**NAME:** OGUNSEMOWO AYOOLA ENIOLUWADUROTI.

**COURSE:** BCH 204- MEDICAL BIOCHEMISTRY.

**COLLEGE:** MEDICINE AND HEALTH SCIENCES.

**DEPERTMENT:** ANATOMY.

**MATRIC NUMBER:** 18/MHS01/254.

ASSIGNMENT.

1a. What are coenzymes

b. Differentiate between fat and water soluble vitamins

c. Describe niacin in relation to its coenzymic function

ANSWER.

1a Coenzyme are substances that enhances the action of an enzyme. (An enzyme is a protein that functions as a catalyst to mediate and speed a chemical reaction). They are also small molecules and 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). 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 are divided into two groups;

1. Those taking part in reactions catalyzed by oxidoreductases by donating or accepting hydrogen atoms or electrons.
2. Those coenzymes taking part in reaction transfer ring groups other than hydrogen.

1b.

|  |  |
| --- | --- |
| Fat soluble Vitamins | Water soluble vitamins |
| It is fat soluble | It is water soluble |
| Its absorption requires bile salt | Its absorption is simple |
| Carrier proteins are present | No carrier proteins are present |
| It is stored in the liver | It has no storage |
| It is not secreted | It is secreted |
| Deficiency manifests only when storage is depleted. | Deficiency manifests rapidly as there is no storage. |

1c Niacin also known as vitamin B3 is a general name for the nicotinic acid and nicotinamide.

Active Form; Nicotinamide adenine dinucleotide and nicotinamide adenine dinucleotide phosphate.

Nicotinamide adenine dinucleotide is a first group coenzyme and what this coenzyme does is to counter balance the change occurring in the substrate. Therefore this coenzyme is considered as a co-substrate.

Nicotinamide adenine dinucleotide is a coenzyme synthesized from nicotinamide. The reversible reaction of lactate to pyruvate is catalyzed by the enzyme lactate dehydrogenase but the actual transfer of hydrogen is taking place on this coenzyme {Nicotinamide adenine dinucleotide}. In this case, two hydrogen atoms are removed from lactate, out of which one hydrogen and two electrons {hydrogen ion} are accepted by the nicotinamide adenine dinucleotide to form NADH, and the remaining hydrogen ion is released into the surrounding medium. The hydrogen is accepted by the nicotinamide.