T-GB General Biology Week 6 10/10 1) What is the pH if  $[H^{\oplus}] = 10^{-6}M^{-7} - (-6)$ 2) what is the pOH if  $[OH^{\circ}] = 10^{-2} M \frac{-(-2)}{2}$ 3) what is the [H&] if pH = 8? 10 M What is the  $[OH^{\circ}]$  if  $POH = 11? 10^{-11}$  PH + POH = 14 = 14 = 14 PH = 3Swhat is the PH if  $[OH^{\circ}] = 10^{-5}$  PH = 9 PH = 9  $[OH^{\circ}] = 10^{-5}$   $[H^{\circ}] = 10^{-9}$ 

Ç-H -H H H-0 Ç . sugar - corbohydrate monoshed Glucose mono saccharide Ho-C-H H 0-6 sugar H H H PH H'C Dehydration 4 synthesis polysacc take away wates saccharide, synthesis-build Build by removing water





## Ch. 3b: The Structure and Function of Macromolecules



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#### 4 different macromolecules



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Fats or Lipids

Components	Examples	Functions
Giverol 3 fatty acids	Triacylglycerols (fats or oils): glycerol + three fatty acids	Important energy source Solid buffer buffer
Head with P 2 fatty acids	Phospholipids, glycerol + phosphate group + two fatty acids cell membranes	Lipid bilayers of membranes Hydrophobic tails Hydrophilic heads
Steroid backbone	Steroids: four fused rings with attached chemical groups hormone - chemica Messenger S	<ul> <li>Component of cell membranes (cholesterol)</li> <li>Signaling molecules that travel through the body (hormones)</li> </ul>
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4 macromolecules - prolems, nucleofides, sugars, Fats.

## You Must Know

- The role of **dehydration synthesis** in the formation of organic compounds and **hydrolysis** in the digestion of organic compounds.
- How the sequence and subcomponents of the four groups of organic compounds determine their properties.
- The cellular functions of carbs, lipids, proteins, and nucleic acids.
- How changes in these organic molecules would affect their function.

## You Must Know

- The 4 structural levels of proteins and how changes at any levels can affect the activity of the protein.
- How proteins reach their final shape (conformation), the denaturing impact that heat and pH can have on protein structure, and how these changes may affect the organism.
- Directionality influences structure and function of polymers, such as nucleic acids (5' and 3' ends) and proteins (amino and carboxyl ends).

#### Monomers

Small organic
Used for building
blocks of polymers
Connects with
condensation reaction
(dehydration synthesis)

#### Polymers

•Long molecules of monomers

•With many identical or similar blocks linked by covalent bonds

### **Macro**molecules

Giant molecules

•2 or more polymers bonded together

multiple atoms fastened together through anovelap of electrons (bonds)



Dehydration Synthesis Condensation Reaction	Hydrolysis
Make polymers	Breakdown polymers
Monomers $\rightarrow$ Polymers	Polymers $\rightarrow$ Monomers
$A + B \rightarrow AB$	$AB \rightarrow A + B$
Combines + -> + H <sub>2</sub> O mino mono poly	$+ H_2 O \longrightarrow + H_2 O$



## **Dehydration Synthesis**









# **Proteomics:** Analysis of proteins and sequences



Data from Human: http://www.ncbi.nlm.nih.gov/protein/AAA21113.1; rhesus monkey: http://www.ncbi.nlm.nih.gov/protein/122634; gibbon: http://www.ncbi.nlm.nih.gov/protein/122616

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Species

Human

Monkey Gibbon

Human

Monkey

Gibbon

Human

Monkey

Gibbon