



Imuno TF® Complex

The definitive option to regulate immune defense

The Imuno TF® Complex

- Food Supplement with Transfer Factors
- Contains vitamin C, selenium, and zinc which contribute to the protection of cells from oxidative stress and to the normal function of the **immune system**.

The normal function of the immune system is the key for a health life

The immune system is a highly differentiated system and an interactive network in the human body that involves multiple cells (cellular response, e.g. macrophages and dendritic cells) and circulating molecules (humoral response, e.g. immunoglobulins) to create a unique defense mechanism.

If our immune system is healthy, the natural defenses are sufficient to eliminate pathogens and to prevent diseases. On the other hand, if our immune system is not healthy enough (due to bad eating habits, stress, sedentarism and others), our body is not able to eliminate pathogens in due time and diseases can appear (or be more severe, compared to a healthy person).

In addition, we live in a world that is every day more prone to put us in contact with infectious virus and other microorganisms, threatening our immune system and, consequently, our health.

Therefore, the normal function of the immune system is indeed the preponderant factor for healthy, diseases-free life. To help you in the journey to regulate your immune system, we present you the **Imuno TF® Complex**.



The Imuno TF® Complex

The **Imuno TF® Complex** is a blend of carefully chosen ingredients that can play a role on the regulation of the immune responses through multiple pathways, contributing to a normal function of your immune system and also to the protection of cells from oxidative stress and to the reduction of tiredness and fatigue.

- Imuno TF®
- Cat's Claw bark extract (*Uncaria tomentosa*)
- Astaxanthin (from *Haematococcus pluvialis*)
- Zinc
- Selenium
- Vitamin D₃
- Vitamin C
- Ferulic acid
- Resveratrol (from *Polygonum cuspidatum*)
- Spirulina powder (*Spirulina platensis*)
- N-acetyl cysteine
- Glucosamine sulfate potassium chloride

Imuno TF® Complex ingredients

Imuno TF®

Ultra-purified and non-allergenic blend of oligo- and polypeptides known as transfer factors.¹⁻⁶ Regulates the immune response, increasing the natural defenses and avoiding overproduction of inflammatory and allergenic molecules.⁷⁻⁹

Uncaria tomentosa (Cat's claw)

Cat's claw has immunostimulant, antioxidant and anti-inflammatory activities.¹⁰ Moreover, it can decrease lipid peroxidation and reduce the level of reactive oxygen species¹¹ and presents activity against bacteria and virus.¹²⁻¹⁸

Astaxanthin

(from *Haematococcus pluvialis*)

Astaxanthin is often referred as a "super-antioxidant" molecule, because of its capacity to reduce free radicals and oxidative stress: 65 times greater than vitamin C, 54 times more than β -carotene, and 100 times more than α -tocopherol.¹⁹ Additionally, the molecule also presents immunomodulating activity.²⁰⁻²²

Zinc

Zinc is a crucial element for normal development and function of cells mediating nonspecific immunity, such as neutrophils and natural killer (NK) cells; therefore a good zinc status is recommended to support an effective immune function.^{23,24}

Selenium

Selenium can contribute to the normal function of the immune system through the stimulation of CD4⁺ Th1 and CD8⁺ lymphocytes, NK cells, and macrophage phagocytosis.²⁵ Selenium is also a potent antioxidant that contributes to the protection of cells from oxidative stress.²⁶

Vitamin D₃

Vitamin D₃ plays a role on the regulation (inhibition) of B cell proliferation and differentiation (B cells are recognized as key factors in inflammation, as they can secrete inflammatory cytokines).²³ As Vitamin D₃ exhibits anti-inflammatory properties, it could therefore potentiate innate immunity while controlling the potentially harmful inflammatory response. This immunoregulatory effect could in turn prevent hyperinflammatory response caused by respiratory tract infections.^{23,27-29}

Vitamin C

Vitamin C contributes to the normal functional of the immune system.³⁰ Vitamin C can increase lymphocytes B and T proliferation and differentiation at a controlled rate.³¹⁻³³ It can also potentially increase the activation of NK-cells, improving immune response against foreign invaders.³⁴

Ferulic acid

Ferulic acid induces various peroxidase enzymes (enzymes that neutralize hydrogen peroxidase, a reactive oxygen species) and promote synthesis of glutathione (antioxidant). It also provides potential protection against tissue damage (including lung) coming from excessive inflammatory response.²⁴

Resveratrol

(from *Polygonum cuspidatum*)

Resveratrol can inhibit the production of inflammatory factors and reduce NF- κ B, TNF- α , IL-1 and IL-6.³⁵⁻³⁷ Resveratrol can potentially increase the activation of NK-cells, improving immune response against foreign invaders.^{38,39}

Spirulina

Spirulina can potentially increase the activation of macrophages and NK-cells, improving immune response against foreign invaders,^{40,41} and of T-cells functions, promoting their activation and proliferation.^{23,42}

N-acetyl cysteine

N-acetyl cysteine might be expected to help to prevent and control RNA virus infections.²⁴

Glucosamine sulfate potassium chloride

Glucosamine might be expected to help to prevent and control RNA virus infections.²⁴



References

- Lawrence HS. The transfer in humans of delayed skin sensitivity to streptococcal M substance and to tuberculin with disrupted leucocytes. *J Clin Invest.* 1955;34(2):219-230.
- Kirkpatrick CH. Structural Nature and Functions of Transfer Factors. *Ann N Y Acad Sci.* 1993;685:362-368.
- Rozzo SJ, Kirkpatrick CH. Purification of Transfer Factors. *Mol Immunol.* 1992;29(2):167-182.
- White A. *Transfer Factors & Immune System Health.* 2nd ed. U.S.A.: BookSurge Publishing; 2009.
- Kirkpatrick CH. Activities and characteristics of transfer factors. *Biotherapy.* 1996;9(1-3):13-16.
- Berrón-Pérez R, Chávez-Sánchez R, Estrada-García I, et al. Indications, usage, and dosage of the transfer factor. *Rev Alerg Mex.* 2007;54(4):134-139.
- Krishnaveni M. A review on transfer factor an immune modulator. *Drug Invent Today.* 2013;5(2):153-156. doi:10.1016/j.dit.2013.04.002
- Kirkpatrick CH. Biological Response Modifiers. Interferons, Interleukins, and Transfer Factor. *Ann Allergy.* 1989;62(3):170-176.
- White A. Research on Transfer Factors in Disease Treatment and Prevention ©. *Explore!*. 2009;18(5):4.
- Valerio JR LG, F GG. Toxicological Aspects of the South American Herbs Cat's Claw (*Uncaria tomentosa*) and Maca (*Lepidium meyenii*): A Critical Synopsis. *Toxicol Rev.* 2005;24(1):11-35. doi:10.2165/00139709-200524010-00002
- Cheng AC, Jian CB, Huang YT, Lai CS, Hsu PC, Pan MH. Induction of apoptosis by *Uncaria tomentosa* through reactive oxygen species production, cytochrome c release, and caspases activation in human leukemia cells. *Food Chem Toxicol.* Published online 2007. doi:10.1016/j.fct.2007.05.016
- Caon T, Kaiser S, Feltrin C, et al. Antimutagenic and antiherpetic activities of different preparations from *Uncaria tomentosa* (cat's claw). *Food Chem Toxicol.* 2014;66(January):30-35. doi:10.1016/j.fct.2014.01.013
- Gama CR. Avaliação Clínica da *Uncaria tomentosa* no Tratamento e Controle de Lesões Decorrentes de Infecção pelo Vírus Herpes Simplex. *J Bras Doenças Sex Transm.* 2010;22(4):215-221. doi:10.5533/2177-8264-201022408
- Passos MRL, Eleutério J, Cavalcanti SMB, Salles RS. Genital herpes on the penis and topic use of *Uncaria Tomentosa*: case report. *J Bras Doenças Sex Transm.* Published online 2014. doi:10.5533/dst-2177-8264-2014261-407
- Querino A Caldas L, Olej B, Slomp H, et al. *Uncaria tomentosa* in the treatment of the herpes labialis: randomized double-blind trial. *DST j bras doenças sex transm.* Published online 2010.
- Romero M, Passos L, Geller M, et al. Herpes Genital Vulvar e uso tópico de *Uncaria tomentosa*: relato de caso *Uncaria tomentosa* and topical Use in Genital Herpes in VUIVa: case report. *DST -J bras Doenças Sex Transm.* Published online 2010.
- Lima-Junior RS, Da Silva Mello C, Kubelka CF, Siani AC, Valente LMM. *Uncaria tomentosa* alkaloidal fraction reduces paracellular permeability, il-8 and ns1 production on human microvascular endothelial cells infected with dengue virus. *Nat Prod Commun.* Published online 2013. doi:10.1177/1934578x1300801112
- European Medicines Agency. *Assessment Report on Uncaria Tomentosa (Willd. Ex Schult.) DC., Cortex.*; 2015.
- Shah MMR, Liang Y, Cheng JJ, Daroch M. Astaxanthin-producing green microalga *Haematococcus pluvialis*: From single cell to high value commercial products. *Front Plant Sci.* Published online 2016. doi:10.3389/fpls.2016.00531
- Park JS, Mathison BD, Hayek MG, Massimino S, Reinhart GA, Chew BP. Astaxanthin stimulates cell-mediated and humoral immune responses in cats. *Vet Immunol Immunopathol.* Published online 2011. doi:10.1016/j.vetimm.2011.08.019
- Chew BP, Mathison BD, Hayek MG, Massimino S, Reinhart GA, Park JS. Dietary astaxanthin enhances immune response in dogs. *Vet Immunol Immunopathol.* Published online 2011. doi:10.1016/j.vetimm.2010.12.004
- Park JS, Chyun JH, Kim YK, Line LL, Chew BP. Astaxanthin decreased oxidative stress and inflammation and enhanced immune response in humans. *Nutr Metab.* Published online 2010. doi:10.1186/1743-7075-7-18
- Cicero AFG, Colletti A. *Handbook of Nutraceuticals for Clinical Use.*; 2018. doi:10.1007/978-3-319-73642-6
- McCarty MF, DiNicolantonio JJ. Nutraceuticals Have Potential for Boosting the Type 1 Interferon Response to RNA Viruses Including Influenza and Coronavirus. *Prog Cardiovasc Dis.* Published online 2020:[Epub ahead of print].
- Hoffman PR, Berry MJ. The influence of selenium on immune responses. *Mol Nutr Food Res.* 2008;52(11):1273-1280.
- European Food Safety Authority. Scientific Opinion on the safety and efficacy of selenium in the form of organic compounds produced by the selenium-enriched yeast *Saccharomyces cerevisiae* NCYC R645 (SelenoSource AF 2000) for all species. *EFSA J.* 2011;9(6). doi:10.2903/j.efsa.2011.2279
- Aranow C. Vitamin D and the immune system. *J Investig Med.* 2011;59(6):881-886. doi:10.3899/jrheum.090797
- Grant WB, Lahore H, McDonnell SL, et al. Evidence that vitamin d supplementation could reduce risk of influenza and covid-19 infections and deaths. *Nutrients.* 2020;12(4):1-19. doi:10.3390/nu12040988



29. Hansdottir S, Monick MM. Vitamin D Effects on Lung Immunity and Respiratory Diseases. *Vitam Horm.* 2011;86(319):217-237. doi:10.1016/B978-0-12-386960-9.00009-5
30. European Food Safety Authority. Scientific Opinion on the re-evaluation of ascorbic acid (E 300), sodium ascorbate (E 301) and calcium ascorbate (E 302) as food additives. *EFSA J.* 2015;13(5):1-124. doi:10.2903/j.efs.2015.4087
31. Carr AC, Maggini S. Vitamin C and immune function. *Nutrients.* 2017;9(11):1-25. doi:10.3390/nu9111211
32. Anderson R, Oosthuizen R, Maritz R, Theron A, Van Rensburg AJ. The effects of increasing weekly doses of ascorbate on certain cellular and humoral immune functions in normal volunteers. *Am J Clin Nutr.* 1980;33(1):71-76. doi:10.1093/ajcn/33.1.71
33. Anderson R. Ascorbate-mediated stimulation of neutrophil motility and lymphocyte transformation by inhibition of the peroxidase/H₂O₂/halide system in vitro and in vivo. *Am J Clin Nutr.* 1981;34(9):1906-1911. doi:10.1093/ajcn/34.9.1906
34. Heuser G, Vojdani A. Enhancement of natural killer cell activity and T and B cell function by buffered vitamin C in patients exposed to toxic chemicals: The role of protein kinase - C. *Immunopharmacol Immunotoxicol.* 1997;19(3):291-312. doi:10.3109/08923979709046977
35. Baur JA, Sinclair DA. Therapeutic potential of resveratrol: The in vivo evidence. *Nat Rev Drug Discov.* 2006;5(6):493-506. doi:10.1038/nrd2060
36. Malaguarnera L. Influence of resveratrol on the immune response. *Nutrients.* 2019;11(5):1-24. doi:10.3390/nu11050946
37. Yang Y, Li S, Yang Q, et al. Resveratrol reduces the proinflammatory effects and lipopolysaccharide-induced expression of HMGB1 and TLR4 in RAW264.7 Cells. *Cell Physiol Biochem.* 2014;33(5):1283-1292. doi:10.1159/000358696
38. Li Q, Huyan T, Ye LJ, Li J, Shi JL, Huang QS. Concentration-dependent biphasic effects of resveratrol on human natural killer cells in vitro. *J Agric Food Chem.* 2014;62(45):10928-10935. doi:10.1021/jf502950u
39. Leischner C, Burkard M, Pfeiffer MM, Lauer UM, Busch C, Venturelli S. Nutritional immunology: Function of natural killer cells and their modulation by resveratrol for cancer prevention and treatment. *Nutr J.* 2016;15(1):1-12. doi:10.1186/s12937-016-0167-8
40. Khan Z, Bhadouria P, Bisen P. Nutritional and Therapeutic Potential of Spirulina. *Curr Pharm Biotechnol.* 2005;6(5):373-379. doi:10.2174/138920105774370607
41. Hirahashi T, Matsumoto M, Hazeki K, Saeki Y, Ui M, Seya T. Activation of the human innate immune system by Spirulina: Augmentation of interferon production and NK cytotoxicity by oral administration of hot water extract of *Spirulina platensis*. *Int Immunopharmacol.* 2002;2(4):423-434. doi:10.1016/S1567-5769(01)00166-7
42. Park HJ, Lee YJ, Ryu HK, Kim MH, Chung HW, Kim WY. A randomized double-blind, placebo-controlled study to establish the effects of spirulina in elderly Koreans. *Ann Nutr Metab.* 2008;52(4):322-328. doi:10.1159/000151486



Disclaimer

All statements in this document have not been evaluated by the Food and Drug Administration or the European Medicines Agency. **Imuno TF® Complex** refers to a dietary supplement and it is not intended to diagnose, treat, or cure any disease.

Consult a doctor or healthcare professional before use if you are taking any medications or are under medical supervision, pregnant or breast-feeding.

Discontinue use and consult a doctor if adverse reactions occur.

Keep out of reach of children.

Do not exceed the recommended daily dose.

Scientific Support

Detailed information on the mechanism of action and safety profile of the **Imuno TF® Complex** is available in the "**Imuno TF® Complex Scientific Brochure**", available upon request.

Fagron works in collaboration with universities and research centers around the world to strengthen the scientific backing of **Imuno TF® Complex**. We maintain a database of published literature which is used by our technical experts to provide tailor-made, well-researched answers on technical questions.

Please contact our scientific experts to get more details about the applications and technical benefits of **Imuno TF® Complex**.



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