Chemistry of Life

Nonpolar covalent bonds: electrons shared equally between atoms

Polar covalent bonds: one atom has greater electronegativity unequal sharing of electrons

Ionic bonds: chemical bonds from attration between charged ions

Hydrogen bonds: weak bonds berwwen partial + charged hydrogen atom and electronegatice oxygen/nitrogen of another, cause Cohesion(sticking of like molecules), adhesion(sticking of unlike molecules), and transpiration(movement of water molecules in plants)

Specific heat: amount of heat required to raise or lower temp by 1 degree C

pH scale: between 0 and 14,

acids: excess of H+ ions pH>7

Bases: excess of OH- pH>7

Respiration/Fermentation

Glycolisis: breakdown two pyruvate(glucuse) into 2 pyruvate + 2 h20, 2 ATP, 2 NADH + 2H+

Pyruvate Oxidization: pyruvate turns into CO2, NADH, Acetyl CoA

Citric Acid/Krebs cycle: starts w/ acetyl CoA turns into 2CO2, 3NADH, 1ATP, 1FADH

ETC: pumping of protons to create a gradient which powers chemiosmosis

Chemiosmosis: ATP synthesis powered by ETC

Total yield: 30-32 ATP(2 from glycolisis, 2 from citric acid, 26-28 from oxidative phosphorylation)

C 6 H 12 O 6 + 6 O 2 --> 6 CO 2 + 6 H 2 O + ATP

fermentation: expansion of glycolis where ATP is produced by substrate level phosphorylation, anerobic

Macromolecules

Monosaccharide: monomer of carbs

Lipids:function is energy/protection

Proteins: polymers made of amino acid monomers, linked by peptide bonds

Nucleic acids: DNA and RNA, monomers are nucleotides

polysaccharides: polymers of carbs

steroids: four rings fused together

Primary structure: amino acid sequence

Made of nitrogenous base, 5 carbon sugar and a phosphate group

Energy-storing polysaccarides: starch, glycogen

Secondary:hydrogen bonding results in alpha helix or beta pleated sheet

Structural polysaccharides: cellulose, chitin

tertiary:complex shapes from bonding between R groups

QUaternary" two or more polypeptide chains into one large protein

The Cell

Ribosomes: protein factories

Isotonic solution: same amount of solute

Endoplasmic Reticulum: smooth(sythesis of lipids, package to transport vesicles), meatabolize carbs, detoxify, storage), Rough(sythesize proteins)

Hypertonic: more solute

Golgi apparatus(receives, sorts, ships)

hypotonic: less solute

Endosymbiont theory: mitochondria and chloroplast from prokaryotic cells, have dna and double membrane

peroxisomes: transfer hydrogen to oxygen, detoxify

Energy of Life

Catabolic: release of energy by breakdown of complex to simple

Anabolic: consume enrgy to make complicated from simple

Exergonic: energy released

Endergonic: requires energy