The Peptide Blueprint

Master the Science of Recovery, Performance, Longevity & Regeneration

THE MOST COMPREHENSIVE PRACTICAL PEPTIDE REFERENCE AVAILABLE

A complete, evidence-based reference to therapeutic peptides — what each one is, how it actually works, and when it genuinely helps. Twenty-six peptides profiled in full clinical depth, every one built the same way: mechanism, protocol, real combinations, and the risks worth knowing before you start — plus eight additional emerging and legacy compounds covered in brief.

Version 1.0 — Digital Edition

Front Matter

You've probably already met one of these molecules, even if nobody called it by name. Maybe a training partner mentioned "BPC" the way people used to mention fish oil. Maybe your doctor mentioned a GLP-1 for a patient's diabetes, and you filed it away as unrelated to you. Or maybe you're simply the kind of person who reads the label on everything, and you got tired of the internet's two default answers to "what is this stuff, actually": breathless hype, or reflexive dismissal.

This book is the third option. It exists because the actual science here — decades of it, in some cases — is genuinely interesting, and almost none of it reaches people in a form they can use. Not "use" as in a marketing sense. Use as in: understand the mechanism well enough to reason about it yourself, know the real protocol instead of a forum rumor, and know exactly where the evidence stops and the speculation begins.

That last part matters more than any of the individual facts in this book. So before anything else:

> ⚠ NOTICE
>
> **Every dose, cycle, and protocol in this book is educational** — drawn from published research and documented research-context use, not a prescription, and not a personal recommendation. Regulatory status varies by country. If you take one thing from this page, take this: informed does not mean unsupervised. Talk to a licensed professional before you act on anything here.

Educational and Legal Notice

All content in this book is educational and informational. It is drawn from published scientific literature, preclinical and clinical data, and documented practices in jurisdictions where research use of peptides is permitted. Nothing in this book is a medical prescription, a personal recommendation to use any substance, or a substitute for individualized clinical evaluation by a licensed health professional.

Doses, cycles, and protocols described here reflect ranges reported in the scientific literature and in research and integrative-medicine contexts, primarily in the United States. Regulatory status varies by country, and commercial availability, prescription status, and legality of use depend on jurisdiction,

compound, and purpose. Before considering any protocol, verify current regulations in your country and consult a licensed professional. Peptides discussed as emerging or investigational are, in most jurisdictions, research compounds not approved for human use by any regulatory agency.

This book does not promise results. Biological response varies by individual, and responsible use begins before administration: with information, an honest assessment of risk, and professional guidance.

If you are experiencing a health crisis, please consult a licensed medical professional directly rather than relying on this book.

How This Book Is Organized

Here's the shape of the argument this book makes, part by part:

- **Part I — Fundamentals** makes the biological case for why any of this works: how your body actually talks to itself at the molecular level, why that conversation gets quieter after 30, and the three systemic breakdowns — insulin resistance, silent inflammation, and wrecked sleep — that most protocols in this book are really trying to fix.
- **Part II — The Peptide Compendium** is the A–Z reference: every peptide in this book, profiled the same way every time — where it comes from, how it actually works, when it makes sense, the real protocol, what it pairs with, and where it bites people who get it wrong.
- **Part III — Combining Peptides** is where individual profiles become a plan: the REC Method, the 7-axis hierarchy, and full protocols organized by goal — bulking, cutting, injury recovery, sleep, endurance, neuroregeneration, metabolism, sexual function, skin and hair.
- **Part IV — History and Future** is the story of the field, told straight: the 1970s origins, the classics that are still standing decades later, the 2015–2025 boom, the molecules that flopped and why that matters, a real projection through 2035, and an honest chapter on how peptides and anabolic steroids actually intersect in competitive sport.
- **Part V — Reconstitution and Technical Practice** is the unglamorous part that decides whether any of the above works at all: solvents, technique, dosing math, storage.
- **Part VI — Master Support Formulas** — 20 non-injectable support blends built to back up specific protocols and hold the line between peptide cycles.
- **Part VII — Safety, Regulation, and Ethics** is the master reference for contraindications, legal status, and the principles this whole book is built on.
- **Part VIII — The Regulatory Turning Point: The Future of Peptides (2026–2030)** covers the July 2026 FDA advisory committee vote, the real difference between FDA drug approval and pharmacy compounding, why so many well-studied peptides never reach full approval, where pharmaceutical investment is actually going, and a grounded look at which peptides are most

Contents

The 10 Core Failure Pathways

Underneath the 26 individual profiles in this Part is one simple idea: almost everything peptides are used for traces back to one (or a small combination) of ten underlying systems breaking down. Once you know which failure pathway you're actually dealing with, choosing a peptide stops being guesswork and starts being matching a tool to a specific, named problem.

1. **Inflammation** — chronic, low-grade immune activation that never fully resolves
2. **Energy Failure** — mitochondrial output too low to sustain repair or performance
3. **Metabolic Dysfunction** — impaired insulin sensitivity, glucose handling, fat metabolism
4. **Hormonal Dysregulation** — disrupted GH, sex-hormone, or cortisol signaling
5. **Nervous System Dysfunction** — CNS noise, poor stress resilience, cognitive fog
6. **Gut Barrier / Microbiome Dysfunction** — intestinal permeability, dysbiosis, GI inflammation
7. **Vascular Dysfunction** — poor blood flow and angiogenesis limiting delivery and repair
8. **Structural Degeneration** — tendon, ligament, cartilage, and connective-tissue breakdown
9. **Cellular Repair Failure** — slow or incomplete tissue regeneration at the cellular level
10. **Communication Failure** — broken signaling between cells, systems, or circadian rhythms

Every profile in this Part opens by naming which of these ten pathways it primarily and secondarily addresses, before a single word about mechanism. This isn't a competing framework — it's the same underlying biology from Part I's Three Pillars (Section 1.6) and Part III's 7-Axis Hierarchy (Section 3.1), viewed at the resolution that actually matters when you're choosing a single peptide: the Three Pillars are the simplest version (why any of this matters at all), the 7-Axis Hierarchy is the sequencing version (what order to address things in when you're combining peptides), and the 10 Failure Pathways here are the diagnostic version — the lens for picking the right individual tool for a specific problem.

⚠ NOTICE

About the Profile Card, and the Clinical Insight box. Every entry opens with an At-a-Glance card — read it alone and you'll know in twenty seconds whether the entry is worth reading in full, including an evidence-strength rating on its

Research Status line (see the key below). Each entry closes with a *Re:Formd Clinical Insight*: the voice of Sabrina, Re:Formd's AI health advisor, offering the judgment call an experienced practitioner makes before writing a protocol. The *Re:Stack* app applies that same judgment to your own stack in real time, with reconstitution math and dose tracking built in.

EVIDENCE-STRENGTH KEY

Every rating below was assigned from a fresh check of current clinical evidence, not assumed from a compound's popularity — a well-known name still gets an honest rating if the human data is thin.

★★★★★ FDA-approved / robust multi-trial human evidence

★★★★☆ Strong clinical support — multiple human trials

★★★☆☆ Early human evidence — at least one real study

★★☆☆☆ Mostly preclinical — animal/mechanistic data only

★☆☆☆☆ Experimental — in vitro or purely theoretical

Peptides are grouped by what they're actually for, not alphabetically — see **Appendix C** for a complete alphabetical index with a page reference for every entry. All doses are educational reference ranges drawn from research and research-adjacent clinical use, not prescriptions (see the Front Matter notice, and Part VII for the full safety picture).

The Compendium at a Glance

Section	Best for	Evidence range
A — Tissue Repair	Injury, gut, and skin repair	Early to strong
B — GH Secretagogues	Recovery, GH support, anabolic goals	Strong to approved
C — Mitochondrial & Longevity	Energy, fatigue, cellular aging	Mostly preclinical
D — Sleep & Neurological	Sleep, cognition, anxiety	Early to strong
E — Metabolic & Incretin	Fat loss, insulin resistance	Strong to approved
F — Inflammation & Gut	Chronic inflammation, gut barrier	Preclinical to strong
G — Sexual Function	Libido, sexual function	Early to approved

Color signals where each section's evidence typically lands: gray marks sections that are still mostly preclinical, gold marks a wide early-to-strong range, green marks sections that reach strong clinical support or full approval.

Quick-Reference: Find Your Peptide by Symptom

Before the full A–Z reference, here's the fast path: find what you're actually dealing with, see what's typically recommended, and jump to the full entry for the details. This isn't a substitute for the profiles that follow — it's the twenty-second version that tells you where to start reading.

TENDON OR LIGAMENT PAIN

Recommended Peptides: BPC-157, TB-500, GHK-Cu

Evidence: BPC-157 and GHK-Cu — early human evidence; TB-500 — mostly preclinical

Mechanism: Angiogenesis and collagen support restore blood flow and matrix repair to poorly vascularized tissue

Typical Combo: BPC-157 + TB-500 for local plus systemic repair, GHK-Cu layered in for collagen support

⚠ **Cautions:** Active cancer or uncontrolled proliferative disease (angiogenic risk) — see Part VII

GUT INFLAMMATION OR "LEAKY GUT"

Recommended Peptides: KPV, BPC-157, LL-37

Evidence: KPV and LL-37 — mostly preclinical to early human; BPC-157 — early human evidence

Mechanism: Oral KPV acts locally on epithelial tissue; BPC-157 restores endothelial and mucosal integrity systemically

Typical Combo: BPC-157 + KPV is the systemic base protocol for serious chronic gut inflammation

⚠ **Cautions:** KPV's benefit is local, not systemic — it isn't a substitute for treating inflammation that originates elsewhere

POOR OR NON-RESTORATIVE SLEEP

Recommended Peptides: DSIP, Epitalon, CJC-1295 + Ipamorelin (nocturnal)

Evidence: DSIP — early human evidence; CJC-1295/Ipamorelin — strong clinical support; Epitalon — mostly preclinical

Mechanism: DSIP changes what your sleep is doing while you're in it; CJC-1295/Ipamorelin potentiate the deep-sleep GH peak

Typical Combo: DSIP + Epitalon for chronic, circadian-level sleep disruption

⚠ **Cautions:** DSIP is not a sedative — don't expect it to feel like one

FAT LOSS OR STUBBORN BODY COMPOSITION GOALS

Recommended Peptides: Semaglutide, Tirzepatide, Retatrutide, AOD-9604, 5-Amino-1MQ

Evidence: Semaglutide and Tirzepatide — FDA-approved; Retatrutide — strong clinical support (Phase III); AOD-9604 — strong trial history but failed its pivotal endpoint; 5-Amino-1MQ — mostly preclinical

Mechanism: GLP-1 class peptides drive satiety and metabolic effect; AOD-9604 and 5-Amino-1MQ act on lipolysis and adipose NAD+ metabolism

Typical Combo: GLP-1 class peptides plus resistance training and protein intake to preserve muscle during the loss

⚠ **Cautions:** Titration speed and a planned exit strategy matter as much as the dose — see each profile's Technical Protocol

BRAIN FOG OR COGNITIVE FATIGUE

Recommended Peptides: Semax, Selank

Evidence: Both — strong clinical support (Russian-approved, real RCTs; no Western regulatory recognition)

Mechanism: Semax reduces cognitive fatigue through a non-stimulant adaptogenic mechanism; Selank targets anxiety-driven cognitive noise

Typical Combo: Semax for daytime mental fatigue, Selank when anxiety is the thing clouding focus

⚠ **Cautions:** Semax is mornings-only — using it at night disrupts sleep

LOW LIBIDO OR SEXUAL FUNCTION CONCERNS

Recommended Peptides: PT-141, Kisspeptin, Melanotan II

Evidence: PT-141 — FDA-approved; Kisspeptin — strong clinical support; Melanotan II — early human evidence

Mechanism: Kisspeptin restarts the hormonal axis at its source; PT-141 activates desire directly in the brain, independent of vascular mechanisms

Typical Combo: Kisspeptin + PT-141 covers more of the actual pathway than either alone

⚠ **Cautions:** Melanotan II's four-receptor mechanism means four side-effect pathways — a mole-map check is non-negotiable

CHRONIC FATIGUE OR LOW CELLULAR ENERGY

Recommended Peptides: MOTS-C, SS-31, Humanin

Evidence: All three — mostly preclinical for the exact marketed compound (see each profile for the specific human-data caveat)

Mechanism: SS-31 repairs the mitochondrial membrane itself; MOTS-C signals metabolically; Humanin protects cells from dying under stress

Typical Combo: SS-31 first to repair structure, then MOTS-C or Humanin layered on top

⚠ **Cautions:** Don't run any of these without a plan to track glycemia and HOMA-IR — the value shows up in bloodwork, not how you feel day to day

INTEREST IN GH SUPPORT, RECOVERY, OR ANTI-AGING

Recommended Peptides: CJC-1295, Ipamorelin, Tesamorelin, IGF-1 LR3

Evidence: CJC-1295 and Ipamorelin — strong clinical support; Tesamorelin — FDA-approved; IGF-1 LR3 — mostly preclinical

Mechanism: CJC-1295/Ipamorelin stimulate the body's own GH pulse; IGF-1 LR3 is direct anabolic signal, not a secretagogue

Typical Combo: CJC-1295 + Ipamorelin is the backbone most GH-support protocols in this book are built around

⚠ **Cautions:** IGF-1 LR3's six-week ceiling and glucose risk are non-negotiable, not suggestions

INSULIN RESISTANCE OR METABOLIC DYSFUNCTION

Recommended Peptides: MOTS-C, 5-Amino-1MQ, Tirzepatide, Semaglutide

Evidence: Tirzepatide and Semaglutide — FDA-approved; MOTS-C and 5-Amino-1MQ — mostly preclinical

Mechanism: AMPK activation and NAD+ availability restore glucose uptake and mitochondrial metabolism

Typical Combo: MOTS-C or 5-Amino-1MQ to prepare cellular terrain before or alongside a GLP-1 class peptide

⚠ **Cautions:** Track glycemia and HOMA-IR throughout — see Part I, Section 1.13

SKIN, HAIR, OR CONNECTIVE-TISSUE AGING

Recommended Peptides: GHK-Cu, Epitalon

Evidence: GHK-Cu — early human evidence (topical form has 50+ years of literature); Epitalon — mostly preclinical

Mechanism: GHK-Cu organizes the collagen matrix and supports epigenetic tissue remodeling; Epitalon acts on telomerase and circadian regulation

Typical Combo: GHK-Cu topically for skin, layered with a structural-repair peptide (BPC-157/TB-500) if the goal extends to connective tissue

⚠ **Cautions:** The injectable/systemic form of GHK-Cu has a far thinner evidence base than the topical form

CHRONIC, SYSTEMIC INFLAMMATION

Recommended Peptides: BPC-157, KPV, MOTS-C, SS-31

Evidence: BPC-157 — early human evidence; KPV — mostly preclinical; MOTS-C and SS-31 — see their individual profiles

Mechanism: NF-κB inhibition and endothelial/mitochondrial protection address inflammation from several different angles at once

Typical Combo: BPC-157 + SS-31 for endothelial protection plus mitochondrial ROS reduction

⚠ **Cautions:** Sequence matters — resolve inflammation before layering on anabolic signaling (see Part I, Section 1.7)

ANXIETY OR POOR STRESS RESILIENCE

Recommended Peptides: Selank, Semax

Evidence: Both — strong clinical support (Russian-approved; head-to-head RCTs against benzodiazepines for Selank)

Mechanism: Anxiety reduction without the dependence/tolerance tradeoffs of a benzodiazepine

Typical Combo: Selank + DSIP as an anxiolytic-hypnotic pairing without sedation

⚠ **Cautions:** "No dependence" doesn't mean "no protocol" — cycle length still matters

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Section A — Tissue Repair and Regeneration

PEPTIDE DETAIL

BPC-157

The body's master repair signal.

SECTION 1

The Big Idea

If your shoulder won't finish healing, if inflammation never quite resolves, if your gut has been "off" for months, or a tendon injury keeps almost-but-not-quite getting better — BPC-157 is usually the first peptide people investigate, and often the right one. It doesn't force one specific outcome; it works by restoring the underlying environment where healing can actually happen, which is why its effects show up across so many different tissues at once.

That breadth is also why it's the most-studied peptide in this book — well over 80 publications indexed in **PubMed** (the U.S. National Library of Medicine's public database of biomedical research, and the standard reference point scientists use to gauge how thoroughly a compound has actually been studied) — and why it's usually the right starting point whenever the real problem is "repair isn't finishing," rather than any single named condition.

> AT A GLANCE
>
> Master tissue-repair and gut-restoration peptide. Works best with TB-500, GHK-Cu, CJC-1295/Ipamorelin, and KPV.

SECTION 2

Practical Context

CLINICAL APPLICATIONS

- **Tendon and ligament injury** — the first-choice use, because the angiogenesis mechanism directly targets the reason these tissues heal slowly in the first place: poor native blood supply.
- **Chronic GI inflammation and "leaky gut"** — BPC-157 has the strongest evidence base of any peptide in this book for intestinal restoration, consistent with its origin as a gastric-protective compound.

- **Gastric ulcers and gastritis** — a direct extension of the same gastroprotective, gut-derived mechanism.
- **Acute muscle injury** — the fibroblast-proliferation and satellite-cell mechanisms that rebuild tendon and ligament apply to muscle tissue as well.
- **Brain injury and concussion support** — an emerging use built on the same dopaminergic/serotonergic and anti-inflammatory mechanisms described above, though the evidence base here is less mature than for musculoskeletal or GI use.
- **General chronic systemic inflammation** — where NSAIDs suppress inflammation by blocking repair, and corticosteroids can inhibit the regeneration they're supposed to be supporting, BPC-157 resolves inflammation by *accelerating* repair instead, without the gastric-mucosal damage or adrenal suppression that come with those alternatives.

WHERE THIS PEPTIDE EXCELS

Excellent: Tendon and ligament injury; chronic GI inflammation and leaky gut — both are the direct, first-choice applications with the deepest evidence base described above.

Very Good: Gastric ulcers and gastritis — a direct extension of the same gut-protective mechanism.

Useful: Acute muscle injury; general chronic systemic inflammation — real mechanisms, broader and somewhat less targeted than the "Excellent" tier.

Limited: Brain injury and concussion support — mechanistically plausible and increasingly discussed, but the evidence base here is still the least mature of the applications above.

COMBINATION STRATEGIES & WHY

- **BPC-157 + TB-500** — the most widely used stack in this field: BPC-157 builds the regenerative microenvironment, TB-500 mobilizes progenitor cells into it, pairing repair capacity with the cells to carry it out.
- **BPC-157 + CJC-1295/Ipamorelin** — pairs local repair with nocturnal, growth-hormone-driven collagen synthesis.
- **BPC-157 + GHK-Cu** — BPC-157 creates the regenerative environment; GHK-Cu helps organize the resulting collagen matrix.
- **BPC-157 (oral) + KPV** — used together for severe intestinal inflammation, combining gut-lining repair with KPV's anti-inflammatory action.
- **Alongside an anabolic steroid cycle** — BPC-157 is one of the few peptides considered safe to run for proactive tendon protection during a cycle (see Part IV, Section 4.4).

SECTION 3

Technical Protocol

Route	Dose	Schedule	Cycle
Subcutaneous (systemic)	250–500 mcg/day (beginner) → 500–800 mcg 2×/day (advanced)	Morning fasted or before sleep	4–12 weeks; 2–4 week break
Perilesional	200–500 mcg per point	3 sessions/week	As above
Oral (GI-focused)	250–1,500 mcg fasted, 30 min before breakfast	Daily	6–8 weeks minimum for chronic leaky gut

SOLVENT

Bacteriostatic (BAC) water. Reconstituted storage: 20–30 days refrigerated — exceptionally stable compared to most peptides in this book.

Generally considered one of the more approachable peptides in this book to start with.

SECTION 4

What to Expect

- FIRST 48 HOURS
  NF-κB inhibition begins settling acute inflammation; pain often starts to ease.
- WEEK 1–2
  VEGF/eNOS-driven blood flow improves; repair signaling ramps up.
- WEEKS 3–6
  Fibroblast proliferation and collagen remodeling; measurable strength returns.
- MONTHS 2–3
  Scar tissue matures into properly organized collagen; function normalizes.

Individual response and timing vary.

COMMON MISTAKES

- Assuming oral BPC-157 delivers the same systemic benefit as an injection — it acts locally in the GI tract and does not produce meaningful systemic effects; the routes serve different purposes.
- Shaking the vial when reconstituting instead of using a gentle swirl.
- Running it alone while ignoring the underlying systemic inflammation that caused healing to stall in the first place.
- Continuing regular NSAID use during a cycle, which inhibits COX-2 — a pathway BPC-157 needs active to start the repair cascade.
- Stopping at the first sign of relief (often weeks 1–2) rather than continuing through weeks 6–8, when the collagen-remodeling and strength gains actually consolidate.

SECTION 5

Safety and Execution

IMPORTANT CAUTIONS

An active or recent cancer history (the angiogenic effect could theoretically favor tumor vascularization) and pregnancy.

COMMONLY REPORTED SIDE EFFECTS

- Injection-site redness beyond mild and transient.
- New or worsening GI symptoms.

TYPICAL USE PATTERN

Less diffuse pain and better sleep within 1–2 weeks, faster post-training recovery by weeks 3–4, visible strength and tissue-quality gains by weeks 6–8.

STOP AND SEEK EVALUATION IF

- Signs of infection develop at an injection site.
- Any unexplained new mass or growth appears.

SECTION 6

How It Works

BPC-157 works through four connected mechanisms: new blood vessel growth into poorly supplied tissue, direct stimulation of the cells that rebuild connective tissue, local anti-inflammatory signaling, and gut/neurological receptor activity.

MECHANISM OF ACTION

Angiogenesis

Angiogenesis is the medical term for the body growing new blood vessels from existing ones — it's how injured tissue normally gets the extra blood supply it needs to repair itself. BPC-157 upregulates two of the body's own signals for this process: **VEGF** (Vascular Endothelial Growth Factor) and **eNOS** (endothelial Nitric Oxide Synthase). Tendons and ligaments have under 5% natural vascularization, which is exactly why they normally take 6–12 months to heal — switching on VEGF and eNOS together is the main reason BPC-157 can compress that timeline toward 4–8 weeks.

Connective Tissue Repair

Stimulates **fibroblasts** (the specialized cells responsible for producing collagen and rebuilding connective tissue) to proliferate, and increases synthesis of type I and type III **collagen**. It also activates muscle **satellite cells** (dormant stem cells that sit on muscle fibers and activate specifically to repair damage).

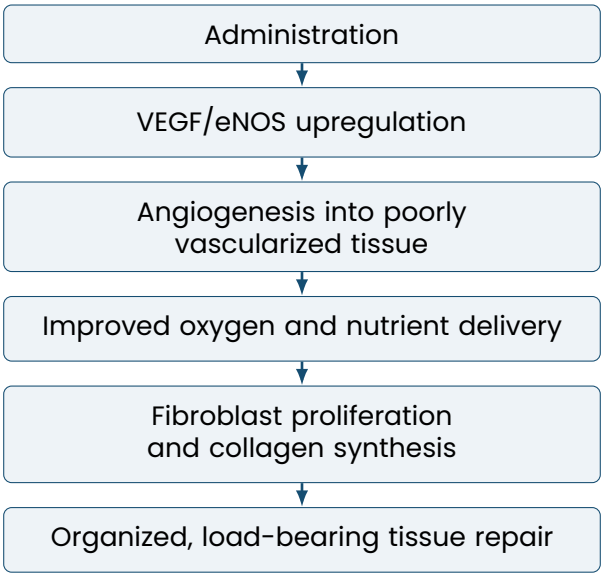
Inflammation

Modulates nitric oxide signaling for local vasodilation and reduced acute inflammation, and inhibits two of the body's main inflammatory-signaling pathways: **COX-2** and **NF-κB**. Blocking these settles inflammation without shutting down the repair process the way NSAIDs or corticosteroids can.

Gut and Neurological Effects

Acts on **dopaminergic and serotonergic** receptors and supports the gastric-mucosal lining directly (consistent with its origin in gastric juice) — the only peptide in this book with simultaneous, well-documented intestinal and central nervous system action.

BIOLOGICAL CASCADE



SECTION 7

Scientific Foundation

CLASSIFICATION

A synthetic pentadecapeptide — from the Greek pentadeca ("fifteen"), a chain of 15 amino acids linked together. It's a stable fragment rather than a full protein.

SEQUENCE

GEPPPGKPADDAGLV.

ORIGIN

A fragment of a protective protein found naturally in human gastric juice — hence "Body Protection Compound."

DISCOVERY

Isolated and studied in Croatia beginning in the 1990s, led by Dr. Predrag Sikiric (University of Zagreb).

CHARACTERISTICS

Unusually stable, including in acidic gastric environments, which is part of why it survives oral dosing well enough to act locally in the gut. The most researched peptide in this book by PubMed publication count.

EVIDENCE CLASSIFICATION

Early human evidence — extensive preclinical data, growing human data. Availability remains research/compounding, under active FDA regulatory review (see Part VIII).

> *SABRINA'S INSIGHT*
>
> *I rarely recommend BPC-157 just because someone has pain — I recommend it when healing itself has stalled: persistent inflammation, slow recovery, a failed rehab attempt, poor sleep undermining repair. Those are terrain problems, not tissue problems. BPC-157 restores that environment; it doesn't replace fixing what stalled healing in the first place.*

Part III — Combining Peptides

III PART III OF VIII

Stacks, Protocols, and the REC Method

Part II gave you twenty-six individual tools, profiled in full. This Part is where you stop thinking about them one at a time. Most people who feel like peptides "didn't work for them" didn't pick the wrong molecule — they picked the right molecule and used it on the wrong day of a sequence that has an order for a reason.

IN THIS PART

Stacking is not adding molecules together like a shopping list. It's organizing biological signals in a logical sequence that respects the hierarchy your own body already runs on.

3.1 The REC Method and the 7-Axis Hierarchy

The **REC Method** organizes any peptide protocol into three phases, and none of them are optional:

Phase	Purpose
R — Restore	Restore the biological terrain: sleep, circadian rhythm, energy metabolism, neuroimmune communication, basic mitochondrial function. Peptides enter here as modulators — never as the lone star of the show.
E — Stimulate	Regeneration is signaling the right tissue at the right moment, not forcing growth. Bioactive peptides, neuropeptides, and mitochondrial peptides enter here — always in cycles, always with a pause, always with you actually paying attention to how you respond.
C — Consolidate	Reduce therapeutic dependence and increase biological autonomy; teach your body to sustain itself rather than mistaking short-term improvement for a permanent fix.

The REC Method: three phases, run in order, none of them optional.

Within that structure, your relevant systems break down into **7 axes**, each with a governing question and a non-negotiable priority order — this is the detailed version of Part I's 4-level model:

Priority	Axis	Clinical Question	Representative Peptides
1 (base)	1. Inflammatory-Immune	How much inflammatory noise is present?	BPC-157, KPV, LL-37, Semax / Selank
1 (base)	2. Mitochondrial-Energetic	Is there cellular energy to sustain regeneration?	SS-31, MOTS-C, Humanin
2 (organizing)	3. Neurocentral (CNS/HPA)	Is the CNS in noise mode or predictable?	Semax, Selank, DSIP, Epitalon
2 (organizing)	4. Metabolic-Incretinic	Does insulin work? Is there metabolic flexibility?	GLP-1, Tirzepatide, MOTS-C
3 (execution)	5. Tissue-Structural (Muscle/tendon/cartilage)	What repair is needed?	BPC-157, TB-500, GHK-Cu
3 (execution)	6. Epigenetic-Chronobiological	Circadian rhythm, gene expression, aging	Epitalon, DSIP, GHK-Cu
4 (consolidation — always last)	7. Anabolic-Hormonal	Muscle mass, consolidation	CJC-1295, Ipamorelin, Tesamorelin, Follistatin

MYTH • REALITY

Myth: "The anabolic peptides are the 'real' ones — the rest is just supporting cast."

Reality: It's exactly backwards. Axis 7 is where you consolidate a result the other six axes already built. Reach for it first and you're not accelerating anything — you're pushing an anabolic signal into a system with no terrain ready to use it, which is the single most common reason people write off peptides as "not working."

Whoever starts at axis 7 without resolving axis 1 wastes money and gets fractional results — this is the single most common cause of therapeutic failure with peptides, full stop. In burnout or high-stress presentations, the Neurocentral axis temporarily jumps to top organizing priority; metabolism gets organized before anabolism in every single case; and the Anabolic-Hormonal axis exists to consolidate results already earned lower in the hierarchy — never to be the entry point.

This 7-axis model is the sequencing view — what order to address things in

once you already know which peptides you're combining. Part II's 10 Core Failure Pathways is the same underlying map at diagnostic resolution: the framework each individual peptide profile uses to answer "what specific problem is this actually for" before you ever get to a stack.

Part V — Reconstitution

V PART V OF VIII

Storage and Technical Practice

You did everything right. You read Part II, you picked the correct peptide, you got the dose from a real protocol instead of a forum post. Then you mixed it wrong, and none of that mattered — because the molecule was already dead before it ever touched your skin, and it never once told you.

IN THIS PART

- **5.1–5.2** Why reconstitution technique matters, and solvent selection
- **5.3–5.4** The reconstitution protocol step by step, and the 8 errors that destroy a peptide before use
- **5.5–5.6** Dosing and dilution math, and the definitive storage table
- **5.7–5.8** Signs of degradation, and cellular terrain preparation

That's not a scare tactic. It's the actual, unglamorous foundation underneath every protocol in Parts II and III, and it's the part most guides skip because it isn't as exciting as the peptide names.

5.1 Why Reconstitution Technique Matters

A peptide is a precise, fragile three-dimensional structure. Its amino-acid sequence, bonds, and spatial shape determine whether it can bind its receptor and actually do anything. The wrong temperature, too much agitation, the wrong pH, or the wrong solvent can collapse that structure into fragments with zero biological activity — or just quietly wreck its ability to bind the receptor it's supposed to find.

Here's the part that actually matters: **degraded peptide gives you no warning.** It doesn't change color. It doesn't develop a smell. In most cases it doesn't form a visible precipitate. It simply stops working, and there's no obvious way to know why — the physicochemical properties that actually determine whether it works (solubility, resistance to your body's own enzymes, the ability to bind its target) can all change while the solution still looks exactly like it did the day you mixed it. So good practice starts before you even open the vial: read the technical data sheet, use sterile materials, pick the right diluent, avoid sudden movement, and respect the storage time and temperature limits — all under one general principle: minimize mechanical and chemical stress on the molecule at every step.

5.2 Solvent Selection

Solvent	Composition	Best For	Why	Reconstituted Stability
BAC Water (Bacteriostatic Water)	Sterile water + 0.9% benzyl alcohol (antimicrobial preservative)	BPC-157, CJC-1295, Ipamorelin, DSIP, Semax, Selank, TB-500, MOTS-C, 5-Amino-1MQ, GHK-Cu, LL-37, Humanin, SS-31, Epitalon, KPV, Follistatin, PEG-MGF, PT-141, Melanotan II	Benzyl alcohol inhibits bacterial growth, so you can safely puncture the same vial multiple times over weeks	20–30 days refrigerated
Acetic Acid 0.6%	Dilute acetic acid solution	AOD-9604, "hard" GHRPs, hydrophobic peptides, IGF-1 LR3	Acidic pH changes solubility, helping dissolve hydrophobic peptide structures and preventing aggregation/thread formation	45+ days refrigerated. **Not for intranasal use.**
CAG Water (Carboxy-Acetic-Glycerol)	Specialized solvent	AOD-9604 (when acetic acid alone isn't enough), Tesamorelin (extremely fragile), GHK-Cu with initial dissolution difficulty, second-generation mitochondrial peptides	Provides extra stabilization beyond acetic acid alone, for the most fragile compounds in this book	30–40 days refrigerated

5.3 The Reconstitution Protocol, Step by Step

1. **Prepare the area.** Clean the rubber cap of both vials with cotton and 70% alcohol.
2. **Draw the solvent.** Draw the calculated volume into an insulin syringe (1 mL, 27–31G needle).
3. **Enter laterally.** Insert the needle into the lateral wall of the vial — never the center, and never straight onto the powder.
4. **Run down the wall.** Push the solvent along the vial wall so it runs gently over the powder instead of hitting it directly.
5. **Dissolve without shaking.** Do not shake it. Tilt the vial slowly and rotate with gentle movements; give it 5–15 minutes if it needs it.
6. **Store cold, immediately.** The solution should look clear or slightly cloudy. Get it into the refrigerator right away.

If it won't fully dissolve, warm it gently between your palms for 1–2 minutes and rotate again. A little initial cloudiness in GHK-Cu is normal — not a sign anything's wrong.

5.4 The 8 Errors That Destroy a Peptide Before Use

Error	Why It's a Problem

Error	Why It's a Problem
Shaking the vial like juice	Mechanical agitation breaks the hydrogen bonds holding the molecule's correct shape together — this is the single most common way a peptide ends up dead on arrival.
Injecting solvent directly onto the powder	Creates pockets without even mixing; part of the peptide stays undissolved and can degrade sitting in a concentrated clump.
Leaving the vial outside the refrigerator	At room temperature, reconstituted peptide can degrade within 2–6 hours depending on the molecule — faster than most people assume.
Exposing to direct sunlight	Photo-oxidation is especially destructive for SS-31, GHK-Cu, and any peptide with tryptophan residues.
Using a shared syringe	Cross-contamination risk, no exceptions — a local or systemic infection is never worth the convenience.
Using the wrong solvent	AOD-9604 in BAC water alone forms threads; Tesamorelin in BAC water degrades fast (see Section 5.2).
Freezing after reconstitution with BAC water	Benzyl alcohol crystallizes when frozen, altering the peptide's structure. Never freeze a reconstituted vial, ever.
Assuming "it looks fine" means it's fine	Most degraded peptide is visually identical to correctly handled product (Section 5.1). Prevention — not a visual check — is the only real strategy that works.

5.5 Dosing and Dilution Math

This is arguably the single most important practical skill in this entire book. Get it wrong and you either underdose (nothing happens) or overdose (unnecessary risk), and with the low-dose peptides in this book, the margin for error is genuinely small.

Formula: Desired dose (mcg) ÷ Concentration (mcg/mL) = Volume to inject (mL). Multiply by 100 to convert to units on a standard 1 mL insulin syringe (100 units = 1 mL; each unit = 0.01 mL).

Worked examples:

- Vial: 5 mg + 1 mL solvent → concentration = 5,000 mcg/mL. For a 500 mcg dose: 500 ÷ 5,000 = 0.1 mL = **10 units**.
- Vial: 2 mg + 2 mL solvent → concentration = 1,000 mcg/mL. For a 200 mcg dose: 200 ÷ 1,000 = 0.2 mL = **20 units**.

The dose math, worked out on a standard insulin syringe.

Precision matters most with the low-dose peptides: for something like LL-37 (dosed in the 10–25 mcg range), being off by even a small number of units can mean a dosing error over 50%. As a rule, **more solvent means a lower concentration and a bigger injection volume per dose** — which is actually the better setup for low-dose peptides (DSIP, LL-37), because it gives you a more precise, easier-to-read volume. Draw slowly, check the meniscus at eye level, and verify the reading before you inject. The syringe is the last checkpoint standing between you and a dosing mistake.

5.6 Storage: The Definitive Table

State	Temperature	Light	Shelf Life
Lyophilized powder (regular use)	2–8°C (refrigerator)	Dark	Months to 1–2 years
Lyophilized powder (long-term)	–20°C (freezer)	Dark	3–5 years
Lyophilized powder (in active use)	Room temperature	Dark	Up to 2–4 weeks
Reconstituted with BAC water	2–8°C	Dark	20–30 days
Reconstituted with acetic acid	2–8°C	Dark	45+ days
Reconstituted with CAG water	2–8°C	Dark	30–40 days

Peptides that deserve extra care: Tesamorelin (always CAG water, strict refrigeration, no more than 30 days reconstituted); SS-31 (sensitive to light and heat, don't push past roughly 20 days reconstituted); GHK-Cu (needs strict darkness); Follistatin (degrades fast after reconstitution — use it promptly, don't let it sit).

5.7 Signs of Degradation

Visible Signs	Possible Invisible Degradation (No Visual Cue)
Yellow or brown discoloration in a previously clear solution	Incorrect reconstitution (agitation, wrong temperature)
Precipitate that doesn't dissolve on gentle rotation	Prolonged storage outside the refrigerator
Unusual odor (strong acid, ammonia) — chemical degradation byproducts	Exposure to direct sunlight
Very dark GHK-Cu (copper oxidation)	More than 45 days reconstituted, even refrigerated
A viscous or "oily" solution that was previously liquid	Multiple freeze-thaw cycles of the powder

When in doubt, throw it out and start a new vial. The cost of a vial is always smaller than the cost of running a full protocol on something that quietly stopped working weeks ago.

5.8 Cellular Terrain Preparation Protocol

As established in Part I (Section 1.12), every act of biological signaling costs energy, and dysfunctional mitochondria generate oxidative noise that interferes with receptor signaling. Athletes who spend 2–4 weeks preparing their cellular terrain before starting a peptide protocol consistently get away with lower doses, fewer side effects, and results that actually last.

Nutrient / Compound	Dose	Function
Vitamin D3	5,000–10,000 IU/day	Immune and hormonal modulation
Magnesium bisglycinate	400–600 mg (night)	Cofactor for 300+ enzymes
Zinc + Copper	25 mg Zn + 2 mg Cu	Synthesis of endogenous GHK-Cu
CoQ10	200–300 mg	Mitochondrial respiratory chain support
Omega-3	2–3 g EPA+DHA	Membrane anti-inflammatory effect
NMN or NR	300–500 mg	NAD+ precursor
Astaxanthin	12 mg	Mitochondria-specific antioxidant
Urolithin A	500 mg	Mitophagy and mitochondrial biogenesis

Every peptide profile in Part II follows the same structure, so you can read this book cover to cover or flip straight to the molecule you came for:

Every profile also opens with a quick-reference card — primary role, best uses, the failure pathways it addresses, what it pairs with, and what it's not the right choice for — so you can size up a peptide before reading the full entry.

All reference doses reflect ranges reported in research and research-adjacent clinical use in the U.S. They're a map, not an order.

Appendix C — Alphabetical Peptide Index

A quick lookup by name. Every entry points back to its full profile in Part II, and — where relevant — its origin story in Part IV.

Closing Note

Go back to the question this book opened with: why do you do everything right and still stop progressing? By now you have the actual answer, and it isn't a lack of effort. It's signaling — inflammation, insulin resistance, and sleep, quietly breaking down in that order, undoing work you're still putting in every single day.

Peptides are not a shortcut. They're a precise, high-specificity way to reinforce biological signaling that training, nutrition, and sleep alone can no longer restore once it's degraded — most powerful when the underlying terrain is addressed first, and close to useless when used as a substitute for that work instead of a complement to it. Read this book once, start to finish, for the reasoning. Then keep it on the shelf you actually reach for, because you'll be back for the specifics: what a given peptide really does, what it stacks with, how to reconstitute it without wasting it, and exactly where the real limits are.

This is an educational reference. It does not replace individualized clinical evaluation, and nothing in it constitutes a medical prescription or a personal recommendation to use any substance. See the Front Matter and Part VII for the complete legal and educational notice.