

FOR RESEARCH USE ONLY

GLP-3

28-Day Stability Study

A reconstituted-solution stability profile measuring purity (HPLC-UV / LC-MS) and pH across five timepoints over 28 days, interpreted against LuvionBio's internal stability grading framework.

TEST ARTICLE

GLP-3

MS IDENTITY

GLP-3 (CAS 2381089-83-2)

LOT NUMBER

LBL-0625-RT10-1027

ACCESSION #

2507140021

TESTING LABORATORY

Freedom Diagnostics (USA)

STUDY WINDOW

28 Days · 5 Timepoints

METHODS

HPLC-UV · LC-MS/MS · pH

DOCUMENT

v1.0

Purity held essentially flat *over 28 days.*

Over a 28-day reconstituted-solution window, the GLP-3 lot showed High-Grade purity stability — a 0.04% total drift. Solution pH stayed within its Acceptable band, with greater run-to-run variability than the purity measure.

<p>PURITY DRIFT (DAY 1 → 28)</p> <p>0.04%</p> <p>99.76% → 99.72%</p>	<p>PURITY SPREAD (MAX-MIN)</p> <p>0.08%</p> <p>99.70% – 99.78%</p>	<p>PH VARIATION (TOTAL)</p> <p>0.51</p> <p>7.12 – 7.63</p>	<p>STABILITY TIER</p> <p>See below</p> <p>Purity High · pH Acceptable</p>
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Purity was the standout result: across all five timepoints it stayed within a 0.08% band and drifted just 0.04% from Day 1 to Day 28 — firmly inside the High-Grade tier. Solution pH was more variable, moving across a 0.51-unit range over the window. That total excursion lands in the Acceptable band of the framework rather than the tightest High-Grade band, and is reported transparently below.

BOTTOM LINE

The GLP-3 lot delivered High-Grade purity stability (0.04% drift over 28 days). Solution pH showed greater run-to-run variability, with a 0.51-unit total excursion that sits in the Acceptable tier — a result worth noting honestly rather than rounding away. Purity, the primary degradation indicator, was excellent.

Stability is what purity at $t = 0$ can't tell you.

A single certificate-of-analysis purity number describes the molecule at one moment, in the bottle, before anything has happened to it. It is a necessary check — but it is not a complete one. Once a lyophilized peptide is reconstituted into solution and stored, a second set of questions opens up.

In solution, a synthesized peptide is exposed to hydrolysis, oxidation, aggregation, deamidation, and pH drift. Reconstitution medium, fill consistency, residual moisture, lyophilization quality, and handling all influence how the material behaves over time. None of this is visible in a one-point purity reading.

PLAIN LANGUAGE

A purity number tells you what is in the vial on day one. A **time-course stability study** tells you whether what is in the vial *stays* what it was — across reconstitution and storage, measured repeatedly, on the same instrument, against a defined grading framework.

What a 28-day reconstituted profile adds. It records how the material behaves after reconstitution and through storage, captured repeatedly on the same methods, so that buyers see a degradation trajectory rather than a single point. Here, that trajectory cleanly separates a very stable purity profile from a noisier pH signal — exactly the kind of distinction a single $t=0$ number would hide.

Why LuvionBio commissioned this work. LuvionBio submitted a representative lot for independent purity (HPLC-UV / LC-MS) and pH measurement across five timepoints over 28 days. The result is a documented degradation profile rather than a single snapshot — a more demanding signal of manufacturing and stabilization quality.

An internal stability *grading framework*.

The framework below is used internally by LuvionBio to describe how tightly a test article holds its purity and pH over the study window. Purity is evaluated on percent drift; pH on absolute change — each measured both per week and as a total excursion across 28 days.

■ High-Grade

Purity $\Delta \leq 0.5\%/wk$ • $\leq 2.5\%$ total
pH $\Delta \leq 0.2/wk$ • ≤ 0.4 total

Minimal change across the window. Indicates a well-controlled, stable preparation with tight run-to-run consistency.

■ Acceptable

Purity $\Delta 0.5-1.5\%/wk$ • $\approx 2.5-7.5\%$ total
pH $\Delta 0.2-0.4/wk$ • $0.5-0.8$ total

Measurable but bounded change. Within usable range for research material; greater variability than the High-Grade tier.

■ Sub-Optimal

Purity $\Delta > 1.5\%/wk$ • $> 7.5\%$ total
pH $\Delta > 0.4/wk$ • > 0.8 total

Change large enough to warrant investigation of synthesis, lyophilization, or handling before release.

IMPORTANT FRAMING

This framework is an internal comparative review tool used by LuvionBio. It is **not** a regulatory stability standard, an industry benchmark, or a certified release specification. It is presented here to make the interpretation of the results in this report transparent and reviewable.

Purity across 28 days.

HPLC-UV with LC-MS identity confirmation, measured at five timepoints over the study window.

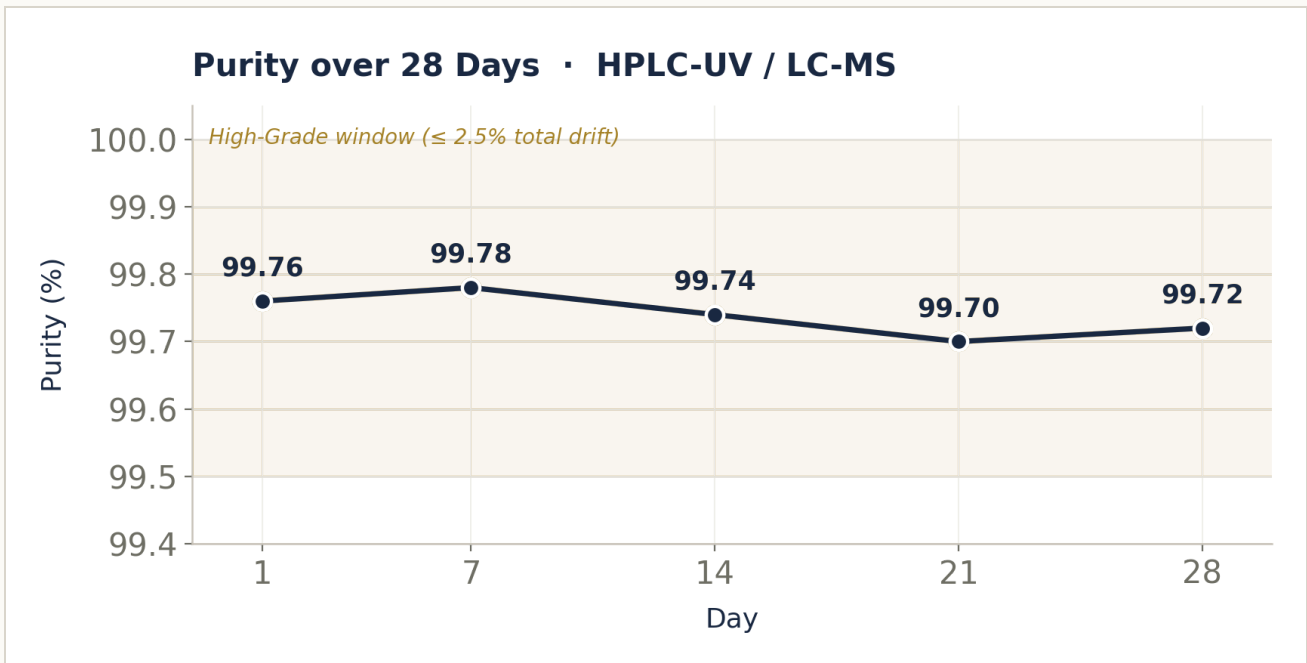


Figure 1 • Purity by timepoint.

HPLC-UV / LC-MS, single lot.

Timepoint	Day 1	Day 7	Day 14	Day 21	Day 28
Purity	99.76%	99.78%	99.74%	99.70%	99.72%

TAKEAWAY • PURITY

Purity held between 99.70% and 99.78% across the full window — a 0.08% peak-to-trough spread and just 0.04% drift from Day 1 to Day 28. At roughly 0.01% per week, this is deep inside the High-Grade tier and is the strongest indicator in the dataset.

pH across 28 days.

Solution pH measured at the same five timepoints, reconstituted in bacteriostatic water.

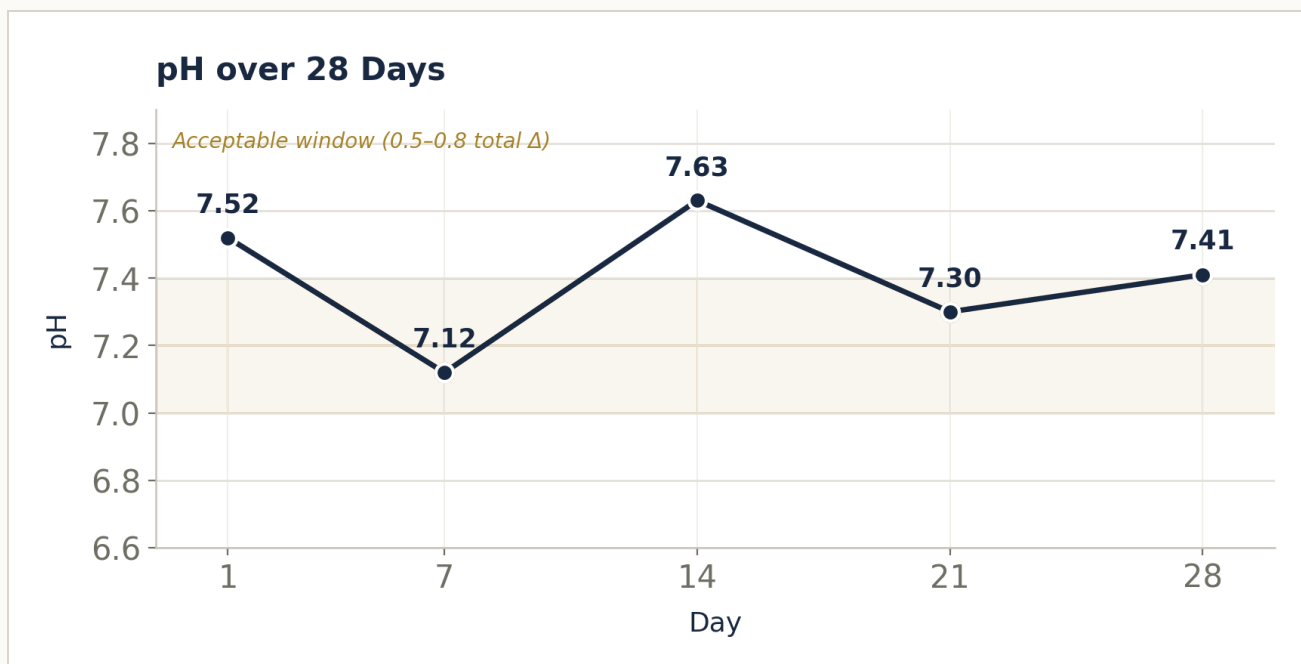


Figure 2 • pH by timepoint.

Reconstituted solution, single lot.

Timepoint	Day 1	Day 7	Day 14	Day 21	Day 28
pH	7.52	7.12	7.63	7.30	7.41

TAKEAWAY • pH

Solution pH ranged from 7.12 to 7.63 (0.51-unit total excursion) and did not move in a single direction — it dipped at Day 7, peaked at Day 14, then settled. The total excursion sits in the Acceptable band, and the largest single between-timepoint step exceeds the High-Grade weekly limit. This is reported as found; it most likely reflects measurement and handling variability rather than purity-linked degradation, given how flat the purity curve is over the same period.

Drift versus *framework thresholds*.

Measured change across the 28-day window, placed against the internal grading framework from Section 03.

<p>PURITY – TOTAL DRIFT</p> <p>0.04%</p> <p>Limit: ≤ 2.5% · High-Grade</p>	<p>PH – TOTAL Δ</p> <p>0.51</p> <p>Acceptable band (0.5–0.8)</p>	<p>OVERALL</p> <p>Purity High</p> <p>pH Acceptable</p>
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Measure	Total Δ (28 d)	Per-week avg	High-Grade limit	Tier
Purity	0.04%	≈0.01%/wk	≤ 0.5%/wk · ≤ 2.5% total	High-Grade
pH	0.51	≈0.13/wk	≤ 0.2/wk · ≤ 0.4 total	Acceptable

Purity sits deep within the High-Grade tier. The pH total excursion (0.51) falls in the Acceptable band, and one between-timepoint step exceeds the High-Grade weekly limit. Because purity remained essentially flat over the same window, the pH variability is most consistent with measurement/handling scatter rather than directional degradation — but it is reported as measured.

How LuvionBio thinks about *quality*.

Reference-framework grading, independent testing, and documented evidence — applied at the batch level, not the marketing level.

TIME-COURSE EVIDENCE

Stability is measured across multiple timepoints, not asserted from a single t=0 reading.

INDEPENDENT TESTING

Purity and pH analysis is performed by an outside laboratory and reported as found.

DEFINED FRAMEWORK

Results are interpreted against a transparent internal grading framework, disclosed in full.

MANUFACTURING DISCIPLINE

Synthesis, purification, lyophilization, and fill steps are controlled against internal specifications.

BATCH-LEVEL QC

Quality control is applied to representative lots to generate evidence reviewable by technical partners.

SCIENTIFIC ACCOUNTABILITY

Source data, testing laboratory, lot, and accession identifiers are reported so reviewers can verify independently.

POSITION

LuvionBio is committed to raising the floor on what counts as evidence of quality in the RUO peptide category. A documented stability profile is one piece of that commitment — and is not the last piece.

07 · SOURCE DATA & SUBSTANTIATION

The numbers, *traceable.*

TEST ARTICLE	GLP-3
MS IDENTITY	GLP-3 (CAS 2381089-83-2)
APPEARANCE	White lyophilized powder
LOT NUMBER	LBL-0625-RT10-1027
ACCESSION · SEARCH CODE	2507140021 · luvi2507140021
TESTING LABORATORY	Freedom Diagnostics (USA) · verifiable via FreedomDiagnosticsTesting.com
METHODS	HPLC-UV purity; LC-MS/MS identity; solution pH
RECONSTITUTION	10 mg lyophilized GLP-3 in bacteriostatic water
TIMEPOINTS	Day 1, 7, 14, 21, 28 (28-day window)
REPORT DATE	8/18/2025 · received 7/14/2025

CLAIMS SUBSTANTIATION

CLAIM MADE IN THIS REPORT	SUPPORT	SOURCE
Purity 99.76% → 99.72% (Day 1 → Day 28); total drift 0.04%	DIRECT	COA 2507140021
pH range 7.12–7.63 across 28 days; total excursion 0.51	DIRECT	COA 2507140021
Identity confirmed as GLP-3 (CAS 2381089-83-2) by LC-MS	DIRECT	COA 2507140021
Purity within High-Grade tier; pH within Acceptable tier	INFERRED	Framework applied to COA data
Stability grading tiers (High / Acceptable / Sub-Optimal)	INFERRED	LuvionBio internal framework
Time-course stability is a stronger quality signal than t=0 purity alone	CONTEXT	General peptide manufacturing literature

How to read: Direct = read from the source COA. Inferred = LuvionBio framework applied. Context = widely held views, not specific to this study.

Research Use *Only*.

RESEARCH USE ONLY DISCLAIMER

All LuvionBio materials referenced in this report are provided strictly for laboratory research use only. They are **not** intended for human consumption, clinical use, diagnostic use, therapeutic use, veterinary use, or household use. This report is provided for informational and research-quality evaluation purposes only and does not constitute medical, clinical, or regulatory advice.

About the testing. The purity, identity, and pH data in this report were generated by Freedom Diagnostics, an independent analytical laboratory. The signed certificate of analysis is reproduced in full as the final page of this document. LuvionBio commissioned the testing and is the data owner.

About this document. Pages 1–8 are a LuvionBio-authored customer-facing summary and interpretation of the underlying certificate of analysis. The narrative, framework, and figures on those pages are LuvionBio's own and were not authored by the testing laboratory. The original signed certificate that follows is the authoritative source record and has not been modified.

The purity analysis was conducted under standard laboratory conditions and is specific to the sample(s) provided. The peptides tested are intended for research use only and are not approved for human or veterinary use, or for diagnostic, therapeutic, or clinical applications. Results should be interpreted by qualified professionals within the scope of the intended research. Accuracy may be influenced by sample integrity, handling, and other experimental variables.

LUVION.BIO

BRILLIANCE IN BIOSCIENCE

09 • ORIGINAL SOURCE DOCUMENT

Original Verifiable *Study Results.*

The signed Stability Study & Certificate of Analysis on the following page is the original source document issued by the testing laboratory.

It is reproduced here without modification. All purity, pH, and identity values summarized in this report are drawn directly from it, and it can be independently verified using the accession and search code below.

ACCESSION #
2507140021

SEARCH CODE
luvi2507140021

VERIFY VIA
FreedomDiagnosticsTesting.com

LOT NUMBER
LBL-0625-RT10-1027

Proudly Owned and Operated
In the USA

Verifiable Via:	FreedomDiagnosticsTesting.com	Assession #	2507140021
Product:	GLP-3	Client	LuvionBio LLC
MS Identity:	GLP-3 (2381089-83-2)	Search Code	luvi2507140021
Received Date:	7/14/2025	Lot Number	LBL-0625-RT10-1027
Report Date:	8/18/2025	Appearance	White Lyophilized Powder

CHEMICAL ANALYSIS METHODOLOGY:

We reconstituted 10mg lyophilized GLP-3 in bacteriostatic water and recorded weekly purity (HPLC-UV, MS) and pH. The data define the degradation profile and inform manufacturing/stabilization quality.

REFERENCE STANDARDS

High-Grade

Purity Δ | 0.5%/wk | 2.5% Total
pH Δ | 0.2/wk | 0.4 Total

Acceptable Grade

Purity Δ | 0.5–1.5%/wk | ≈2.5–7.5% Total
pH Δ | 0.2–0.4/wk | 0.5–0.8 Total

Sub-Optimal Grade

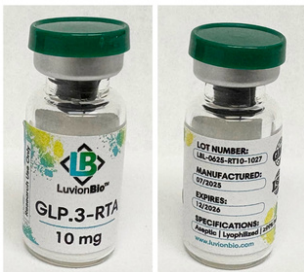
Purity Δ | >1.5%/wk | >7.5% Total
pH Δ | >0.4/wk | >0.8 Total

STUDY RESULTS

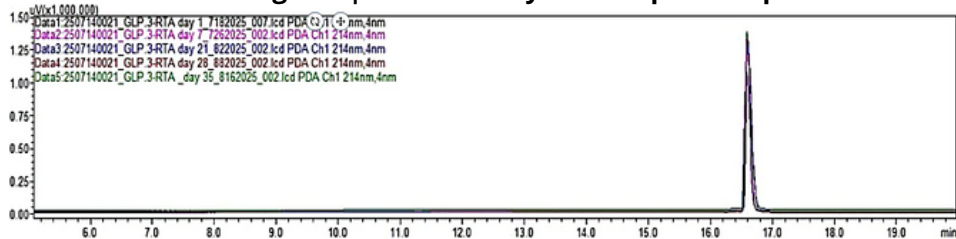
	Day 1	Day 7	Day 14	Day 21	Day 28
Purity	99.76%	99.78%	99.74%	99.70%	99.72%
pH	7.52	7.12	7.63	7.30	7.41

INTERPRETATION OF RESULTS

Over 28 days, the LuvionBio sample showed only a 0.04% purity shift with pH variation limited to ±0.25 units, confirming exceptional stability. These results exceed reference standards and indicate manufacturing quality at the highest level.



Chromatogram | HPLC Overlay of Multiple Timepoints



Stephen Schmidt

Stephen Schmidt
Principal Chemist

COA: 2507140021

The peptide purity analysis reported here was conducted using LCMS/MS under standard laboratory conditions. This analysis is intended for informational purposes only and is specific to the sample(s) provided. The peptides tested are intended for research use only and are not approved for human or veterinary use, diagnostic, therapeutic, or clinical applications. Results should be interpreted by qualified professionals within the scope of the intended research. The accuracy and reliability of the test may be influenced by sample integrity, handling, and other experimental variables.

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Searchable Via: FreedomDiagnosticsTesting.com