MATRIC NUMBER-18/MHS01/160

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COURSE CODE – BCH 204

DEPARTMENT – ANATOMY

ASSIGNMENT –

1. WHAT ARE COENZYMES.

A substance that enhances 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 catalyse 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).

A number of the water-soluble [vitamins](https://www.medicinenet.com/vitamins_and_calcium_supplements/article.htm) such as [vitamins](https://www.medicinenet.com/vitamins_and_supplements_quiz/quiz.htm) B1, B2 and B6 serve as coenzymes. Coenzymes bind to the enzyme and assist in enzyme activity. They can bind and react with many different enzymes, so they're not specific to a particular enzyme. They help enzymes change starting elements (substrates) into their final version (products). In doing this, the coenzyme can be changed and often alternates between various forms. There is a specific location on an enzyme which binds to substrates and helps turn them into products. This location, called the **active site**, is where coenzymes bind. There are several ways coenzymes assist in enzyme function, including changing their shape to activate, or turn on, enzymes, or aiding in chemical reactions by acting as carriers of energy or molecular groups.

1. Differentiate between fat and water soluble vitamins

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| S/N | FAT SOLUBLE VITAMINS  | WATER SOLUBLE VITAMINS |
| 1 | They are absorbed first into the lymph then the blood | They are absorbed directly into the blood. |
| 2 | They are fat soluble  | They are water soluble.  |
| 3 | Bile salts are required for absorption.  | They undergo simple intestinal absorption. |
| 4 | They are transported by carrier proteins. | They travel freely in the body without requiring carrier proteins (except Vitamin B12) |
| 5 | They are stored in liver and fatty tissues. | They are not stored (except Vitamin B12) |
| 6 | Usually the surplus vitamins are stored  | Surplus vitamins are detected in the kidney and removed in the urine.  |
| 7 | There is accumulation of fats in the body which leads to hypervitaminosis | Usually hypervitaminosis does not occur cause there is no accumulation. |
| 8 | They are required in periodic doses to fulfil the deficiency compensation (weeks or month) | They are required in frequent doses (1-3 days) |

1. Describe niacin in relation to its coenzymic function.

Vitamin B3, generally referred to as niacin, is a water-soluble vitamin. This vitamin can generally be found in two distinctive forms, namely nicotinic acid and nicotinamide. These substances are used by the body to form the coenzymes NAD and NADP. Niacin coenzymes degrade carbohydrates, fats, proteins and alcohols and synthesize fatty acids and cholesterol. They play a role in cell signaling.

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, 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 conditions is commonly characterized by the 4 D's: dermatitis, diarrhoea, dementia and death. Pellagra literally means raw skin. The conditions was named this because the skin of a patient develops a dark pigmented rash on areas exposed to bright sunlight.