How to Read a Peptide Certificate of Analysis

Document ID: FLK-DOC-003 · Version: 1.0 · Issued: 2026-10-08 · Supersedes: none · Owner: FLASK

1. What a certificate is

A certificate of analysis (COA) is the laboratory's report on a sample drawn from one lot. It describes that sample under the methods stated on the report. It is not a description of any other lot, and it is not a statement about the vial on the bench unless the lot numbers match.

2. Five checks before reading any number

Check	What to look for	If it fails
Lot number	Identical, character for character, on the vial label, on the certificate and in the batch ledger.	The certificate does not describe the vial. Request the correct document.
Laboratory	A named laboratory with its own web presence and, where offered, a report lookup by report number.	The result cannot be verified at the source.
Report number and date	A unique report identifier and a tested date plausible for the stock being sold.	A reused or undated document is not batch-specific evidence.
Method beside each result	Column, detection wavelength, gradient or at minimum the technique named next to the figure.	A percentage without a method cannot be compared with any other.
Raw output attached	The chromatogram for purity and the spectrum for identity.	A single number with no trace asks the reader to accept a conclusion without the measurement.

3. Reading the purity figure

HPLC purity is the area of the main peak divided by the total area of all peaks, under the stated method. A value of 99.0 percent means that 99.0 percent of the UV-absorbing material registered under those conditions eluted as the main peak. It does not say which molecule produced the peak, and it does not account for water and counterions, which produce no peak but are part of the weight in the vial.

On the trace, look for a symmetrical main peak, a flat baseline, and whether small peaks were included in the calculation. Two reports can state the same percentage and show very different traces.

4. Reading the identity line

Mass spectrometry compares the observed molecular mass with the theoretical mass of the stated sequence. A complete identity line states the technique, the theoretical mass marked as average or monoisotopic, the observed mass, and the lot number. In an electrospray spectrum the same molecule appears once per charge state; those peaks are not separate substances. A peak 16 units above the target indicates oxidation; a peak lighter by one residue mass indicates a deletion sequence.

5. Purity is not peptide content

Purity describes the composition of the peptide fraction. Peptide content (net peptide content) describes how much of the solid in the vial is peptide at all. Water and counterions typically account for 10 to 30 percent of the mass of a lyophilized peptide, so a vial labeled 10 mg at 99 percent purity and 85 percent peptide content contains about 8.5 mg of peptide. Any calculation that depends on the actual amount of peptide requires peptide content, not purity.

6. The lines many certificates omit

Line	Why it matters
Water content (Karl Fischer)	Non-peptide mass; bound water enables the hydrolysis that dry storage prevents.
Counterion content (TFA or acetate)	Non-peptide mass; trifluoroacetate has been reported to affect cultured cells at low concentrations.
Endotoxin (EU/mg)	Not detectable by HPLC; relevant to any cell-based experiment.

A certificate that reports only HPLC purity is not fraudulent, but the omitted figures are the ones that show how much peptide the label weight represents. Water, counterion and peptide content should account for approximately the whole mass; a reader can check that they do.

7. What a certificate does not establish

It does not establish sterility unless a sterility test is reported, suitability for any application, or any outcome. FLASK materials are for laboratory research use only; see FLK-DOC-001.