

Substrate for respiration and immediate in respiration

Carbohydrates contain the elements C,H,O and some molecules The simplest carbohydrates are called MONOSACCHARIERS the searce made of motioners of carbohydrates. Larger carbohydrates are made by Juining monosaccharides toget for that have between 3 are 6 (a bons all have similar for petting)

- Sweetn ١g
- orm crystals
- Soluble in water

Monosaccharides are grouped according to the number of carbon atoms in the molecule. 3 carbon monosaccharides are known as triose sugars (involved in respiration ATP,) 5 as pentose and 6 as hexose. Hexose are the most common with glucose and fructose been examples. Pentose and hexose sugars tend to be ring formation. Like proteins there are numerous groups of carbohydrates- Monosaccharide's, disaccharides (2 monosaccharide's joined together) and



All monosaccharides have the formula Cn(H20)n

polysaccharides (many joined together)

Joining two monosaccharides makes a disaccharide, joining many makes a polysaccharide such as starch, glycogen and cellulose. The joining reaction is condensation forms a covalent bond known as a glycosidic bond and water is removed. Hydrolysis reactions break down the bond

NUCLEOTIDES

There are two forms nucleic acid- DNA/RNA- they code for everything. In eukaryotic cells all DNA is found in the nucleus. The information is stored in three different forms of RNA- need to read/translate the information in order to produce various proteins.



The monomer of all nucleic acids is called NUCLEOTIDES. Each nucleotide has three subunits: an organic nitrogenous base, a sugar molecule and a phost hate group. These are joined by the valent bond to form a

The phosphete group in RNA and DNA is Always to same. The bases alternate. The sugar molecule is a 5 carbon sugar. In DNA the sugar is deoxyribose and the possible bases are A, C, G, and T and in RNA the sugar is ribose and the possible bases are A, C, G, U

When nucleotides join in a condensation reaction a bond forms between the phosphate group of one nucleotide and the sugar of another, this forms a repeated long chain of nucleotides. This chain acts as the backbone of the molecule. The organic bases project out from the backbone. The sequence of the nucleotide bases is what forms the coded information in nucleic acid. Chains of nucleotides bond to from nucleic acid. Only nucleotides carrying the same sugar can bind together. This ensures that RNA can only bind with RNA and DNA with other DNA acids.

The five bases are grouped- 3 are PYRIMIDINES and 2 are PURINES. The pyrimidines are smaller- this is important as effect DNA structure. When excess purines are broken down in the liver URIC ACID is produced. If too much of this is in the body it forms a crystals and casuses joint to swellespecially toes/fingers. Substrate and enzyme concentration- in an experiment the substrate concentration can be varied for a fixed concentration of enzyme. An increase in substrate leads to more collisions between enzyme and substrate meaning more complexes are formed and rate of reaction increases. Reaction rate will increase until a max value is reached- all active sites are occupied. This works the other way around with concentration of enzyme as well. If both are constantly increases the rate of reaction would keep going up.



Fits so substrate can't

Competitve inhibitor

Amount of inhibitors effect inhibitation rate

Rate

Limiting factors can be enzyme/substrate concentration, anything that causes plateau and prevents further increase in reaction rate. When limiting factors are removed the reaction rate will increase. Enzyme concentration is maintained as they are used over and over again. The INITIAL REACTION RATE is during the very early stages of a reaction when the reaction rate is at its highest. As time increases the rate of reaction will go down as substrate is used up. Bestrine to measure a reaction is the beginning.

INHIBITORS

- Competitive Inhibitors- treate tale a similar shape to the active site and can occupy it to for a KNA (ME-INHIBTOR COMPLEX). mese don't lead to formation of products and there (2) ne doesn't catalyse a reaction. It decleases the reactions into active inhibitor is occupying the site so the substrate can not.
- Non-competitive inhibitors- these don't compete with substrate for active site. They attach to the enzyme at different regions. They can distort the tertiary structure- changing the active site and preventing complexes from forming. This reduces reaction rate. Level of inhibition depends on number of inhibitors- if there's enough to bind to all enzymes then reaction will cease. IRREVERSIBLE
- Permanent inhibitors- most competitive inhibitors don't bind permanently bind to the active site for a short time then leave. Many non-competitive bind permanently and are irreversible. Effectively they denature the enzyme.

Some enzymes can only catalyze a reaction if another non protein substance is present. These are called cofactors. A COFACTOR is any substance that must be present to ensure the reaction takes place. Some can be part of the enzyme (prosthetic group) whilst others affect the enzyme on a temporary basis (COENZYMES and INORGANIC IRON COMPOUNDS)