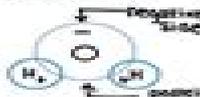


Structure of H₂O
hydrogen bonding
Denser at 4°C



unit one guide

Biological molecules
proteins
nucleic acids

H₂O provides cushion, adhesion, surface tension, high specific heat, high heat of vaporization, excellent solvent, pH buffer, temperature stability

hydrogen bonds require lots of energy to change state of matter

CONDENSATION → when two molecules react, produce hydrogen and hydroxyl ions, releases H₂O

Hydrolysis → attracted to same
Hydrolysis → attracted to different
Hydrolysis → breaking down
Hydrolysis → breaking down
Hydrolysis → breaking down

C	H	N	O	P	S
Carbon	Hydrogen	Nitrogen	Oxygen	Phosphorus	Sulfur

more hydrogen bonds → C⁻ hold together molecules, cell formation
N⁺ hold positive, amino acids
P⁻ hold nucleic acids + lipids
→ make up 98% of organisms

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

Condensation synthesis is the removal of an H₂O molecule to bond monomers together to create a bond between monomers (amino acids, nucleic acids)
Nucleic acid structure:
• One carbon sugar (deoxyribose/ribose), phosphate, nitrogenous base (A, T, C, G), exact copies of strands



Starch vs Cellulose
Starch → α glucose
Cellulose → β glucose

Proteins: specific order of amino acids

1st group: substructure determines structure + function



PROTEINS

• amino acids bond via a peptide bond (covalent) through dehydration synthesis
• 1st 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

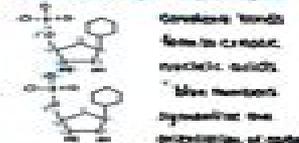
Phospholipid macromolecules
• differences in saturation determine structure and function
• Cells, sterols, phospholipids
• Saturated → no double bonds
• Unsaturated → has double bonds
• Lipids: triglycerides, cholesterol, most of the membrane
• Steroids: hormones, 4 fused carbon rings, cholesterol, maintaining flexibility, embedded into up cell membranes, polar region due to phosphorus and fatty acid



Amino Acids: have directionality

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

DEHYDRATION SYNTHESIS



Chaperones:

• protein molecules that assist protein folding

PROTEIN STRUCTURE

• Primary: sequence of amino acids, specific order determines 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 interactions
• 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

NH₂ = Amino
COOH = Carboxyl

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

• contains aldehyde functional group



VS KETOSE

• contains ketone functional group



ALPHA VS BETA

• all monomers are in the same orientation



• Every glucose monomer is upside down from its neighbor

Ap Biology Chapter 12 Notes

A Gutmann



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Biomacromolecules Mohamed Elzagheid,2024-12-30 The second edition of the Macromolecular Chemistry broadens into two areas biomacromolecules Volume 1 and polymers Volume 2 Biomacromolecules covers carbohydrates lipids proteins nucleic acids their classifications and properties The first chapter looks at the structural formulas and cyclic forms of monosaccharides as well as their synthesis and breakdown Cyclization enolization isomerization tautomerization mutarotation and epimerization are all briefly described Examples of disaccharides and polysaccharides are also presented The second chapter covers triglycerides steroids vitamins and their constituents The third chapter examines the primary structure of proteins including amino acid properties peptide bond formation and peptide synthesis It also addresses secondary tertiary and quaternary structures The book concludes with a chapter on nucleic acids which covers the chemistry of nucleosides and oligonucleotides as well as topics such as genetic code DNA secret code Polymerase Chain Reaction and DNA fingerprinting

What is Natural? Jan Sapp,2003 This detailed account of the ongoing destruction of coral reef communities crystallizes one of sciences most profound questions is there a balance of nature 13 illustrations

Game of Fear: A gripping psychological thriller Gledé Browne Kabongo,2016-02-24 Sometimes good girls do very bad things Academic overachiever and popular good girl Abbie Cooper is used to being in control and strives to keep it that way As senior year at her elite New England private school kicks off she s focused on one goal getting into the Ivy League But even good girls have dark secrets One morning Abbie discovers a cryptic note in her locker I know what you did hypocrite Justice will be served The Avenger Then a photo arrives in the mail It captures in great detail the explosive secret she s kept hidden from everyone the shocking blunder that could get her expelled from Saint Matthews Academy and keep her out of the Ivy League for good Determined to protect her future and the people she loves Abbie is drawn into a diabolical game of blackmail cyber spying and deception For 50 000 the mystery girl known as The Avenger assures Abbie that her secret will remain safe There s only one problem The Avenger may not exist at all So who s stalking Abbie with anonymous text messages that disappear after they ve been read Who s out to ruin her and why To uncover the horrifying truth Abbie must play the game all the way to its stunning conclusion Provided by publisher

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Fulder,1980 **Biological Science** Biological Sciences Curriculum Study,1963 New Technical Books ,1929

Invertebrate Medicine Gregory A. Lewbart,2022-04-19 Winner of the Textbook Academic Authors Association 2024 McGuffey Longevity Award for Life Sciences Presented in full color for the first time Invertebrate Medicine is the definitive resource on husbandry and veterinary medicine in invertebrate species Presenting authoritative information applicable to both in human care and wild invertebrates this comprehensive volume addresses the medical care and clinical condition of most important invertebrate species providing biological data for sponges jellyfish anemones snails sea hares corals cuttlefish squid octopuses clams oysters crabs crayfish lobsters shrimp hermit crabs spiders scorpions horseshoe crabs honey bees butterflies beetles sea stars sea urchins sea cucumbers various worms and many other invertebrate groups The extensively revised third edition contains new information and knowledge throughout offering timely coverage of significant advances in invertebrate anesthesia analgesia diagnostic imaging surgery and welfare New and updated chapters incorporate recent publications on species including crustaceans jellyfishes corals honeybees and a state of the science formulary In this edition the authors also discuss a range of topics relevant to invertebrate caretaking including conservation laws and regulations euthanasia diagnostic techniques and sample handling Edited by a leading veterinarian and expert in the field Invertebrate Medicine Third Edition Provides a comprehensive reference to all aspects of invertebrate medicine Offers approximately 200 new pages of expanded content Features more than 400 full color images and new contributions from leading veterinarians and specialists for each taxon Includes updated chapters of reportable diseases neoplasia sources of invertebrates and supplies and a comprehensive formulary The standard reference text in the field Invertebrate Medicine Third Edition is essential reading for practicing veterinarians veterinary students advanced hobbyists aquarists and aquaculturists and professional animal caretakers in zoo animal exotic animal and laboratory animal medicine Ladies in the Laboratory? American and British Women in Science, 1800-1900 Mary R.S. Creese,2000-01-01 A systematic survey and comparison of the work of 19th century American and British women in scientific research this book covers the two countries in which women of the period were most active in scientific work and examines all the fields in which they were engaged The field by field examination brings out patterns and concentrations in women s research in both countries and allows a systematic comparison of the two national groups Through this comparison new insights are provided into how the national patterns developed and what they meant in terms of both the process of women s entry into research and the contributions they made there Ladies in the Laboratory features a specialized bibliography of nineteenth century research journal publications by women created from the London Royal Society s Catalogue of Scientific Papers 1800 1900 In addition 23 illustrations present in condensed form information about American and British women s scientific publications throughout the nineteenth century This well organized blend of individual life stories and quantitative information presents a great deal of new data and field by field analysis its broad and methodical coverage will make it a basic work for everyone interested in

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