Technical Data Sheet

TB-500

Product Information

Alternate Names:	Thymosin Beta-4 fragment (active region)
Size:	10.0mg
Format/Appearance:	Lyophilized, white/off-white powder
Sequence:	N-Acetyl-Leu-Lys-Lys-Thr-Glu-Thr-Gln
Purity:	>98%
Recommended Diluent:	Bacteriostatic Water

Description

TB-500 is a synthetically produced fragment of the active region of a naturally occurring peptide produced in the thymus, Thymosin Beta-4. Its role in the body is to upregulate cell building proteins, for example, actin, which is a protein that structures (along with myosin) the contractile fibers of muscle cells, and is additionally associated with migration and metabolism in many cell types. Upregulation of actin by TB-500 promotes healing, cell renewal/growth, cell migration and proliferation. This allows the body to create new blood vessel pathways to supply injured areas with nutrients and upregulate acute (or "good") inflammation, which is directly correlated with faster wound healing.

TB-500 has been found to play an important role in protection, regeneration, and remodeling of injured or damaged tissues.

Indications and Benefit

- Soft tissue repair
- Cardiac and kidney function
- Hair loss
- Reduced inflammation of tissue in joints
- Prevents the formation of adhesions and fibrous bands in muscles, tendons, and ligaments

Preparation and Storage

Peptides should be stored in a dry, cool, dark place. For best preservation, store at 4°C or colder away from bright light. Dry peptides are stable at room temperature for many weeks but for long-term storage -20°C is to be preferred. Once reconstituted, refrigeration is essential.

Clinical Research and Related Publications

Bjørklund, G., Dadar, M., Aaseth, J., & Chirumbolo, S. (2020). Thymosin β4: A Multi-Faceted Tissue Repair Stimulating Protein in Heart Injury. Current Medicinal Chemistry, 27(37), 6294–6305. https://doi.org/10.2174/0929867326666190716125456

Hara, T. (2011). Thymosins and Muscle Regeneration. Vitamins & Hormones, 277–290. https://doi.org/10.1016/b978-0-12-386015-6.00032-9

Hinkel, R., Klett, K., Bähr, A., & Kupatt, C. (2018). Thymosin β4-mediated protective effects in the heart. Expert Opinion on Biological Therapy, 18(sup1), 121–129. https://doi.org/10.1080/14712598.2018.1490409

Kaur, H., & Mutus, B. (2012). Platelet function and thymosin β4. Biological Chemistry, 393(7), 595–598. https://doi.org/10.1515/hsz-2012-0131

Kleinman, H. K., & Sosne, G. (2016). Thymosin β4 Promotes Dermal Healing. Vitamins and Hormones, 251–275. https://doi.org/10.1016/bs.vh.2016.04.005

Li, X., Zheng, L., Peng, F., Qi, C., Zhang, X., Zhou, A., Liu, Z., & Wu, S. (2007). Recombinant thymosin beta 4 can promote full-thickness cutaneous wound healing. Protein Expression and Purification, 56(2), 229–236. https://doi.org/10.1016/j.pep.2007.08.011

Philp, D., Goldstein, A. L., & Kleinman, H. K. (2004). Thymosin β4 promotes angiogenesis, wound healing, and hair follicle development. Mechanisms of Ageing and Development, 125(2), 113–115. https://doi.org/10.1016/j.mad.2003.11.005

PHILP, D., ST-SURIN, S., CHA, H.-J., MOON, H.-S., KLEINMAN, H. K., & ELKIN, M. (2007). Thymosin Beta 4 Induces Hair Growth via Stem Cell Migration and Differentiation. Annals of the New York Academy of Sciences, 1112(1), 95–103. https://doi.org/10.1196/annals.1415.009

Pipes, G. T., & Yang, J. (2016). Cardioprotection by Thymosin Beta 4. Vitamins and Hormones, 209–226. https://doi.org/10.1016/bs.vh.2016.04.004

Silva, W. A. (2003). The Profile of Gene Expression of Human Marrow Mesenchymal Stem Cells. Stem Cells, 21(6), 661–669. https://doi.org/10.1634/stemcells.21-6-661

Song, K., Han, H.-J., Kim, S., & Kwon, J. (2020). Thymosin beta 4 attenuates PrP(106-126)-induced human brain endothelial cells dysfunction. European Journal of Pharmacology, 869, 172891. https://doi.org/10.1016/j.ejphar.2019.172891

Sosne, G., Szliter, E. A., Barrett, R., Kernacki, K. A., Kleinman, H., & Hazlett, L. D. (2002). Thymosin Beta 4 Promotes Corneal Wound Healing and Decreases Inflammation in Vivo Following Alkali Injury. Experimental Eye Research, 74(2), 293–299. https://doi.org/10.1006/exer.2001.1125

Tokura, Y., Nakayama, Y., Fukada, S.-, Nara, N., Yamamoto, H., Matsuda, R., & Hara, T. (2010). Muscle injury-induced thymosin 4 acts as a chemoattractant for myoblasts. Journal of Biochemistry, 149(1), 43–48. https://doi.org/10.1093/jb/mvq115

Young, J. D., Lawrence, A. J., MacLean, A. G., Leung, B. P., McInnes, I. B., Canas, B., Pappin, D. J. C., & Stevenson, R. D. (1999a). Thymosin β 4 sulfoxide is an anti-inflammatory agent generated by monocytes in the presence of glucocorticoids. Nature Medicine, 5(12), 1424–1427. https://doi.org/10.1038/71002

Young, J. D., Lawrence, A. J., MacLean, A. G., Leung, B. P., McInnes, I. B., Canas, B., Pappin, D. J. C., & Stevenson, R. D. (1999b). Thymosin β 4 sulfoxide is an anti-inflammatory agent generated by monocytes in the presence of glucocorticoids. Nature Medicine, 5(12), 1424–1427. https://doi.org/10.1038/71002

Zuo, Y., Chun, B., Potthoff, S. A., Kazi, N., Brolin, T. J., Orhan, D., Yang, H.-C., Ma, L.-J., Kon, V., Myöhänen, T., Rhaleb, N.-E., Carretero, O. A., & Fogo, A. B. (2013). Thymosin β4 and its degradation product, Ac-SDKP, are novel reparative factors in renal fibrosis. Kidney International, 84(6), 1166–1175. https://doi.org/10.1038/ki.2013.209