

◆ **Zinc** was first recognized as essential for human health over forty years ago.¹ As one of the most important trace elements, it plays a vital role in more than 300 enzymatic and biological processes,² and is considered a major element in assuring the correct functioning of an organism from the earliest embryonic stages to the last periods of life.³ It is an essential element for growth and nervous system function,⁴ and the relevance of zinc for immune efficiency has been well established.⁵ Its supplementation has been demonstrated to increase the efficiency of the immune system in a number of study populations, ranging from those considered “healthy” to those with severe immune dysfunction.^{6,7} Within the immune system, zinc is crucial for development and function of neutrophils, NK cells, macrophages, T cells and B cells. It is a critical cofactor of Thymulin, a thymic hormone involved in T-cell maturation.⁸ Zinc also plays an role in important oxidative modulating/antioxidant and balance of inflammatory processes,⁹ thus reducing free-radical-induced cellular injury.¹⁰

¹ **Zinc in Human Health: Effect of Zinc on Immune Cells.** Prasad A, Mol Med. 2008 May–Jun; 14(5-6): 353–357. <http://www.ncbi.nlm.nih.gov/pubmed/18385818>; Free full text: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2277319/?tool=pubmed>

² **Zinc, metallothioneins, immune responses, survival and ageing.** Mocchegiani E, Muzzioli M, Giacconi R. Biogerontology 1: 133-143, 2000. <http://www.ncbi.nlm.nih.gov/pubmed/11707929>

³ **Zinc, Human diseases and aging.** Fabris N, Mocchegiani E. Aging (Milano). 1995 Apr;7(2):77-93. <http://www.ncbi.nlm.nih.gov/pubmed/7548268>

⁴ **Zinc and immune function: the biological basis of altered resistance to infection.** Shankar A, Prasad A. Am J Clin Nutr 1999;68(suppl):447S-63S. <http://www.ncbi.nlm.nih.gov/pubmed/9701160>; Free full-text access: <http://www.ajcn.org/cgi/reprint/68/2/447S>

⁵ **Therapeutic Application of Zinc in Human Immunodeficiency Virus against Opportunistic Infections.** Mocchegiani E, Mario M. J Nutr. 2000 May;130(5S Suppl):1424S-31S. <http://www.ncbi.nlm.nih.gov/pubmed/10801955>; Free full-text access: <http://jn.nutrition.org/cgi/content/full/130/5/1424S>

⁶ **Zinc, Human diseases and aging.** Fabris N, Mocchegiani E. Aging (Milano). 1995 Apr;7(2):77-93. <http://www.ncbi.nlm.nih.gov/pubmed/7548268>

⁷ **Zinc in Human Health: Effect of Zinc on Immune Cells.** Prasad A. Mol Med. 2008 May–Jun; 14(5-6): 353–357. <http://www.ncbi.nlm.nih.gov/pubmed/18385818>; Free full text: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2277319/?tool=pubmed>

⁸ **Zinc: Mechanisms of Host Defense.** Prasad A. J Nutr. 2007 May;137(5):1345-9. <http://www.ncbi.nlm.nih.gov/pubmed/17449604>; Free full-text access: <http://jn.nutrition.org/cgi/content/full/137/5/1345>

⁹ **Clinical, immunological, anti-inflammatory and antioxidant roles of zinc.** Prasad AS. Exp Gerontol. 2008 May;43(5):370-7. <http://www.ncbi.nlm.nih.gov/pubmed/18054190>

¹⁰ **Zinc in Human Health: Effect of Zinc on Immune Cells.** Prasad A. Mol Med. 2008 May–Jun; 14(5-6): 353–357. <http://www.ncbi.nlm.nih.gov/pubmed/18385818>; Free full text: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2277319/?tool=pubmed>