

Editorial on Amino Acids

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Editorial

Amino acids are organic compounds that contain the functional groups amino ($-NH_2$) and carboxyl ($-COOH$), as well as a side chain (R group) unique to each amino acid. Carbon (C), hydrogen (H), oxygen (O), and nitrogen (N) are the four essential elements of an amino acid, while other elements can be present in the side chains of some amino acids. As of 1983, there are approximately 500 naturally occurring amino acids (though only 20 exist in the genetic code) that can be categorized in a variety of ways. They are categorized as alpha, beta, gamma, or delta-amino acids based on where the main structural functional groups are located; other categories include polarity, pH level, and side chain group form (aliphatic, acyclic, aromatic, or containing hydroxyl). Amino acid residues, in the form of proteins, are the second-largest component of human muscles and other tissues.

Uses in industry

Amino acids are used in a number of industries, but they are most commonly used

as animal feed additives. This is crucial because many of the feed's bulk ingredients, such as soybeans, have low levels or lack some of the essential in amino acids: lysine, methionine, threonine, and tryptophan are the most important the feed's output. Amino acids are also used in this industry to chelate metal cations in order to increase mineral absorption from supplements, which may be essential to improve the health or productivity of these animals.

Synthesis

Chemical synthesis: Normally, mutant bacteria that overproduce individual amino acids using glucose as a carbon source are used in industrial amino acid processing. Enzymatic conversions of synthetic intermediates generate certain amino acids.

Biosynthesis

In plants, nitrogen is first adapted into organic compounds in the form of glutamate, from alpha-ketoglutarate and ammonia in the mitochondrion. For other amino acids, plants use transaminases to move the amino group from glutamate to another alpha-keto acid.

How to cite this article: Raajitha Bellamkonda. "Editorial on Amino Acids." *Chem Sci J* 12 (2021). 230

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Received 03 March 2021; **Accepted** 10 March 2021; **Published** 15 March 2021