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BCH204

WHAT ARE COENZYMES

Coenzyme Definition:

A coenzyme is an organic non-protein compound that binds with an enzyme to catalyze a reaction. Coenzymes are often broadly called cofactors, but they are chemically different. A coenzyme cannot function alone, but can be reused several times when paired with an enzyme. A **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.

DIFFERENTIATE BETWEEN FAT SOLUBLE AND WATER SOLUBLE VITAMINS

|  |  |
| --- | --- |
| FAT SOLUBLE | WATER SOLUBLE |
| Not easily absorbed into the tissues of the body and metabolized more quickly | easily absorbed into the tissues of the body and metabolized more quickly |
| Vitamin A,D,E,K | Vitamin b1,b2,b3,b5,b6,b7,b9,b12 and c. |
| any excess of fat-soluble vitamins don’t immediately leave the body,  Instead, they’re stored in the liver or fatty tissue for later use. | excess of water-soluble vitamins, like the Vitamin B complex or Vitamin C, are excreted through the urination process |
| absorbed by fat globules within the body and then carried throughout the bloodstream | Not absorbed by fat globules within the body and then carried throughout the bloodstream |
| Doesn’t dissolve in water | dissolves in water |
| found in high-fat food sources like egg yolks, liver, beef, fatty fish, and dairy products | Many B vitamins and Vitamin C [can be found in vegetables](https://ritual.com/articles/am-i-getting-enough-vitamin-c) (like leafy greens and other green vegetables) and fruits (like citrus fruits). |
| Dissolves in fat | Doesn’t dissolve in fat |
|  |  |
|  |  |
|  |  |
|  |  |

NIACIN AND ITS COENZYMIC FUNCTIONS

This colorless, water-soluble solid is a derivative of [pyridine](https://en.wikipedia.org/wiki/Pyridine), with a [carboxyl group](https://en.wikipedia.org/wiki/Carboxyl_group) (COOH) at the 3-position. Other forms of vitamin B3 include the corresponding [amide](https://en.wikipedia.org/wiki/Amide) [nicotinamide](https://en.wikipedia.org/wiki/Nicotinamide) (niacinamide), where the carboxyl group has been replaced by a [carboxamide](https://en.wikipedia.org/wiki/Carboxamide) group (CONH2), as well as more complex amides and a variety of [esters](https://en.wikipedia.org/wiki/Ester).

Niacin functions as part of a coenzyme involved in the metabolism of carbohydrates and acts to catalyze the oxidation of sugar derivatives and other substances.

Component of coenzymes used broadly in cellular metabolism, oxidation of fuel molecules, and fatty acid and steroid synthesis. Niacin coenzymes degrade carbohydrates, fats, proteins and alcohols and synthesize fatty acids and cholesterol. They play a role in cell signaling.