

(1A) Vitamins are classified either as water soluble or fat soluble. Water soluble vitamins include Vitamin B complex which are

- Thiamine
- Riboflavin
- Niacin
- Pantothenic acid
- Pyridoxine
- Biotin
- Folic acid
- Cobalamin and;

Vitamin C (ascorbic acid)

Fat soluble vitamins include:

- Vitamin A (retinol)
- Vitamin D (cholecalciferol)
- Vitamin E (tocopherol)
- Vitamin K

(1B) Biochemical significance of vitamins include:

- Vitamin A acts as a regulation of cell and tissue growth and differentiation
- Vitamin D provides a hormone-like function, regulating mineral metabolism for bones and other organs
- The B complex vitamins function as enzyme cofactors or the precursors of them
- Vitamins C and E function as anti-oxidants.

(2) With the aid of two named vitamins; Vitamins B2 and Vitamins B3 (i.e. Riboflavin and Niacin), coenzyme play a role in group-transfer reactions such as ATP and coenzyme A, and oxidation-reduction reactions such as NAD<sup>+</sup> and coenzyme Q10.

(3a) Nomenclature of nucleic acid, nucleotide and nucleosides:

- Nucleic acid are of two types deoxyribonucleic acid (DNA) and Ribonucleic acid (RNA).
- Nomenclature of nucleoside: For ribonucleoside: {Adenosine, Guanosine, Uridine and Cytidine} and For deoxyribonucleoside: { deoxyadenosine, deoxyguanosine, deoxyuridine, deoxycytidine and deoxythymidine }

-Nomenclature of nucleotide:

For Ribonucleotide they are Adenosine monophosphate (AMP), Guanosine monophosphate (GMP), Uridine monophosphate (UMP) and Cytidine monophosphate (CMP)

For Deoxyribonucleotide they are

Deoxyadenosine monophosphate (dAMP), Deoxyguanosine monophosphate (dGMP), Deoxyuridine monophosphate (dUMP), Deoxycytidine monophosphate (dCMP) and Deoxythymidine monophosphate (dTMP).

(5) Response of an individual's eye to bright light:

is mediated by three different retinal containing pigments in the cone cells, the three pigments are called porphyropsin, iodopsin and cyanopsin and are sensitive to the three essential colors: red, green and blue respectively. All these pigments consist of 11-cis-retinal bound to protein opsin.

Response of an individual's eye to dim light is mediated by rhodopsin of the rod cells.

(8) Watson crick's contribution in the DNA structure was determining the double-helix structure of DNA, the molecule containing the human gene.

(10) Functions of nucleotide:

-ATP (adenosine triphosphate) serves as the main biological source of energy in the cell. ATP is required as a source of energy in several metabolic pathways, e.g. fatty acid synthesis, glycolysis, etc.

-Cyclic adenosinemonophosphate (c-AMP) acts as a second messenger for many hormones, e.g. epinephrine, glucagon, etc.

-CTP (Cytidine triphosphate) and CDP (Cytidine diphosphate) are required for the biosynthesis of some phospholipids.