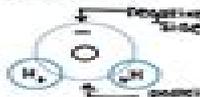


Structure of H<sub>2</sub>O  
hydrogen bonding  
Denser at 4°C



# unit one guide

Biological molecules  
proteins  
nucleic acids

H<sub>2</sub>O provides cushion, adhesion, surface tension, high specific heat, high heat of vaporization, excellent solvent, stable chemistry, low compressibility

THIS GONNE when ions → water expands due to hydrogen bonding, molecules want to stay together

hydrogen bonds require lots of energy to change state of matter

CONDENSATION → when two molecules → products hydrogen and hydroxyl ions, releases pH → more hydrogen

OH<sup>-</sup> → attracted to same  
OH<sup>-</sup> → attracted to other  
OH<sup>-</sup> → hydrogen bonds  
OH<sup>-</sup> → hydrogen bonding  
OH<sup>-</sup> → surface of the liquid  
OH<sup>-</sup> → surface of the liquid

<b>C</b>	<b>H</b>	<b>N</b>	<b>O</b>	<b>P</b>	<b>S</b>
Carbon	Hydrogen	Nitrogen	Oxygen	Phosphorus	Sulfur

more hydrogen  
C → build biological molecules, cell formation  
N → build proteins, nucleic acids  
P → build nucleic acids + lipids  
→ make up 98% of organisms

Carbohydrates ↓ C, H, O	Lipids ↓ C, H, O, P	Nucleic acids ↓ C, H, N, O, P	Proteins ↓ C, H, N, O, S
-------------------------------	---------------------------	-------------------------------------	--------------------------------

Condensation synthesis → the removal of an H<sub>2</sub>O molecule to bond monomers

## Nucleic acid structure:

• the carbon sugar (deoxyribose/ribose), phosphate, nitrogenous base (A, T, C, G), exact shape of strand



Starch, glycogen  
Glycogen → 1-4 glucose  
Cellulose → 1-4 glucose  
Chitin → 1-4 glucose

## Proteins:

Specific order of amino acids → primary structure

→ 1 group interactions determine structure + function



## PROTEINS

• amino acids bond via a peptide bond (covalent) through dehydration synthesis  
• 1 group change can cause a hydrophobic protein to lose the place of a hydrophilic protein

## membranes

• made up of phospholipids  
• create selectively permeable barrier  
• contain phospholipids, cholesterol, and proteins



## LIPIDS

Phospholipid macromolecules

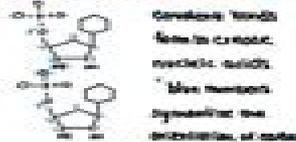
• differences in saturation determine structure and function  
• Cells, sterols, phospholipids  
• Saturated → no double bonds  
• Unsaturated → has double bonds  
• Lipids → hydrophobic, composed, most of the membrane



## Amino Acids:

• linear chains, connected by covalent bonds  
• amino end and carboxyl end

## DEHYDRATION SYNTHESIS



## Chaperones:

• protein molecules that assist protein folding

## NUCLEIC ACIDS

• add new nucleotides to the 3' end  
• base nitrogenous bases: purine + pyrimidine  
• pyrimidine is single ringed, purine is double  
• antiparallel double helix  
• 5' on phosphate end, 3' on hydroxyl end  
• both back and forth have nitrogenous bases (purines) + sugar-phosphate backbone

## ANTIPARALLEL



## ALDOSE VS KETOSE

• contains aldehyde functional group



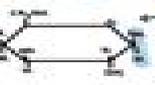
## ALPHA VS BETA

• contains ketone functional group



## ALPHA VS BETA

• all monomers are in the same orientation



## ALPHA VS BETA

• Every glucose monomer is upside down from its neighbor

## PROTEIN STRUCTURE

• Primary: sequence of amino acids, specific order determine protein shape  
• Secondary: how folding of chain into alpha helix and beta sheet occurs  
• Tertiary: 3-D shape, hydrogen bonds, disulfide link, ionic bonds, hydrophobic int.  
• Quaternary: interactions between multiple polypeptide chains

## + FUNCTION

• Enzymes → speeds up reaction rates in the cell  
• Cell structure → part of the cellular membrane  
• Communication between cells

## DENATURATION:

• the protein starts to lose its shape/structure when (bonds break)  
• Temperature change  
• pH of surrounding area  
• Salt concentration

NH<sub>2</sub> = Amino  
COOH = Carboxyl

# Ap Biology Chapter 12 Notes

**Chao Zhang**



## **Ap Biology Chapter 12 Notes:**

## **Ap Biology Chapter 12 Notes** Book Review: Unveiling the Magic of Language

In a digital era where connections and knowledge reign supreme, the enchanting power of language has become more apparent than ever. Its capability to stir emotions, provoke thought, and instigate transformation is really remarkable. This extraordinary book, aptly titled "**Ap Biology Chapter 12 Notes**," written by a very acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound affect our existence. Throughout this critique, we will delve into the book is central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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