TB-500 Purity Testing: How to Read a Certificate of Analysis

What Is a Certificate of Analysis?

A certificate of analysis, often called a COA, is a report showing how one batch performed in laboratory tests. For **TB-500**, it should help a researcher confirm what the material is and how pure it appears. The name usually refers to Ac-LKKTETQ, a synthetic seven-amino-acid fragment of thymosin beta-4. Think of the report as a school mark sheet that belongs to one student and cannot be borrowed by another.

- **Product and batch:** the name and lot number match the container
- **Identity:** the measured mass agrees with the expected molecule
- **Purity:** the method, result and chromatogram are shown
- **Accountability:** the testing laboratory and analysis date are named



Why Is the Batch Number Important?

The batch number connects a particular container with a particular set of results. A report from an older batch cannot confirm the quality of a newer one. Researchers should compare every character on the label with the document.

Who Performed the Test?

A useful report names the laboratory that carried out the analysis. An independent laboratory is separate from the business selling the material. Readers can contact it to ask whether the document is genuine.

How Is Purity Measured?

Purity is commonly measured with high-performance liquid chromatography, known as HPLC. The instrument carries a dissolved sample through a column, where different substances travel at different speeds. A detector draws these substances as peaks on a graph called a chromatogram. The purity percentage usually compares the area of the main peak with the total area of all detected peaks.

A Simple Calculation Example

Imagine that all detected peaks have a combined area of 100 units. If the main peak covers 98 units, the reported area purity is 98 percent. This invented example does not mean that 98 percent of the container’s total weight is the target molecule.

Purity Versus Net Content

Purity describes the share of a detected signal that belongs to the main substance. Net content estimates how much target material is actually present by weight. Water and salts can affect that weight even when the chromatogram looks clean.

How Is Identity Confirmed?

Identity is mainly checked with mass spectrometry, which measures the mass of charged molecules. The acetylated free form has the formula C38H68N10O14 and a mass of roughly 889 Da. An acetate salt contains additional acetate, so the report should clearly state which form and mass it describes. A tall HPLC peak alone cannot prove that the correct sequence is present.

A Real Laboratory Case

Researchers at Ghent University examined a vial seized by Belgian Customs. Mass spectrometry and sequence analysis identified the acetylated fragment rather than full thymosin beta-4. The team then made a matching molecule to confirm its finding.

How Should Combined Materials Be Checked?

A mixture needs evidence for every named ingredient, not just one overall purity statement. When a label says **BPC 157 and TB-500**, the report should identify both molecules and explain how each was measured. Two main peaks can make a single purity percentage confusing unless the method defines the calculation. Clear records help a laboratory understand what is present before it plans any controlled experiment.

Questions to Ask the Laboratory

Ask whether the method can separate the two materials clearly. A report for BPC-157 and TB-500 should also state the measured amount of each ingredient if both amounts are claimed. Separate certificates for raw materials do not automatically verify the final mixture.

What Other Tests Matter?

Identity and purity are important, but they do not reveal every possible contaminant. A researcher reviewing BPC 157 and TB-500 records may also look for endotoxin, microbial and heavy-metal results. A 2026 legal advisory from Arnold & Porter lists such checks among the conditions in a draft federal compounding policy. That policy concerns qualifying compounders, so it should not be read as approval of research-use-only products.

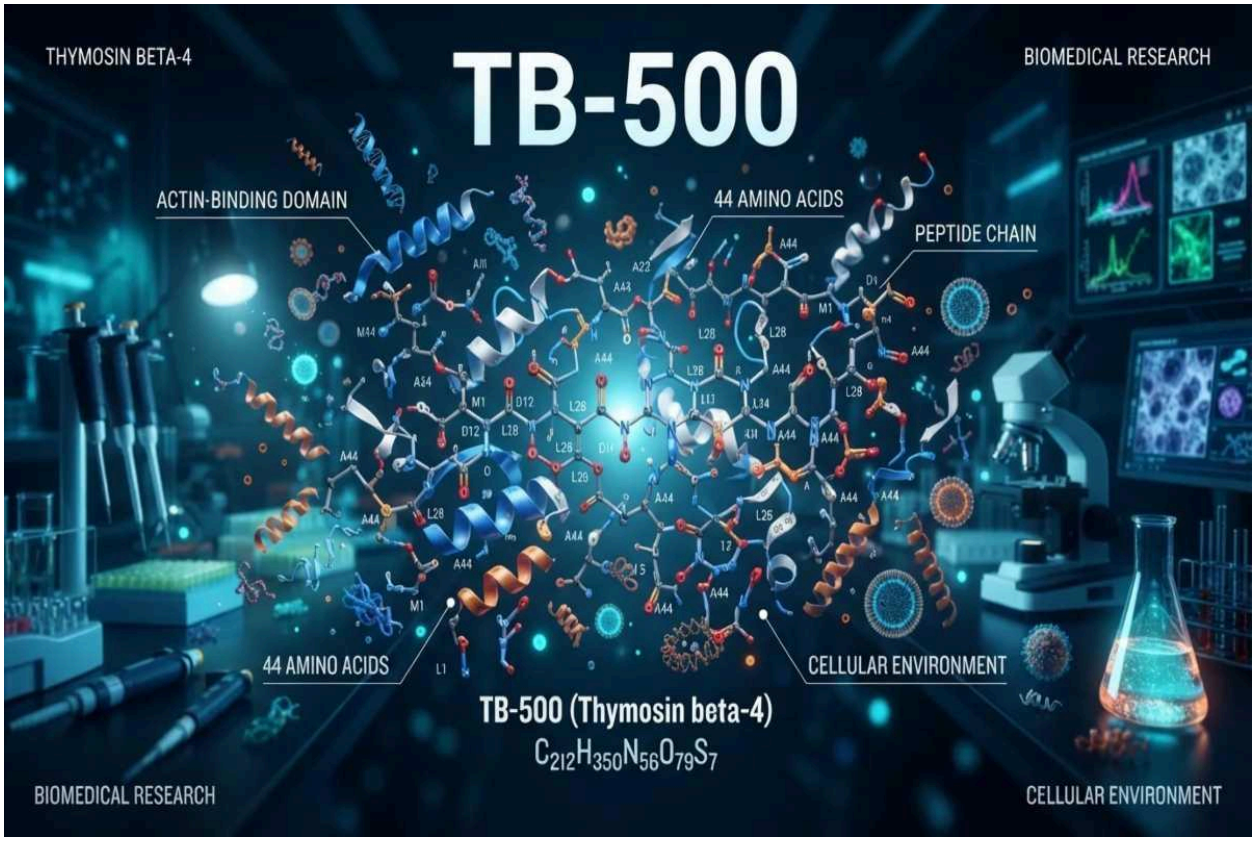
Understanding Missing Results

A test that is absent has not been shown to pass. Even a high purity figure for **BPC-157 and TB-500** cannot establish sterility or safety. Write down every missing result and ask the supplier for supporting data.

What Are the Warning Signs?

Warning signs include missing details, mismatched numbers and results without supporting graphs. Before accepting a document for TB-500, check that the sample name, lot and date agree throughout every page. A cropped chromatogram or an unnamed laboratory makes independent review much harder. These signs do not always prove fraud, but they are good reasons to ask questions.

- **Repeated graphs:** identical images appear under different batch numbers
- **Missing method:** a percentage is given without the test used
- **Mismatched mass:** the result does not fit the stated molecular form
- **No contact:** the laboratory cannot be identified or reached



Frequently Asked Questions

These quick answers explain common terms found in analytical reports. They give the main point first for easy reading. Students can use them as a short revision guide. They are not medical or legal advice.

Does 99 percent purity mean a product is safe?

No, a purity result does not prove safety. It describes a measurement made by a particular method. Contaminants outside that method may remain undetected.

Can one certificate cover every batch?

No, each batch should have its own results. Manufacturing conditions and outcomes can vary. The lot number provides the essential link.

What is a chromatogram?

It is a graph produced during a separation test. Peaks represent signals recorded as substances leave the column. Their position and size help an analyst interpret the sample.