

Thymosin Beta-4

Patient Education Guide — What It Does, Why a Physician Would Prescribe It, and What the Evidence Says

NJ Weight Loss & Preventive Care Clinics PA · 420 Route 46 East Fairfield NJ 07004 & 1605 E Evesham Road Voorhees NJ 08043 · (908) 598-0509 · jbock@njweightloss.us · njweightloss.us

Important Disclaimer

This information is not medical advice and is provided only to help begin your research. All clinical and dosing decisions must be made with a licensed, experienced physician and a licensed, experienced compounding pharmacist, supported by published clinical studies. This material was compiled using Artificial Intelligence, statements from videos and websites by apparent qualified professionals, and available published research. Anyone starting a medication they have never taken before should take an extremely conservative approach. We are not affiliated with any of the doctors whose videos are referenced below.

Thymosin Beta-4

Investigational

Compounded

Also known as: TB4, Tβ4

Category: Tissue Repair & Recovery — Endogenous Regenerative Protein

What it actually is—and why the name confusion matters. Thymosin Beta-4 is a naturally occurring 43-amino-acid protein present in nearly every human cell except red blood cells. It was first isolated from calf thymus, which is where the name comes from, though it turned out to be nearly ubiquitous in the body. It is *not* the same thing as TB-500, which is a much shorter synthetic fragment. Patients and clinics use the two names interchangeably constantly. They shouldn't—different molecules, different pharmacokinetics, different evidence bases, and different regulatory considerations. That is exactly why we give each its own page.

How it works. TB4's best-characterized biochemical role is regulating actin—the cytoskeletal protein cells use to change shape and migrate—by sequestering monomeric G-actin. That single mechanism sits underneath most of what the literature explores: cell migration into injured tissue, angiogenesis (new blood vessel formation), anti-inflammatory signaling, and cytoprotection. In healthy bodies, TB4 levels rise naturally after injury to help orchestrate repair. Animal studies from the 1990s onward demonstrated that TB4 promotes tissue repair in skin and increases blood supply to damaged tissue.

Why a physician might discuss it, and honest expectations. Full-length TB4 carries the more substantial human research record of the two forms, including the RegeneRx Biopharmaceuticals clinical program in topical and ophthalmic wound healing—corneal repair, dry eye, and dermal wounds—plus cardiac studies following ischemic injury. That human safety context is real, and it is more than most repair peptides can claim. What it does not do is validate injectable use for general soft-tissue repair, which remains investigational. TB4 is not FDA-approved for human use and is on the World Anti-Doping Agency prohibited list at all times. Because pro-migratory and pro-angiogenic effects could theoretically support occult tumor growth, cancer history matters. Effects, when reported, develop gradually over weeks—this is not a painkiller, and it is not a reason to postpone imaging, physical therapy, or surgical evaluation.

Published Evidence: Goldstein, Hannappel, Sosne, and Kleinman's comprehensive review (*Expert Opin Biol Ther*, 2012) documents TB4's multi-functional regenerative properties and clinical applications across dermal, corneal, and cardiac repair. Sosne et al. published corneal wound-healing work supporting ophthalmic clinical study, and Bao et al. (*Front Pharmacol*, 2013) reported cardioprotection with systemic TB4 dosing following ischemic myocardial injury in animal models.

Key Study: Goldstein AL, Hannappel E, Sosne G, Kleinman HK. "Thymosin β4: A Multi-Functional Regenerative Peptide. Basic Properties and Clinical Applications." *Expert Opin Biol Ther*. 2012;12(1):37-51.

Recommended Videos (educational, independent sources)

► **Drew Timmermans, ND, RMSK** — Thymosin Beta-4 for Musculoskeletal Healing

https://www.youtube.com/watch?v=YF_UAUE3jsq

► **Dr. David Geier, Orthopedic Surgeon** — Thymosin Beta 4 for Injury Recovery and More

https://www.youtube.com/watch?v=HcuYhU7y_zw

► **Drew Timmermans, ND, RMSK** — TB500 vs TB4: The Truth They Rarely Tell You
<https://www.youtube.com/watch?v=351XVzOWBwk>

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njweightloss.us/Peptide-Guide-Dosing.html