



How to Read a Peptide COA

3 questions every COA answers · 2 real certificates annotated · a 60-second checklist

THE LONGEVITY DESK · DESK GUIDE N° 2 · 2026 EDITION · VERSION
1.9

THELONGEVITYDESK.ORG

About The Longevity Desk

The Longevity Desk is a research publication covering 65 compounds sold on the grey market. For each one we read the primary record: the trials, the labels, the regulator filings, and the independent lab tests. Then we report what that record actually says, including when the honest answer is that nobody knows yet. Every figure in this guide traces to a named source. Where a number has no source, we say so plainly instead of inventing one.

We hold ourselves to the standard we apply to everyone else. Every factual error we publish and then fix is logged publicly at thelongevitydesk.org/corrections: what we said, what is true, and how the mistake happened. If you find an error in this guide, it goes there too.

This guide may be shared freely, unmodified.

Educational material, not medical advice. Consult a qualified clinician before making decisions about your health.

The short version

A Certificate of Analysis is a lab report for one specific batch. It answers three questions, and most people only ask one of them.

What is it. How pure is it. How much is in there.

Purity and content are not the same number, and the difference is where people get caught. A vial can be 99 percent pure and still hold far less peptide than the label says. It can also hold far more.

The rest of this guide is how to check all three yourself, in about sixty seconds, without a chemistry degree.

A vial of white powder arrives and you cannot read a label off a molecule. The Certificate of Analysis is the only document that can tell you what is in it: a lab report for that batch, much like the nutrition facts on a food package but with instruments doing the measuring.

By the numbers

FIGURE	WHAT IT IS
98%	Purity floor for research grade material. Under 95 percent is dangerous territory. The best companies post above 99. and an exact 100.00 percent is its own warning

FIGURE	WHAT IT IS
9.22 to 10.49 mg	Measured content of three legitimate, independently tested “10 mg” vials. Roughly 8 percent under label at one end, 4.9 percent over at the other. Not one exactly 10
28.6 to 38.7%	More semaglutide in grey-market vials than the label claimed, while purity ran 7.7–14.37 percent against 99 advertised (PMID 39509151)
0.125 Da	Gap between expected and measured mass on the retatrutide certificate below. A fraction of a dalton apart is a match. A whole dalton or more is not

Every figure here comes off a real certificate or a published test discussed in this guide.

The two machines behind every real COA

HPLC gives you purity. The sample runs through a narrow column at high pressure, like an airport security line, so each compound reaches the far end at a different time and a detector draws a graph of peaks. Purity is the largest peak measured against all the others, so a clean report shows one tall spike and a flat line either side. On a real N-Acetyl Semax Amidate report the machine found seven peaks, the largest at 99.14 percent and the other six combined under one percent.

Mass spectral analysis confirms identity, and no purity figure will ever do that job. Every material has a weight set by the atoms it is made of, so a mass spec compares the weight it finds against the known weight of what you ordered. A match is not identical numbers, instruments carry a small tolerance. A fraction of a Dalton apart is a match. A whole Dalton or more apart is not, and that is the gap that matters.

The number almost everyone misses: net content

Purity and content are not the same thing. A freeze-dried vial also holds residual water and counterions, charged particles left from manufacturing. They add weight without being peptide, and they do not show up on an HPLC test.

So the two numbers can disagree. Take a vial labeled 10 mg that reports 99 percent purity and an assay of 9.0 mg. You would be measuring off a number 10 percent too high, and the purity figure would never tell you.

It can also run the other way. In 2024, researchers bought semaglutide from three online sellers. Purity came back at 14.37, 8.97 and 7.7 percent against 99 advertised, but the amount of actual semaglutide was **28.6 to 38.7 percent higher than the label said** (PMID 39509151). Both numbers wrong, in opposite directions, at once. The researchers’ own conclusion: the real risk is accidental overdose.

Reading a results table

Some labs print a results table instead of graphs. These rows come from a real BPC-157 report in that format.

ROW ON A RESULTS TABLE	WHAT IT MEASURES	WHAT A GOOD NUMBER LOOKS LIKE
Assay	Milligrams of peptide in the vial	Read against the number on the label
ID by RT	Retention time. minutes to cross the column	Close to 1.00 is a match. This report showed 1.00
ID by Spectral	A second identity check, scored out of 1000	1000 is an exact match. This report listed 999–1000
Coelution control	How much of the sample hides under other peaks	Near the top of the scale means what you see is real. This report: 998–999

A real one, annotated

An actual certificate, not a description of one. Retatrutide, 10 mg, tested by an independent lab.

BIOVIRIDIAN

Excellence in HPLC-MS Analysis

CERTIFICATE OF ANALYSIS

Web Verification Code: COA5627

Sample Received: June 19, 2026

COA Issued: June 25, 2026

PRODUCT INFORMATION

Vendor: American Peptides Sample Name: Retatrutide 10mg Sample Type: White lyophilized powder Lot Number: RETA10-0616 MW (g/mol): 4731.2

ANALYTICAL METHODS

Identity: Confirmed via MALDI-MS

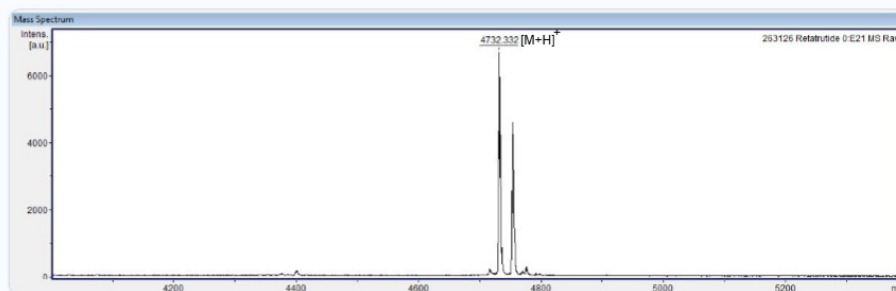
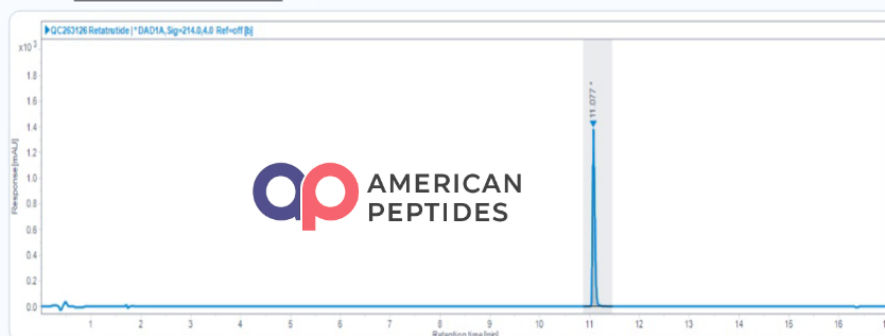
Purity: RP-HPLC (214 nm)

Content: HPLC quantitation

TEST RESULTS

Specification	Result	Method	Status
Identity: Retatrutide	Retatrutide	MALDI-MS	✓ Conforms
Content	10.49 mg	HPLC Quantitation	✓ Conforms
Overall Purity	99.8%	RP-HPLC (214 nm)	✓ Conforms
Endotoxin	<0.05 EU/mL	<USP85>	✓ Conforms
Heavy Metals	<0.01 ppm	<USP232>	✓ Conforms

HPLC Chromatogram (Retention Time: 11.077 min)



Certification: This COA confirms that the tested material meets or exceeds Bioviridian's analytical quality specifications for peptide research use.

Visit: <https://bioviridians.com/coa-search.html>



Shane Straight

Shane Straight, M.S.
Principal Chemist, Bioviridian Inc.

What the annotations point at:

1. **The verification code:** printed by the lab so the report can be checked against the lab's own records, not the vendor's. Everything else is pixels until you confirm the lab issued it.

2. **The lot number:** RETA10-0616. This has to match the number on your vial. A perfect COA for a different lot tells you nothing.
3. **Identity, by mass spec:** MALDI-MS confirms the molecule is what the label claims. The test that catches an analog sold as the real thing, and the one dishonest vendors leave out.
4. **Content: 10.49 mg:** a 10 mg vial that actually holds 10.49, so 4.9 percent OVER label. Legitimate, independently tested, and still not exactly 10.
5. **Purity: 99.8 percent:** of the powder present, 99.8 percent is retatrutide. A different question from the line above it. Purity is *what*, content is *how much*.
6. **One dominant peak:** a clean chromatogram: a single tall spike at 11.077 minutes, flat baseline everywhere else. Several large peaks would mean a mixture.
7. **Mass: 4732.332:** expected 4732.207, so off by 0.125. A match. (The instrument measures the molecule plus one added hydrogen, written [M+H]+.)
8. **How to check it yourself:** a QR code, a verification URL, and a named chemist. Enter COA5627 on the lab's site and compare.

The sixty second walkthrough

On a different report, BPC-157, 10 milligrams, table format:

1. **Read the header.** Compound name, date, and who did the testing. The compound is what you expect, the date is recent, and an independent laboratory did the work.
2. **Match the lot or batch number against your own vial.** The step almost nobody does, and the one that decides whether the rest of the page applies to your vial at all.
3. **Confirm identity.** ID by RT shows 1.00 and ID by Spectral lists 999, the vial contains authentic BPC-157. On a graph-format report, compare expected mass against measured mass instead.
4. **Read the purity figure.** This report lists 99.82 and 99.99 percent on the two vials tested, against a floor of 98.
5. **Read the content (“assay”).** 9.22 and 9.30 milligrams on a vial that lists 10, so this vial holds 92 to 93 percent of the peptide stated. Purity would never have told you that.
6. **Verify against the lab, not the vendor.** A verify key, QR code or report number entered on the lab's own site returns the original.

A second one, with a problem in it

The retatrutide certificate above is clean. Here is another real report from the same independent lab, BPC-157 at 10 milligrams. Run the sixty-second check and it passes everything: purity 99.8, content 10.02 on a 10 mg vial, endotoxin passed, single clean peak, named chemist, verification code. You would close the tab satisfied. Look for another thirty seconds and two things do not line up.

BIOVIRIDIAN

Excellence in HPLC-MS Analysis

CERTIFICATE OF ANALYSIS

Web Verification Code: COA3400

Sample Received: March 26, 2026

COA Issued: April 3, 2026

PRODUCT INFORMATION

Vendor: American Peptides Sample Name: BPC-157 10mg Sample Type: White lyophilized powder Batch Number: BP10-0318 MW: 1419.2 g/mol

ANALYTICAL METHODS

Identity: Confirmed via MALDI-MS

Purity: RP-HPLC (214 nm)

Content: HPLC quantitation

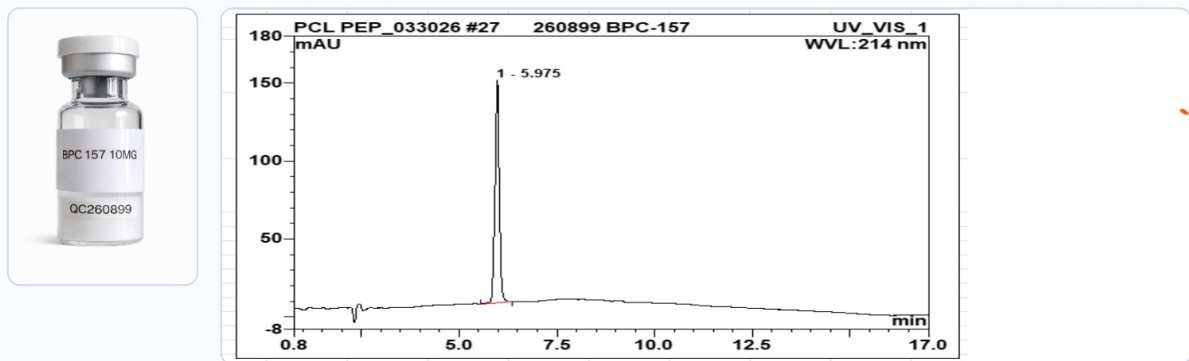
TEST RESULTS

Specification	Result	Method	Status
Identity: BPC-157	BPC-157	MALDI-MS	✓ Conforms
Content	10.02 mg	Mass Spectrum (MALDI-MS)	✓ Conforms
Overall Purity	99.8%	RP-HPLC (214 nm)	✓ Conforms

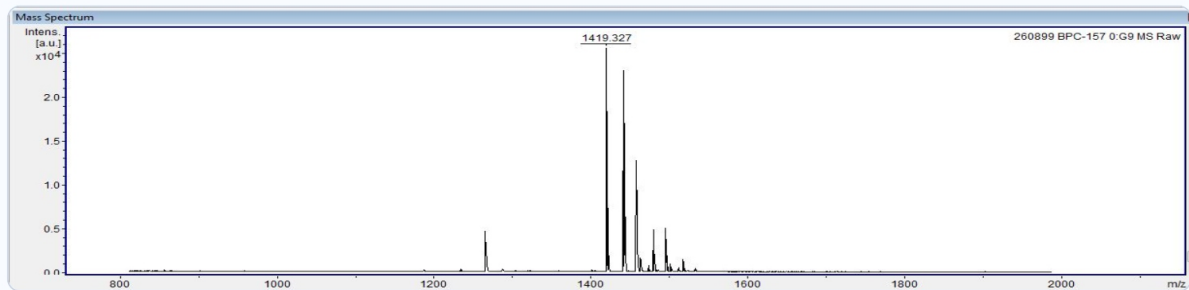
Endotoxin Threshold		Result
Replicate 1	≤ 0.05 EU/mL	PASS

ANALYTICAL DATA

HPLC Chromatogram (Retention Time: 5.975 min)



Mass Spectrum (MALDI-MS)



Certification: This COA confirms that the tested material meets or exceeds Bioviridian's analytical quality specifications for peptide research use.



bioviridians.com/coa-search.html

Shane Straight, M.S.
Principal Chemist, Bioviridian Inc.

What the annotations point at:

1. **A different code:** same lab, different report, different code. One real report from a lab tells you nothing about whether the next one is real.

2. **What the methods block says:** content was measured by HPLC quantitation. Hold on to that line.
3. **What the results table says:** the method for that same content row reads MALDI-MS, contradicting the line above. MALDI is an identity test: it weighs molecules, it does not count milligrams. One of these two lines is wrong.
4. **Content: 10.02 mg:** the tightest content figure in this guide, 0.2 percent over label. Set it beside the 10.49 and the 9.22: three legitimate vials, not one exactly 10.
5. **A threshold, not a measurement:** endotoxin “at or under 0.05 EU/mL, passed” says it cleared the limit, not by how much. And this report has no heavy-metals row at all, where the retatrutide report had one. Nothing on a page marks the gap where a test should be.
6. **The number matches the picture:** 5.975 minutes stated, and the chromatogram shows one tall peak at 5.975. Checking the stated retention time against the graph takes two seconds and almost nobody does it.
7. **Mass: 1419.327** against 1419.2 stated, an apparent match. Do the check yourself anyway: BPC-157’s fifteen residues (GEPPPGKPADDAGLV) add to 1419.55. The *measurement* is fine; it is the reference weight printed on the certificate that is slightly off.

The results are genuinely good, and 10.02 on a 10 mg label is the best content number in this guide. What the two slips tell you is that the paperwork got less care than the testing. A certificate that contradicts itself in a small way is a certificate nobody proofread. Someone assembling a fake from a template makes exactly this kind of error. So does a real lab having a busy week. You cannot tell which from the page alone, and that is precisely what the verification code is for.

Who did the testing, and how to check they did

In house means the vendor tested their own product, the player grading his own exam. **Third party** means an outside lab did it, and nobody but the lab benefits from the result.

PDFs are digital images, and anything that is a digital image can be altered. Both certificates here carry a verification code that returns the lab’s own original, not the vendor’s copy. Without that route back, everything on any PDF is just marketing.

Red flags that should stop you cold

- ■ A recycled COA, one old report continually repurposed for other customers
- ■ No independent laboratory listed, or no way to verify the document
- ■ A cropped or screenshot report with the lab name, date, or peak summary cut off
- ■ A suspiciously round number like 100.00 percent purity, or no peak summary at all
- ■ A molecular weight that does not match the expected weight for the compound name
- ■ The methods section and the results table naming different tests for the same row

- ■ Vague dates, or reference-only language tied to no specific batch number

The analog trap

Order research grade Semax and there is a good possibility you will not be getting the original substance. A family of related compounds is sold under closely similar names, including N-Acetyl Semax and N-Acetyl Semax Amide. An HPLC will not tell them apart, the weight differences disappear into the light impurities on the graph. A mass spectrometer will.

N-Acetyl Semax Amide's expected weight is 854 Da against regular Semax's 813 Da. If you ordered regular Semax and the weight comes back near 854, the COA has told on the product.

The sixty second checklist

Run this on every COA before you trust it:

- ☐ Does the compound name match what you purchased?
- ☐ Does the lot or batch number match your vial? (*A perfectly good COA for lot 1305 is useless if your vial is lot 1420.*)
- ☐ Is the date recent, and relevant to your vial?
- ☐ Is an independent laboratory listed, one you recognize by name?
- ☐ Does the report include a method to verify its authenticity?
- ☐ Are both identity (mass spec) and purity (HPLC) listed? (*An HPLC test on a sample that is 99 percent the wrong peptide only tells you it is 99 percent the wrong peptide.*)
- ☐ Is the purity 98 percent or higher?
- ☐ Is an assay, or content, listed for the vial? (*Purity tells you what you are getting. Content tells you how much. Ask for both.*)
- ☐ Are any of the red flags above present?

Nine items, and it only takes one to find a dishonest vendor.

The Desk's take

Reading a COA is about demanding proof rather than accepting claims, and the right kind of proof. Know the three questions, know where the answers sit, and know how to check them against the lab rather than the seller.

Nobody is coming to do this for you. The regulatory system that would normally check any of this does not apply here, which is exactly why the document matters and exactly why so many of them are worthless.

Both certificates in this guide came back good, and both had something on them worth arguing with. If you have asked a vendor for the certificate covering your own batch, we want to know what came back, the report for your lot, a report for some other lot, or nothing:

hello@thelongevitydesk.org.

Where to compare vendors

Biohack Blueprint (biohackblueprint.ai) lists what eleven vendors charge per milligram for the same compound, side by side, with each product's certificate linked where the vendor publishes one. It is our price directory, and its outbound links are affiliate links.

Where to go from here

- **Before you buy anything:** the four free checks: Desk Guide N° 1, and thelongevitydesk.org/articles/buying-peptides-without-getting-ripped-off
- **The mixing arithmetic:** Desk Guide N° 3, and thelongevitydesk.org/articles/reconstitution-math
- **Every term in plain language:** thelongevitydesk.org/glossary
- **One email a week at most**, nothing for sale: thelongevitydesk.org/subscribe

This content is for educational and informational purposes only and is not medical advice. Peptides discussed are research compounds and may not be approved for human use. Nothing here should be used to diagnose, treat, cure, or prevent any disease. Always consult a qualified healthcare professional before starting any peptide, supplement, or protocol. Individual responses vary. Do not self-administer compounds without proper medical supervision.

© 2026 The Longevity Desk · thelongevitydesk.org · Version 1.9 · Corrections: thelongevitydesk.org/corrections