

PRODUCT IDENTIFICATION

Field	Value
Product Name	Thymalin (Thymulin / STF)
CAS Number	63958-90-7
Molecular Formula	
Molecular Weight	C ₃₉ H ₅₄ N ₁₂ O ₁₅
Amino Acid Sequence	858.86 Da
CoA / Lot / QC	pGlu-Ala-Lys-Ser-Gln-Gly-Gly-Ser-Asn-OH
Report Date	BPL872999 / 38209872 / QC #999
	29/08/2026

IDENTITY · QUANTITY · PURITY

Parameter	Specification	Result	Status
Molecular Mass (ESI-HRMS)	MW 858.86 Da · m _Δ < 5 ppm	[M+H] ⁺ 859.9 m/z · m _Δ < 2 ppm	PASS
Charge States (ESI+)	z=1 [M+H] ⁺ (base) · z=2 [M+2H] ²⁺	z=1: 859.9 · z=2: 430.4 m/z	PASS
Sequence (MS/MS)	pGlu-Ala-Lys-Ser-Gln-Gly-Gly-Ser-Asn-OH	Confirmed by b/y fragmentation	PASS
N-terminal (pGlu)		Confirmed	PASS
Purity (RP-UHPLC)	Cyclic pyroglutamate — no free NH ₂	99.2% · RT 4.8 min	PASS
Related Substances	≥ 99.0% area — UV 214 nm	0.8% sum	PASS
Net Peptide Content	Total ≤ 1.0%	99.2% · no excipients	PASS
Quantity	≥ 98.0% (mannitol-free)	10.00 mg net peptide	PASS
UV Detection	10 mg nominal (lyophilized)	Single-channel 214 nm	PASS
	214 nm only (no aromatics)		PASS
Endotoxin (LAL)	<1.0 EU/mg (1:10 dilution)	<0.05 EU/mL — see Form 1	PASS

ANALYTICAL NOTE — PYROGLUTAMATE (PGLU) N-TERMINAL & ZINC DEPENDENCY

Thymalin contains a pyroglutamate (pGlu) at the N-terminus formed by cyclization of the N-terminal glutamine residue. This cyclic lactam blocks the N-terminus — Edman degradation FAILS at cycle 1. Sequence confirmation requires MS/MS fragmentation (b/y ion series). In ESI+, ionization occurs primarily at Lys (epsilon-amine) and C-terminal Asn. Additionally, Thymalin requires Zn²⁺ for full biological activity. The analytically confirmed zinc-free form reported here is biologically inactive until zinc is complexed. Avoid adding Zn chelators (EDTA, EGTA) to reconstituted samples intended for bioassay. Zn²⁺ complexation does not alter MW or HPLC retention time under standard conditions.

ANALYTICAL METHOD PARAMETERS

Parameter	Details
System	Agilent 1290 Infinity II UHPLC
MS Detector	Agilent 6545 Q-TOF HRMS
Ionization	ESI+ · Dual AJS source

AUTHORIZATION

Reviewed & Released by

Jefrey Collins

Operations Manager

Biopelabs Laboratories



Report Date / Reference

29/08/2026

Lot: 38209872

CoA: BPL872999

Solubility / Storage

Deionized Water or WFI

−20 °C · desiccated

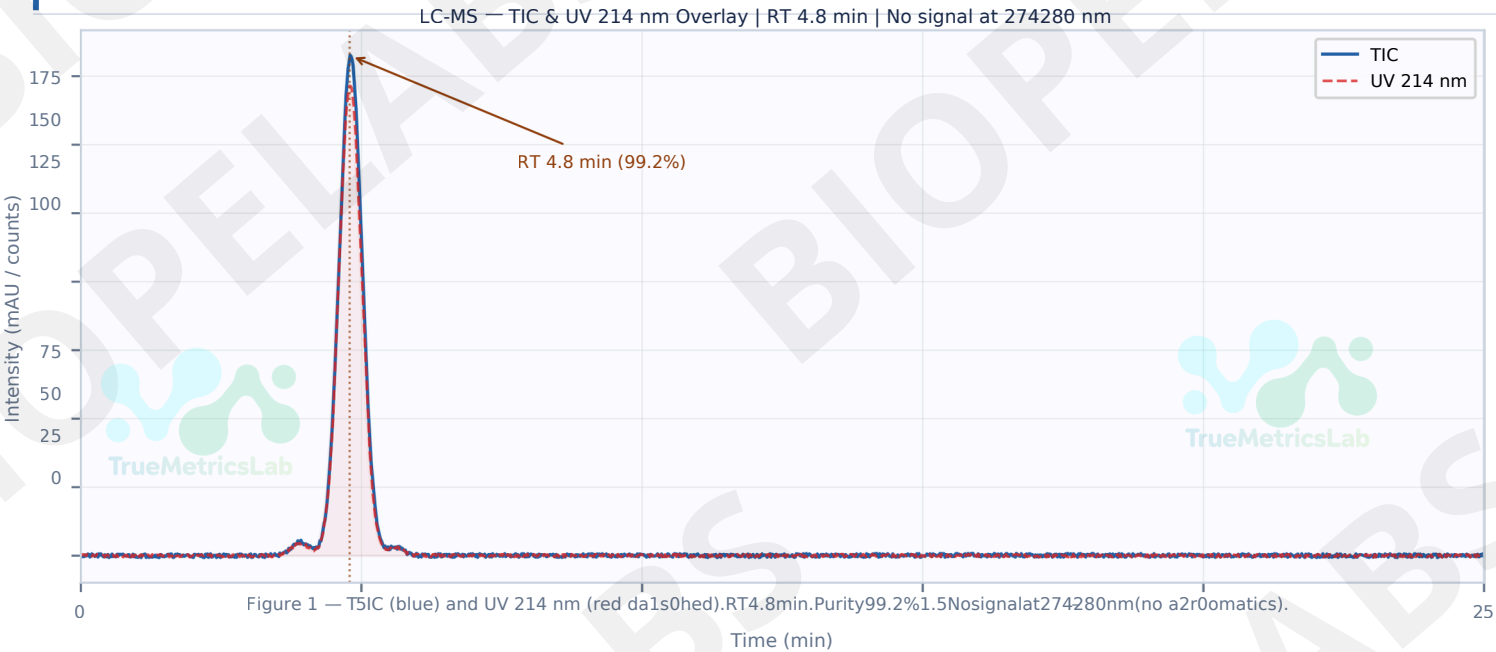
Protected from light



CHARGE STATE CALCULATIONS — ESI+ | FORMULA: $M/Z = (MW + Z \times 1.00728) / Z$

Charge (z)	Calculated m/z	Observed m/z	Δm (Da)	Δm (ppm)	Rel. Intensity	Ion
z = 1	859.87	859.9	< 0.1	< 2 ppm	100% (base peak)	[M+H] ⁺
z=1 (M+1)	860.87	860.9	< 0.1	< 2 ppm	~62% (13C isotope)	[M+13C+H] ⁺
z = 2	430.44	430.4	< 0.1	< 2 ppm	~22%	[M+2H] ²⁺
Na adduct	881.85	881.9	< 0.1	< 2 ppm	~4%	[M+Na] ⁺

LC-MS CHROMATOGRAM — TIC&UV214NMOverlay



FULL SCAN MS ANALYSIS — ESI+HRMS

