Panacea

PANACEA BIO CHEM

THE PANACEA ADVANTAGE

LYOPRESTER® & LIQUIPRESTER

Beyond conventional vials, dual-chamber cartridges and premixed pens.

THE CARTRIDGE IS ONLY THE BEGINNING.

For professional in vivo and in vitro laboratory research only



LyoLevit™ — cakes levitating in their Lyoprester® cartridges while they dry · Panacea Bio Chem laboratory

01 · THE PROPOSITION

THE CARTRIDGE IS ONLY THE BEGINNING.

What distinguishes a Panacea product is the engineering, chemistry, manufacturing process, protective environment, analytical quality and formulation intelligence behind it.

Four categories of product are often compared as if they were the same. They are not. Each is shown here by what it actually is.

A · CONVENTIONAL

Lyophilised peptide vial

Freeze-dried product in a single container, sealed under vacuum: a sound way to keep a peptide dry.

Everything after that is left to the user: a separately bought diluent such as bacteriostatic water, syringes, transfers, volumes and calculations.

B · CONVENTIONAL

Dual-chamber cartridge

Two chambers separated by a moving plunger, with a bypass for reconstitution inside the cartridge. It spares the user one task: drawing the liquid from a second vial.

It gives up the vial's vacuum to do so. The cake chamber holds air, the cake is freeze-dried resting on the middle plunger, and an air bubble travels with the liquid. Air on both sides of the plunger is oxygen, and oxygen drives the oxidation of the peptide.

C · PANACEA

Lyoprester

Panacea's proprietary integrated dry-peptide preservation and reconstitution platform: a separately prepared lyophilised cake, sealed under vacuum with an argon backfill, and an engineered P-EARLs™ liquid (Panacea-Engineered Aseptic Reconstitution Liquids) in a precision dual-chamber cartridge.

Formulated with Dicoias Ψ™, Peptourbillon™ and RedoxVault™. **Dried** in the Lyochrysalis™ under S3Pulse™: LyoLevit™, Cryolapse™, TgShift™, DiastolVAC™, RF Tunnel™. **Closed** with PleniDose™, OxyDeplete™, ArgonLock™, VANA™ with ElimiVoid™, and SealoPrester™. **Delivered** with the EZnject™ pen and IncreSure™.

D · PANACEA

Liquiprester

Panacea's advanced liquid-cartridge platform. The active ingredients are kept in solution, in an engineered formulation.

Formulation chemistry, precisely controlled filling, oxygen depletion, argon conditioning, a cartridge with no gas pocket and dose-fidelity engineering. Not merely an ordinary premixed pen.

Formulated with Dicoias Ψ™, Peptourbillon™ and RedoxVault™. **Filled** with PleniDose™ with ElimiVoid™, and Cryoviscous™. **Protected** by OxyDeplete™ and ArgonLock™. **Delivered** with IncreSure™.

> A cartridge's physical shape is only one part of product quality. Panacea offers an integrated technological architecture — not merely a cartridge filled with peptides and bacteriostatic water.

02 · LYOPRESTER®

LYOPRESTER® AND ITS LONGEVITY

5 years
SEALED · ROOM TEMPERATURE 18–25 °C · AWAY FROM DIRECT SUNLIGHT

8 years
SEALED · REFRIGERATED

6 months
REFRIGERATED · AFTER RECONSTITUTION

40 days
ROOM TEMPERATURE · AFTER RECONSTITUTION · AWAY FROM DIRECT SUNLIGHT

No freezing
DURING STORAGE OF THE FINISHED PRODUCT



Why it lasts

Lyoprester® combines a below-zero desorption finishing stage, a dry cake sealed under vacuum with an argon backfill, and a separately stored, peptide-specific P-EARLs™ reconstitution liquid with dissolved argon. Together they remove the main causes of peptide degradation: residual moisture, oxygen, unsuitable reconstitution chemistry and long storage in solution.

Dried cold. Finished cold.

Ordinary freeze dryers end with a +40 to +60 °C bake to drive off the last bound water. The Lyochrysalis™ never overheats a cake: TgShift™ raises the glass-transition ceiling so the cake dries with its structure intact, and the final desorption is completed a few degrees below zero. The peptide leaves the dryer with its binding affinity and bioavailability preserved.

Freezing belongs to manufacture, not to storage

Controlled freezing is a deliberate step inside Panacea's lyophilisation process. The finished product is never frozen: it is kept dry, sealed and protected. Greater storage flexibility, and no freezer.

Sealed: five years at room temperature, eight years refrigerated. After reconstitution: six months refrigerated, forty days at room temperature. These are the storage figures of the genuine Lyoprester® system with its matched P-EARLs™ liquid; no generic vial and no generic dual-chamber cartridge carries them. Ordinary room lighting does it no harm; direct sunlight does.

03 · THE MANUFACTURING DIFFERENCE

THE CAKE IS ENGINEERED — NOT FREEZE-DRIED ON THE MIDDLE STOPPER.

Every other laboratory lyophilises with a middle elastomer stopper already installed in the cartridge. The peptide solution is deposited directly over this stopper, then frozen and dried with the product resting on it.

Panacea does not manufacture the Lyoprester® cake that way.

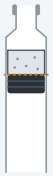
In Panacea's process no plunger is in the cartridge while the cake is made. The peptide solution is aliquoted, frozen and dried on glass, levitating in the Lyochrysalis™; both plungers enter only after lyophilisation is complete.

Why it matters

- Elastomers contain extractable constituents, and a cake dried on a stopper stays in contact with them through the shelf life.
- Product dried into the ribs of the middle plunger obstructs the bypass at reconstitution: slow, incomplete dissolution, inconsistent doses and a stiff injection stroke.
- Silicone-related particles, leachables and moisture transfer are recognised concerns in pharmaceutical dual-chamber development.
- A cake formed on glass, with no plunger present, has none of these exposures.

ENGINEERING FEATURE	CUSTOMER VALUE
No peptide solution is ever freeze-dried on a plunger.	No plunger chemistry in the cake; a clean bypass and a full dose at reconstitution.

EVERY OTHER LABORATORY



Mouth up, the middle stopper already installed. The peptide solution is deposited over it, then frozen and dried **resting on the elastomer (contact line)**. The cake stays on that stopper for the whole shelf life.

THE PANACEA SEQUENCE



1 · ALIQUOTED
Mouth down. The peptide solution rests in the head of the cartridge, on glass. No plunger is in the cartridge.



2 · FROZEN AND FREEZE-DRIED
Frozen and dried there, in the Lyochrysalis™. The cake forms on glass.



3 · ARGON
Argon is admitted over the finished cake (ArgonLock™).



4 · MIDDLE PLUNGER, THEN P-EARLS™
Only now does the middle plunger enter, onto a finished cake. The P-EARLs™ liquid is dispensed onto it.

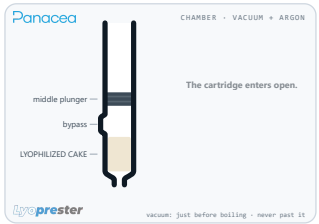


5 · VANA™
Vacuum through the mouth, then a controlled fraction of argon. The top plunger and the cap are fitted together.



6 · SEALOPRESTER™
Mouth up. The final mechanical seal closes the cartridge.

STEPS 4 AND 5, IN MOTION



The cartridge stands mouth down, the finished cake in its chamber and the middle plunger above it. The P-EARLs™ liquid is aliquoted while vacuum draws the gas from the cake's chamber; argon is then admitted to both chambers, and the top plunger and the cap are fitted together. No air bubble is left in the liquid.

Drawings: schematic sections, each cartridge standing as it stands at that step. References: dual-chamber lyophilisation and container materials — PMC8575750; PMC11744310; PubMed 28928293 (see Technical references).

04 · P-EARLS™

Panacea-Engineered Aseptic Reconstitution Liquids

NO AIR BUBBLE. NO GENERIC DILUENT. NO UNNECESSARY EXPOSURE.

> Panacea's P-EARLs™ liquid is engineered for the peptide it dissolves, oxygen-depleted, argon-conditioned and enclosed between precision plungers with no air bubble. With the sealed cartridge and its own buffering, it keeps oxygen away from the peptide and its pH steady through storage.

Not just water in the second chamber

- Formulated for the chemistry of the peptide it dissolves.
- pH, buffering, solubility and compatibility set at manufacture.
- No generic solvent and no bacteriostatic water for the customer to select and measure.
- Stored apart from the lyophilised cake until activation.
- Conditioned with OxyDeplete™ and ArgonLock™.
- Enclosed plunger to plunger, with no air bubble.
- Sealed, buffered and oxygen-depleted: its pH stays where it was set.

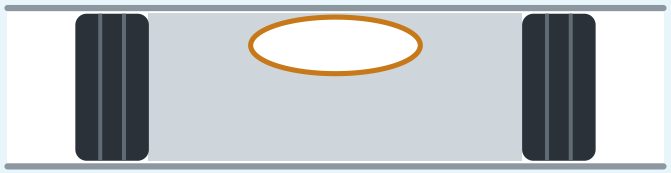
Why Panacea is the only one

Every other liquid cartridge carries a gas bubble. A bubble is a reservoir of oxygen and a gas–liquid interface, and a dissolved peptide degrades at both.

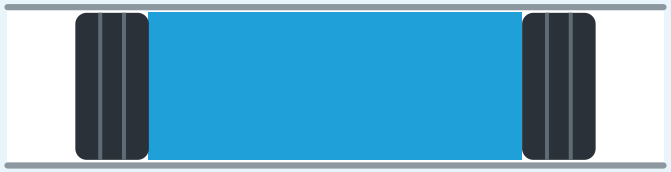
Completing a liquid chamber plunger to plunger, with no gas phase left in it, cannot be done on standard filling equipment. Panacea spent a year and a half designing and building the machines that do it. Nobody else made that investment, and nobody else has the result.

ENGINEERING FEATURE	CUSTOMER VALUE
Matching the liquid to the peptide.	No solvent to choose, no solvent error, the same reconstitution every time.

THE LIQUID CHAMBER, PLUNGER TO PLUNGER



A conventional liquid chamber with its gas pocket. The pocket is a reservoir of oxygen and a gas–liquid interface.



P-EARLs™ chamber. Engineered liquid from plunger to plunger: oxygen removed by OxyDeplete™, argon held dissolved by ArgonLock™, no gas pocket.

A world first. Panacea Bio Chem is the first manufacturer, and the only one, to complete a peptide dual-chamber cartridge with an engineered, oxygen-depleted, argon-conditioned liquid and no air bubble.

Drawings: schematic sections of the liquid chamber. Edition of November 2026.

05 · OXYGEN, REACTIVE OXYGEN SPECIES AND REDOX PROTECTION

ENGINEERED OXYGEN DEPLETION. MULTI-LAYER OXIDATIVE PROTECTION.

> Panacea Bio Chem approaches peptide oxidation at several levels: removing oxygen during processing, eliminating internal gas reservoirs, establishing protective argon conditions and controlling molecular interactions through formulation engineering.

Methionine, cysteine, tryptophan and other sensitive residues oxidise. The reactions are driven by dissolved molecular oxygen, hydroperoxides, free radicals, light and trace metals.

EXAMPLE · METHIONINE SIDE CHAIN



methionine (Met) — methionine sulfoxide (Met(O))

One oxygen atom added to the sulfur changes the residue — and changes how the peptide behaves. Panacea removes the conditions that drive such reactions.

ENGINEERING FEATURE	CUSTOMER VALUE
Deliberate oxygen management (ArgonLock™ + OxyDeplete™).	A peptide kept away from oxygen, from manufacture to use.

TECHNOLOGY	WHAT IT DOES
OxyDeplete™	Removes dissolved and entrained oxygen from the liquids before they are sealed.
ArgonLock™	Controlled argon conditioning. In the dry-cake chamber it operates with vacuum-derived low-pressure conditions and controlled argon admission. In P-EARLs™ and Liquiprester™ liquids, argon is held in dissolved form, not as a heavy-gas blanket sitting on the liquid.
ElimiVoid™	Completes the liquid chamber with no gas pocket. Built into VANA™ for the Lyoprester®, into PleniDose™ for the Liquiprester™.
RedoxVault™	Redox protection built into the formulation. Lipid microsphere encapsulation holds a reactive active in its own micro-reservoir, so compounds that would attack each other coexist in one formulation.
P-EARLs™	The right chemical environment for each peptide: buffering and compatibility set at manufacture.

These technologies work together: they remove the conditions that promote oxidation and suppress ROS-mediated degradation. Argon acts through its inertness and by displacing the oxygen available to the peptide.

Reference: peptide oxidation and aqueous stability — PMC10056213 (see Technical references).

06 · PEPTOURBILLON™ · VANA™ · LYOLEVIT™ · THE ENGINEERING ECOSYSTEM

FORMULATION AND MANUFACTURING INTELLIGENCE

peptourbillon

Panacea's single-, dual- and multi-layer formulation architecture. Different formulation components or active ingredients are prepared and arranged in deliberate layers, rather than every component being mixed into a single homogeneous bulk liquid before freezing.

- Formulation-specific layers and a controlled manufacturing sequence.
- Built for complex multi-component combinations.
- Each ingredient placed where its compatibility requires; every recipe computed with Dicoias Ψ™.

The layers serve manufacture and storage; on complete reconstitution the components dissolve together.

VANA

Vacuum–Argon–Nitrogen Architecture

Cake side. Argon is introduced following lyophilisation; the VANA™ Machine subsequently establishes the final reduced-pressure, partially argon-conditioned dry chamber during sealing — not a cartridge simply filled with argon at atmospheric pressure.

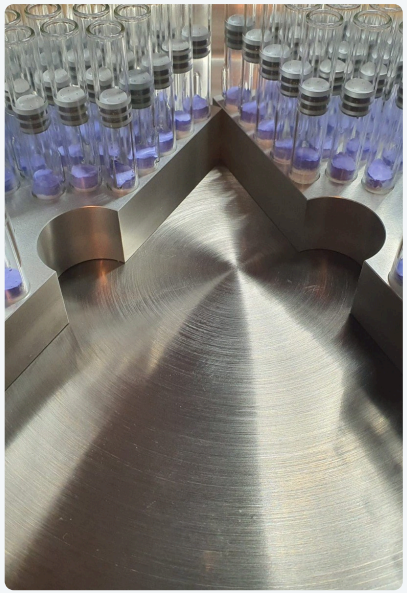
Liquid side. P-EARLs™ and Liquiprester™ liquids are separately degassed and argon-conditioned, without depending on a retained visible headspace bubble.

An integrated, chamber-specific preservation strategy.

LyoLevit

Zero-contact orbital levitation: a vapour-supported, high-spin sublimation state without solid surface support. The cake levitates and spins in high orbit while it dries.

Layer placement is Peptourbillon™; levitated drying is LyoLevit™.



The Lyochrysalis™ chamber loaded with Lyoprester® cartridges — Panacea Bio Chem laboratory

INSIDE THE PANACEA ENGINEERING ECOSYSTEM

Lyochrysalis™	Panacea's own peptide lyophiliser — one instrument running the Panacea gentle-drying technology stack.
S3Pulse™	The process-control algorithm that runs the Lyochrysalis™ through freezing, primary sublimation and secondary desorption.
Cryolapse™	Panacea's secondary-vacuum lyophilisation method for gentle, surfactant-free freeze-drying of sensitive peptides.
CryoSurge™	The nucleation-induced crystallisation exotherm of a freezing formulation, recorded per product holder as onset, peak and return.
CryoFlare™	The product-temperature signature of heating that runs ahead of the ice during sublimation. S3Pulse™ detects and records it, and the heating ramp that caused it is never used again.
DiastolVAC™	Biomimetic vacuum control — pumps, valves and sensors governing chamber pressure by gentle difference rather than brute force.
TgShift™	One process across two stages, with radio-frequency and ultrasound. "Teach them young": during the ultra-low-temperature freeze it opens the RF Tunnel™; during sublimation it raises the glass-transition temperature (Tg′), so drying proceeds with the cake intact. The run finishes cold, a few degrees below zero, never in a hot bake.
Dicoias Ψ™	Panacea's formulation mathematics: it computes the recipe of every peptide liquid and every P-EARLs™ liquid.
SealoPrester™	Aseptic cartridge closure: the final mechanical seal after the VANA™ vacuum/argon cycle.
RF Tunnel™	Reconstitution pathways: a channel through the cake, opened while it freezes, so it redissolves from its core and its surface at once.
IncreSure™	Dose-fidelity engineering: verified active content per pen increment.

06 · DICOIAS Ψ™ — THE FORMULATION DECIDES

WHAT TRAVELS WITH AN ACTIVE DECIDES WHAT THE BODY RECEIVES.

One glass of grapefruit juice

Take a medicine with a glass of grapefruit juice. The dose on the label is unchanged; the amount that reaches the blood is not. Furanocoumarins in the juice remove CYP3A4, the enzyme of the intestinal wall that destroys part of the dose before it is absorbed.

284 %
felodipine reaching the circulation, against the same dose taken with water (range 164–469 %)[1]

16×
simvastatin exposure with double-strength juice (range 9.0 to 37.7-fold)[2]

−62 %
CYP3A4 in the cells of the intestinal wall after six days of juice[3]

One whole fruit or 200 mL of juice is sufficient; a quarter of the effect remains 24 hours later; more than 85 medicines are affected.[4] Nothing was added to the medicine. Only its company changed.

The grapefruit is a comparison, used here to make the principle easy to see. It is not how peptides work. An injected peptide never meets the intestinal wall or CYP3A4. Its fate is decided in its own liquid: charge, folding, aggregation, oxidation, solubility. The mechanism is different; the principle is the same.

The same law, used on purpose

- Semaglutide as a tablet exists because of one excipient: its absorption “requires coformulation with SNAC”.[5]
- Insulin aspart, the same molecule in a new formulation: twice the early exposure (ratio 2.01) and an onset 4.9 minutes earlier.[6]

Dicoias

This is what Dicoias Ψ™ calculates. Nothing in a formulation is neutral. pH, counter-ion, buffer, sugar, surfactant, dissolved gas, trace metal: each one moves the charge of the active, its folding, its aggregation, its oxidation and its solubility at the moment it is needed. The industry settles these by habit and by trial. Panacea computes them.

Dicoias Ψ™ writes every active and every excipient as a vector on the same six axes: electrostatic proximity (pI window), net-charge burden at pH, aggregation & interfacial stress, chemical & oxidative liability, solid-state / matrix dependence, molecular crowding / viscosity. It rejects any recipe that breaks a hard limit before a score is given, scores every recipe that remains, and prescribes the additions that close the distance to the best one.

- The P-EARLs™ liquid of each Peptourbillon™ is computed for the cake it dissolves: pH, buffer, tonicity and protectants set for that active, in that layer.
- In the Lyoprester®, cake and liquid meet only at reconstitution: the recipe is computed for that meeting.
- In the Liquiprester™, the active stays in its liquid for its whole shelf life: the recipe is computed for that life, with no phenols and no antifreeze-type excipients.

Grapefruit juice changes a medicine by accident. Dicoias Ψ™ sets the company of every Panacea active by calculation.

[1] Bailey DG et al., Lancet 1991;337:268–9. [2] Lilja JJ et al., Clin Pharmacol Ther 1998;64:477–83. [3] Lown KS et al., J Clin Invest 1997;99:2545–53. [4] Bailey DG et al., CMAJ 2013;185:309–16. [5] Buckley ST et al., Sci Transl Med 2018;10:eaar7047. [6] Heise T et al., Clin Pharmacokinet 2017;56:551–9.

06 · PEPTOURBILLON™ — SEVERAL ACTIVES, ONE CARTRIDGE

THE INDUSTRY USES TWO CONTAINERS. PANACEA USES ONE CARTRIDGE.

The problem the largest companies still carry to the user

Two actives rarely want the same liquid. Each has its own pH, its own stability window and its own enemies; blended into one bulk solution, one of them pays. The industry's answer is to keep them apart, and to hand the user two of everything.

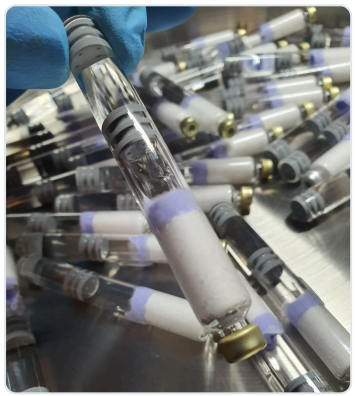
NOVO NORDISK · CAGRISEMA (CAGRILINTIDE + SEMAGLUTIDE)

Its two components are “injected separately with a dual-chamber pen device”.[1] In 2026 the work on a single-chamber device was abandoned.[2] Two liquids, two chambers, one of the largest development budgets in the industry.

SYMLIN (PRAMLINTIDE) WITH INSULIN

Pramlintide is formulated at about pH 4, insulin near neutral. The two are never mixed: separate syringes, separate injection sites, at every meal.[3]

Two chambers, two syringes, two injections. After decades of work, the answer to an incompatibility is still to pass both halves of it to the person holding the pen.



TelomeREGEN, after the lyophilisation run. One cake, two layers, in the cake chamber of each Lyoprester®: the blue layer is GHK-Cu2+, the white layer is Pineal Gland Peptide T-38. Two actives, one cartridge, one injection.

peptourbillon

Peptourbillon™ is layered lyophilisation: each active in its own layer of one freeze-dried cake. Dual-layer for two actives; multi-layer for three or more. Every layer is formulated for the active it carries: its own pH, its own protectants, its own place in the cake. Dry, the layers do not react with each other. They meet only at reconstitution, minutes before use, in a P-EARLs™ liquid computed for that meeting.

- Each active kept at its own conditions for the whole shelf life.
- No compromise formulation: no active pays for the other.
- One cartridge, one reconstitution, one injection.
- Every recipe computed with Dicoias Ψ™; reactive actives protected by RedoxVault™.
- The same sealed, argon-backfilled Lyoprester® and the same EZnject™ pen as a single-active product.

Solved at Panacea ages ago

PRODUCT	LAYERS AND ACTIVES, IN ONE CARTRIDGE
TelomeREGEN	Dual-layer. Pineal Gland Peptide T-38 + GHK-Cu2+. The first.
GonadoTROPINEX	Multi-layer, three layers. Human GnRH + Vasoactive Intestinal Peptide + Oxytocin
ExADIPO²	Dual-layer. Tirzepatide + Selank
ExADIPO³	Dual-layer. Retatrutide + Oxytocin
HealCONEX	Dual-layer. Thymosin β4 + Bepecin
NocTANEX	Multi-layer, three layers. Bremelanotide + Melanotan II + Oxytocin

[1] BioPharma Dive, 20 December 2024, “Novo's next-gen obesity drug misses expectations in closely watched trial”. [2] Fierce Biotech, 2026, “Novo CEO insists ‘no change in plan’ for CagriSema launch after single-chamber device ditched”. [3] Symlin (pramlintide acetate) prescribing information: not to be mixed with insulin; administered as separate injections.

07 · RECONSTITUTION AND MEASUREMENT

FEWER PREPARATION OPERATIONS. FEWER OPPORTUNITIES FOR ERROR.

Panacea EZnject™

110 × 0.01 mL

INDEXED MECHANICAL INCREMENTS

- Made for Lyoprester® cartridges.
- A precision-indexed pen mechanism.
- No syringe markings to read: each volume is selected in indexed steps.
- Repeated selection through a dedicated mechanism.
- No vial withdrawals after reconstitution.

Activation is internal: the vacuum of the cake chamber draws the P-EARLs™ liquid through the bypass, inside the closed cartridge.

110 increments span a nominal mechanical displacement range of 1.10 mL.

SINGLE-USE ARCHITECTURE

Lyoprester SS

A separate configuration: a special top plunger accommodates a syringe piston and a needle adaptor, turning the cartridge itself into a complete, self-contained system. The lyophilised cake rests in its chamber under argon while the P-EARLs™ liquid waits in the second chamber, behind the middle plunger.

Activation

1. The needle is screwed onto the adaptor.
2. The device is held needle up.
3. The rod is pushed: the middle plunger moves into line with the bypass and the liquid passes over it onto the cake, while the argon leaves through the needle.
4. The cake dissolves into one clear liquid inside the closed cartridge, ready to inject.

Its own mechanism, separate from the EZnject™ pen.

The convenience comparison

Compared with conventional vial preparation, the integrated system removes:

- Separate diluent selection.
- Separate diluent-volume measurement.
- Drawing liquid from an external solvent vial.
- Transferring liquid between independent containers.
- Repeated withdrawals from a conventional vial.
- Repeated manual concentration calculation.
- Additional accessories used solely for reconstitution.

The advantage is fewer preparation operations and fewer opportunities for error, with nothing given up in preservation: the cake remains sealed under vacuum, exactly as in a classical lyophilised vial, and **an argon backfill is added on top of that vacuum** (VANA™, ArgonLock™).

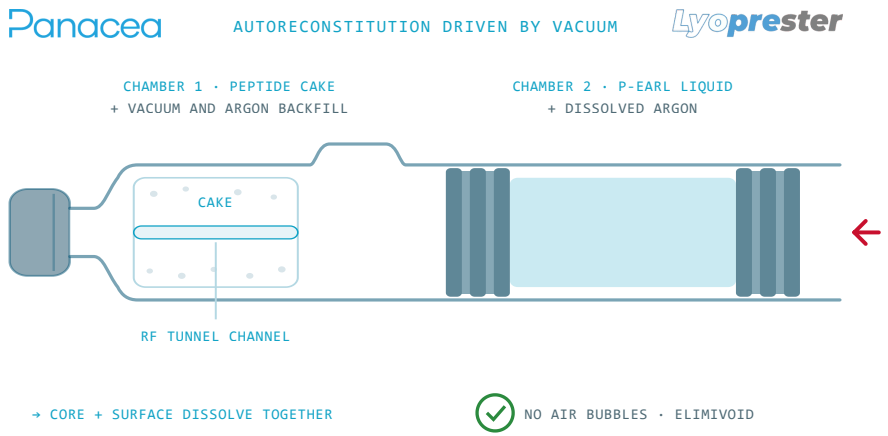
ENGINEERING FEATURE	CUSTOMER VALUE
Indexed mechanical volume selection.	Simpler, repeatable selection without conventional syringe-scale measurement.

“Why not just buy a conventional peptide vial?”

Because Lyoprester® keeps what is right about the vial, a dry cake sealed under vacuum, and adds what the vial lacks: **an argon backfill over the cake**, reconstitution inside the closed cartridge, a liquid matched to the peptide's chemistry, and none of the preparation steps. The customer receives a complete engineered system, not a container and a preparation task.

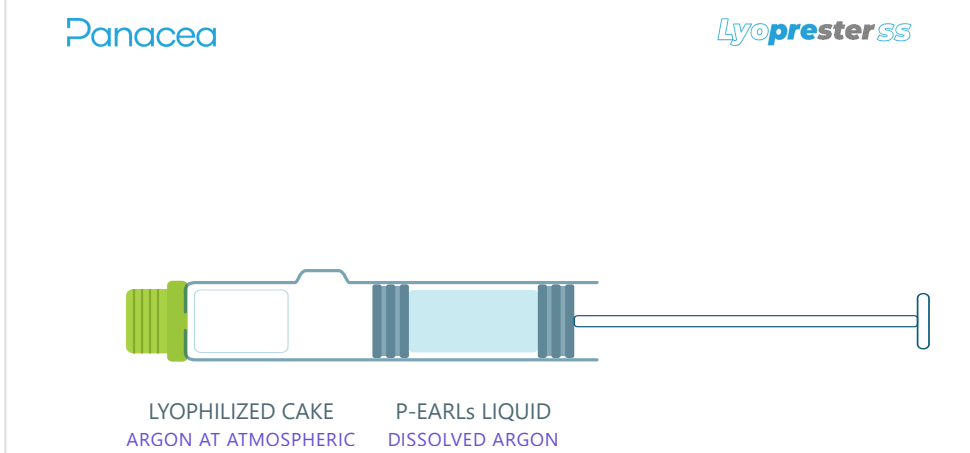
07 · RECONSTITUTION, IN MOTION

ONE TAP. OR ONE PUSH.



Lyoprester®: it reconstitutes by itself

One tap starts it. Both plungers advance until the middle plunger sits in the bypass; the vacuum of the cake chamber then draws the P-EARLs™ liquid over it and into the cake. Core and surface dissolve together, with no air bubble, and the argon backfill remains.



Lyoprester® SS: the single shot

The cartridge is the whole injection system. Needle on, needle up, push the rod: the P-EARLs™ liquid enters the cake's chamber while the argon leaves through the needle. A few droplets at the tip, and it is ready to inject.

The on-screen edition plays both sequences; in print each drawing shows its device as stored. The same animations run on lyoprester.com.

08 · VIAL · STANDARD DUAL-CHAMBER · LYOPRESTER®

WHY NOT BUY AN ORDINARY DUAL-CHAMBER CARTRIDGE?

FEATURE	CONVENTIONAL VIAL	STANDARD DUAL-CHAMBER CARTRIDGE	GENUINE LYOPRESTER®
Atmosphere over the dry cake	Vacuum	Air	**Vacuum, plus an argon backfill — VANA™ + ArgonLock™**
Where the cake is freeze-dried	On glass	Resting on the middle plunger, and in contact with it through the shelf life	Levitating, on no plunger — LyoLevit™. Both plungers enter after drying
The bypass at reconstitution	No bypass	Product dried into the plunger's ribs obstructs it: slow, incomplete reconstitution	Clean: no product was ever dried on a plunger
What moves the liquid into the cake	The user, with a syringe and a needle	The user's push on the plunger	The vacuum of the cake chamber: the cartridge reconstitutes by itself
Dry formulation and liquid in one container	No	Yes	Yes
Reconstitution liquid	Bought separately: bacteriostatic water	A general diluent	P-EARLs™, made for the peptide it dissolves
Gas in the liquid	Air enters at every transfer	A gas bubble travels with the liquid	None: the liquid chamber is completed with no air
Dissolved oxygen in the liquid	Not removed	Not removed	Removed — OxyDeplete™, with argon held dissolved
Dose consistency	Depends on the user's measuring and calculation	Inconsistent when the bypass is obstructed, with a stiff injection stroke	EZnject™: 110 indexed increments of 0.01 mL
Formulation	One blended bulk solution	One blended bulk solution	Peptourbillon™ layers computed with Dicoias Ψ™; RedoxVault™ lipid microsphere encapsulation
Final drying	Commonly a +40 to +60 °C secondary bake	Commonly a +40 to +60 °C secondary bake	Finished a few degrees below zero — Lyochrysalis™, TgShift™
Sealed shelf life	Protected by its vacuum; kept refrigerated or frozen	Shorter than a vial's: air in the cake chamber	Up to 5 years at room temperature, up to 8 years refrigerated
After reconstitution	Short: a solution in a punctured vial	Short: a general diluent, and air in the cartridge	Up to 6 months refrigerated, up to 40 days at room temperature

protects the peptide works against it

The standard dual-chamber cartridge spares the user one task: drawing the liquid from a second vial. It pays for that with the vial's best property. Its cake chamber holds air where the vial holds vacuum. Its cake is dried resting on the middle plunger, and product dried into the plunger's ribs obstructs the bypass: reconstitution becomes slow and incomplete, doses inconsistent and the injection stroke needlessly stiff. For stability and shelf life the classical vial is the better of the two. **Lyoprester® keeps the vial's vacuum, adds an argon backfill, and removes every step the vial leaves to the user.**

09 · INTRODUCING LIQUIPRESTER™

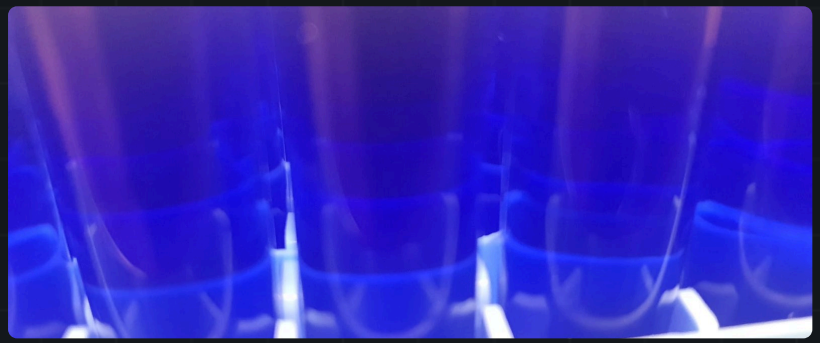
Liquiprester

THE GLASS MAY VARY. THE DOSE MUST NOT.

LIQUIPRESTER™ — NOT SIMPLY PREMIXED. PRECISION-ENGINEERED.

Panacea's advanced liquid-cartridge platform. Unlike Lyoprester®, the active ingredients are kept in solution, in an engineered formulation. Liquiprester™ combines formulation chemistry, precisely controlled filling, oxygen depletion, argon conditioning, a cartridge with no gas pocket and dose-fidelity engineering.

“Isn't this just another premixed pen?” No. A conventional premixed pen keeps its peptide with preservative chemistry: phenol, with propylene glycol or benzyl alcohol. Liquiprester™ keeps it by removing what degrades it. The oxygen is taken out, argon is dissolved in, no gas pocket is left, and each reactive active is protected in its own lipid micro-reservoir. Every recipe is computed with Dicoias Ψ™, for the best outcome without compromise.



Liquiprester™ cartridges in their rack — Panacea Bio Chem laboratory

PARAMETER	CONVENTIONAL PREMIXED LIQUID PEN	LIQUIPRESTER™
How long-term stability is obtained	Preservative chemistry added to the liquid	By removing what degrades the peptide: oxygen out, argon in, no gas pocket
Preservatives and co-solvents in the liquid	Phenol, with propylene glycol or benzyl alcohol[1]	No harsh preservative chemistry and no antifreeze-type excipients such as propylene glycol
Gas pocket in the cartridge	An air bubble	None — ElimiVoid™
Oxygen removed, argon dissolved in the liquid	Not part of the product	OxyDeplete™ + ArgonLock™
Protection of reactive actives	Not part of the product	RedoxVault™ lipid microsphere encapsulation
Several peptides in one liquid	One active per pen[1]	Co-formulations, each active in its own micro-reservoir — RedoxVault™, Peptourbillon™
How the recipe is determined	Conventional formulation practice	Computed with Dicoias Ψ™, Panacea's formulation mathematics
Filling and rear-plunger position	Standard liquid filling	PleniDose™ datum, Cryoviscous™ filling
Dose per pen increment	Nominal volume	IncreSure™: verified active content per increment
Unopened, refrigerated at 2–8 °C	24 to 36 months[1]	**Up to 60 months (5 years)**
Unopened, at room temperature	Kept in a refrigerator[1]	**Up to 6 months** at 18–25 °C, away from direct sunlight
After first use	30 days to 8 weeks[1]	**Up to 4 months** at 2–8 °C, **up to 1 month** at room temperature, away from direct sunlight

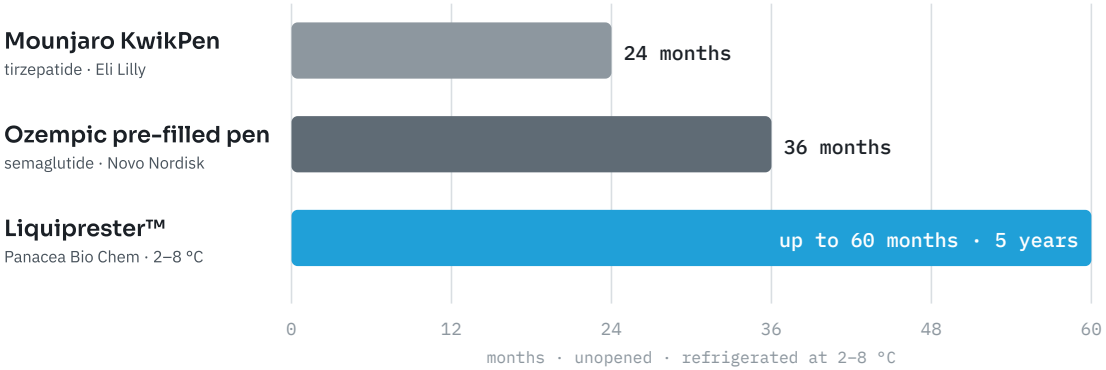
[1] Mounjaro KwikPen and Ozempic pre-filled pen: Summaries of Product Characteristics, sections 6.1, 6.3 and 6.4 (sources on the next page).

10 · LIQUIPRESTER™ PRESERVATION

LIQUIPRESTER™ — UP TO FIVE YEARS OF ENGINEERED LIQUID PRESERVATION AT 2–8 °C

> An advanced liquid-peptide preservation platform incorporating oxygen reduction, dissolved argon conditioning, bubble-free liquid containment and formulation-specific molecular protection.

UNOPENED · REFRIGERATED STORAGE · MONTHS



2.5×

60 ÷ 24 MONTHS
THE MOUNJARO REFERENCE PERIOD

1.67×

60 ÷ 36 MONTHS
THE OZEMPIC REFERENCE PERIOD

THE LIQUIPRESTER™ SPECIFICATION

- **Unopened: up to 5 years** refrigerated at 2–8 °C.
- **Unopened: up to 6 months** at room temperature, 18–25 °C.
- **After first use: up to 4 months** at 2–8 °C.
- **After first use: up to 1 month** at room temperature, 18–25 °C.
- **Never frozen** during storage.
- Kept away from direct sunlight. Ordinary room lighting does it no harm; direct sunlight does.

WHY IT LASTS

OxyDeplete™
Oxygen reduction in the liquid.

ArgonLock™
Dissolved argon conditioning.

ElimiVoid™
Bubble-free containment.

RedoxVault™
Lipid microsphere encapsulation: each reactive active in its own micro-reservoir.

The comparison is unopened refrigerated storage against unopened refrigerated storage, each figure from its manufacturer's own product information. The reference pens reach their periods with phenol and propylene glycol or benzyl alcohol in the liquid; Liquiprester™ reaches five years without that chemistry. Its figures are its own, separate from the dry-state Lyoprester® figures.

Sources: Mounjaro KwikPen (tirzepatide) SmPC section 6.3 “Before use 24 months”, store at 2–8 °C, revised 29 August 2026, medicines.org.uk/emc/product/15484; Ozempic pre-filled pen (semaglutide) SmPC section 6.3 “Before first use … 3 years”, store at 2–8 °C, revised July 2026, medicines.org.uk/emc/product/9750. Excipients, section 6.1 of the same documents: Mounjaro KwikPen includes glycerol, phenol and benzyl alcohol; Ozempic includes propylene glycol and phenol. Liquiprester™: Panacea Bio Chem specification.

11 · THE COMPLETE LIQUIPRESTER™ TECHNOLOGY STACK

PRECISION FILLING, PROTECTIVE ATMOSPHERE, ENGINEERED CHEMISTRY

FILLING

PLENIDOSE

PRECISION CARTRIDGE FILLING

Precision filling architecture with a controlled rear-plunger datum and a defined active-content aliquot, keeping cartridge geometry, total liquid content, pen mechanism and intended dose mapping in their proper relationship. The published design describes a target 3.00 mL primary aliquot within a defined tolerance, followed by controlled completion.

COMPLETION

ELIMIVOID

PRECISION MENISCUS COMPLETION

Completion of the remaining liquid space with no bubble left in it, without shifting the rear plunger and without losing a drop of active liquid. Customer value: a more tightly controlled liquid-containing environment.

CONDITIONING

CRYOVISCOUS

FORMULATION BIOTECH

A controlled low-temperature, higher-viscosity processing condition within the liquid preparation and completion sequence. It holds the active-containing liquid still, damping convection and intermixing, so the completion step can be carried out above it with precision.

ATMOSPHERE

Oxy O_2 deplete

18 Ar Argon 39.948 LOCK

Reduction of dissolved and entrained oxygen, then argon conditioning of the prepared liquid — argon held in dissolved form, not as a heavy-gas blanket.

DOSE FIDELITY

IncreSure

Dose-fidelity engineering that considers cartridge geometry and the relationship between pen movement, actual liquid delivery and active content — addressed across the start, middle and end of the stroke and across cartridge and pen variations. A defining engineering principle, backed by measurement.

MOLECULAR PROTECTION

REDOX VAULT

Molecular protection by lipid microsphere encapsulation: each active in its own micro-reservoir, so several peptides share one liquid without attacking each other.

CO-FORMULATION

peptourbillon

Peptourbillon™ in liquid form. Sophisticated co-formulations in which multiple actives coexist within a deliberately engineered liquid environment — compatibility engineering and selected protective molecular compartments, rather than the assumption that combining peptide solutions creates a stable product.

CHEMISTRY

P-EARLs

P-EARLs™ expertise. Panacea's liquid-formulation expertise in pH management, chemical compatibility, buffering and controlled formulation conditions. Each Liquiprester™ formulation has its own engineered liquid chemistry.

FEATURE AND VALUE

ENGINEERING FEATURE	CUSTOMER VALUE
Precision liquid filling, protective atmosphere and engineered formulation chemistry.	Ready-prepared liquid convenience combined with a long-term preservation strategy.

> The glass may vary. The dose must not.

12 · QUALITY AND ENGINEERING ASSURANCE

SUPPORTED BY ANALYTICAL SCIENCE, NOT ONLY BY PACKAGING

QUALITY ATTRIBUTE	SCIENTIFIC RELEVANCE
Residual moisture	Low residual moisture limits water-dependent degradation in the freeze-dried matrix.
Dry-chamber residual oxygen	Vacuum with an argon backfill keeps oxygen away from the cake through storage.
Dissolved oxygen in liquids	Removing the oxygen removes the reactant behind oxidative degradation.
Bubble-free liquid completion	No internal gas reservoir and no gas–liquid interface.
pH consistency	Buffering, gas control and chemical compatibility keep the pH where it was set.
Cartridge closure integrity	Preserves compartment separation and the protective internal conditions.
Reconstitution time and active recovery	Demonstrate whether the integrated formulation dissolves appropriately and retains its intended active content.
HPLC and LC-MS analysis	Support identity, assay, chemical purity and related-substance characterisation.
Extractables and leachables	Explain why product-contact materials and the manufacturing contact sequence matter.
Delivered-volume accuracy	Characterises actual pen/cartridge delivery instead of relying solely on nominal mechanical increments.
In-use stability	The condition of the formulation after reconstitution or first use.
Sterility	A microbiological quality attribute, assessed on its own.
Endotoxins	Require their own appropriate assessment, not simply an HPLC purity result.
Particulates	Important to formulation and container-related quality.
Fill-content verification	Confirms that the intended active quantity is contained in the finished unit.

INDEPENDENT ANALYTICAL QUALITY

Panacea places exceptional emphasis on chemical purity. Its peptide products have demonstrated exceptionally high purity through independent third-party analytical testing, complementing internal analytical and quality-control work.

“What about purity?”

Panacea's peptide products have demonstrated exceptionally high chemical purity in independent third-party analytical testing, alongside Panacea's own analytical and quality-control work. Sterility and endotoxins are separate quality attributes with their own assessments.

Controlled processing

Analytical purity, chemical stability, controlled processing, oxygen reduction and cartridge integrity work together: Panacea's product quality is supported by analytical science in addition to its sophisticated physical packaging.

13 · GENUINE PANACEA

GENUINE LYOPRESTER® IS DEFINED BY ITS MANUFACTURER AND ITS TECHNOLOGY — NOT BY THE SHAPE OF ITS CARTRIDGE.

The market contains generic dual-chamber cartridges and products marketed with language similar to Lyoprester®. The presence of two chambers does not establish that a product is a genuine Panacea Lyoprester®.

A generic cartridge does not include

- Panacea's manufacturing sequence
- P-EARLs™
- Peptourbillon™
- OxyDeplete™
- ArgonLock™
- VANA™
- ElimiVoid™
- RedoxVault™
- Panacea's approved stability specifications
- Genuine Panacea analytical and quality records

IDENTIFYING A GENUINE PRODUCT

Panacea

Lyoprester

Liquiprester

P-EARLs

Panacea EZnject™

- Approved Panacea logos and authentic packaging.
- Batch identification.
- Manufacturer documentation from Panacea Bio Chem Ltd.
- Lyoprester® is a registered trade mark. The technology names in this brochure are Panacea trade marks.

Supplied by Panacea Bio Chem Ltd, United Kingdom: the original developer and manufacturer of its named technologies.

“Why choose Panacea rather than a cheaper generic cartridge?”

Because purchasing a container is not the same as purchasing the complete engineered system: the manufacturing sequence, the matched liquid, the protective atmosphere and the analytical quality behind it.

“What is so special about the shelf life?”

Dry-state storage, vacuum with an argon backfill, oxygen-free liquids and peptide-specific chemistry. Up to: Lyoprester®, sealed, 5 years at room temperature or 8 years refrigerated; reconstituted, 6 months refrigerated or 40 days at room temperature. Liquiprester™, unopened, 5 years at 2–8 °C or 6 months at room temperature; in use, 4 months at 2–8 °C or 1 month at room temperature.

“How can I tell whether this is genuine?”

By its manufacturer's provenance: Panacea Bio Chem's identity, batch identification and documentation — not by the appearance of the glass.

“Can Panacea make a formulation for our research requirements?”

Yes: from custom synthesis to custom Peptourbillon™ formulations, with custom lyophilisation and contract manufacturing.

> A genuine Panacea product cannot be assessed simply by comparing the appearance of its glass cartridge with a generic alternative.

14 · PANACEA BIO CHEM — THE REBIRTH

BIG PHARMA TECHNOLOGY. NO LONGER EXCLUSIVELY FOR BIG PHARMA.

From the molecule to the machine. From concept to production.

Panacea Bio Chem brings together scientific expertise, custom manufacturing, analytical capabilities, proprietary software and advanced pharmaceutical machinery within one independent technology ecosystem.

From independent innovators and emerging biotechnology companies to established pharmaceutical organisations, Panacea provides the tools, technologies and expertise required to turn scientific ambition into reality.

01 · MADE FOR YOU

Custom Development & Manufacturing

From API synthesis, formulation and lyophilisation to finished packaging.

- Custom peptide synthesis
- Custom formulations, liquid or lyophilised, with Peptourbillon™ layering and matched P-EARLs™
- Custom lyophilisation in Lyochrysalis™, finished below zero
- Filling and closure in Lyoprester® and Liquiprester™, and custom packaging from the API to the outer pack

02 · MEASURED AND DESIGNED

Analytical Services

Independent analytical, characterisation and formulation development capabilities.

- Identity and purity by HPLC and Orbitrap mass spectrometry
- Binding-affinity and gene-expression data: multiplex assays, DNA microarrays, PCR
- Formulation development with Dicoias Ψ™, the formulation mathematics
- The analytical data that matters, shown in full: more than a certificate

03 · LICENSED

Software & Automation

Access to Panacea's proprietary pharmaceutical software, process control and automation technologies, subject to commercial licensing arrangements.

- S3Pulse™: the process control that runs a freeze-drying cycle from the product's own temperature
- KineticON™: motion control in which the machine knows what happened on every move
- Dicoias Ψ™ and the Peptourbillon™ calculator: formulation, computed
- A developer platform: signed, versioned motion programs the controller validates and owns

04 · BUILT

Machinery & Equipment

Pharmaceutical machinery, laboratory equipment and proprietary manufacturing systems.

- Lyochrysalis™: the freeze-dryer that runs LyoLevit™, Cryolapse™ and TgShift™
- VANA™ and SealoPrester™: closed under vacuum and argon, then sealed
- PleniDose™: the filling gantry for both cartridges
- DiastolVAC™ vacuum ensemble; Syntheseract™ continuous-flow synthesis

Science. Analytical services. Manufacturing. Software. Machinery. One independent technology ecosystem. From A to Z.

Every door is open to independent researchers, startups, emerging biotechnology companies and established pharmaceutical organisations alike. Invented, developed and manufactured by Panacea Bio Chem; the intellectual property stays Panacea's. Enquiries: panaceabiochem.co.uk/contact

APPENDIX · THE 36 COMPARISON AREAS

CONVENTIONAL VIAL OR LYOPRESTER® — AREA BY AREA

#	AREA	CONVENTIONAL LYOPHILISED VIAL	RISK FOR THE CUSTOMER	GENUINE LYOPRESTER®
PRODUCT ARCHITECTURE AND STORAGE				
1	Product format	Lyophilised powder alone in a vial.	The customer receives an intermediate product and is responsible for its preparation.	Dry cake and engineered P-EARLs™ liquid in separate chambers of one cartridge, supplied as a closed system.
2	Storage	Depends on the product: many lyophilised peptides are kept refrigerated, some frozen.	An unsuitable temperature may accelerate peptide degradation.	Sealed: up to 5 years at room temperature (18–25 °C, away from direct sunlight); up to 8 years refrigerated.
3	Removal from the freezer / temperature excursions	Where frozen storage is used, the vial may be taken out and re-cooled repeatedly.	Cold-to-warm cycles may promote condensation and accelerate degradation.	No freezing during storage; repeated freeze–thaw handling does not arise.
4	Moisture exposure	Temperature changes may cause condensation.	Moisture may trigger degradation of the lyophilised material.	Hermetically sealed cartridge: limited exposure of the dry cake to moisture until activation.
5	Oxygen exposure	Sealed under vacuum at manufacture; that protection ends at the first puncture.	Oxygen may cause oxidation and a gradual loss of quality.	The vial's vacuum, plus an argon backfill: VANA™ + ArgonLock™.
6	Residual oxygen in the product	May retain dissolved oxygen or headspace oxygen.	Oxidation may occur during storage; the customer cannot control it.	OxyDeplete™ oxygen reduction in the liquids; reduced oxygen available in the sealed chambers.
7	Redox reactions	The peptide may undergo oxidation and reduction reactions during storage.	Chemical purity may decrease and degradation products may form.	RedoxVault™ redox protection, built into the formulation.
8	Factory testing	The certificate shows the condition of the sample at the time of testing.	After transport and storage, parameters may differ from the initial results.	A protective system that keeps oxygen and moisture away from the product through transport and storage.
9	HPLC purity	A result such as 99 % primarily describes chemical purity.	It may be mistaken for proof of sterility or complete safety.	Exceptionally high chemical purity, independently tested; sterility and endotoxins are distinct attributes with their own assessments.
10	Sterility after purchase	Even a correctly manufactured vial is subsequently reconstituted by the user.	Microorganisms may be introduced during mixing.	Reconstitution inside the closed cartridge: fewer contamination opportunities during preparation.
11	Endotoxins	Cannot be assessed from appearance or the purity result.	Not identified by visual inspection or HPLC alone.	A distinct attribute with its own assessment; the closed system reduces risks arising during subsequent manual preparation.
12	Solvent selection	The customer must select and buy a suitable liquid separately.	An unsuitable solvent or one of inadequate quality may be chosen.	The matched P-EARLs™ liquid is held in the cartridge's second chamber.

protects the peptide works against it

#	AREA	CONVENTIONAL LYOPHILISED VIAL	RISK FOR THE CUSTOMER	GENUINE LYOPRESTER®
RECONSTITUTION AND HANDLING				
13	Solvent volume	The customer measures the volume.	1 mL instead of 2 or 3 mL completely changes the concentration.	The liquid volume is set at manufacture.
14	Concentration after reconstitution	Depends on the amount of liquid added.	A wrong concentration leads to wrong calculations for every later portion.	The cake-to-liquid ratio is determined by the design.
15	Reconstitution syringe	Required.	An additional component that may be touched or contaminated.	Not required for reconstitution.
16	Needle for drawing up liquid	Required.	Every needle handling adds a potential contamination point.	Not required for transferring liquid.
17	Disinfection of stoppers	Surfaces must be prepared correctly before puncturing.	A hygiene error may introduce microorganisms.	No separate solvent vial and powder vial to puncture for reconstitution.
18	Hand cleanliness	The user carries out reconstitution.	Touching the needle, stopper or syringe tip may cause contamination.	Mixing takes place inside the cartridge: far fewer user actions.
19	Worktop cleanliness	Vial, syringes and accessories often rest on an ordinary surface.	The surface may be a source of bacteria, dust and other contaminants.	A closed cartridge: fewer open components in contact with the surroundings.
20	Ambient air during preparation	Preparation usually takes place in an ordinary environment.	No microbiological control of air or particles.	Closed reconstitution limits the product's exposure to its surroundings.
21	Liquid transfer	Liquid is drawn from one container and injected into another.	Each transfer adds the possibility of error, contamination or liquid loss.	Not needed: the liquid is already in the cartridge, in the chamber next to the cake.
22	Mixing process	The customer reconstitutes the powder.	Incorrect handling may affect the quality of the solution.	Reconstitution is provided for by the cartridge's design.
23	Mixing up vials	With several products, powder, solvent or concentration may be confused.	Risk of preparing the wrong product.	The peptide and its intended liquid form a single cartridge.

protects the peptide works against it

#	AREA	CONVENTIONAL LYOPHILISED VIAL	RISK FOR THE CUSTOMER	GENUINE LYOPRESTER®
FORMULATION AND IN-USE QUALITY				
24	Layered formulations	A conventional blend does not control the distribution of individual ingredients.	Ingredients may behave differently during production.	Peptourbillon™ single-, dual- and multi-layer formulation architecture: each layer placed by design.
25	Stability before reconstitution	Depends on the lyophilised material, the packaging and storage conditions.	Temperature, oxygen, moisture and light may gradually affect the product.	ArgonLock™, OxyDeplete™, RedoxVault™ and P-EARLs™ together; sealed up to 5 years at room temperature, 8 years refrigerated.
26	Timing of reconstitution	The customer decides when to open the accessories and prepare the liquid.	The solution may be prepared too early and stored unnecessarily long.	The chambers remain separate until use.
27	Stability after dissolution	Once water is added, many chemical reactions proceed faster.	Hydrolysis, oxidation, deamidation, aggregation and other changes are possible.	Dissolution only when use begins; up to 6 months refrigerated or up to 40 days at room temperature after reconstitution.
28	Storage of prepared solution	The customer must know how long and at what temperature it can be kept.	Loss of chemical or microbiological stability may be invisible.	Kept in its own cartridge: up to 6 months refrigerated or up to 40 days at room temperature, away from direct sunlight; never frozen.
29	Repeated vial punctures	The needle pierces the stopper at every withdrawal.	Each puncture is another opportunity for contamination.	A pen with a replaceable needle; no repeated draws from a vial with a syringe.
MEASUREMENT AND CUSTOMER EXPERIENCE				
30	Calculating product amounts	The customer converts between mg, mL and units.	A calculation error may give a different amount from the one intended.	EZnject™ indexed 0.01 mL increments reduce the calculations the user performs.
31	Measurement accuracy	An insulin syringe requires its scale to be read correctly.	Confusing units, mL and mg may cause a substantial error.	EZnject™: 110 indexed mechanical increments of 0.01 mL — volume selected in repeatable steps of the device.
32	Repeatability of subsequent portions	Depends on how the liquid is drawn up each time.	Reading and handling differences cause differences between withdrawals.	Repeatability moves from manual measurement to the pen mechanism.
33	Number of components	Powder vial, liquid, syringe, mixing needle, withdrawal syringe and needle, hygiene supplies.	More separate components, more opportunities for error or contamination.	One cartridge, a pen and a replaceable needle.
34	Customer knowledge required	Storage, reconstitution, hygiene, concentration and measurement.	An error may occur at any of these stages.	Most key parameters are defined by the manufacturer.
35	Total number of risk points	Numerous manual actions: cooling, liquid and needle handling, drawing up, disinfection, mixing, calculations, withdrawals.	Each stage is another opportunity for a technical, microbiological or calculation error.	A closed dual-chamber cartridge with a dedicated delivery system: fewer decisions and actions by the end user.
36	Main difference	The customer receives a lyophilised product and prepares the solution from it.	The quality of the final solution depends on the manufacturer and on the customer's knowledge and handling.	The manufacturer controls far more of the path from lyophilised product to prepared solution.

protects the peptide works against it

APPENDIX · THE PANACEA-SPECIFIC DISTINCTIONS

DISTINCTION	PANACEA
Cake formed without lyophilising on the middle elastomer plunger	Panacea manufacturing sequence (page 4)
Reduced manufacturing-stage elastomer contact	Avoids that particular contact pathway during cake formation
Peptide-specific reconstitution chemistry	P-EARLs™
Bubble-free liquid-chamber completion	No gas pocket
Dissolved-oxygen reduction	OxyDeplete™
Internal oxygen-reservoir management	No retained separate gas reservoir
Argon conditioning of liquids	ArgonLock™, in dissolved form
Controlled reduced-pressure dry chamber	VANA™ + ArgonLock™
Reactive oxygen species management	Integrated oxygen and redox controls
Formulation-specific redox separation	RedoxVault™ lipid microsphere encapsulation
Reduced pH drift	Buffering, gas control and the sealed configuration

DISTINCTION	PANACEA
Internal bypass and activation architecture	Reconstitution inside the closed cartridge
Cartridge-to-pen geometric compatibility	Lyoprester® with EZnject™
Fixed rear-plunger positioning (Liquiprester™)	PleniDose™ datum
Liquid completion without active loss	ElimiVoid™
Viscosity-conditioned filling	Cryoviscous™
Dose-fidelity mapping	IncreSure™
Complex multi-peptide liquid co-formulations	Selected compatible formulations
Extended refrigerated shelf life (Liquiprester™)	Up to 60 months at 2–8 °C versus 24 and 36 months (page 14)
Genuine provenance and authentication	Panacea Bio Chem Ltd as manufacturer, batch identification, documentation, the registered Lyoprester® mark
Lyoprester® SS versus EZnject™	Single-use self-contained system versus indexed pen
Equipment and formulation engineering as integrated IP	Lyochrysalis™, S3Pulse™, VANA™, SealoPrester™ and PleniDose™, with Peptourbillon™, P-EARLs™ and RedoxVault™ formulation engineering

TECHNICAL REFERENCES

1. Jameel F, Alexeenko A, Bhambhani A, et al. Recommended Best Practices for Lyophilization Validation 2021 Part II: Process Qualification and Continued Process Verification. AAPS PharmSciTech 2021;22(8):266. PMC8575750
2. Cheng Y, Duong HTT, Hu Q, et al. Practical advice in the development of a lyophilized protein drug product. Antibody Therapeutics 2024;8(1):13–25. PMC11744310
3. PubMed record 28928293. pubmed.ncbi.nlm.nih.gov/28928293
4. Nugrahadi PP, Hinrichs WLJ, Frijlink HW, et al. Designing Formulation Strategies for Enhanced Stability of Therapeutic Peptides in Aqueous Solutions: A Review. Pharmaceutics 2023;15(3):935. PMC10056213
5. ICH Q1A(R2) Stability testing of new drug substances and products; ICH Q1E Evaluation of stability data: the scientific frameworks for stability testing. ema.europa.eu
6. Mounjaro KwikPen, Summary of Product Characteristics, sections 6.3 and 6.4, revised 29 August 2026. medicines.org.uk/emc/product/15484/smpc
7. Ozempic pre-filled pen, Summary of Product Characteristics, sections 6.3 and 6.4, revised July 2026. medicines.org.uk/emc/product/9750/smpc
8. Panacea technology pages: lyoprester.com · liquiprester.com · p-earls.com · peptourbillon.com · argonlock.com · oxydeplete.com · redoxvault.com · elimivoid.com · plenidose.com · incresure.com · cryoviscous.com · lyolevit.com · lyochrysalis.com · s3pulse.com · tgshift.com · cryolapse.com · cryosurge.org · cryoflarepoint.com · diastolvac.com · rftunnel.com · vanamachine.com · sealoprester.com · panaceaeznject.com · dicoias.com

THE PANACEA DIFFERENCE

NOT JUST A PEPTIDE. NOT JUST A CARTRIDGE. AN ENGINEERED PRESERVATION SYSTEM.

“Conventional peptide products are often assessed by what is inside the container.

“At Panacea Bio Chem, we believe that how the product is formulated, dried, protected, sealed, reconstituted and delivered is equally important.

“Lyoprester® and Liquiprester™ unite advanced formulation science with precision manufacturing, oxygen-managed preservation, engineered cartridge construction and uncompromising attention to analytical quality.

“From extended dry-peptide preservation to advanced ready-prepared liquid systems, Panacea Bio Chem develops technologies that overcome the limitations of traditional peptide presentation.

“The difference is not simply what the cartridge contains. The difference is everything Panacea engineers around it.”

Panacea

- Genuine Panacea manufacturing.
- Two advanced cartridge platforms.
- Integrated formulation and preservation technologies.
- Exceptional analytical quality.

DISCOVER WHAT GENUINE PANACEA ENGINEERING CAN DO FOR YOUR RESEARCH.

Enquire about Lyoprester®, Liquiprester™, custom development and manufacturing, analytical services, software, machinery, laboratory research supply and qualified distribution opportunities.

LABORATORY RESEARCH SUPPLY · CUSTOM SYNTHESIS · CUSTOM FORMULATION · CUSTOM PEPTOURBILLON™ · CUSTOM LYOPHILISATION · CONTRACT MANUFACTURING · ANALYTICAL SERVICES · SOFTWARE & AUTOMATION · MACHINERY & EQUIPMENT · QUALIFIED DISTRIBUTION

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