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## L-Glutamine

L-Glutamine, a carbon and nitrogen donor is the most abundant amino acid in the body, and the most important component of muscle protein. It is the preferred fuel for intestinal tissues, promoting repair and intestinal healing, and has been demonstrated to be a functional component in the repair of ulcers, as well as a contributor to the healing of leaky gut conditions.

Glutamine is vital in protein synthesis, as it prevents muscles from being catabolised, and aids in the maintenance of both cell volume and hydration. The main storage site of glutamine is the musculature, where approximately 60% of unbound amino acids are glutamine. Glutamine also supports the immune system, and can stimulate human growth hormone levels. Additionally, it aids in accelerating wound healing, as well as in the healing of burns.

Although glutamine is naturally produced in the body, both stress and elevated levels of cortisol can lower the body's stores of glutamine. During times of physical stress glutamine production may be insufficient for healing, during which supplemental glutamine may be of benefit. Additionally, clinical studies have associated supplemental glutamine with a strengthened immune response.

The amount of glutamine in reserve for release as needed is directly related to muscle mass: the greater the muscle mass the more glutamine available for metabolic processes. Subsequently, one of the benefits of muscle-building exercise for good health is the increased availability of glutamine during times of stress. Under conditions of metabolic stress, including injuries, illness, or severe emotional distress, the level of glutamine in the body declines markedly. This decline is thought to adversely influence resistance to infectious diseases. Additionally, in certain muscle wasting diseases, glutamine levels may be insufficient to meet daily needs, and thus contribute to the overall disease pathology. In addition to contributing to needs during times of stress, high doses of L-Glutamine may also contribute to increase the in vivo production of growth hormone, thus contributing to increasing muscle mass. Glutamine also functions as a nitrogen shuttle, allowing circulating glutamine to bring metabolic fuel to various organs.



## Research Pertaining to Other Topics of Interest

More evidence on Vitamin D and MS – Earlier we reported on the relationship between maternal vitamin D levels and the impact on MS risk on babies(1). Additional new research supports vitamin D therapy for MS(2). In this study, funded by the National Multiple Sclerosis Society, researchers investigated different combinations of vitamin D therapy in a mouse MS model known as experimental autoimmune encephalomyelitis (EAE). They found that an initial in dose of calcitriol, the active vitamin D hormone, and vitamin D3 supplementation was hugely successful in reversing clinical signs of EAE, without inducing hypercalcemia. The therapy increased Treg immune cells in the central nervous system (CNS) and reduced CNS CD4+ T cells, as well as spinal cord and optic nerve pathology, promoting clinical recovery. According to Colleen Hayes, the lead investigator, the therapy was extremely successful, with 100% of mice responding.

(1) Dobson et al. *J. Neurol Neurosurg Psychiatry* 2013;84:427-432

(2) Faye E. et al, *Journal of Neuroimmunology* Vol 263, Issues 1-2, Pages 64-74, doi; 10.1016/j.jneuroim.2013.07.016