

Thymosin β4

Thymosin β4 is a naturally occurring 43-amino-acid peptide that binds monomeric actin and is abundant in many cell types. It has been studied in animal models of tissue repair and in human trials of ophthalmic and topical formulations, and is not approved.



■ Hydrophobic ■ Acidic ■ Basic ■ Polar ■ Gly, Pro, Cys ■ Non-standard

Length	43 residues
Formula	C ₂₁₂ H ₃₅₀ N ₅₆ O ₇₈ S
Average mass	4,963.44 g/mol
Monoisotopic mass	4,960.4863 Da
Evidence	Late-stage clinical trials
US status	Not FDA-approved for any use
WADA	Prohibited (S2)

43 residues, N-terminally acetylated.

Expected ions (monoisotopic)

[M+H] ⁺	[M+2H] ²⁺	[M+3H] ³⁺	[M+4H] ⁴⁺
4,961.4936	2,481.2504	1,654.5027	1,241.1289

What the COA should show

A good certificate of analysis should confirm identity by mass spectrometry, with the observed mass matching the expected mass shown on this page for the N-acetylated 43-residue sequence, and report HPLC purity with the chromatogram. Confirm that the sample is full-length thymosin β4 and not a fragment sold under a similar name, since the masses differ greatly. Check for loss of the N-terminal acetyl group, for truncated sequences typical of long syntheses, and for a +16 Da species indicating methionine oxidation. The salt form and net peptide content should be stated. For recombinant material, host-cell protein and endotoxin results are also relevant.

Storage and stability

Store lyophilized thymosin β4 sealed at -20 °C or colder, protected from light and moisture, and equilibrate to room temperature before opening. Its methionine residue is oxidation-prone, so minimize air exposure, consider purging vials with inert gas for long-term storage, and avoid oxidizing buffers. In solution, keep refrigerated for short-term lab use, aliquot for frozen storage at -20 °C or below, and avoid repeated freeze-thaw cycles. Long, flexible peptides can adsorb to plastic surfaces at low concentrations, so low-binding tubes may help.

Full entry, references and latest research: <https://peptidewiki.net/compounds/thymosin-beta-4/>
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