

# What is the Role of Amino Acids in Human Body?

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## ABSTRACT

**Amino Acids:** Amino acids are organic compounds that contain amine ( $-NH_2$ ) and carboxyl ( $-COOH$ ) functional groups, along with a side chain (R group) specific to each amino acid. The key elements of an amino acid are carbon (C), hydrogen (H), oxygen (O), and nitrogen (N), although other elements are found in the side chains of certain amino acids. About 500 naturally occurring amino acids are known (though only 20 appear in the genetic code) and can be classified in many ways.

**Keywords:** Amino Acids; Biotechnology; Glutamic acid; DNA; Cell Biology

## DESCRIPTION

Amino acids are the organic compounds which combine to form proteins; proteins are large biomolecules, or macromolecules, consisting of one or more long chains of amino acid residues. Proteins perform a vast array of functions within organisms, including catalysing metabolic reactions, DNA replication, responding to stimuli, providing structure to cells and organisms, and transporting molecules from one location to another. These proteins and amino acids are essential for the human body. Amino acids can also be used as a source of energy by the body. The capacity for rapid uptake/release of amino acids by equine and human erythrocytes provided evidence to support the theory that mammalian erythrocytes have a significant role in transport of amino acids from the liver to tissues, muscles and organs [1].

There are three groups of Amino Acids

- Essential amino acids
- Nonessential amino acids
- Conditional amino acids

**Essential amino acids:** An essential amino acid that cannot be synthesized *de novo* (from scratch) by the organism at a rate commensurate with its demand, and thus must be supplied in its diet. Some of the examples of amino acids are phenylalanine, valine, threonine, tryptophan, methionine, leucine, isoleucine, lysine, and histidine.

**Nonessential amino acids:** Nonessential amino acids can be made by the body, while essential amino acids cannot be made

by the body so you must get them from your diet. These nonessential amino acids will support immune function, formation of red blood cells, hormone synthesis, tissue growth and repair. It indicates our body produces an amino acid, even if we do not get it from the food we consume some of the examples of nonessential amino acids are alanine, arginine, asparagine, aspartic acid, cysteine, glutamic acid, glutamine, glycine, proline, serine, and tyrosine.

**Conditional amino acids:** Conditional amino acids are not that much of useful for human body, sometimes it may use for decreasing stress and illness and also like to reduce the disorders in Cardiovascular Diseases (CVD), some of the examples of conditional amino acids are Arginine, glutamine, and cysteine [2-3].

## WHAT IS THE ROLE OF AMINO ACIDS IN DNA?

Scientists have also used CRISPR to detect specific targets, such as DNA from cancer-causing viruses and RNA from cancer cells. Most recently, CRISPR has been put to use as an experimental test to detect the novel coronavirus.

## ADVANCES IN CRISPR/CAS-BASED GENE THERAPY

Enzymes in the body will first read the information in a DNA molecule which reproduces into an intermediary molecule called mRNA (messenger ribonucleic acid) and further mRNA molecule will reproduce into the language of amino acids [4].

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### ADVANTAGES OF AMINO ACIDS

- Muscles growth, connective tissue, assisting in formation of skin
- Improves the tissue strength
- Normal Digestion
- Supply energy for the body
- Helps to produce hormones in the body
- Maintaining healthy hair

### NATURAL SOURCES OF AMINO ACIDS

- Milk, Eggs, potatoes, Broccoli
- Spinach, Soy products (ex: tofu, edamame, soy milk)
- Salmon and tuna fish

### ROLE OF AMINO ACIDS IN CANCER

Amino acid catabolism produces metabolic intermediates affecting tumor cell growth and survival. Amino acids are involved in pathways that feed cancer cells and provide building blocks for cancer cell growth.

### CONCLUSION

A balanced food regimen can assist make certain which you get a wholesome consumption of critical and nonessential amino

acids at some stage in your day. Without an adequate intake of amino acids, your body will now no longer be capable of produce proteins for your body as effectively, and in a few instances the proteins in muscle and tissues will begin to weaken or degrade.

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