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Assignment Title: Vitamins and coenzymes
Course Title: Medical Biochemistry II
Course Code: BCH 204

Question
1a. What are coenzymes

b. Differentiate between fat and water soluble vitamins

c. Describe niacin in relation to its coenzymic function

Answers
1a.) According to the note given, coenzymes are cofactors that are loosely bound to enzymes. They are nonprotein compound that are necessary for the functioning of an enzyme and are organic in nature.
According to Medicine Net, Coenzyme is 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 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).
Reference: https://www.medicinenet.com/script/main/art.asp?articlekey=13153

1b.)

FAT SOLUBLE VITAMINS	WATER SOLUBLE VITAMINS
• Soluble in fat	• Not soluble in fat
• Not soluble in water	• Soluble in water
• Absorption occurs along with lipids and require bile salt.	• Absorption is simple.
• Carrier proteins are present	• No carrier protein is needed
• Stored in the liver	• No storage
• Deficiency manifest only when stores are depleted.	• Deficiency manifest rapidly as there's no storage.
• Hyper vitaminosis may occur, there's possibility of toxicity.	• Toxicity is unlikely since excess is excreted.
• The treatment of deficiency involves single large doses.	• Regular dietary supply is required

1c.) Vitamin B3 also know as 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 also plays a role in converting carbohydrates into glucose, metabolizing fats and proteins, and keeping the nervous system working properly.
Reference: https://www.lenntech.com/vitamins/vitamin-b3.htm#ixzz6NkMuDUgZ

- Niacin is part of the nicotinamide adenine dinucleotide (NAD+) involved in oxidation-reduction reactions and deficiency can result in dermatitis, muscle fatigue and loss of appetite.