

Structural Basis for the Site-Specific Incorporation of Lysine Derivatives

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Posttranslational modifications (PTMs) of proteins determine their structure-function relationships, interaction partners, as well as their fate in the cell and are crucial for many cellular key processes. For instance chromatin structure and hence gene expression is epigenetically regulated by acetylation or methylation of lysine residues in histones, a phenomenon known as the 'histone code'. Recently it was shown that these lysine residues can furthermore be malonylated, succinylated, butyrylated, propionylated and crotonylated, resulting in significant alteration of gene expression patterns. However the functional implications of these PTMs, which only differ marginally in their chemical structure, is not yet understood. Therefore generation of proteins containing these modified amino acids site specifically is an important tool. Lysine is one of the essential amino acids, which are those that the body cannot make and that people need to obtain from dietary sources.

According to one small-scale study, lysine can help reduce high blood pressure in people whose dietary intake of this amino acid is insufficient. However, more research is necessary before experts can determine whether or not lysine is an effective treatment for high blood pressure.

Lysine interacts with arginine, which is an amino acid that supports the circulatory system. Taking large quantities of lysine may reduce the body's ability to move arginine through the system. Lysine may also interact with a group of antibiotics called aminoglycosides, potentially resulting in kidney damage. Doctors usually give these antibiotics, which include streptomycin and neomycin, by injection to treat serious infections. As lysine increases the absorption of calcium, people should monitor how much calcium they take when they use lysine supplements.

Doctors do not recommend lysine supplements for children or for women who are pregnant or breastfeeding. People taking lysine supplements should monitor their cholesterol levels due to the potential link with higher cholesterol. Anyone with kidney or liver problems should avoid taking lysine supplements. Lysine is an essential amino acid. It is one of the building blocks of proteins and is necessary for human health. The body does not make lysine on its own, but most people take in enough through their diet to meet basic health needs. Lysine has very few known side effects.

Scientific data on some lysine benefits are not yet conclusive. However, many people are exploring the use of lysine supplements, particularly in athletes and people who do not eat animal products. It is best to discuss the use of any supplement with a doctor. Lysine is an amino acid (building block of protein). Unlike some other amino acids, the human body cannot make lysine; therefore it must be eaten in the diet. Sources of lysine include meat, fish, dairy, eggs, and some plants such as soy and other legumes.

Lysine is taken by mouth or applied directly to the skin for preventing and treating cold sores (caused by the virus called herpes simplex labialis). Lysine is taken by mouth to improve athletic performance and for improving symptoms of schizophrenia. Lysine is also used to reduce symptoms of canker sores, and for diabetes, high triglyceride levels in the blood, muscle strength, stress, and a metabolic condition called metabolic alkalosis.

Because of its significance in a few organic cycles, an absence of lysine can prompt a few sickness states including faulty connective tissues, impeded unsaturated fat digestion, sickliness, and foundational protein-vitality insufficiency. Interestingly, an excess of lysine, brought about by incapable catabolism, can cause serious neurological issues.

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