1. What are coenzymes?

Coenzymes are cofactors that are attached to the enzymes loosely also ,**coenzyme** is a substance that works with an [enzyme](https://www.thoughtco.com/enzyme-biochemistry-4042435) to initiate or aid the function of the enzyme. It can be considered a helper molecule for a biochemical reaction. Coenzymes are small, nonproteinaceous molecules that provide a transfer site for a functioning enzyme. They are intermediate carriers of an atom or group of atoms, allowing a reaction to occur. Coenzymes are not considered part of an enzyme's structure. They are sometimes referred to as **cosubstrates**.

Coenzymes cannot function on their own and require the presence of an enzyme. Some enzymes require several coenzymes and cofactors.

1. Difference between fat soluable and water soluable vitamins

* Fat soluble vitamins can be stored in our body while water soluble vitamins cannot be stored in our body.
* Fat soluble vitamins are dissolved in fat and stored in liver and fatty tissues while water soluble vitamins are dissolved in water and eliminated in urine.
* Vitamin A, D, E and K are fat soluble vitamins and Vitamin B-complex and vitamin C are water soluble vitamins.
* Fat soluble vitamins are toxic if taken in excessive amounts while water soluble vitamins are not toxic if taken in high amounts.
* Fat soluble vitamins can be taken in a single large dose while water soluble vitamins are required on daily basis.

1. Niacin as a coenzyme

Niacin and nicotinamide are both [precursors](https://en.wikipedia.org/wiki/Precursor_(chemistry)) of the [coenzymes](https://en.wikipedia.org/wiki/Coenzyme) [nicotinamide adenine dinucleotide](https://en.wikipedia.org/wiki/Nicotinamide_adenine_dinucleotide) (NAD) and [nicotinamide adenine dinucleotide phosphate](https://en.wikipedia.org/wiki/Nicotinamide_adenine_dinucleotide_phosphate) (NADP) [*in vivo*](https://en.wikipedia.org/wiki/In_vivo).[[61]](https://en.wikipedia.org/wiki/Niacin#cite_note-isbn1-57259-153-6-61) NAD converts to NADP by phosphorylation in the presence of the enzyme [NAD+ kinase](https://en.wikipedia.org/wiki/NAD%2B_kinase). NADP and NAD are coenzymes for many [dehydrogenases](https://en.wikipedia.org/wiki/Dehydrogenase), participating in many hydrogen transfer processes.[[62]](https://en.wikipedia.org/wiki/Niacin#cite_note-ncbi.nlm.nih.gov-62) NAD is important in catabolism of fat, carbohydrate, protein, and alcohol, as well as cell signaling and DNA repair, and NADP mostly in anabolism reactions such as fatty acid and cholesterol synthesis