Vitamin B9 (Folate)

Vitamin B9, or folate, is a vitamin crucial to many biochemical processes. Dietary sources include leafy green vegetables. It is absorbed in the jejunum and stored in the liver. It is metabolized by dihydrofolate reductase into tetrahydrofolate. This molecule plays a crucial role in the proper functioning of methionine synthase. Functions of folate in the body include nucleotide synthesis and endothelial protection.



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Characteristics

Dark Green Leafy Vegetables
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The body's primary sources of folate include dark green leafy vegetables, wheat germ, egg yolk, liver, fortified breakfast cereal, yeast, beans, and legumes.

Absorbed in Jejenum
Absorbing-sponge Judge-Judy
Folate is mainly absorbed in the duodenum and jejunum. The colon can also absorb folate, however the absorption gradient decreases from the jejunum to the colon.

Hepatic Storage
Liver Storage
The body contains a small reserve pool of folate in the liver and kidneys.

Mechanism

Dihydrofolate Reductase (DHFR)
Di-hydryl-foliage Red-duck
Dihydrofolate Reductase (DHFR) is the key enzyme for the metabolism of folate. It converts dihydrofolate (DHF) to tetrahydrofolate (THF).

Tetrahydrofolate (THF)
Tetris-hydryl-foliage
Tetrahydrofolate (THF) is the active form of folate needed for various one-carbon transfer reactions in nucleotide synthesis.

Methionine Synthase
Methyl-thimble
Methionine synthase is an important enzyme in the remethylation pathway. It promotes methyl group transfer from methylated folate to homocysteine in order to generate methionine. Methionine is used to synthesize proteins and is a precursor of S-adenosylmethionine (SAM), which is a methyl group donor for more than 100 enzymatic reactions.

Functions

Nucleotide Synthesis
Nuclear-toad Synthesized
Folate acts as a coenzyme in many biological processes. It is essential in the synthesis of nucleotides for DNA and RNA and methylation. Nitrogenous bases including adenosine, guanine, and thymine are synthesized with the help of folate.

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Endothelial Protection

Protecting Inner-layer

Folate supplementation is thought to improve endothelial function through the production of Nitric Oxide (NO) and reducing oxidative stress.

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