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Sommario/riassunto

Tryptophan is a rate-limiting essential amino acid and a unique building block of peptides and proteins. This largest amino acid serves as the precursor for the important endogenous indoleamines serotonin, N-acetylserotonin, and melatonin that act as neurotransmitters, neuromodulators, and neurohormones. Kynurenic acid is the most potent endogenous antiexitotoxic agent. Other highly relevant

pathways of tryptophan are the reversible transamination to indole-3-pyruvate with formation related indolic acids that act as potent antioxidant agents. Tryptophan metabolites, such as melatonin, and structurally related agents, such as indole-3-propionic acid, act as potent catalytic antioxidants and bioenergetic agents that facilitate regeneration and protection against stress and aging. Several indole compounds act as uremic toxins since these agents can induce radical formation that is associated with enhanced oxidative stress and damage. The exploration of the effects of these protective and toxic tryptophan derived agents has revealed important molecular mechanisms and mediators of adaptation and aging. Research on tryptophan in nutrition and health can facilitate the development of new approaches to extend human health and life span. Amino acids are the building blocks of life that enable repair, as well as recycling and regeneration. Research on nutrients like amino acids, such as tryptophan and its metabolites, as well as peptides and proteins, or extracts containing this molecular metabolism modifiers can improve health. Research into the indololome is a new emerging and rapidly growing field of utmost relevance to science and society.