Atiku Faith Selit
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Medical lab Scienca.

1. Fat Soluble vitamins and Water Soluble vitamins. The biochemical importance of vitamins is that it acts as a regulator of cell and tissue growth and differentiation, It provides a hormone like function, regulating mineral metabolism for bones and other organs. Some vitamins function as enzyme cofactors or precursors.

2. Thiamin helps in breaking down glucose for energy and acts as a coenzyme in the metabolism a maintenance agent (It help in maintaining the cognitive ability of the branch-chain amino acids). Riboflavin is a part of two co-enzymes (flavin mononucleotide and adenine dinucleotide). It helps in the oxidation-reduction during energy production within the metabolic pathways. It helps in extracting energy needed for metabolism, it helps in the Counter free-radical damage.

3. Nucleotide Nomenclature: It contains three characteristic components: A nitrogenous base, a pentose and one or more sphosphate groups.
Nucleoside Nomenclature: Nucleosides are glycosylamines that can be thought of as nucleotides without a phosphate group. It consists of a nucleobase (nitrogenous base) and five carbon sugar ribose
Nucleic acids Nomenclature :- They are composed of nucleotides, which are the monomers made of three components: a 5 carbon sugar, a phosphate group and a nitrogenous base. If the sugar is a compound nbose the polymer is RNA ; if the sugar is derived from ribose as deoxynbose, the polymer is DNA

4. The role of vitamin A in the visual cycle is specifically related to the retinal form. Within the eye, 11-cis-retinal is bound to the protein "opsin" to form rhodopsin in rods and iodopsine (cones) at conserved lysine residues. As light enters the eye, the 11 cis-retinal is isomerized to the all-"trans" form. The all "trans" retinal dissociates from the opsin in a series of steps called photobleaching. This Isomerization induces a nervous signal along the optic nerve to the visual center of the brain. After seperating from opsin, the all "tran"-retinal is recycled and converted back to the 11-cis-retinal form by a series of enzymatic reactions. In addition, some of the all "trans" retinal may be

may be converted to all "trans" retinol form and then transported with an interphotoreceptor retinol-binding protein (IRBP) to the pigment Epithelial cells. Further esterification into all-trans-retinol within the pigment epithelial cells to be revised when needed. The final stage is conversion of 11-cis-retinal rebinding to opsin to reform rhodopsin (visual purple) in the retina. Rhodopsin is needed to see in low light (contrast as well as for night vision. Kuhne showed that rhodopsin in the retina is only regenerated when the retina is attached to retinal pigmented epithelium, which provides retinal. It is for this reason that a deficiency in vitamin A will inhibit the reformation of rhodopsin and will lead to one of the first symptoms, night blindness.

6. The named vitamin is vitamin D which is a hormone. The skin is responsible for producing vitamin D. During exposure to sunlight/ultraviolet radiation penetrates into the epidermis and photolyzes provitamin D3 to previtamin D3. Previtamin D3 can either isomerize to vitamin D3 or be photolyzed to lumisterol and tachysterol. Vitamin D is also sensitive to sunlight and is photolyzed to 5,6 transvitamin D3. The epidermis possesses receptors for 1,25-(OH)2-D3, 1,25-(OH)2-D3 inhibits the proliferation of cultured keratinocytes and induces the skin is the site for the synthesis of vitamin D from the sun and a target tissue for active metabolite. When the skin is exposed to sunlight it makes vitamin D from cholesterol. The sun's ultraviolet B rays hit cholesterol in the skin allowing the energy for vitamin D synthesis to occur.

7. If Nucleic acids are exposed to moderate concentration of alkali it causes depurination, causing the DNA to be denatured, if they are expose to high conc of alkali it will induce a hydrolysis of phosphodiester bonds which would be cleaved to smaller fragments. If Nucleic acids are exposed to high acids the DNA is depurinated of purines which causes DNA meltings and the DNA sequence is lost and when they are exposed to extremely high acids the phosphodiester bonding of the DNA is disrupted which cleaves the DNA into nucleosides and nucleotides.

8. According to James Watson (1928):- The DNA is a double-stranded helical molecule. It consists of two sugar phosphate backbones on the outside held together by hydrogen bonds between pairs of nitrogenous base on the inside. The bases are of four types (A, C, G and T),

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- Francas Crick (19
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8 · RNA

1. RNA contains
ribose
2. RNA is a single
molecule
3. RNA is not stable
conditions
4. RNA directly co
acids and acts
between DNA and
to make prote
5. RNA uses adenine
and guanine for it
6. RNA is relati
to UV damage

a) A Nucleotid
is the main en
b) Nucleotide
also form
c) They are
used in many
d) It is foun
in many pr
transporting

: Pairing always occurs between A & T, and C and G -
- Francis Crick (1916-2004) realized that these pairing rules meant that either strand contained information necessary to make a new copy of the entire molecule and that the aperiodic order order of bases might provide a "genetic code"

| RNA | DNA |
|---|---|
| 1. RNA contains sugar deoxy-ribose | 1. DNA contains sugar ribose |
| 2. RNA is a single-stranded molecule | DNA is a double-stranded molecule |
| 3. RNA is not stable under alkaline conditions | DNA is stable under alkaline conditions |
| 4. RNA directly codes for amino acids and acts as a messenger between DNA and ribosomes to make proteins | DNA is responsible for storing and transferring genetic information. |
| 5. RNA uses thymine, Cytosine and guanine for its base pairing | DNA uses thymine, cytosine and guanine For its base pairing. |
| 6. RNA is relatively resistant to UV damage. | DNA is susceptible to UV damage. |

10) A Nucleotide can be a base in another molecule such as (ATP) which is the main energy molecule of the cell
5) Nucleotides not only make up the building blocks of life but also form different moleculesthat function to make life possible
c) They are found in co-enzymes like and NAD and NADP which are used in many chemical reactions that play different roles in metabolism
d) It is found in cyclic AMP an messenger molecule that is important in many processes including the regulation of metabolism and transporting chemical signals to cells.
4:
4. Vitamin A or retinol is essential for proper functioning of

the organism and in visual clarity of an organism. Once it is taken into the body from diets it is processed or stored. Vitamin A, via 11-cis retinal underlies and is responsible for visual phototransduction A complex signaling cascade in turn prompting others to relay the signal to centres in the brain where processing of visual perception takes place. For the vision to be sustained and achieved, the all-trans isomerized chromophore must be converted back to the cis form which is accomplished through a series of enzyme-catalyzed reactions collectively known as the retinoid or visual cycle