Research Peptide Storage Conditions Chart

A laboratory reference for handling lyophilised and reconstituted peptide research materials by compound class. Conditions are indicative ranges based on published pharmaceutical stability science and ICH guidelines; the receiving laboratory must confirm against lot-specific COA data. **Research Use Only — not for human or veterinary use.**

> *"A lyophilised peptide is stable because drying arrested the chemistry that destroys it. Reconstitution restarts that clock. Every handling decision either respects that fact or ignores it."*[3]

KEY: ● Standard laboratory practice ● Requires additional care ● Strict precaution — high sensitivity

Lyo = lyophilised powder | Rec = reconstituted research solution

STORAGE CONDITIONS BY COMPOUND CLASS

	LYOPHILISED POWDER				RECONSTITUTED RESEARCH SOLUTION		
COMPOUND CLASS	TEMP.	LIGHT	HUMIDITY / SEAL	F/T CYCLES	TEMP.	IN-USE WINDOW	F/T CYCLES
Linear peptides (no Met / Cys / Trp) e.g. BPC-157, TB-500, Ipamorelin, Epitalon, KPV, bioregulator peptides	● −20 °C or below; 2–8 °C acceptable short-term (sealed)[14]	● Protect from direct light; not critical for sealed opaque vials	● Sealed, desiccated; allow vial to reach room temp before opening to prevent condensation[4]	● Minimise; divide into working aliquots before first freeze[5]	● 2–8 °C between uses	● Short-term; make fresh near use; do not stockpile solution[5]	● Limit to minimum; single-use aliquots preferred
Oxidation-sensitive peptides (contain Met, Cys or Trp) e.g. PT-141, Melanotan I/II, LL-37, SS-31, Sermorelin (Met-containing)	● −20 °C or below; avoid any temperature excursion[36]	● Protect from UV and ambient light; store in amber vial or light-opaque packaging[6]	● Sealed, inert atmosphere desirable; minimise headspace air; open briefly; reseal promptly[3]	● Avoid; thermal cycling accelerates oxidation; aliquot before freezing[5]	● 2–8 °C, protected from light; do not leave at room temperature	● Very short; prepare fresh; do not store solutions beyond immediate use[6]	● Avoid entirely if possible; single-use aliquots essential
Disulfide-bridged peptides e.g. Linaclotide analogues, some cyclic peptides, CJC-1295 (if disulfide variant)	● −20 °C or below; inert atmosphere strongly preferred[4]	● Protect from light and UV; disulfide chromophore sensitive to photodegradation	● Rigorous seal; avoid any reducing atmosphere; do not co-store with reducing agents[3]	● Avoid; ice formation can promote disulfide scrambling; pre-freeze aliquots	● 2–8 °C; avoid prolonged storage in solution	● Use promptly; disulfide integrity in solution is time- and pH-dependent[5]	● Avoid; single-use aliquots; thaw once only
Copper-chelating peptides e.g. GHK-Cu, AHK-Cu	● −20 °C or below preferred; 2–8 °C short-term if sealed[4]	● Protect from direct light; metal–peptide complexes can be photosensitive	● Sealed, desiccated; avoid contact with metal-chelating buffers or EDTA	● Minimise; chelate complex generally tolerates moderate cycling	● 2–8 °C; avoid EDTA or strong chelating solvents in reconstitution buffer	● Short-term; copper complex stability in aqueous solution is pH-dependent[5]	● Limit; aliquot before freezing
GHRH analogues & long-acting modifications e.g. CJC-1295 DAC, Tesamorelin, Sermorelin	● −20 °C; DAC modification does not change lyophilised storage requirements[3]	● Protect from direct light; amber packaging preferred	● Sealed, desiccated; standard precautions apply	● Minimise; aliquot before freezing[5]	● 2–8 °C; longer half-life in vivo does not imply greater in-vitro solution stability	● Short-term; confirm with lot-specific stability data[1]	● Limit; single-use aliquots preferred
Nootropic & bioregulator peptides e.g. Semax, Selank, Pinealon, Cortagen, Vesugen, Epitalon (see also row 1)	● −20 °C; short peptides (2–4 residues) generally stable when dry and cold[4]	● Standard light protection; sealed vial	● Sealed, desiccated; avoid humidity; reseal after each use	● Minimise; divide into working aliquots before first freeze	● 2–8 °C; short peptides can aggregate or deamidate in solution[5]	● Prepare fresh near use; do not stockpile solutions	● Limit; single-use aliquots preferred

Temperature ranges are illustrative defaults derived from ICH Q1A(R2) stability science and published formulation literature.[14] The receiving laboratory is responsible for confirming conditions against the lot-specific COA and its own stability data. "Short-term" in-use windows are indicative only — no specific number of days is stated because this varies substantially by peptide sequence, solvent, pH, and lab conditions. Research Use Only.

RECONSTITUTION SOLVENT QUICK-REFERENCE (RESEARCH SAMPLE PREPARATION ONLY)

RESEARCH SOLVENT	TYPICAL IN-VITRO USE	STABILITY / HANDLING NOTE	COMPOUND-CLASS FIT
Sterile water *(research grade, for irrigation)*	Simple aqueous dissolution where no buffering needed	Unbuffered; pH can drift; no preservative effect — make fresh, keep cold, use promptly[5]	Suitable for most linear, non-sensitive peptides; not ideal for disulfide-bridged or oxidation-prone sequences

RESEARCH SOLVENT	TYPICAL IN-VITRO USE	STABILITY / HANDLING NOTE	COMPOUND-CLASS FIT
Bacteriostatic water *(research solvent)*	Aqueous reconstitution where solution is held longer between in-vitro uses	Contains bacteriostatic agent (e.g. benzyl alcohol); aqueous — hydrolysis-driven ageing continues once dissolved[3]	Common choice for many research peptides; check compatibility with specific assay readouts
Phosphate-buffered saline (PBS)	Cell-based assays, binding assays requiring near-physiological pH and ionic strength	Buffers pH, which can support stability; salt concentration and pH must suit the peptide and assay[5]	Well-suited to in-vitro cell work; avoid with peptides sensitive to phosphate or high ionic strength
Acetic acid (dilute, ~0.1–1%)	Dissolving poorly water-soluble or basic peptides (e.g. some GH secretagogues)	Lowers pH to aid solubility of basic peptides; ensure downstream assay tolerates acidic pH; not for disulfide-bridged peptides[3]	Useful for cationic linear peptides; not appropriate for acid-sensitive sequences or copper complexes
DMSO	Dissolving poorly water-soluble peptides for stock solutions	Excellent solubiliser; strong solvent that can interfere with assays at higher concentrations; not appropriate for every peptide chemistry[3]	Reserve for water-insoluble compounds; avoid with disulfide-bridged peptides; dilute into aqueous buffer before cell assays

Solvent selection is an experimental decision for the receiving laboratory based on peptide chemistry and assay requirements. This table describes laboratory sample preparation for in-vitro and research work only. It is not guidance for preparation of anything intended for human or veterinary use. Source: published formulation science[345] and ICH quality guidelines.[12]

SIX PRINCIPLES THAT UNDERLIE ALL ROWS ABOVE

1. TEMPERATURE IS THE MASTER VARIABLE.
Reaction rates for hydrolysis, oxidation and aggregation fall steeply with temperature. Colder is always safer for long-term storage.[1]

2. WATER IS THE UNIVERSAL ENEMY OF DRY POWDERS.
Lyophilisation removes water to arrest degradation. Humidity, condensation or premature reconstitution reintroduces it.[4]

3. WARM THE SEALED VIAL BEFORE OPENING.
Bringing a cold vial to room temperature before unsealing prevents condensation of ambient moisture onto the powder.[4]

4. FREEZE-THAW CYCLES ARE CUMULATIVE STRESS.
Each cycle imposes ice formation, concentration changes and pH shifts that can promote aggregation. Aliquot before freezing to limit exposures.[5]

5. RECONSTITUTION RESTARTS THE STABILITY CLOCK.
A solution is not the same thing as a powder. Once dissolved, ageing resumes. Make solutions close to use and do not stockpile.[4]

6. THE COA CERTIFIES RELEASE, NOT POST-HANDLING INTEGRITY.
A COA documents identity and purity at the moment of manufacture. What happens after shipment is the receiving laboratory's responsibility.[2]

RELATED LABORATORY RESOURCES — CONDOR RESEARCH

Full guide: How to Store and Reconstitute a Lyophilised Peptide | How to Read a Certificate of Analysis (COA) | Bacteriostatic Water vs Acetic Acid vs Sterile Water | What “99% Pure” on a COA Really Means

RESEARCH USE ONLY • NOT FOR HUMAN OR VETERINARY USE • LABORATORY SAMPLE PREPARATION REFERENCE • CONDOR RESEARCH

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