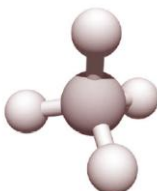
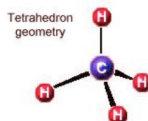
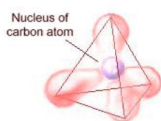


Chemistry of Life

- Organic chemistry is the study of **carbon** compounds
- C atoms are versatile building blocks
 - Bonding properties
 - 4 stable covalent bonds



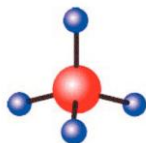
Complex molecules assembled like tinker toys

Molecular Formula	Structural Formula	Ball-and-Stick Model	Space-Filling Model
CH_4			
(a) Methane			
C_2H_6			
(b) Ethane			
C_2H_4			
(c) Ethene (ethylene)			

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Hydrocarbons

- Simplest C molecules = hydrocarbons
 - Combinations of C & H
- Simplest HC molecule = methane
 - 1 carbon bound to 4 H atoms
 - Non-polar
 - Not soluble in H₂O
 - Hydrophobic
 - Stable
 - Very little attraction between molecules
 - A gas at room temperature

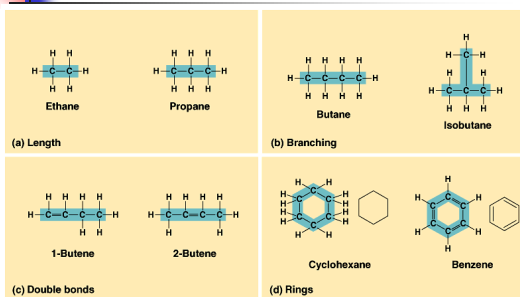


Hydrocarbons can grow

- Adding C-C bonds
 - Straight line
 - Ethane
 - Hexane
 - Branching
 - Isohexane
 - Ring
 - cyclohexane



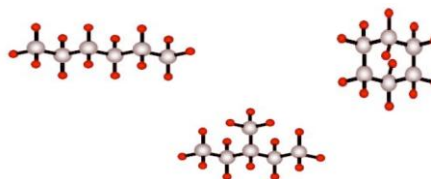
Diversity of organic molecules



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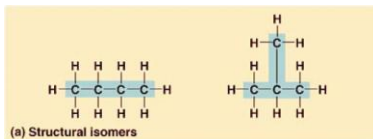
Isomers

- Molecules with same molecular formula but different structures
 - Different chemical properties



Structural Isomers

- Molecules differ in structural arrangement of atoms



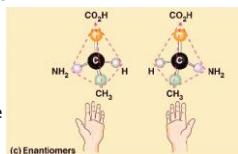
Geometric Isomers

- Molecules differ in arrangement around C=C double bond
 - Same covalent properties



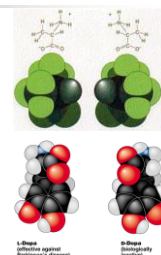
Enantiomer (stereo) isomers

- Molecules which are mirror images of each other
 - C bonded to 4 different atoms or groups
 - Asymmetric
 - Left-handed & right-handed versions
 - "L" versions are biologically active



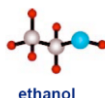
Form affects function

- Structural differences create important functional significance
 - Amino acid alanine
 - L-alanine used in proteins
 - But not D-alanine
 - Medications
 - L-version active
 - But not D-version
 - Sometimes with tragic results...



Diversity of molecules

- Substitute other atoms or groups around C
 - Ethane vs. ethanol
 - H replaced by an hydroxyl group (-OH)
 - Nonpolar vs. polar
 - Gas vs. liquid
 - Biological effects!

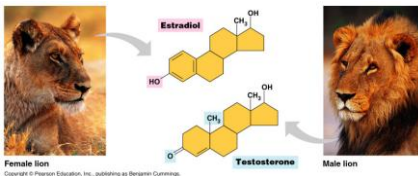


Functional groups

- Components of organic molecules that are involved in chemical reactions
 - Give organic molecules distinctive properties
 - Ex. Male & female hormones...

Small change...Big effect

- Basic structure of male & female hormones is identical
 - Identical C skeleton
 - Attachment of different functional groups
 - Interact with different targets in the body



Survey

- What are you most nervous about AP BIO?
- What subject is the most exciting to you in this course?
- What subject are you dreading the most?
- What type of learning environment do you prefer?
- What have you done in the past that has helped you succeed on exams?