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18/MHS06/041

MEDICAL LABORATORY SCIENCE

BCH204

Coenzymes are substances that enhance the action of an enzyme. (An enzyme is a protein that functions as a catalyst to mediate and speed a chemical reaction).

Coenzymes are small molecules. They cannot by themselves catalyze a reaction but they can help enzymes to do so. In technical terms, coenzymes are organic nonprotein molecules that bind with the protein molecule (apoenzyme) to form the active enzyme (holoenzyme).

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| FAT SOLUBLE VITAMINS | WATER SOLUBLE VITAMINS |
| 1. They are not used as coenzymes
 | They are used as coenzymes |
| 1. They are not soluble in water
 | They are not soluble in fat |
| 1. Absorption of fat soluble vitamins occurs along with lipids and require bile salt
 | Absorption is simple |
| 1. Carrier proteins are present
 | No carrier protein is required  |
| 1. They are stored majorly in the liver
 | They have no storage |
| 1. Deficiency manifest only when stored ones or stores are depleted
 | Deficiency manifest rapidly as there is no storage  |
| 1. Hypervitaminosis may occur due to the possibility of toxicity
 | Toxicity is unlikely since excess is excreted  |
| 1. The treatment of deficiency involves single large doses to prevent it
 | Regular dietary supply is required |
| 1. They include vitamin A, D, E, K
 | They include vitamin B complex and vitamin C. |

3. Niacin assists functions of the nervous and digestive system. It plays a role in food metabolism and in the formation of red blood cells and skin. NAD and NADP are coenzymes that are part of the energy production system of the body. This system works by means of oxidation and reduction (redox) reactions. Niacin deficiency occurrence causes many symptoms, such as fatigue, headaches, dry skin, and loss of appetite, ulcers and emotional instability. On rare occasions (mainly in developing countries) people may experience severe deficiency, which leads to a condition known as pellagra. This condition is commonly characterized by the 4 D's: dermatitis, diarrhea, dementia and death. Pellagra literally means raw skin.