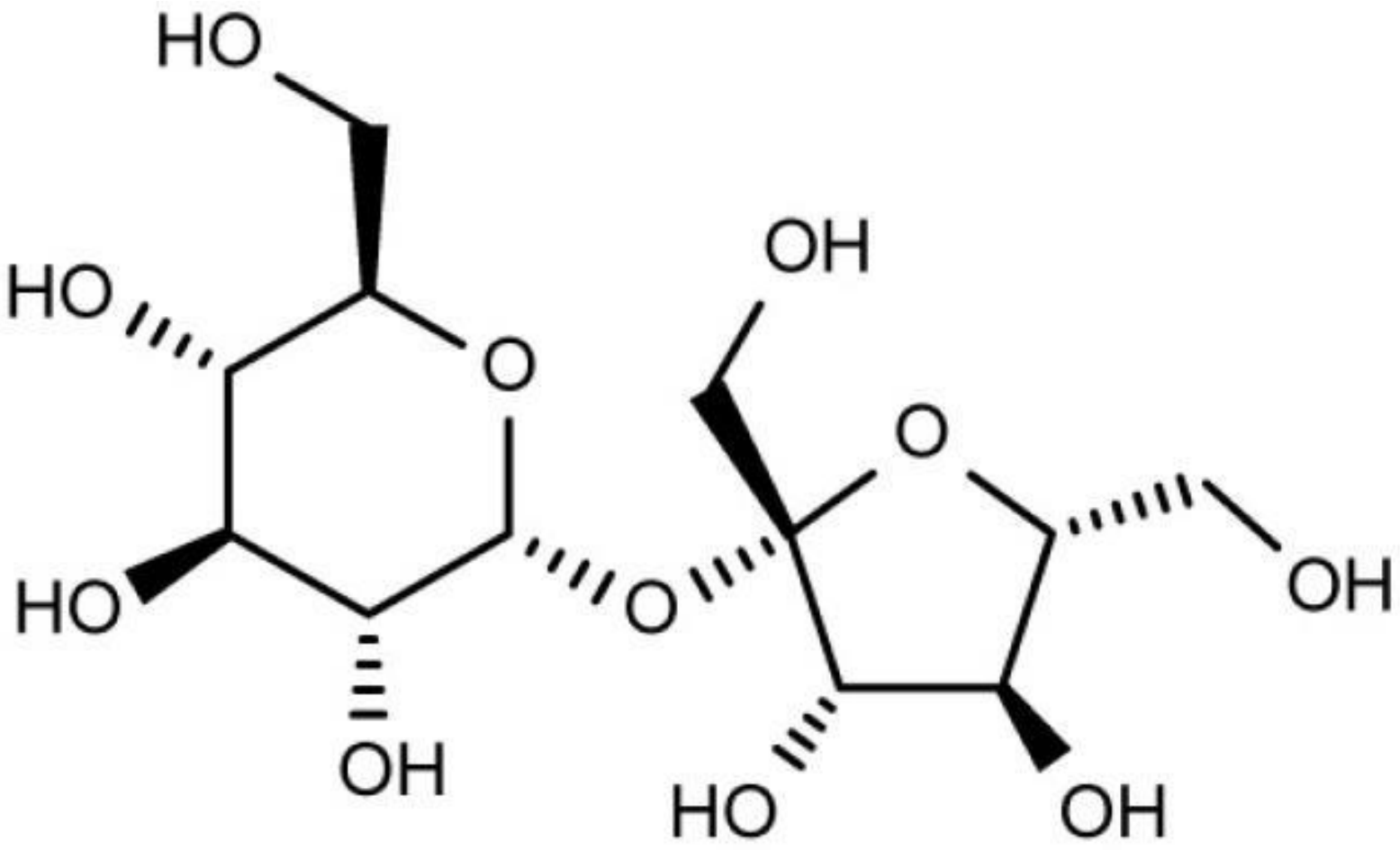
- Clue: Sorry, just have to know this one (no details given to show Nucleic Acid hints)


H
H—C—OH
C=O
HO—C—H
H—C—OH
H—C—OH
CH2OH

Carbohydrate

- Fructose (Linear)

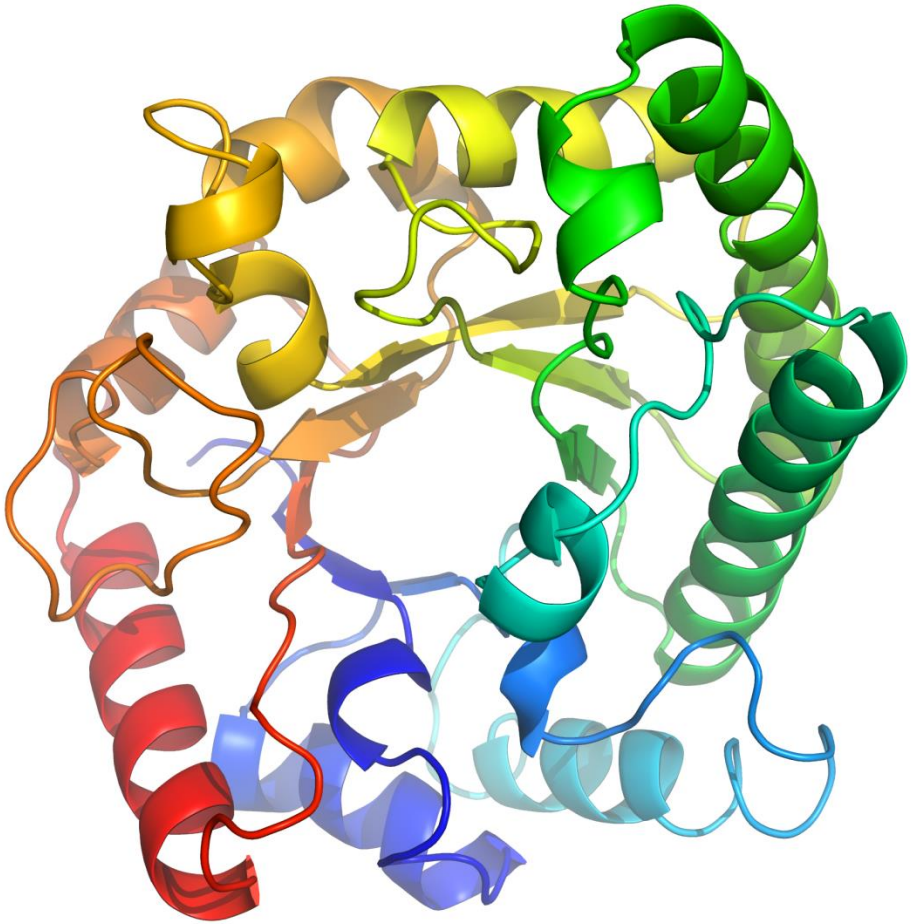
- Clue: 1:2:1 Carbon:Hydrogen:Oxygen


HO
HO
HO
OH
O
O
OH
O
OH
HO
OH

Carbohydrate

- Sucrose

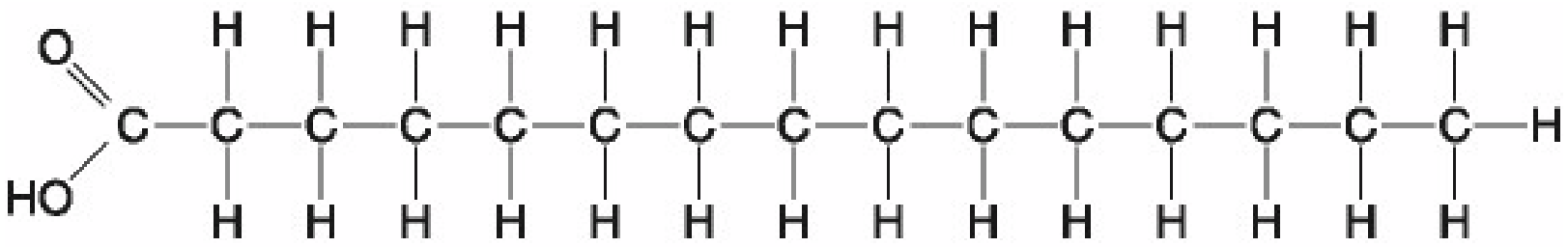
- Clue: Lots of Carbons and Oxygens
- 1:2:1 Carbon:Hydrogen:Oxygen



Protein (Peptide)

- (Ribbon Model)

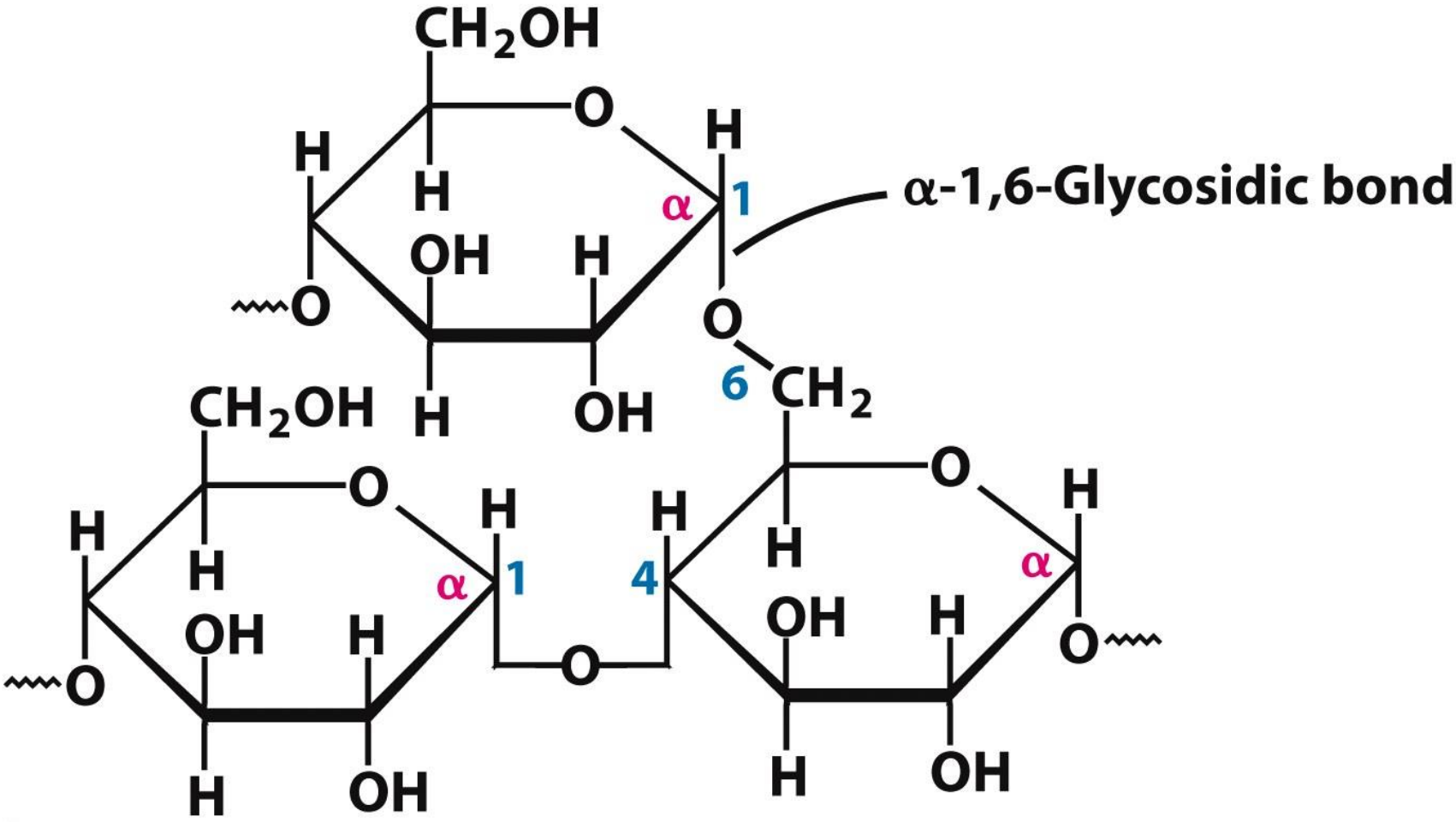
- Clue: Just have to know that the ribbon model refers to proteins like hemoglobin


O
C
C
C
C
C
C
C
C
C
C
C
C
C
C
C
H
HO
H

Lipid

- Saturated Fatty acid chain

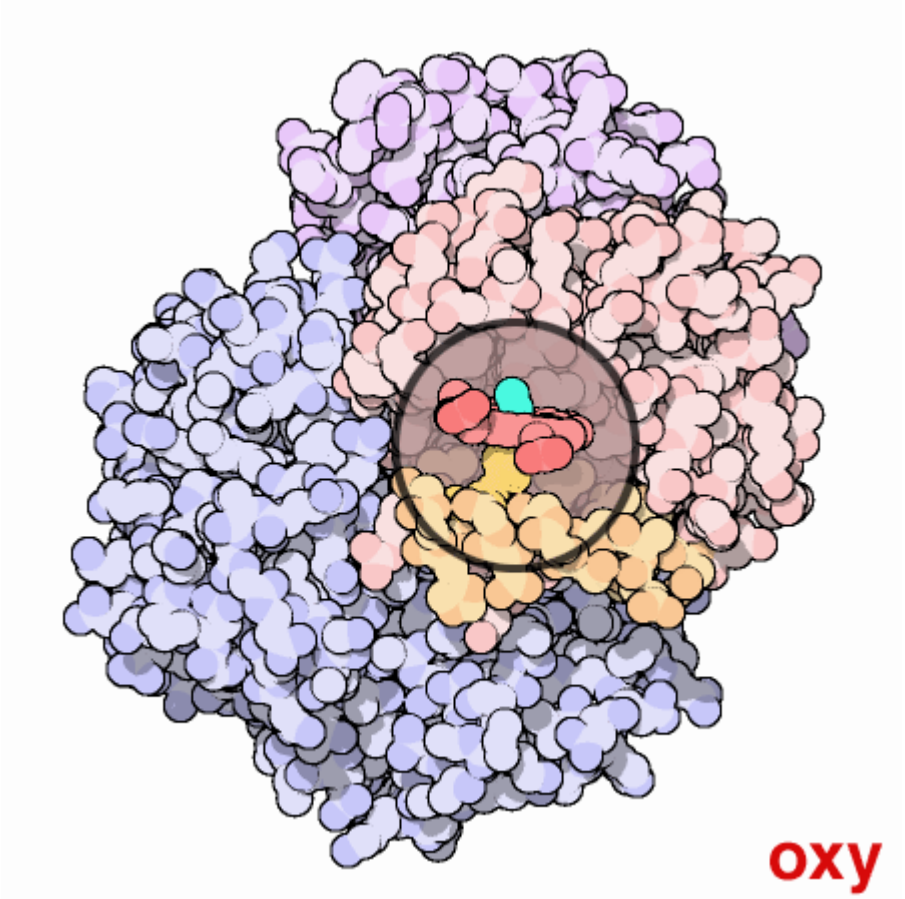
- Clue: Long hydrocarbon chain, no double bonds so it’s saturated


CH2OH
O
H
H
α
1
α-1,6-Glycosidic bond
OH
H
O
O
6
CH2
H
OH
CH2OH
O
H
H
H
α
1
4
α
H
O
OH
H
O
O
H
OH
H
OH

Carbohydrate

- Glycogen

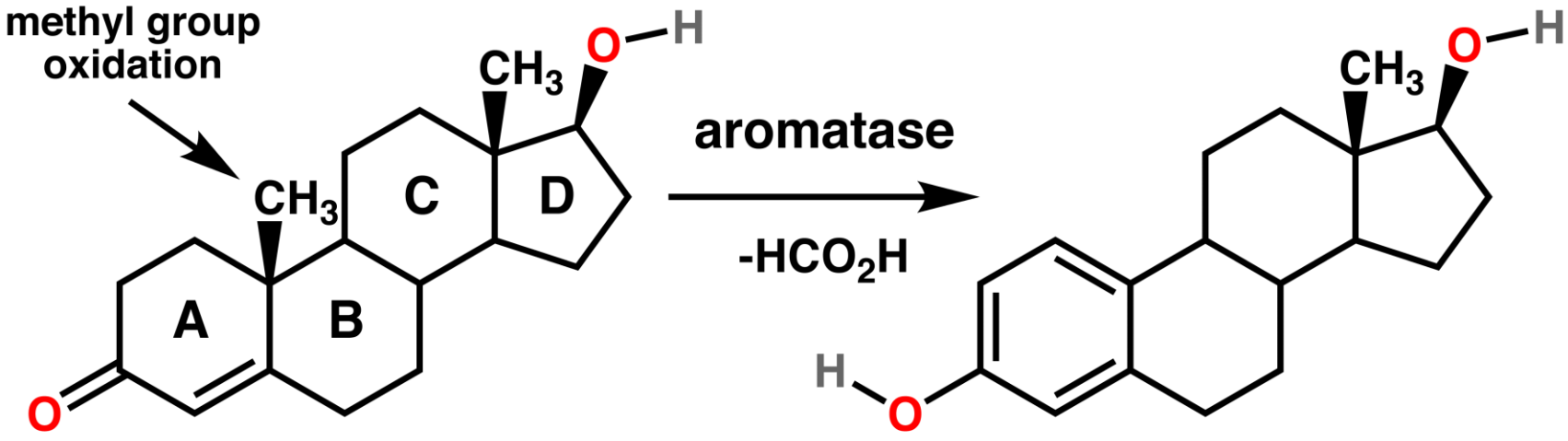
- Clue: Lots of Carbons and Oxygens
- 1:2:1 Carbon:Hydrogen:Oxygen


oxy

Protein (Peptide)

- Hemoglobin (Quaternary Model)

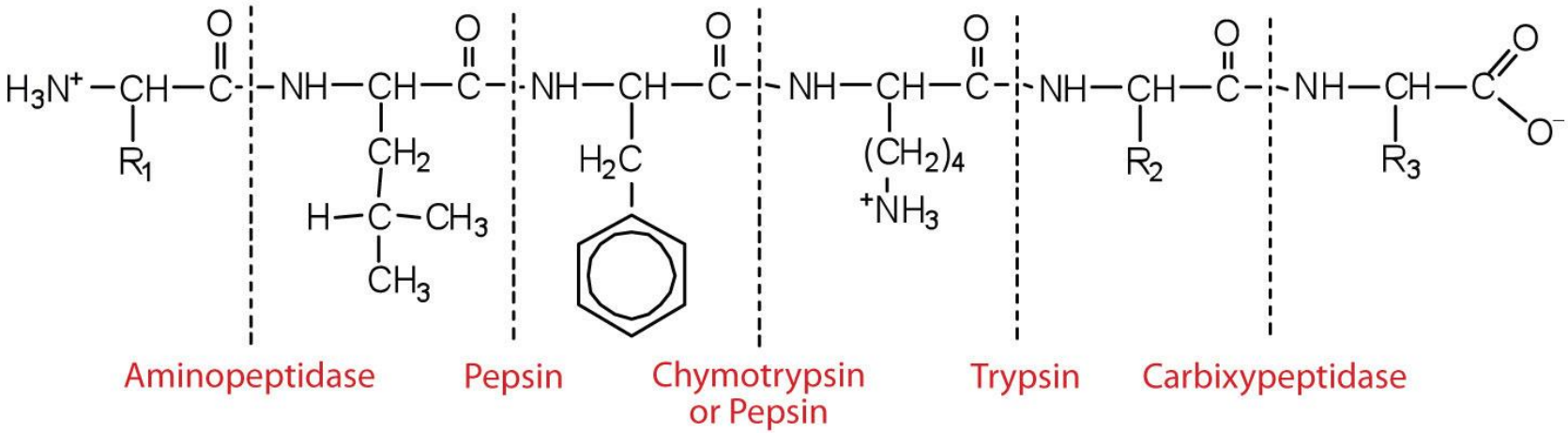
- Clue: Multiple polypeptide domains (different colored groups of protein beads.)


methyl group
oxidation
CH3
O
H
CH3
C
D
A
B
O
aromatase
-HCO2H
CH3
O
H
H
O

Lipid

- Estrogen converted to Testosterone

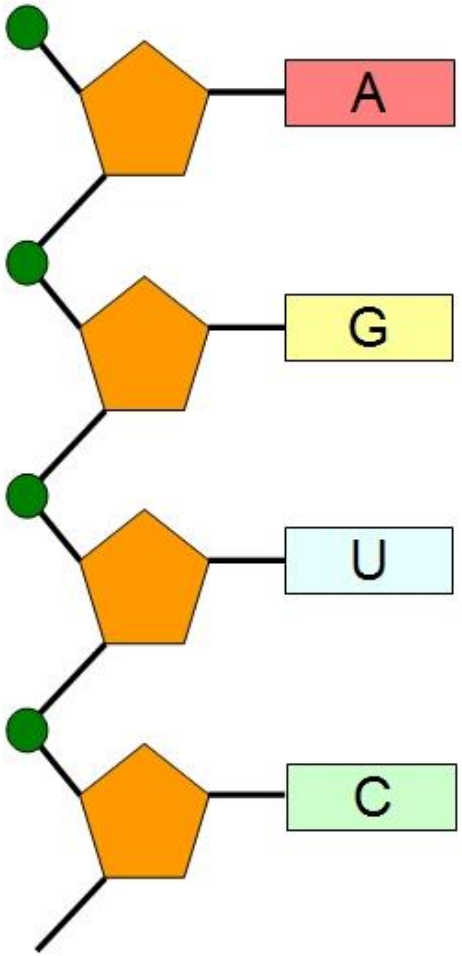
- Clue: 4 fused carbon rings, Lots of Carbon (there is a Carbon at every line intersect)
- very few oxygens


Aminopeptidase
Pepsin
Chymotrypsin or Pepsin
Trypsin
Carbixypeptidase

Protein (Peptide)

- Amino Acid chain

- Clue: R group markers (R is the variable group)
- Amino group ($-NH_3^+$)
- Carboxylic acid group


A
G
U
C

Nucleotide

- RNA

- Clue: Sugar+Phosphate+Nitrogen base arrangement, Only see U base in RNA

CONGRATULATIONS!!!

YOU KNOW YOUR BIOMOLECULES!