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Metal Ions In Biological System (cont.)

Role of metal ions in living organism is very is very important and all the vital activities are controlled by their ions. Living organism store and transport the metal ions in appropriate concentration to carry out various biological processes. According to periodical table the important metal ions ~~are~~ of biological system can be divided into four major groups.

I — First group I comprises which occur largely as free ion e.g Na^+ and K^+. They provide an osmetic balance and and electrolyte current. Na^+, K^+ ions and other gradients are required for the transmission of nerve impuls. They also help in transport of amino acids, ~~sg~~ sugars, nucleotides and other substances. They also regulate the cell volume an cell

shape. High cellular K^+ ion concentration is required for the optimal glycolysis and protein synthesis. They occur, in living organisms as. Na^+ and K^+ are as the salt of inorganic acids, organic acid and salts of proteins. Na^+ is the extra-cellular cation, whereas K^+ is the main intracellular cation. Important physiological function which ions perform in the body of plants and animals are:

(a) Maintainance of normal hydration of the body through osmotic regulations controlled by Na^+/K^+ pump.

(b) Maintainace of normal acid base equilibrium by forming buffers, which play important role in the regulation of pH under different physiological conditions.

(c) In gaseous transport of CO_2.

(d) Maintance of normal neuromuscular irritability and excitability.

(e) Maintainace of proper blood viscosity by keeping the globulins in physical solution and regulating the degree of hydration and plasma proteins.

(f) Na^+, K^+ ions are responsible for secreting digestive juices like

pancreatic, bile and gastric HCl etc.

(g) Potassium is responsible for cell growth, repair and storage of proteins and glycogen.

(h) Na^+ and K^+ salts get excreted by kidneys in urine. sodium salts are also excreted by skin in the form of prespiration.

Role of Calcium — calcium is the major cation in the structural materials such as teeth, bones, shells and a number of other less well known calcium-rich deposits. These calciferous biological materials like bones, though consits largely of calcium carbonate and phosphate is continuously being deposited and reabsorbed and as well as buffer for body. calcium and phosphate ions are controlled by hormonal action. The form of calcium phosphate that occure in bones and teeth has the same composition as the mineral apatite ($Ca_{10}(PO_4)_6X_2$ where $X = F, Cl$ or OH). It also required for the clotting of blood and maintain regular beating of our heart. They also play important role in the muscle contraction.

In children ~~maintaining~~ malnutrition is due to the difficiency of the Ca^{2+} ions.

Among the most vital function of Ca^{2+} is its involvement in enzymatic systems, including its being a regulator of muscle contraction, a transmitter of nervous pulses and an ~~agent~~ agent of blood coagulation