



Mechanism and Health Benefits of Bioactive Compound Allicin

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Description

Antioxidants are compounds that help neutralize harmful free radicals in the body, which can otherwise lead to oxidative stress and damage to cells. One such potent antioxidant is allicin, a compound found in garlic with a myriad of potential health benefits. Found primarily in garlic, allicin has garnered attention for its antioxidant properties and various potential health benefits. From supporting cardiovascular health to its antimicrobial effects, allicin continues to be a subject of scientific inquiry and a staple in alternative medicine practices.

Absorption mechanism

The absorption of antioxidants is a complex process influenced by various factors, including the chemical structure of the antioxidant, its source, and interactions with other compounds. For example, some antioxidants are fat-soluble, meaning they require the presence of dietary fats for optimal absorption, while others are water-soluble and can be absorbed directly into the bloodstream. In the case of allicin, its absorption is facilitated by the breakdown of garlic's cell walls. When garlic is crushed, chopped, or chewed, an enzyme called alliinase converts the precursor compound alliin into allicin. Once allicin is formed, it undergoes further metabolic processes in the body, including absorption in the stomach and small intestine.

Absorption of allicin primarily occurs in the gastrointestinal tract. However, its bioavailability is limited due to its unstable nature and susceptibility to degradation by stomach acid and other factors. Despite this, studies suggest that some allicin and its derivatives can be absorbed intact or metabolized into bioactive compounds upon consumption. Factors such as food matrix, processing methods, and individual differences in gut microbiota may influence the absorption and bioavailabil-

ity of allicin.

Antioxidant properties

One of the most celebrated attributes of allicin is its potent antioxidant activity. Antioxidants are compounds that neutralize harmful free radicals in the body, thus protecting cells from oxidative damage and reducing the risk of chronic diseases. Allicin, with its sulphur-containing structure, exhibits strong antioxidant properties by scavenging free radicals and enhancing the activity of endogenous antioxidant enzymes.

Research indicates that allicin may help combat oxidative stress, a condition characterized by an imbalance between free radicals and antioxidants in the body. By neutralizing free radicals and modulating oxidative pathways, allicin holds promise in mitigating various oxidative stress-related conditions, including cardiovascular diseases, neurodegenerative disorders, and aging processes.

Uses of allicin

The versatile nature of allicin lends itself to a myriad of potential applications across different domains:

Cardiovascular health: Allicin is believed to support heart health by promoting healthy blood lipid levels, reducing inflammation, and exerting antioxidant effects. Studies suggest that regular consumption of garlic or allicin supplements may help lower cholesterol levels, regulate blood pressure, and reduce the risk of atherosclerosis and cardiovascular events.

Antimicrobial activity: Allicin possesses potent antimicrobial properties, making it a natural remedy for combating various pathogens, including bacteria, viruses, fungi, and parasites. Its ability to inhibit the growth of harmful microorganisms has implications in the treatment of infections, ranging from the common cold to an-

tibiotic-resistant strains.

Immune support: As an immunomodulatory agent, allicin may bolster the immune system's defences against infections and diseases. By stimulating immune cell activity, enhancing cytokine production, and exerting anti-inflammatory effects, allicin contributes to overall immune function and resilience.

Anticancer potential: Preliminary studies suggest that allicin and garlic-derived compounds may possess anticancer properties by inhibiting tumor growth, inducing apoptosis (programmed cell death), and suppressing angiogenesis (formation of new blood vessels). While further research is warranted, these findings underscore the potential of allicin in cancer prevention and adjunctive therapy.

Gastrointestinal health: Allicin exhibits gastro protec-

tive effects by modulating gastric acid secretion, promoting mucosal integrity, and combating gastrointestinal pathogens. Its anti-inflammatory properties may also offer relief from digestive discomfort and conditions such as gastritis and peptic ulcers.

Allicin emerges as a multifaceted compound with diverse health-promoting properties. From its antioxidant prowess to its antimicrobial and immunomodulatory effects, allicin continues to captivate researchers and health enthusiasts alike. While further studies are needed to elucidate its mechanisms of action and therapeutic potential fully, the existing evidence underscores the value of incorporating allicin-rich foods or supplements into a balanced diet for enhanced well-being and disease prevention. As our understanding of allicin deepens, its role in promoting optimal health and vitality is poised to become increasingly prominent.