



CERTIFICATE NO.  
**PL-26-00102**

VERIFICATION KEY  
**TZ5SX6M6**

Scan or enter both at  
prymalab.net/testing/verify

CERTIFICATE OF ANALYSIS · LOT RELEASE · ISSUED FOR VIRSTELLIS

## TB-500 (Thymosin $\beta$ 4) 10 mg

TESTED IN-HOUSE BY PRYMALAB

Lot PL-2609-102 · Lyophilized powder · Label claim 10 mg/vial · Distributed as TB-500

In-house analytical result,  
not an independent third-party test

|                                          |                                          |                                       |                                      |
|------------------------------------------|------------------------------------------|---------------------------------------|--------------------------------------|
| LOT / BATCH NUMBER<br><b>PL-2609-102</b> | DATE MADE<br><b>2026-09-18</b>           | DATE OF ANALYSIS<br><b>2026-09-19</b> | DATE ISSUED<br><b>2026-10-03</b>     |
| RETEST / EXPIRY<br><b>2028-09-18</b>     | UNITS IN LOT / SAMPLED<br><b>250 / 2</b> | STORAGE<br>-20 °C, desiccated, dark   | CERTIFICATE TYPE<br>Lot COA, 2 pages |

|                                                                                                                                                                                                                                   |                                 |                                                                                         |                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------|
| COMPOUND<br><b>TB-500 (Thymosin <math>\beta</math>4)</b><br>N-acetyl thymosin $\beta$ 4, full-length 43-residue peptide<br>SEQUENCE<br>Ac-SDKPDMAEIEKFDKSKLKKTTETQEKNPSPKETIEQEKQAGES-OH (43 residues; N-acetyl; free C-terminus) | CAS NUMBER<br><b>77591-33-4</b> | MOLECULAR FORMULA<br><b>C<sub>212</sub>H<sub>350</sub>N<sub>56</sub>O<sub>78</sub>S</b> | THEORETICAL MASS (AVG.)<br><b>4963.5 Da</b> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------|

PURITY · RP-HPLC, AREA %

**99.53%**

Specification 99.0% • main peak at 6.08 min

IDENTITY · OBSERVED MASS

**4963.7 Da**

Theoretical 4963.5 Da • +0.2 Da (40 ppm)

OVERALL CONCLUSION

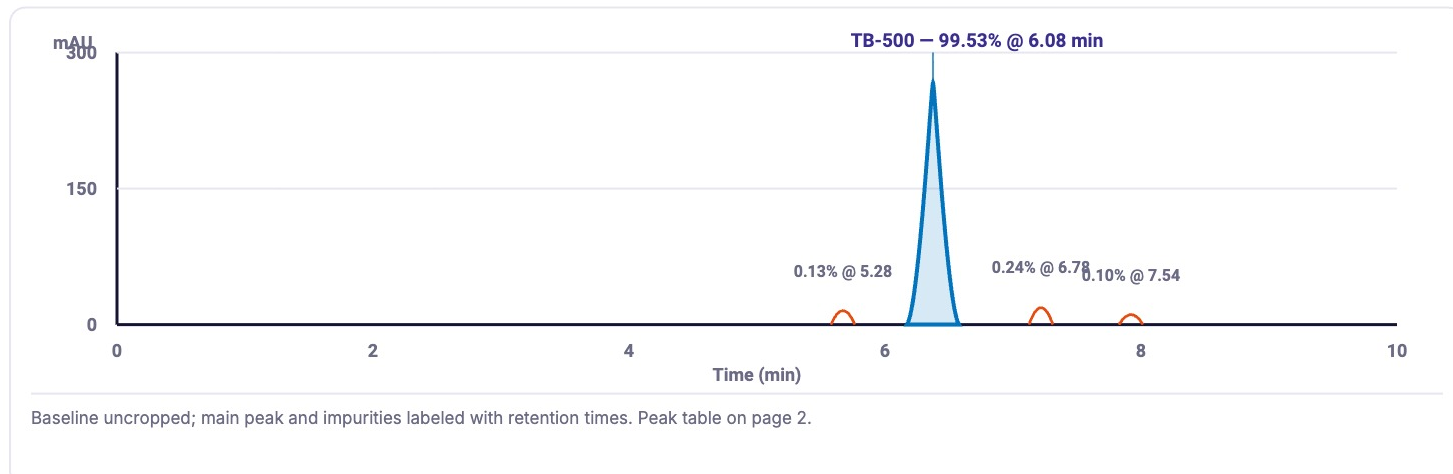
**PASS**

Meets every specification for the tests performed

| TEST                  | METHOD                        | SPECIFICATION                         | RESULT                                 | CONCLUSION |
|-----------------------|-------------------------------|---------------------------------------|----------------------------------------|------------|
| Appearance            | Visual inspection             | White to off-white lyophilized powder | White lyophilized powder               | PASS       |
| Identity (mass)       | LC-MS, ESI positive           | Theoretical $\pm$ 1.0 Da              | 4963.7 Da                              | PASS       |
| Purity                | RP-HPLC, UV 214 nm, area%     | 99.0%                                 | 99.53%                                 | PASS       |
| Largest impurity      | RP-HPLC, area%                | 1.0%                                  | 0.24% at 6.78 min (des-acetyl species) | PASS       |
| Water content         | Karl Fischer                  | 5.0%                                  | 1.9%                                   | PASS       |
| Bacterial endotoxin   | LAL, kinetic                  | $\leq$ 5.0 EU/mg                      | 0.08 EU/mg                             | PASS       |
| Sterility / bioburden | USP <71>, membrane filtration | No growth after 14 days               | No growth; conforms                    | PASS       |

### 1 HPLC CHROMATOGRAM

Data file: TB5\_PL-2609-102\_20260919\_01 · Column C18, 150  $\times$  4.6 mm · UV 214 nm



**2 HPLC METHOD · TB5\_PL-2609-102\_20260919\_01**

## INSTRUMENT

Waters Alliance e2695, SN E2695B742

## DETECTION WAVELENGTH

214 nm

## MOBILE PHASE A

0.1% TFA in water

## COLUMN TEMPERATURE

30 °C

## SAMPLE DILUENT

Water, 0.1% TFA

## REFERENCE STANDARD

In-house TB-500 reference, lot PL-RS-TB5-01, RT 6.06 min

## DATA SYSTEM

Empower 3, Build 3471

## COLUMN

C18, 150 × 4.6 mm, 3.5  $\mu$ m

## MOBILE PHASE B

0.1% TFA in MeCN

## INJECTION VOLUME

20  $\mu$ L

## SAMPLE CONCENTRATION

0.5 mg/mL

## DETECTOR

Waters 2998 PDA

## COLUMN PART / SERIAL

186003326 / USHX18211

## FLOW RATE

1.0 mL/min

## RUN TIME

10 min

## BLANK INJECTED

Yes

**3 GRADIENT PROGRAM**

| TIME (MIN) | % A | % B |
|------------|-----|-----|
| 0.0        | 95  | 5   |
| 3.0        | 95  | 5   |
| 7.0        | 55  | 45  |
| 8.0        | 20  | 80  |
| 9.0        | 20  | 80  |
| 10.0       | 95  | 5   |

**4 PEAK TABLE**

| PEAK           | RT (MIN)    | AREA             | AREA %       |
|----------------|-------------|------------------|--------------|
| 1              | 5.28        | 5,590            | 0.13         |
| <b>2</b>       | <b>6.08</b> | <b>4,279,790</b> | <b>99.53</b> |
| 3 (des-acetyl) | 6.78        | 10,320           | 0.24         |
| 4              | 7.54        | 4,300            | 0.10         |
| Total          |             | 4,300,000        | 100.00       |

Threshold 0.05% area · Blank subtracted: Y · Purity = main peak area ÷ total integrated area × 100, to two decimals; main peak shaded.

**5 IDENTITY BY MASS SPECTROMETRY**

## INSTRUMENT

Waters Acquity SQD

## DECONVOLUTED MASS

4963.7 Da

## DATA FILE

TB5\_PL-2609-102\_MS\_20260919\_01

## IONIZATION / MODE

ESI, positive

## THEORETICAL MASS

4963.5 Da (N-acetylated 43-mer)

## ACCEPTANCE

Within  $\pm$  1.0 Da

## OBSERVED M/Z (CHARGE)

1241.9 (4+ [M+4H]) · 993.7 (5+ [M+5H])

## DIFFERENCE

+0.2 Da (40 ppm)

**6 ADDITIONAL TESTS**

| TEST          | PERFORMED BY | DATE       | REPORT / FILE      |
|---------------|--------------|------------|--------------------|
| Water content | PrymaLab     | 2026-09-20 | RPT-KF-PL-2609-102 |
| Endotoxin     | PrymaLab     | 2026-09-21 | RPT-ET-PL-2609-102 |
| Sterility     | PrymaLab     | 2026-10-02 | RPT-ST-PL-2609-102 |

A test with no row here was not performed on this lot. Outside-laboratory reports, when used, are attached and named below.

**7 REVIEW AND APPROVAL****D. Reynolds**

Analyst · performed the testing  
Date: 2026-09-19

**S. Calloway**

Reviewer · checked against raw data  
Date: 2026-10-02

**M. Phelps**

Lab Director · approved for release  
Date: 2026-10-03

Raw data retained at: Empower 3 (Build 3471), project PL-2609, archive PL-ARC-2026; 7 years. Outside laboratory reports attached: None

This certificate applies only to the lot named above and describes the units sampled from it; it is not a guarantee for any other lot. Results were obtained by PrymaLab LLC's own laboratory (PrymaLab Analytical) and are not an independent third-party test unless an outside report is attached. This copy is issued for Virstellis, a distributor of the lot; the brand shown does not change the laboratory, the method or the results. Reference values (CAS, formula, theoretical mass, sequence) are literature values for the named compound. Authenticity: scan the QR code or enter certificate number PL-26-00102 and key TZ5SX6M6 at [prymalab.net/testing/verify](https://prymalab.net/testing/verify); any copy that does not match the record shown there is not a PrymaLab certificate. PrymaLab LLC products are supplied for laboratory research use only and not for human or veterinary use.