ZUBAIR KHADIJAH ATINUKE
18/mhs06/058
Medical laboratory science
Medical biochemistry

Question
1a. What are coenzymes
b. Differentiate between fat and water soluble vitamins
c. Describe niacin in relation to its coenzymic function

Answers
1a. Coenzymes
These are reusable non-protein molecules that contain carbon (organic). They bind loosely to an enzyme at the active site to help catalyze reactions. Most are vitamins, vitamin derivatives, or form from nucleotides.

1b. Differences between fat and water soluble vitamins

Fat soluble vitamins	Water soluble vitamins
They require carrier proteins to be transported within the body	They do not require carrier protein
They are stored in the liver	They are not stored in the body
Their absorption require bile salt	Absorption does not require bile salt
They’re not excreted	They are usually excreted
Deficiency manifests only when stores are depleted	Deficiency manifests rapidly as there is no storage

1c. Niacin- coenzymic function

The active forms of niacin are Nicotinamide adenine dinucleotide (NAD) and nicotinamide adenine dinucleotide phosphate (NADP) which function as coenzymes.

In cells, most oxidations are accomplished by the removal of hydrogen atoms. Both of these coenzymes play crucial roles in this. Each molecule of NAD+ (or NADP+) can acquire two electrons; that is, be reduced by two electrons. However, only one proton accompanies the reduction. The other proton produced as two hydrogen atoms are removed from the molecule being oxidized is liberated into the surrounding medium. For NAD, the reaction is thus:

$$NAD+2H \rightarrow NADH+ H+$$

NAD participates in many redox reactions in cells, including those in glycolysis and most of those in the citric acid cycle of cellular respiration.

They are involved in various redox reactions catalysed by dehydrogenases in metabolism. They are therefore involved in many metabolic pathways of carbohydrates, lipid and protein.