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FIELD MANUAL

PEPTIDE
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10 Research Peptides
Explained in Plain English

BPC-157	TB-500	CJC-1295	TESAMORELIN	NAD+
GHK-CU	PT-141	SEMAGLUTIDE	TIRZEPATIDE	RETATRUTIDE

BY ANDY DAVIS

the starter guide for the curious civilian

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A plain-English starter guide to ten of the most-discussed compounds in the modern peptide conversation.

PEPTIDE FIELD MANUAL

The Starter Guide: 10 Research Peptides Explained in Plain English

By Andy Davis

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This book is for educational and informational purposes only. It is not medical advice, and it is not intended to diagnose, treat, cure, or prevent any disease. The peptides discussed in this book are, with a few exceptions, classified as research chemicals and are not approved by the U.S. Food and Drug Administration (FDA) or by similar regulatory agencies in other countries for general human use. Some, such as semaglutide and tirzepatide, are FDA-approved for specific medical conditions and are available only with a valid prescription.

Nothing in this book should be interpreted as a recommendation to purchase, possess, or use any of these compounds outside of a properly supervised medical or research setting. The author is not a physician, pharmacist, or licensed healthcare provider. Always consult a qualified medical professional before making any decisions about your health, your medications, or any substance you are considering putting into your body.

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If you remember nothing else from this disclaimer, remember this: **just because a substance can be ordered online does not mean it is safe, legal, or appropriate for you.**

A QUICK NOTE FROM THE AUTHOR

If you have picked up this book, you have probably heard the word "peptides" thrown around in a podcast, a gym locker room, a wellness influencer's Instagram story, or maybe a casual conversation that started with "have you heard about the new shot everyone is using to lose weight?" You might be

curious, a little skeptical, and probably overwhelmed by how much information (and misinformation) is out there.

I wrote this book for that exact person.

I am not a doctor. I am someone who got curious about peptides a few years ago, started reading, started asking questions, and quickly realized that almost every resource on the subject was either written for biochemistry PhDs or written by someone trying to sell you something. There did not seem to be a single, reasonably honest, plain-English starter guide for the average person who just wants to understand what these compounds are, what they do, why people are interested in them, and what the risks look like.

So I built one.

This book is not going to make you an expert. It will, however, give you a solid foundation. By the end, you will know what each of these ten peptides actually is, what people use them for, what the science says, what the side effects look like, and how to think critically about the claims you encounter in the wild. You will be able to read a Reddit thread or listen to a podcast and actually follow along, instead of nodding politely and Googling every other word.

Wherever I can, I have stripped out the jargon and replaced it with everyday language. Where I had to use a technical term, I have done my best to explain it in plain English and added it to the glossary in the back of the book. If something still does not make sense to you after one pass, you are not the problem; the science is genuinely complicated, and sometimes the best you can do is hold a "good enough" mental model and move on.

A final word: I have tried to be honest, including about things that are unflattering to the peptide world. There is a lot of hype out there. There are also some legitimately exciting compounds being studied. Both things can be true. Read with curiosity, but keep your skeptic hat on.

Let's get started.

— Andy Davis

HOW TO USE THIS BOOK

This book is organized so you can either read it cover to cover, or jump straight to the peptide you are curious about. Each chapter follows the same structure, so once you have read one, you know what to expect from the rest.

Each peptide chapter contains four sections:

1. **The Backstory** – Where this peptide came from, who discovered it, and how it works inside your body, written in everyday language.

2. **Why People Are Interested** – The common reasons people use it, the benefits that get talked about most often, and what the published research actually says.

3. **The Other Side of the Coin** – Side effects, risks, contraindications, and warning signs to watch for, including red flags for low-quality or fake products.

4. **Frequently Asked Questions** – Quick answers to the questions that come up over and over again about that specific compound.

Before the chapters, you will find a "Peptides 101" primer that explains what a peptide actually is, why anyone cares about them, and a small handful of concepts you should understand before diving in. Skipping this section is allowed, but if you find yourself confused two chapters in, this is where you should come back to.

After the chapters, there is a glossary of every technical term used in the book, a quick-reference cheat sheet that summarizes each peptide on a single line, and a closing chapter on how to think about peptides going forward.

If you are brand new to this world, I recommend reading straight through. If you are already familiar and just want a refresher on one specific peptide, the table of contents has you covered.

PEPTIDES 101: THE THINGS YOU NEED TO KNOW BEFORE WE START

What is a peptide, in plain English?

A peptide is a short chain of amino acids. That is the technical definition, and you may have already glazed over, so let me try again.

Your body is made of cells. Cells are made of, among other things, proteins. Proteins are made of building blocks called amino acids, strung together like beads on a necklace. When the chain of beads is long, we call it a protein. When the chain is short, we call it a peptide. That is really the only difference. A peptide is just a small protein.

Why does that matter? Because your body uses these short chains as messengers. Many of the hormones and signaling molecules that tell your body what to do are peptides. Insulin, the hormone that controls blood sugar, is a peptide. Oxytocin, the so-called bonding hormone, is a peptide. Growth hormone is a peptide. They are everywhere.

When scientists talk about "research peptides," they are usually talking about peptides that have been either isolated from nature or designed in a lab, and which can be given to a person (or an animal, or a cell in a dish) to produce a specific effect. Some are exact copies of things your body already makes. Some are tweaked versions designed to last longer or work better than the natural version. Some are entirely new molecules inspired by natural peptides.

Why are peptides interesting?

Three big reasons.

First, peptides are specific. Many traditional drugs are like a hammer; they hit a lot of things at once and you hope the side effects are tolerable. Peptides are more like keys; they tend to fit specific receptors and trigger specific responses. That specificity, in theory, means fewer off-target effects.

Second, peptides are part of how your body already works. When you give someone a peptide, you are often nudging an existing system rather than introducing something completely foreign. That is not a guarantee of safety—your body's signaling systems can absolutely be pushed too hard—but it is a different kind of intervention than, say, taking an antibiotic.

Third, the science has matured. Twenty years ago, peptides were hard to manufacture, hard to deliver, and expensive. Today they are produced at industrial scale, can be modified to last longer in the body, and in some cases have become household names (semaglutide, the active ingredient in Ozempic and Wegovy, is a peptide).

How are peptides taken?

Most peptides are not taken as pills, and this trips a lot of people up. The reason is simple: your digestive system is excellent at breaking down proteins. If you swallowed most peptides, your stomach would chop them up into amino acids before they ever reached your bloodstream. So peptides are usually delivered by injection—typically a small subcutaneous shot, similar to how insulin is administered.

A few peptides are formulated as nasal sprays, creams, or specialty oral capsules designed to survive digestion. But injection is the rule, not the exception. This is one of the first reality checks for anyone exploring peptides: if you cannot stomach the idea of giving yourself a small injection, this entire category of compound may not be for you.

What does "research chemical" mean?

You will see this term over and over. "Research chemical," in the context of peptides, usually means: this compound is sold for in-vitro or animal research only, has not been approved for human use, and the seller is legally distancing themselves from any human consumption.

The reality is more complicated. Many peptides sold as research chemicals are, in fact, identical to compounds being studied in human clinical trials. The "research only" label is a legal posture, not a statement about chemical purity or safety. It does not mean the peptide is fake; it also does not mean the peptide is safe, well-dosed, or accurately labeled.

The most important practical implication: when a compound is sold as a research chemical, there is no FDA oversight on what is actually in the vial. Purity, sterility, and labeling accuracy depend entirely on the supplier's honesty and quality control. We will come back to this in every chapter, because it matters.

One more thing: this is a fast-moving field

The peptides in this book represent the state of the world as of the time of writing. Some of these compounds were obscure five years ago. A few will probably be replaced by next-generation versions within five years. Retatrutide, which has its own chapter in this book, did not exist in the public consciousness a few years ago and may be one of the most-prescribed drugs in the country within a few years from now. If you are reading this several years after publication, treat it as a snapshot, not the final word.

Now, on to the peptides.

CHAPTER 1: BPC-157 — THE HEALING PEPTIDE

If you have heard a single peptide name mentioned in a gym, on a podcast, or in a recovery thread on Reddit, there is a very good chance it was BPC-157. This compound has become the unofficial poster child of the peptide world. Athletes talk about it for joint pain. Powerlifters talk about it for tendon injuries. People with stomach problems talk about it for gut healing. It has been the subject of more hype, more anecdote, and more "this changed my life" testimonials than perhaps any other compound in this book.

So what is it, where did it come from, and is any of the hype warranted? Let's start at the beginning.

THE BACKSTORY

BPC-157 stands for "Body Protection Compound 157." It is a synthetic peptide—meaning it is made in a lab, not extracted from a living thing—but it was inspired by a natural protein found in human gastric juice. In the early 1990s, a research group in Croatia, led by Dr. Predrag Sikiric, was studying the protective proteins your stomach produces to keep itself from digesting its own lining. After all, your stomach is essentially a bag of acid strong enough to dissolve meat; whatever keeps it from dissolving itself is presumably doing something interesting.

What they isolated was a larger protein called Body Protection Compound. From that, they identified a specific 15-amino-acid sequence that appeared to be the active part of the molecule. They named that fragment BPC-157 and started running experiments on it. The results were, to put it mildly, unusual. In animal studies, BPC-157 appeared to accelerate the healing of wounds, tendons, ligaments, bones, muscle tears, and the gut lining itself. It seemed to work whether it was injected, given orally, or even applied topically.

That last point is worth lingering on. Most peptides break down in the digestive tract, which is why most of them need to be injected. BPC-157 appears to be one of the rare exceptions—it seems to survive oral administration, at least to some degree. This is part of why it has become so popular outside of clinical settings; for people uncomfortable with needles, the prospect of swallowing a capsule and getting any benefit at all is appealing.

How it works, in plain English

If you ask a biochemist how BPC-157 works, you will get a forty-five-minute lecture full of acronyms. The short version, for our purposes, is this: BPC-157 appears to stimulate the formation of new blood vessels in damaged tissue. This process is called angiogenesis, and it is one of the rate-limiting steps in healing.

Cuts, tears, and inflamed tissues all need fresh blood supply to repair themselves. Without it, healing stalls.

BPC-157 also appears to dial up the production of growth factors—the molecular signals that tell cells to divide, migrate, and rebuild structures. It seems to interact with the nitric oxide system, which is involved in blood flow and tissue protection. And it appears to have an anti-inflammatory effect that is different from the kind you get from ibuprofen, in that it does not seem to suppress healing the way some anti-inflammatories do.

Put all of that together and you have a compound that, at least in animals, behaves like a kind of universal repair signal. Something is damaged? BPC-157 says: bring blood, bring growth factors, calm the inflammation, get to work.

That is the elegant, hopeful version of the story. We will get to the messy version shortly.

WHY PEOPLE ARE INTERESTED

The list of things people use BPC-157 for is long enough to make any honest person suspicious. When a compound is reported to help everything, it usually helps nothing. With BPC-157, however, the reported applications cluster around a small number of themes, and those themes happen to line up with what the animal research suggests.

Tendon and ligament injuries. This is the most common reason people seek out BPC-157. Tendons are notoriously slow to heal. A sprained ankle might take a few weeks, but a serious tendon injury—an Achilles strain, a chronic golfer's elbow, a stubborn rotator cuff issue—can drag on for months or years. Animal studies have shown impressive tendon-healing results with BPC-157, and human anecdotes report similar effects: chronic injuries that had not budged for months apparently turning a corner within weeks.

Joint pain and recovery. Lifters and athletes use BPC-157 for the achy joints that come with hard training. Whether it actually fixes underlying joint problems or just reduces inflammation is unclear, but the subjective reports are consistent: less stiffness, better mobility, faster bounceback between training sessions.

Gut and digestive issues. Because BPC-157 was originally isolated from a stomach-protective protein, it should not be surprising that people use it for gut problems. Reports range from inflammatory bowel symptoms to leaky gut to ulcers to general bloating and discomfort. Animal studies on stomach and intestinal healing are some of the strongest in the BPC-157 literature.

Post-surgery recovery. Some people use BPC-157 in the weeks before and after orthopedic surgery, hoping to speed up the body's repair process. Surgeons, broadly, have not endorsed this, but the practice exists.

Muscle injuries. Strains, pulls, and tears.

Chronic injury and pain that has not responded to other treatments. This is the bucket many people fall into. They have tried physical therapy, anti-inflammatories, cortisone shots, rest, and stretching, and they are still hurting. BPC-157 becomes the "let me try one more thing" option.

What the research actually says

Here is where I have to break the spell a little. Almost all of the research on BPC-157 has been done in animals—primarily rats. There are very few high-quality human studies. There are essentially no large, randomized, placebo-controlled trials in humans that would meet the standard required for FDA approval.

That does not mean BPC-157 does not work. It means we do not have solid, repeatable, large-scale human evidence one way or the other. The animal data is genuinely impressive, and the anecdotes are widespread enough that something is probably going on. But "probably something is going on" is a long way from "we know this works, here is the dose, here is what to expect."

If a friend asked me to summarize the current state of BPC-157 evidence in one sentence, I would say: the early signal is compelling enough that serious clinical trials are overdue, and we should be honest that we do not yet have them.

THE OTHER SIDE OF THE COIN

BPC-157 has a reputation as a remarkably safe compound. Animal studies have used very high doses without finding obvious toxicity. Anecdotal reports of side effects are uncommon. By the standards of "stuff people inject without a prescription," this is about as benign-sounding as it gets.

That said, let's be honest about the things we do not know and the things that have come up.

The angiogenesis question. BPC-157 promotes new blood vessel formation. That is great when you are trying to heal a tendon. It is potentially less great if you have an undiagnosed tumor, because tumors also need blood vessels to grow. There is no published evidence that BPC-157 causes cancer or makes existing cancers worse. There is also not nearly enough human research to rule it out. People with a history of cancer should think hard before using anything that promotes angiogenesis.

Lightheadedness and blood pressure. Some users report dizziness, lightheadedness, or feeling slightly off in the first few days. This may be related to BPC-157's effects on blood flow and nitric oxide.

Injection site reactions. Standard for any injectable peptide. Bruising, redness, soreness, and the occasional small lump are common and usually not concerning.

Mild GI upset. Some people report nausea or stomach changes, especially with oral administration.

Unknown long-term effects. No one has been studying BPC-157 in humans for thirty years. We do not know what happens with chronic, long-term use. The compound was discovered in the 1990s, but widespread off-label use is much more recent.

Red flags when sourcing

Because BPC-157 is sold as a research chemical, what you receive is only as good as the supplier. Here is what to watch for:

- **No certificate of analysis (COA).** A reputable supplier should be able to show you a third-party lab test confirming the identity, purity, and concentration of the product. No COA, no purchase.

- **Unrealistically cheap pricing.** Quality peptides cost money to make. A vial of BPC-157 priced at a small fraction of competitors' prices is either fake, underdosed, or contaminated.

- **Slick marketing that talks about "human use."** Real research chemical suppliers stay legally cautious. Suppliers that openly market for human use are either reckless or running a scam.

- **No batch testing or no expiration dates.** Peptides degrade. A supplier that cannot tell you when a vial was made and when it expires is not a serious supplier.

- **Reconstituted peptides shipped without ice or refrigeration.** Peptides are usually shipped as a freeze-dried (lyophilized) powder and reconstituted at home. If a supplier is shipping ready-to-use liquid without temperature control, the product is likely degraded.

FREQUENTLY ASKED QUESTIONS

Q: Is BPC-157 legal?

In most countries, including the United States, BPC-157 is not approved for human use but is sold legally as a research chemical. It is, however, banned by the World Anti-Doping Agency (WADA), which means competitive athletes can be sanctioned for using it. Always check the laws and regulations that apply to your specific situation.

Q: Can you take BPC-157 as a pill instead of injecting it?

There are oral formulations on the market, and BPC-157 appears to have some resistance to digestive breakdown. Whether the oral form is as effective as the injectable form is unclear; there is some animal data suggesting oral works, but the comparison is not settled. Most users who want maximum effect choose injection.

Q: How long does it take to feel something?

Anecdotal reports vary wildly. Some users report effects within days; others say it took several weeks. Tendon injuries in particular often respond slowly because tendons themselves heal slowly.

Q: Can I use BPC-157 alongside other peptides?

People often stack BPC-157 with TB-500 (covered in the next chapter), since the two compounds have complementary effects on tissue healing. Always understand the additive risks of combining anything.

Q: Does it interact with medications?

Formal drug interaction studies do not really exist. Caution is warranted with blood thinners, blood pressure medications, and anything that affects healing or the immune system. Talk to a doctor.

Q: What about cancer risk?

BPC-157 promotes angiogenesis (new blood vessel growth), and tumors also depend on angiogenesis to grow. There is no published evidence that BPC-157 causes or worsens cancer, but the theoretical concern is real. People with a personal or family history of cancer should be cautious.

Q: Is BPC-157 a steroid?

No. BPC-157 is a peptide, not a steroid. It does not affect testosterone or estrogen, and it does not have anabolic muscle-building effects in the way steroids do.

Q: Does the brand of BPC-157 matter?

Enormously. The compound itself is the same molecule no matter who makes it, but purity, dosing accuracy, sterility, and stability vary widely between suppliers. The brand is essentially a stand-in for "did the supplier do their job correctly?"

CHAPTER 2: TB-500 — THE OTHER HEALING PEPTIDE

If BPC-157 is the famous one, TB-500 is the close cousin that keeps getting mentioned right alongside it. People who use peptides for tissue healing often run the two together, and you will see them paired in stacks, in forum posts, and in vet supply catalogs (more on that in a moment). TB-500 is less of a household name, but in many ways it is just as interesting—and in some ways, more so.

THE BACKSTORY

TB-500 is a synthetic version of a portion of a natural protein called thymosin beta-4. Thymosin beta-4 is found throughout your body. It is in nearly every cell, but it is especially abundant in platelets, in wound fluid, and in tissues that are actively repairing themselves. When you get a cut, thymosin beta-4 levels spike at the site. When you have a heart attack, the surviving heart tissue is awash in it. Your body uses it as a generalized repair signal.

Researchers became interested in thymosin beta-4 in the 1960s and 1970s, originally because they were studying the thymus gland and its role in the immune system. Over time, scientists realized that this little protein had effects far beyond immune function. It seemed to promote the migration of cells to wound sites, encourage the formation of new blood vessels, reduce inflammation, and even appear in tissues that were regenerating after damage.

The full thymosin beta-4 molecule is a 43-amino-acid chain. That is on the larger side, expensive to manufacture, and harder to deliver. So researchers identified the specific region of the molecule that seemed to do most of the heavy lifting—the "active site"—and synthesized that fragment as a stand-alone compound. They called it TB-500.

A quick clarification, because this confuses people: TB-500 is not the same molecule as thymosin beta-4. It is a fragment of it. When you read marketing materials that use the names interchangeably, that is technically incorrect. Some suppliers sell true full-length thymosin beta-4; others sell the TB-500 fragment. The fragment is cheaper to produce and is what most people are buying when they purchase "TB-500."

The horse racing connection

If you wonder why your search results for TB-500 keep turning up equine supply websites, here is why. TB-500 has been used in racehorses for years to help with healing from soft-tissue injuries—pulled tendons, sore muscles, recovery from hard training and racing. In some racing jurisdictions it is banned; in others it has been allowed or tolerated. Either way, the veterinary use predates the human use, and a

lot of the supply chain quirks of this peptide trace back to those origins. If you see "for veterinary research use only" on a vial, that is part of the same story.

How it works, in plain English

The two big things TB-500 does, in the simplest possible terms:

1. **It tells cells to move.** When tissue is damaged, the cells that do the repair work need to migrate from healthy tissue into the damaged area. TB-500 appears to dramatically accelerate this cell migration. Think of it as a recruiter calling reinforcements to the front line.

2. **It encourages new blood vessels.** Like BPC-157, TB-500 promotes angiogenesis, which is essential for delivering oxygen and nutrients to healing tissue. Without fresh blood supply, healing stalls.

TB-500 also seems to have anti-inflammatory effects and to interact with the actin protein in cells in a way that supports tissue remodeling. The details get complicated quickly, but the high-level story is consistent: this is a compound that pushes the body's natural repair machinery into a higher gear.

WHY PEOPLE ARE INTERESTED

The use cases for TB-500 overlap heavily with BPC-157, which is part of why they are often stacked together.

Soft tissue injuries. Pulled muscles, strained tendons, ligament sprains, and the general aches and pains of training. TB-500 is particularly associated with muscle injuries, where its cell-migration effects may help recovery.

Chronic joint issues. People with stubborn knee, shoulder, hip, or elbow problems use TB-500 to try to push past plateaus that physical therapy and rest have not fixed.

Inflammation and recovery. Even in the absence of an obvious injury, some users report better recovery between hard workouts, less stiffness, and a general "I feel younger" sense in the joints.

Skin and wound healing. There is research interest in TB-500 for wound healing, burn recovery, and even cosmetic applications. This is one area where the science is moving forward relatively quickly.

Heart and neurological tissue. This is more speculative, but thymosin beta-4 (the parent molecule) has been studied for its potential role in cardiac repair after heart attacks and in protecting the nervous system. Some of the most interesting future research on TB-500 and its relatives is in these areas. For an average reader curious about peptides, this is far from a "weekend warrior" application, but it is worth knowing the science is broader than just gym recovery.

What the research actually says

Like BPC-157, TB-500 has more animal research than human research. The animal data is interesting and broadly consistent with what users report. Human clinical trial data is limited but slowly growing, particularly in cardiac and wound-healing settings. Most of the recreational use is, again, extrapolated from animal studies and personal experimentation.

Where TB-500 may have a small edge over BPC-157 in the "well, what do we actually know?" department is that its parent molecule, thymosin beta-4, has been more extensively studied in human contexts. So while TB-500 itself is not a fully understood drug, the family of compounds it belongs to is reasonably well-characterized.

THE OTHER SIDE OF THE COIN

TB-500 has a similar safety reputation to BPC-157. Animal studies have used substantial doses without obvious toxicity. Anecdotal side effect reports are uncommon. That said:

Cancer concerns. Same theoretical issue as BPC-157. TB-500 promotes angiogenesis and cell migration—both processes that, in a healthy body, support healing, but in someone with an undiagnosed tumor, could theoretically be unhelpful. The research evidence is murky and the practical risk is unknown, but the concern is worth taking seriously, particularly for anyone with a personal or family history of cancer.

Lethargy and "off" feelings. Some users report feeling unusually tired, foggy, or just slightly off during the first few weeks of use. The mechanism is not well understood, and the effect typically fades.

Headache. Reported occasionally, particularly in the first few doses.

Injection site reactions. Like any peptide, standard injection issues can occur—redness, bruising, mild soreness.

Anti-doping considerations. TB-500 is explicitly banned by WADA. Athletes in any drug-tested sport should treat it as off limits.

Long-term effects unknown. The compound has been in use for a couple of decades in some contexts (horse racing, mostly), but rigorous long-term human safety data is still thin.

Red flags when sourcing

Same playbook as the previous chapter, plus a couple of specific notes:

- **Confirm you are getting the fragment you think you are paying for.** Some suppliers sell full-length thymosin beta-4 marketed as "TB-500." This is not necessarily a scam—the full-length molecule is

arguably a more potent product—but it should be priced and labeled accordingly. Other suppliers may sell a different fragment entirely. A reputable supplier will clearly state what is in the vial.

- **Veterinary versus research labeling.** Some TB-500 is labeled for veterinary use, particularly because of the horse racing market. This is a legal posture and does not necessarily speak to quality, but it does mean you should be even more skeptical about sourcing and lab testing.

- **Certificate of analysis is non-negotiable.** No COA, no purchase. This is true for every compound in this book, but TB-500's veterinary supply chain creates extra room for mislabeling and contamination.

- **Storage and reconstitution matter.** TB-500 is typically shipped lyophilized and should be refrigerated after reconstitution. If a supplier ships ready-to-use liquid with no cold chain, the product is likely degraded.

FREQUENTLY ASKED QUESTIONS

Q: What is the difference between TB-500 and thymosin beta-4?

Thymosin beta-4 is the full-length, naturally occurring molecule—43 amino acids long. TB-500 is a synthetic fragment that contains the active region. They overlap functionally but they are not the same molecule. Many suppliers use the names interchangeably even though they technically should not.

Q: Is TB-500 stronger than BPC-157?

"Stronger" is not really the right comparison. They work on overlapping but slightly different pathways. Many users find that running them together produces better results than either one alone, which is why they are often stacked.

Q: Can I use TB-500 alone for a muscle tear or pulled tendon?

People do. The most common protocol pairs it with BPC-157, but solo use is also reported. Tendon healing in particular tends to be slow, so users typically run it for several weeks before judging effects.

Q: How often is it injected?

TB-500 has a longer half-life than BPC-157, which means it does not need to be injected as frequently. Protocols vary widely depending on what someone is trying to do.

Q: Will I fail a drug test?

If you are subject to WADA-style drug testing, yes—TB-500 is explicitly on the prohibited list and has been detected in athletes. If you are tested for employment in a typical workplace (drug screens for amphetamines, opioids, etc.), TB-500 is not on those panels.

Q: Can it help with hair regrowth?

There is preliminary research interest in thymosin beta-4 for hair follicle health, and a small subset of users try TB-500 for hair purposes. This is one of the less-studied applications and the data is thin.

Q: Is TB-500 a steroid?

No. Like BPC-157, TB-500 is a peptide. It does not raise testosterone or build muscle the way an anabolic steroid does. Its benefits are in tissue repair, not in raw strength or size.

Q: How long does a typical course last?

Most protocols are run in cycles of several weeks rather than continuously. The idea is to provide a healing window, not to permanently alter how your body repairs itself. Continuous, indefinite use has not been well studied and is generally not what users do.

CHAPTER 3: CJC-1295 — THE GROWTH HORMONE BOOSTER

This is the chapter where we start tiptoeing into hormone territory, so before we go any further, a short detour is in order.

Your body produces growth hormone (GH). It is made by your pituitary gland—the little organ tucked under the base of your brain—and it does, more or less, what it says on the tin. It supports growth in children, helps maintain muscle and bone as adults, plays a role in fat metabolism, and seems to be involved in tissue repair and recovery. Growth hormone levels are highest in childhood and decline steadily as we age, reaching low levels by middle age and continuing to drop after that.

A lot of the peptides in this section of the book are not growth hormone itself. They are signals that tell your pituitary gland to produce more of its own growth hormone. There is a meaningful difference between the two approaches. Injecting growth hormone directly is a heavy-handed intervention—you are pushing GH levels way past whatever your body would normally produce, and your natural production tends to shut down in response. Injecting a peptide that nudges your pituitary to make more of its own GH is, in theory, a gentler approach that works with your body's existing systems rather than around them.

CJC-1295 is the most well-known peptide in this category. Let's get into it.

THE BACKSTORY

In the 1980s, scientists identified a natural hormone called growth hormone-releasing hormone, or GHRH. As the name suggests, this hormone is what your brain uses to tell your pituitary gland to release growth hormone. GHRH is produced in a part of the brain called the hypothalamus and travels a short distance to the pituitary, where it triggers GH release.

Researchers naturally wanted to know if they could use GHRH itself as a therapy—essentially, give it to someone whose GH levels were low and let it nudge their pituitary back into action. The problem was that natural GHRH breaks down very quickly in the bloodstream, with a half-life measured in minutes. By the time you administered a dose, most of it was already gone. As a practical therapy, it was a non-starter.

Various research groups worked on modifying the GHRH molecule to make it more durable. One of the most successful versions came out of a Canadian biotech company called ConjuChem in the early 2000s. They produced a modified GHRH analog—a tweaked version of the natural hormone—that they called CJC-1295. The "CJC" stood for ConjuChem.

What made CJC-1295 special was a feature called "drug affinity complex" technology. Without going too far into the weeds, the idea was to attach a small chemical anchor to the peptide that would bind to a common protein in the blood called albumin. Once attached, the peptide would essentially hitch a ride on the albumin, surviving in the bloodstream for days instead of minutes. The version with this albumin-binding modification is technically called CJC-1295 DAC. There is also a version without it, called CJC-1295 without DAC, or sometimes just "modified GRF 1-29" or "Mod GRF 1-29." That version still lasts longer than natural GHRH but does not have the multi-day half-life.

If this all sounds confusing, here is the bottom line: when people talk about CJC-1295, they may be talking about one of two versions. The DAC version lasts much longer, requires less frequent injection, and produces a more constant GH-stimulating signal. The non-DAC version is shorter-acting and is often paired with another peptide called ipamorelin in a once- or twice-daily protocol.

How it works, in plain English

Think of your pituitary gland as a sleepy assistant. GHRH is the manager walking in and saying "hey, can you put out some growth hormone, please?" CJC-1295 is a longer-lasting version of that manager. Instead of asking once and then leaving, it stays around all day, gently and persistently nudging the assistant to do its job.

The result is more growth hormone in your bloodstream—not in one massive spike, but in a steadier, more sustained way. Importantly, CJC-1295 is not adding GH directly; it is asking your body to make its own. That means it works through your existing biological pathways and (in theory) is more self-regulating than just injecting growth hormone.

WHY PEOPLE ARE INTERESTED

If you have started losing some of the markers of youth—muscle mass quietly slipping, body fat accumulating where it never used to, sleep getting shallower, recovery slowing down, skin losing some of its bounce—you may have wondered whether anything can be done about it without committing to full-blown hormone replacement therapy. CJC-1295 sits squarely in that "is there a middle option?" category.

Body composition. More muscle, less fat. This is the headline reason most people are interested. Growth hormone is involved in protein synthesis (muscle building) and lipolysis (fat burning). Boosting your natural production may shift body composition in a favorable direction, though the effects in adults with normal GH levels are usually modest, not dramatic.

Sleep quality. This is one of the more reliably reported effects of CJC-1295 (especially when paired with ipamorelin, which we will not cover in its own chapter but which is closely related). Users frequently report deeper, more restorative sleep, particularly in the first few weeks.

Recovery. Faster bounceback from training, less general soreness, the sense of being able to push harder without paying for it as much. Growth hormone's role in recovery is well-established at the basic-science level, and users tend to notice this benefit.

Skin and hair. Some users report improvements in skin texture, hair quality, and nail growth. These effects are slow and subtle, and they may be partly placebo, but the underlying biology (GH affects connective tissue, skin, and hair) is real.

Anti-aging interest. This is the catch-all. People in their 40s, 50s, and 60s often come to CJC-1295 with a general "I want to feel like I did 10 years ago" goal. The realistic expectation is small, gradual improvements across multiple systems rather than a single dramatic transformation.

What the research actually says

CJC-1295 has more rigorous human research behind it than most peptides in this book. The original development was for clinical use—initially in the context of GH deficiency—and there are published trials showing that the compound reliably increases GH and IGF-1 (a downstream hormone that mediates many of GH's effects) in humans. The pharmacology is reasonably well-characterized.

What there is less of: large, long-term studies on healthy adults using CJC-1295 for body composition or anti-aging purposes. The clinical research focused on people with deficiency. The recreational use in healthy adults is essentially an extrapolation from "if this works in people who are low, can it help people who are merely getting older?" The answer might be yes, but the evidence base is thinner than the marketing would suggest.

THE OTHER SIDE OF THE COIN

CJC-1295 is generally considered well-tolerated, but it is not without risks.

Water retention and puffy face. Higher GH levels can cause fluid retention, especially in the face and hands. Some users report looking "puffy" in the first few weeks, which usually resolves but can be cosmetically unwelcome.

Numbness and tingling. Carpal tunnel-like symptoms—numb fingers, tingling hands—can occur with elevated GH levels and have been reported with CJC-1295. Reducing the dose typically resolves it.

Joint aches. Mild joint pain, especially in the hands and wrists, is a possible side effect.

Insulin resistance. Growth hormone has a complex relationship with blood sugar. Sustained higher GH levels can reduce insulin sensitivity, which is relevant for anyone with prediabetes, diabetes, or insulin resistance.

Headaches and flushing. Some users report headaches or flushing immediately after injection, particularly with the DAC version.

Cancer concerns. This is the big one to think about. Growth hormone and IGF-1 are both involved in cell growth, and chronically elevated levels have been associated with certain cancer risks in observational studies. The connection is real but the magnitude of risk from CJC-1295 specifically is not well-defined. People with a personal or family history of cancer should approach this category very carefully.

Long-term effects unknown. CJC-1295 has not been in widespread off-label use for long enough to know what 20 years of intermittent use does. The clinical trials were short-term.

A specific safety event worth knowing about

In the original clinical development of CJC-1295 DAC, there was a reported death in one of the trials. The death was attributed to a cardiac event in a participant with pre-existing risk factors, and it was unclear whether CJC-1295 was directly responsible. Development was paused and eventually the compound did not move forward to full pharmaceutical approval. People who are intent on using CJC-1295 should know this history and should be aware that the compound did not complete the full safety evaluation that would normally be required for an approved drug.

Red flags when sourcing

- **DAC versus non-DAC clarity.** A reputable supplier should clearly state which version is in the vial. If the labeling is vague or just says "CJC-1295" without specifying, that is a warning sign.

- **Concentration accuracy.** GH-stimulating peptides are dosed in small quantities, and inaccurate dosing can swing the effect dramatically.

- **Certificate of analysis.** Required.

- **Cold storage.** The DAC version is somewhat more stable than the non-DAC version, but both benefit from refrigeration after reconstitution.

FREQUENTLY ASKED QUESTIONS

Q: What is the difference between CJC-1295 with DAC and without DAC?

The "DAC" version has a chemical modification (drug affinity complex) that lets it bind to a blood protein and last much longer in the body. The non-DAC version has a shorter half-life. Practically, the DAC

version is injected less frequently and produces a more sustained GH-stimulating signal, while the non-DAC version produces a series of shorter pulses that more closely mimic natural GH release.

Q: Is CJC-1295 the same thing as growth hormone?

No. Growth hormone is the hormone itself. CJC-1295 is a peptide that tells your pituitary gland to produce more growth hormone. Different mechanism, different practical implications.

Q: Will it make me bigger and more muscular like steroids?

No. Even with elevated GH levels from CJC-1295, the muscle-building effects in healthy adults are modest. People expecting steroid-like results will be disappointed. The realistic effects are gradual improvements in body composition, recovery, and sleep, not a transformation.

Q: What is ipamorelin and why is it always mentioned with CJC-1295?

Ipamorelin is a different class of GH-stimulating peptide called a ghrelin receptor agonist or growth hormone secretagogue. It works through a different pathway than CJC-1295 but produces a similar end result (more GH). The two are often combined because the effects appear to be additive without the side effects scaling proportionally. Stacking the two is one of the most common protocols in the GH-stimulating peptide world.

Q: Will I fail a drug test?

If you are subject to athletic drug testing (WADA, NCAA, professional leagues), yes—growth hormone-stimulating peptides are explicitly banned. Standard employment drug screens do not test for these compounds.

Q: How is it injected?

Subcutaneous injection, similar to insulin. Most users inject in the abdomen or thigh with a small insulin syringe.

Q: Can I just take CJC-1295 by mouth?

No. Like most peptides, it is destroyed by digestion. There is no oral form that works.

Q: When is the best time to inject?

Many users prefer evening or just before bed, since natural GH release is highest during deep sleep. Pairing the injection with your natural rhythm may produce better effects.

CHAPTER 4: TESAMORELIN — THE APPROVED GROWTH HORMONE PEPTIDE

CJC-1295 lives in the gray zone of research chemicals. Tesamorelin, by contrast, is the rare GH-stimulating peptide that has actually crossed the finish line into FDA approval. That changes the entire conversation about it. Where most peptides in this book require a leap of faith about manufacturing quality, dosing, and basic safety, tesamorelin has been through the full pharmaceutical wringer—clinical trials, regulatory review, post-marketing surveillance. We know more about it than we know about most of its peers.

It is also the most expensive peptide in this book by a substantial margin, which is a direct consequence of being a real, approved drug.

THE BACKSTORY

Tesamorelin is, like CJC-1295, a modified version of growth hormone-releasing hormone (GHRH). It was developed by a Canadian pharmaceutical company called Theratechnologies in the 2000s, with a specific medical application in mind: treating a particular kind of abdominal fat that builds up in people living with HIV who take certain antiretroviral medications.

This may sound like a strange origin story for a peptide that has since become popular in the broader wellness world, but it makes sense once you understand the context. People with HIV on long-term medication often developed a condition called HIV-associated lipodystrophy, where fat would accumulate around the organs in the abdomen—what doctors call "visceral" fat—even as fat in other parts of the body was lost. Visceral fat is the dangerous kind, the kind associated with cardiovascular disease, insulin resistance, and metabolic problems. It was a serious quality-of-life and health issue for this patient population, and there were few good treatments.

Tesamorelin turned out to work remarkably well for this specific problem. Clinical trials showed it could reduce visceral fat by 15 to 20 percent over several months of use, without the dieting or exercise interventions that are typically required to lose that kind of fat. In 2010, the FDA approved tesamorelin (sold under the brand name Egrifta) for HIV-associated lipodystrophy.

Once the drug was approved and on the market, two things happened. First, the medical community began studying whether it might help with visceral fat in non-HIV populations—people with metabolic syndrome, fatty liver disease, obesity. Second, the broader wellness and longevity community noticed that there was now an FDA-approved peptide that reliably reduced belly fat and raised growth hormone levels, and interest in off-label use began to grow.

How it works, in plain English

Tesamorelin works essentially the same way as CJC-1295. It is a more stable version of GHRH, meaning it survives longer in your body than the natural hormone. It binds to GHRH receptors on your pituitary gland and tells it to release more growth hormone. The increased GH then triggers an increase in IGF-1 (a downstream hormone) and produces the various downstream effects: more lipolysis (fat burning), some effects on muscle, some effects on connective tissue, and so on.

What makes tesamorelin particularly good at reducing visceral fat, specifically, is not entirely understood. Growth hormone is broadly associated with fat mobilization, but the strong and selective effect on belly fat that tesamorelin produces is more pronounced than what you would predict from a general "more GH" mechanism. There may be additional pathways involved that are not yet fully mapped.

WHY PEOPLE ARE INTERESTED

Stubborn belly fat, particularly visceral fat. This is the headline use case. Tesamorelin is one of the few compounds that has been demonstrated, in proper clinical trials, to reduce visceral fat. For people who diet and exercise and still cannot get rid of the abdominal weight, that is a meaningful proposition.

Metabolic health. Reducing visceral fat is associated with improvements in cholesterol, triglycerides, insulin sensitivity, and various markers of metabolic health. Tesamorelin's effects in clinical trials have included improvements in these markers, not just changes in fat distribution.

Fatty liver. Researchers have explored tesamorelin's effects on liver fat, particularly in the context of non-alcoholic fatty liver disease (NAFLD)—a condition that affects a large and growing portion of the adult population. The early results have been encouraging.

General GH-related benefits. Better sleep, better recovery, modest body composition improvements, improved skin and connective tissue—everything that gets talked about in the CJC-1295 conversation also applies, to some degree, to tesamorelin. The effects tend to be in the same direction but the body of evidence is generally stronger.

Cognitive effects. This is more speculative, but there has been research interest in tesamorelin's potential cognitive effects, particularly in older adults and in people with mild cognitive impairment. The early studies are intriguing but not conclusive.

What the research actually says

This is the rare peptide where "what does the research say" can be answered with proper, peer-reviewed, randomized controlled trials. The visceral fat-reduction effect is well-established. The metabolic improvements are real, though modest. The cognitive research is preliminary but ongoing.

That said: most of the strong evidence is in the original FDA-approval population (people with HIV-associated lipodystrophy). For non-HIV populations, the data is more limited, though it has been expanding.

THE OTHER SIDE OF THE COIN

Injection site reactions. Tesamorelin is injected daily, and over time some users develop redness, lumps, or irritation at injection sites. Rotating injection sites helps but does not eliminate the issue.

Joint pain and swelling. Like other GH-elevating compounds, tesamorelin can cause joint aches, particularly in the early weeks. Some users develop a sensation similar to mild carpal tunnel syndrome.

Fluid retention. Mild swelling, particularly in the hands and feet, is reported. Usually mild and self-resolving.

Elevated IGF-1. GH elevation drives IGF-1 elevation. As discussed in the CJC-1295 chapter, chronically elevated IGF-1 has been associated with certain cancer risks in observational studies. People with active cancer or significant cancer risk factors should be cautious.

Insulin resistance and blood sugar effects. GH elevation can reduce insulin sensitivity. People with diabetes or prediabetes need to monitor blood sugar carefully if using tesamorelin.

Allergic reactions. Rare but reported, particularly to the inactive ingredients in some formulations.

Pregnancy. Tesamorelin should not be used during pregnancy.

A note on legitimacy and sourcing

This is the one chapter in the book where I will say, unambiguously: if you are going to use this compound, get it through legitimate medical channels. Tesamorelin is an FDA-approved drug. You can, in principle, obtain it with a prescription. The brand-name version is extremely expensive, but compounding pharmacies sometimes produce a generic version, and some telehealth platforms specialize in connecting patients with prescribers willing to consider it off-label.

The reason I make a stronger pitch here than in other chapters is that tesamorelin sold on the gray market is, frankly, often not tesamorelin. Because the real version is so expensive, the economic

incentive to fake it is high. Verified pharmaceutical-grade tesamorelin has a clear paper trail and a price tag to match. If something is being sold cheaply, ask hard questions.

Red flags when sourcing

- **Suspiciously low prices.** Tesamorelin is genuinely expensive. Prices that significantly undercut the rest of the market should be approached with extreme skepticism.

- **No prescription pathway available.** A legitimate compounding pharmacy or telehealth provider should have a clear consultation and prescribing process. If a "supplier" is selling tesamorelin like a research chemical with no medical involvement at all, the product is probably not what it claims to be.

- **No COA, or a generic-looking COA.** As with every peptide.

- **Storage.** Tesamorelin requires careful temperature management, both during shipping and after reconstitution.

FREQUENTLY ASKED QUESTIONS

Q: How is tesamorelin different from CJC-1295?

Both are modified versions of GHRH that stimulate the pituitary to release growth hormone. The main practical differences: tesamorelin is FDA-approved (for a specific condition), has a more robust evidence base, and is injected daily. CJC-1295 (especially the DAC version) is longer-acting and is not FDA-approved. Tesamorelin is also significantly more expensive when purchased through legitimate channels.

Q: Can I get tesamorelin with a prescription if I don't have HIV?

This is called off-label use, and it is legal in the United States for doctors to prescribe an approved drug for a condition other than the one it was approved for, if they believe it is appropriate. Some doctors are willing to prescribe tesamorelin off-label for visceral fat or metabolic health concerns; many are not. Telehealth platforms specializing in metabolic health or peptide therapy are often a more accessible pathway than asking a general practitioner.

Q: Will tesamorelin make me lose weight?

It will, in many users, specifically reduce visceral fat. That may or may not translate to a noticeable change on the scale, depending on what else is going on. It is more accurate to think of tesamorelin as a body-composition shifter than a weight-loss drug. For pure weight loss, the GLP-1 family (covered later in this book) is the dominant tool.

Q: How long do I need to take it to see results?

Clinical trials typically run for 6 to 12 months, with visible visceral fat reduction at the three-to-six-month mark. This is not a fast-acting compound.

Q: Can I cycle it?

Some users cycle on and off. The clinical use is continuous in the approved population. There is no clear consensus on whether continuous or cycled use is preferable for off-label purposes.

Q: Will it make me grow taller?

No. Once your growth plates close (which happens in your late teens or early 20s), no amount of GH will make you taller. Tesamorelin's effects are on body composition and metabolism, not on height.

Q: Is it safe long term?

The clinical safety data extends out several years in some populations. Beyond that, we genuinely do not know. The same general cautions about GH elevation apply—cancer risk concerns, insulin resistance—but the body of safety evidence is stronger than for most other peptides in this book.

CHAPTER 5: NAD+ — THE ENERGY MOLECULE

We need to start this chapter with a small confession: NAD+ is technically not a peptide. It is a coenzyme—a small molecule that helps enzymes do their jobs. I have included it in this book because it is sold, injected, marketed, and discussed alongside peptides in essentially every context where peptides come up. If you walk into a wellness clinic that offers BPC-157 and CJC-1295, they almost certainly also offer NAD+. If you read a peptide forum, NAD+ threads sit next to peptide threads. Functionally, in the consumer landscape, it is part of the same world.

So we are going to treat it like a peptide for the purposes of this book, while being honest that it is a different kind of molecule. With that bookkeeping out of the way, let's get into it.

THE BACKSTORY

NAD+ stands for nicotinamide adenine dinucleotide. The "+" indicates that it is the oxidized form of the molecule, as opposed to NADH, which is the reduced form. If your eyes just glazed over, that is fine—the chemistry is not the point. What you need to know is that NAD+ is one of the most fundamental molecules in your body. Every single one of your cells uses it. Without it, you would die within seconds.

Specifically, NAD+ is the workhorse molecule that helps your cells generate energy. When you eat food, your body breaks it down through a series of biochemical steps to produce a molecule called ATP, which is your cellular energy currency. NAD+ is involved in almost every step of that process. It accepts electrons from the food you break down and shuttles them through the energy-production machinery in your cells. Think of NAD+ as a bucket brigade member—it picks up energy here, drops it off there, picks up more, drops it off again. Without that bucket brigade, the whole operation grinds to a halt.

NAD+ has other jobs too. It is essential for the activity of a family of proteins called sirtuins, which are involved in DNA repair, cellular stress responses, and (depending on who you ask) longevity. It is also involved in a class of enzymes called PARPs, which respond to DNA damage. And it plays roles in immune function, brain function, and many other systems.

The wrinkle, and the reason NAD+ became famous in longevity circles, is this: as you age, your NAD+ levels decline. In an older adult, NAD+ levels can be a fraction of what they were in early adulthood. Many of the cellular dysfunctions associated with aging—reduced energy, slower DNA repair, sluggish metabolism—correlate with falling NAD+. The hypothesis, then, is straightforward: if NAD+ decline is part of why we age, maybe restoring NAD+ levels could counteract some of that decline.

That hypothesis is what drives the entire NAD+ supplementation industry. Whether the hypothesis is right, and whether supplementation actually does what we want it to do, is a much harder question.

How it works, in plain English

NAD+ is everywhere in your cells, doing a thousand small jobs simultaneously. The simplified version of the story is that NAD+ is the energy bucket. When you have plenty of it, your cells run efficiently. When you do not have enough, your cells start cutting corners, prioritizing some functions over others, and generally not running at their best.

Supplementing NAD+—or its precursors, which we will get to—is intended to refill the bucket. The idea is not that NAD+ does anything new or special; it is that your body already needs it, you have less of it than you used to, and giving you more should let your cells do their normal jobs better.

WHY PEOPLE ARE INTERESTED

Energy and mental clarity. This is the most common reason people try NAD+. Reports of "feeling like you finally woke up" or "I had energy I haven't had in years" are common, particularly in the first few days after an IV infusion. Some of this may be subjective; some of it appears to be real.

Anti-aging and longevity. This is the marketing umbrella under which NAD+ is most often sold. The science supporting NAD+ as a longevity intervention in humans is much thinner than the marketing suggests, but the basic-science rationale is genuinely interesting.

Cognitive function. Some users report better focus, sharper thinking, and improved mood. NAD+ is involved in neuronal function, and there is research interest (though limited human data) in its role in cognitive aging.

Addiction recovery. This is a less well-known use case but a real one. There are clinics that use high-dose NAD+ IV protocols to help with withdrawal and recovery from substance use disorders. The evidence base is preliminary but intriguing. People recovering from alcohol, opioid, or stimulant addiction sometimes report that NAD+ infusions reduce cravings and ease the early weeks of sobriety.

Athletic performance and recovery. Mitochondrial function (energy production at the cellular level) is heavily NAD+-dependent. Athletes and active people use NAD+ to try to optimize energy production, recovery, and endurance.

Symptoms of chronic illness. Conditions like long COVID, chronic fatigue syndrome, and various poorly-understood inflammatory conditions have been associated with low NAD+ levels and disrupted mitochondrial function. Some patients in these populations try NAD+ supplementation with reports of meaningful improvement.

How NAD+ is taken

This is where things get more nuanced than with most peptides.

IV infusion. This is the gold standard, in the sense that you are putting NAD+ directly into the bloodstream. IV NAD+ is offered at wellness clinics and is the most direct way to raise NAD+ levels. The downside: the infusions take several hours and can feel deeply unpleasant—nausea, chest pressure, anxiety, and a general "this is awful" feeling are common during the first few hours.

Subcutaneous injection. Some clinics and at-home protocols use injected NAD+ in smaller doses, similar to peptide injections. The total dose is smaller than IV, the experience is much more tolerable, and the regimen is more sustainable.

NAD+ precursors (NMN, NR). Most of what is sold as "NAD+ supplements" is actually a precursor molecule—either nicotinamide mononucleotide (NMN) or nicotinamide riboside (NR). These are taken orally, and your body converts them into NAD+ inside your cells. The advantage is convenience: a pill, with food, like any vitamin. The question is how much of the oral precursor actually ends up raising NAD+ in the tissues where you want it raised. The research on this is genuinely mixed, with some studies showing significant increases in blood NAD+ and others showing modest effects.

Nasal sprays and lozenges. Newer formats. The science on absorption through these routes is preliminary.

What the research actually says

NAD+ as a longevity intervention has been studied extensively in mice, where the results are genuinely impressive—older mice given NAD+ precursors look measurably younger by a number of metrics. In humans, the picture is murkier. NAD+ precursor supplementation reliably raises blood NAD+ levels in human studies. Whether that translates to clinically meaningful health improvements in healthy adults is still being worked out.

For specific clinical applications—certain rare metabolic disorders, addiction recovery, some neurodegenerative conditions—there is more targeted human research, with varying levels of evidence.

The honest summary: NAD+ supplementation is one of the most well-studied longevity interventions in basic science and one of the least well-validated in real-world human outcomes. The signal is real enough that serious researchers continue to investigate it; it is also overhyped in consumer marketing.

THE OTHER SIDE OF THE COIN

The IV experience. Worth restating clearly: IV NAD+ infusions are often miserable while they are happening. Nausea, anxiety, chest pressure, flushing, and a general sense of dread are very commonly reported during the infusion. Most clinics now run the infusion slowly over several hours specifically to

manage these effects. After the infusion is over, people usually feel fine, often quite good. But the infusion itself is no fun.

Flushing and skin sensations. Even with subcutaneous NAD+, some users report flushing, tingling, or warmth. Usually mild.

Headaches. Reported with both injectable and oral forms.

GI upset. Particularly with oral precursors at high doses.

Sleep disruption. Some users find that NAD+ taken later in the day disrupts sleep. Morning timing is usually preferred.

Cancer concerns. This is the same conversation we keep having. NAD+ is involved in cellular energy and DNA repair. Both of those processes, while generally good for healthy cells, can theoretically be exploited by cancer cells as well. The evidence on whether NAD+ supplementation affects cancer risk is mixed and inconclusive. People with active cancer should not start NAD+ without medical guidance.

Unknown long-term effects. Same boilerplate. The widespread use of NAD+ and its precursors is recent enough that decades-long safety data does not exist.

Red flags when sourcing

- **Wildly variable pricing.** IV NAD+ at clinics ranges from a few hundred to a few thousand dollars per session, often with little justification for the difference. Shop around.

- **Inflated longevity claims.** "Reverse aging," "20 years younger," and similar language is marketing, not science. A clinic or product that leans hard on these claims is selling a story, not a treatment.

- **Mystery ingredients in "NAD+ stacks."** Some clinics add B vitamins, amino acids, glutathione, or other ingredients to their NAD+ infusions. Some of these additions are reasonable; some are price padders. Ask what is in the bag.

- **Oral NMN and NR products with no testing.** The supplement industry is notoriously poorly regulated. Third-party testing matters.

FREQUENTLY ASKED QUESTIONS

Q: Is NAD+ a peptide?

No. It is a coenzyme—a small organic molecule, but not a chain of amino acids. It is included in this book because it is sold, marketed, and discussed alongside peptides.

Q: What is the difference between NAD+, NMN, and NR?

NAD+ is the molecule you actually want in your cells. NMN (nicotinamide mononucleotide) and NR (nicotinamide riboside) are precursors—your body converts them into NAD+. NMN is one step closer to NAD+ in the conversion pathway than NR. Both are sold as oral supplements. NAD+ itself is typically administered by injection or IV because direct oral absorption is poor.

Q: Should I do IV infusions or just take pills?

This depends on what you are trying to accomplish, your budget, and your tolerance for unpleasant infusion experiences. IV is more direct and produces faster, more dramatic subjective effects. Oral precursors are more convenient and sustainable but may produce more modest effects.

Q: Is NAD+ legal?

Yes. NAD+ and its precursors are legal to purchase and possess in most jurisdictions. The medical use varies—IV NAD+ at a clinic is in a gray zone in some places, treated as a wellness service in others.

Q: How often do I need to do it?

Protocols vary enormously. Some clinics do intensive multi-day infusion courses followed by occasional maintenance. Some users take oral precursors daily. There is no consensus protocol.

Q: Will it make me feel younger?

Maybe. Some people report dramatic effects—better energy, sharper thinking, improved sleep. Some people notice nothing. The variability is high.

Q: Does NAD+ work for hangovers?

There is some evidence that NAD+ can help with alcohol metabolism and hangover symptoms, and "hangover IVs" that include NAD+ are a growing wellness product. Whether it works better than just rehydrating is debatable.

Q: Is the FDA going to crack down on this stuff?

The regulatory landscape around NAD+ and its precursors is in flux. Recent FDA actions have shifted what can and cannot be sold in certain forms. This may continue to evolve. Stay informed.

CHAPTER 6: GHK-CU — THE COPPER SKIN AND HAIR PEPTIDE

After several chapters about injections, this one comes as something of a relief. GHK-Cu is, more often than not, applied to your skin rather than injected into it. It shows up in serums, creams, hair products, and increasingly in injectable peptide stacks, but the most accessible version of GHK-Cu is something you can put on your face in the morning.

It is also, depending on how you measure, one of the oldest "research peptides" in this book. GHK-Cu has been studied for more than 50 years, which is unusual for this category. It is a quietly impressive compound that does not get as much social media hype as the newer peptides, but has more durable evidence behind it than most.

THE BACKSTORY

GHK is a tripeptide—a chain of just three amino acids: glycine, histidine, and lysine. The "Cu" in GHK-Cu stands for copper. This small peptide has an unusual property: it binds tightly to copper ions, forming a stable copper-peptide complex. The copper-bound form is what most of the biology is built around.

The story starts in 1973, when a researcher named Loren Pickart was studying differences between the blood of young people and old people. He was specifically looking for substances that might explain why young livers regenerate quickly while old livers heal slowly. He isolated a small peptide from young blood that, when added to old liver cells in a dish, seemed to make them behave more like young liver cells. That peptide was GHK.

Pickart spent much of the following decades studying GHK and its copper-bound form. The compound turned out to do a remarkable number of things in laboratory studies. It seemed to stimulate the production of collagen and other structural proteins in skin. It supported wound healing. It promoted the migration of new blood vessels into damaged tissue. It seemed to influence the activity of hundreds of genes, including many involved in repair, defense, and regeneration. In aged skin cells, it appeared to nudge the cells back toward a more youthful pattern of gene expression.

That last point is part of what makes GHK-Cu interesting from a longevity standpoint. There is genuine peer-reviewed research showing that GHK-Cu can affect the expression of large numbers of genes in a direction that broadly resembles "younger." Whether that translates to meaningful clinical effects in humans is a separate question, but the basic-science finding is real and well-documented.

Why copper?

Copper is an essential trace mineral that your body needs for various enzyme functions. It is also potentially toxic if there is too much of it floating around free in your tissues. The body keeps copper bound to carrier proteins most of the time. GHK is essentially one of these carriers—it picks up copper, delivers it to where it is needed, and releases it for enzymes to use.

When you apply GHK-Cu to your skin, you are giving your skin a controlled, bioavailable source of copper packaged in a peptide that the skin recognizes. It is a delivery system, not just a peptide.

How it works, in plain English

GHK-Cu does several things at once, and that is part of why it is hard to summarize. Let me try anyway.

In your skin, GHK-Cu appears to encourage cells called fibroblasts to make more collagen, more elastin, and more of the other proteins that give skin its structure and bounce. As we age, our fibroblasts get less productive, which is one reason aging skin gets thinner, looser, and more wrinkled. GHK-Cu seems to give those fibroblasts a kick.

It also seems to have antioxidant effects, reducing the kind of damage that accumulates from sun, pollution, and just being alive. It supports wound healing—cuts, surgical scars, and even chronic wounds seem to respond to it. And it has been studied in hair follicles, where it appears to support hair growth and follicle health.

All of this is mediated through copper and through GHK-Cu's interactions with various genes and signaling molecules. The mechanism is genuinely complicated and not fully mapped. The high-level story, though, is: this small molecule encourages skin and tissues to behave the way they did when you were younger.

WHY PEOPLE ARE INTERESTED

Skin aging. This is the headline use. People apply GHK-Cu serums hoping to reduce fine lines, improve skin texture, fade discoloration, and generally restore some of the youthful quality their skin has lost. The evidence for these effects is among the more substantial in the cosmetic peptide world.

Wound healing and scars. Both fresh wounds and old scars are sometimes treated with GHK-Cu, often as part of post-surgical or post-procedure protocols. Plastic surgeons sometimes recommend it after procedures.

Hair loss. GHK-Cu is increasingly included in hair restoration products, often as part of a stack with other compounds. The evidence is preliminary but interesting, and the mechanism (supporting follicle health and circulation in the scalp) is plausible.

Anti-inflammatory and skin condition support. Some users with rosacea, eczema, or generally reactive skin find that GHK-Cu serums calm things down. The evidence is mostly anecdotal.

General "anti-aging" applications. Some people inject GHK-Cu (rather than just applying it topically) hoping for systemic anti-aging effects. The evidence for injected GHK-Cu in humans is much thinner than for topical use; most of the strong research is on skin and local applications.

What the research actually says

GHK-Cu is unusual in that the basic-science evidence is quite strong. The compound's effects on collagen production, gene expression, and wound healing have been documented in numerous laboratory and animal studies.

The clinical research in humans is more variable. There are clinical trials on cosmetic skin effects that show statistically significant improvements in skin texture, firmness, and appearance with topical GHK-Cu serums. The effects are real but typically modest—do not expect to look ten years younger.

For wound healing in humans, the evidence is reasonably good for certain wound types. For hair loss, the evidence is preliminary. For systemic effects (injected GHK-Cu), the evidence in humans is thin.

THE OTHER SIDE OF THE COIN

GHK-Cu has a strong safety profile. The copper-peptide complex is a controlled delivery system, and the doses used cosmetically are tiny. Side effects are uncommon and usually mild.

Skin irritation. Some users develop redness, irritation, or sensitivity when first using GHK-Cu serums, especially at higher concentrations. Starting with a lower-concentration product and working up usually solves this.

Interaction with other actives. GHK-Cu does not play well with certain other skincare ingredients. Strong acids (vitamin C, glycolic, salicylic) can destabilize the copper-peptide bond and reduce effectiveness. Retinoids are sometimes also problematic. Most experts recommend using GHK-Cu serums at a different time of day than these actives—for example, GHK-Cu in the morning and a retinoid at night.

Copper sensitivity. Rare, but some people have allergic or sensitivity reactions to copper. Discontinuation resolves it.

Injected GHK-Cu reactions. When GHK-Cu is injected rather than applied topically, the side effects can include injection site reactions, headaches, and the general issues that come with any injectable peptide. The evidence base for injected use is also much thinner.

Pregnancy. Best to avoid during pregnancy unless cleared by a doctor.

Red flags when sourcing

The skincare side of GHK-Cu has its own quirks:

- **Concentration matters and is often hidden.** A product labeled "with GHK-Cu" might contain anywhere from a meaningful concentration to a trace amount. Reputable products clearly state the concentration.

- **Formulation stability.** GHK-Cu is a copper complex, and the chemistry of the formulation matters. Poorly formulated products may have GHK-Cu that has separated from the copper, lost activity, or oxidized. Visible color changes in the product over time are a warning sign.

- **Beware of fake luxury markup.** GHK-Cu serums range from inexpensive to absurdly expensive. The price often does not correlate with quality.

- **For injectable GHK-Cu**, all the standard peptide-sourcing rules apply (COA, reputable supplier, etc.).

FREQUENTLY ASKED QUESTIONS

Q: Should I use GHK-Cu as a topical serum or as an injection?

For skin and cosmetic effects, topical use has the strongest evidence and is far less invasive. For systemic effects, injection is the route, but the evidence base is thinner. Most people who use GHK-Cu use the topical form.

Q: Can I use GHK-Cu with vitamin C?

Not at the same time. Strong acids can destabilize the copper-peptide bond. Use GHK-Cu in the morning and vitamin C in the evening, or vice versa.

Q: Is GHK-Cu better than retinol?

They work differently. Retinol is one of the most evidence-supported topical anti-aging ingredients in existence. GHK-Cu is a complementary compound, not a replacement. Many people use both, just not at the same time of day.

Q: Does GHK-Cu help with hair loss?

The research is preliminary but promising for certain types of hair thinning. It is often included in hair restoration cocktails. As a standalone hair treatment, the evidence is less robust than for established treatments like minoxidil or finasteride.

Q: Will it turn my skin blue?

No. The concentration of copper in GHK-Cu serums is far too low to cause any visible skin discoloration. The compound is colored blue (because of the copper), but the diluted product applied to skin will not stain you.

Q: Can men use it?

Yes. Despite some marketing pitched toward women, GHK-Cu works the same way regardless of sex.

Q: How long until I see results?

Skin effects develop slowly. Most studies that have found improvements have been 8 to 12 weeks long. Hair effects, if they occur, are even slower.

Q: Is it safe to use long-term?

The safety profile of topical GHK-Cu is very good. It has been used in cosmetic products for decades. Long-term safety of injected use is less well-established.

CHAPTER 7: PT-141 — THE LIBIDO PEPTIDE

Most of the peptides in this book act on tissues you can think about in a non-awkward way: tendons, muscles, fat, hormones, skin. This chapter is about a peptide that acts, primarily, on the brain regions that control sexual desire. Bracing yourself accordingly is allowed.

PT-141, also known by its generic name bremelanotide and its brand name Vyleesi, is a peptide developed and marketed specifically for sexual function. It is one of the few compounds in this book that works on what scientists politely call the "central pathway" of sexual arousal—meaning it acts in the brain to influence desire itself, rather than acting on blood flow or local tissues the way drugs like Viagra do. It is also one of the few peptides in this book that has actually received FDA approval, though only for a narrow indication.

THE BACKSTORY

PT-141's origin story is one of the more interesting and accidental in this book. The compound traces back to a different peptide called Melanotan II, which was developed as a synthetic version of a hormone that controls skin pigmentation. Researchers were studying Melanotan II as a potential treatment for skin diseases and as a way to encourage protective tanning without sun exposure. During that research, they noticed something unexpected: men in the studies were reporting spontaneous erections after Melanotan II injections.

This was not, to put it mildly, what they were studying. But once you have a finding like that, you investigate. Researchers traced the effect to a specific receptor system in the brain (the melanocortin system) and worked on developing a peptide that would activate that system more selectively for sexual function, without the skin and pigmentation effects of Melanotan II. The result was PT-141.

The compound was developed over many years by a company called Palatin Technologies, which eventually got FDA approval for bremelanotide in 2019 under the brand name Vyleesi. The approved indication is "hypoactive sexual desire disorder" in pre-menopausal women—essentially, low libido that is bothering them and is not caused by another identifiable medical or psychological issue.

The approval was narrow, but the off-label use is broader. Men and women across various age groups have used PT-141 for low libido, erectile difficulties, and general issues with sexual desire and arousal. It has developed something of a cult following among people who have not been helped by more conventional treatments.

How it works, in plain English

To understand PT-141, you need to understand that there are two main pathways to a sexual response.

The first is what most people associate with drugs like Viagra. These drugs work on the local plumbing—they relax certain blood vessels and improve blood flow to the genitals. This works if the brain is already sending the signal "I am aroused, please respond accordingly." If the brain is not sending that signal, more blood flow does not really help.

The second pathway is in the brain itself. Desire, arousal, and the general signal that says "let's go" originate in the central nervous system. If something is suppressing that signal—stress, medication, age, hormonal changes, or just the general malaise of modern life—drugs that only act on the local plumbing have nothing to amplify.

PT-141 works on this second pathway. It activates certain melanocortin receptors in the brain that are involved in sexual desire. Instead of opening the plumbing, it sends the signal in the first place.

For people whose issue is "the desire is just not there," this is a fundamentally different and more useful mechanism than what older drugs offer. For people whose issue is "the desire is there but the response is not," PT-141 may be less effective.

WHY PEOPLE ARE INTERESTED

Low libido. This is the headline use. People of any sex experiencing reduced sexual interest, for any number of reasons, use PT-141 to try to get some of that spark back. The effects are typically felt within hours of injection, last for several hours, and tend to involve a feeling of wanting sex more, not just being able to have it.

Sexual response issues not solved by other drugs. Some people do not respond to PDE5 inhibitors (Viagra, Cialis, Levitra). PT-141 may work for them precisely because it acts at a different stage of the arousal pathway.

Antidepressant-related sexual side effects. SSRI antidepressants are notorious for crushing libido and making orgasm difficult. PT-141 has been studied and informally used as a way to mitigate these side effects.

Aging-related changes. Both men and women experience changes in libido as they age. PT-141 is part of the toolkit some people use to push back against this.

Performance anxiety. Some users find that PT-141 helps with the psychological dimension of sexual difficulties by raising baseline desire enough that performance anxiety has less to work with.

What the research actually says

PT-141 (as bremelanotide) has been through FDA-grade clinical trials. The approval was based on studies showing modest but statistically significant improvements in sexual desire and reductions in distress related to low libido in pre-menopausal women.

For men, the evidence is messier. Earlier trials of PT-141 in men explored its use for erectile dysfunction, and the results were mixed. The compound was effective for some men but had side effects (more on that in a moment) that prevented broader approval.

The off-label use in men, post-menopausal women, and people on antidepressants is largely supported by anecdote and small studies. The mechanism is plausible, the experience is reported to be effective by many users, but the rigorous clinical evidence in these populations is limited.

THE OTHER SIDE OF THE COIN

PT-141 has a side effect profile that is unusual enough to deserve specific attention.

Nausea. This is the most common and most prominent side effect. A significant percentage of users experience nausea after injection, sometimes severe enough that they vomit. It typically starts within an hour of injection and lasts for a few hours. Some people find this side effect tolerable; some find it deal-breaking. The nausea tends to decrease with repeated use for some users, but not all.

Flushing. Hot, red flushing, particularly in the face, is common.

Blood pressure increases. PT-141 can cause transient increases in blood pressure. This is generally not a problem for healthy adults but is a meaningful concern for people with cardiovascular disease, uncontrolled hypertension, or relevant risk factors.

Headaches. Common, particularly with the first few doses.

Increased skin pigmentation. Because PT-141 is structurally related to Melanotan II (the tanning peptide), it has a mild effect on skin pigmentation in some users. Freckles may darken, existing moles may darken, and overall skin tone may shift slightly. This is more of an issue with repeated use.

Long-lasting erections (in men). Most of the time, PT-141 produces normal erections that respond to stimulation. In rare cases, particularly at higher doses, prolonged erections (priapism) can occur. This is a medical emergency if an erection lasts more than several hours and requires immediate attention.

Injection site reactions. Standard.

Cardiovascular concerns. Because of the blood pressure effects, PT-141 is not recommended for people with uncontrolled hypertension or significant cardiovascular disease. The FDA's prescribing information for Vyleesi is explicit about this.

Red flags when sourcing

- **Concentration variability.** PT-141 is dosed in fairly small amounts, and concentration accuracy matters. Underdosed product produces no effect; overdosed product can produce strong side effects.

- **No COA.** As always.

- **Conflation with Melanotan II.** Because the compounds are related, some shadier suppliers conflate them or sell PT-141 mixed with Melanotan II. PT-141 should be PT-141, not a cocktail.

- **Suspicious cheap prices.** Real PT-141 is not the cheapest peptide on the market.

FREQUENTLY ASKED QUESTIONS

Q: How is PT-141 different from Viagra?

Viagra (and Cialis, Levitra, etc.) work on local blood flow to the genitals. PT-141 works on the brain to influence desire and arousal at the central level. If your issue is "the desire is not there in the first place," PT-141 may be more useful. If your issue is "the desire is there but the response is not," Viagra-type drugs are usually more direct.

Q: Can I use PT-141 and Viagra at the same time?

Some people do, since the mechanisms are complementary. The combination is not without risk—both can affect blood pressure, and the combined effects need to be respected. Talk to a doctor.

Q: Does it work for women?

Yes. In fact, PT-141 is FDA-approved specifically for women with low libido (under the brand name Vyleesi). Both men and women report effects.

Q: How fast does it work?

Most users report effects within 30 to 90 minutes of injection.

Q: How long does the effect last?

The active window is typically several hours after injection. Some users report effects lasting a day or more, particularly for changes in baseline desire.

Q: Will I get tan?

PT-141 has some pigmentation effects, but much less than its parent compound Melanotan II. Some users do notice freckling, mole darkening, or slight overall skin tone changes with regular use.

Q: Is the nausea really that bad?

For some people, yes. The nausea is the single biggest reason people stop using PT-141. Lower doses, food before injection, and various anti-nausea strategies help some users. Others find that the side effect simply does not bother them.

Q: Is there an oral or nasal version?

There are nasal spray versions sold as research chemicals. Absorption is less reliable than injection, and dosing accuracy is harder to control. The FDA-approved product (Vyleesi) is injectable.

Q: Will it improve my relationship?

PT-141 changes biology. It does not change the underlying dynamics of a relationship. If sexual difficulties have a meaningful emotional or relational component, a peptide will not solve that part of the problem.

CHAPTER 8: SEMAGLUTIDE — THE PEPTIDE THAT CHANGED EVERYTHING

If you have been paying any attention at all to health news in the last few years, you already know something about semaglutide. You probably know it by its brand names instead—Ozempic, Wegovy, Rybelsus. You probably know someone who is on it, or has been on it, or has at least talked about going on it. You may have seen the before-and-after photos, the celebrity rumors, the price arguments, the supply shortages, the side-effect horror stories, and the wave of telehealth advertising that has followed the drug into every corner of social media.

Semaglutide is the most consequential peptide in this book, and probably the most consequential drug to come along in the United States in many years. It has changed how we talk about obesity, food, willpower, and metabolic health. It has reshaped the pharmaceutical industry. And it has done all of this in a remarkably short time.

So let's slow down, set aside the noise, and actually understand what this compound is.

THE BACKSTORY

To understand semaglutide, you need to know about a natural hormone called GLP-1, which stands for "glucagon-like peptide-1." That is a clunky name, so let's just call it GLP-1 and move on.

GLP-1 is a hormone produced in your intestines. When you eat, especially when you eat carbohydrates, your gut releases GLP-1 into your bloodstream. GLP-1 then does several things at once. It tells your pancreas to release more insulin, which lowers your blood sugar. It tells your stomach to empty more slowly, so food sits in there longer and you feel full. And it sends signals to your brain that say, essentially, "we have eaten, you are satisfied, please stop putting more food in your mouth."

GLP-1 is part of how a healthy person's body naturally regulates eating and blood sugar. In people with type 2 diabetes and in people who struggle with obesity, the GLP-1 signaling system often does not work as well as it should. The signal is weaker, shorter, or less effective at producing the normal sense of fullness. This is one of the reasons (not the only reason, but a meaningful one) that some people seem to be able to eat reasonable amounts and feel satisfied while others feel hungry shortly after a large meal.

Pharmaceutical companies have known about GLP-1 for decades and have been trying to turn it into a drug for almost as long. The problem, again, is that natural GLP-1 breaks down very quickly—within minutes. To make a useful drug, you need a version that survives much longer in the bloodstream.

The breakthrough came in stages. The first GLP-1 drugs were short-acting, requiring injections multiple times per day. Later versions lasted longer. Then a Danish company called Novo Nordisk developed a modified version of GLP-1 that lasted long enough to be injected just once per week. They called it semaglutide.

Semaglutide was first approved by the FDA in 2017, under the brand name Ozempic, for type 2 diabetes. The drug worked well for blood sugar control, but in the trials, doctors noticed something remarkable: patients were also losing significant amounts of weight, often more weight than they had with any other diabetes drug. Novo Nordisk ran additional studies in people with obesity but without diabetes, and the results were striking. In 2021, the FDA approved a higher-dose version of semaglutide for chronic weight management, under the brand name Wegovy.

The rest, as they say, is recent history.

How it works, in plain English

Semaglutide is a synthetic, long-acting version of GLP-1. When you inject it once a week, it slowly releases into your bloodstream and does the things that natural GLP-1 does, but for days at a time instead of minutes.

The practical effects are pretty consistent across users:

You feel full faster. Meals that used to feel satisfying now feel like too much.

You stay full longer. The desire to snack between meals fades.

The constant low-level food noise in your head gets quieter. People who are heavy often describe a kind of background hum of thinking about food—what to eat next, when to eat, whether to eat the thing in the fridge. On semaglutide, that hum tends to go down significantly. Many users describe it as being able to think about other things without the food intrusion.

Cravings for highly palatable foods—the chips, the sweets, the late-night fridge expeditions—often diminish dramatically.

Blood sugar is more stable, even in people who do not have diabetes.

The mechanism for all of this is GLP-1 receptor activation in the brain, pancreas, gut, and other tissues. The drug is essentially turning up the volume on a satiety signal your body already uses, just at a much higher intensity than it would naturally.

WHY PEOPLE ARE INTERESTED

Weight loss. The headline application. In clinical trials, people on semaglutide for weight loss have averaged losses of about 15 percent of their body weight, with many individuals losing significantly more. For comparison, most previous weight-loss drugs averaged 5 to 8 percent. Semaglutide is the first drug to approach the kind of weight loss historically achievable only through bariatric surgery.

Type 2 diabetes management. Semaglutide is highly effective at lowering A1C (a blood sugar marker) and has become one of the leading drugs for type 2 diabetes.

Cardiovascular protection. This is one of the most underrated parts of the semaglutide story. Clinical trials have shown that semaglutide reduces the risk of major cardiovascular events—heart attacks, strokes, cardiovascular deaths—in people with diabetes and obesity. This is a big deal. Most weight-loss interventions do not have proven cardiovascular protection.

Sleep apnea, fatty liver, kidney protection. As trials have expanded, semaglutide has shown benefits in a variety of obesity-related and metabolic conditions. The drug is increasingly being approved or studied for these additional indications.

Reduced cravings beyond food. Some users report that semaglutide reduces compulsive behaviors beyond eating—drinking alcohol less, smoking less, less interest in other addictive behaviors. The science on this is still being worked out, but the anecdotes are widespread enough that serious research is underway.

What the research actually says

The research is extensive and growing. Semaglutide is one of the most-studied drugs of the modern era. The weight-loss effects are real and robust. The cardiovascular protection is real. The diabetes effects are well-established. The long-term effects, however, are still being learned in real time, since widespread use is recent.

There are important nuances. The weight loss only continues while you are taking the drug. When people stop, they tend to regain weight, sometimes substantially. This has implications for how to think about semaglutide—not as a "diet" but as a long-term metabolic treatment, similar to how blood pressure medication is for the long term.

THE OTHER SIDE OF THE COIN

Semaglutide has a real and significant side effect profile that should be taken seriously.

GI side effects. Nausea, vomiting, diarrhea, constipation, bloating, and general digestive misery are extremely common, especially in the first few weeks and after dose increases. For many users, these effects fade with time. For some, they do not, and the drug becomes intolerable.

Loss of appetite that becomes too aggressive. Some users find their appetite drops so much that they cannot consistently meet their nutritional needs. Severe loss of appetite combined with low caloric intake can be a problem.

Muscle loss. When people lose weight quickly, they tend to lose both fat and muscle. Semaglutide is no exception. Without deliberate effort to maintain protein intake and strength training, users can lose meaningful muscle mass alongside fat. This is a particular concern for older adults and for anyone whose long-term functioning depends on physical strength.

Gastroparesis. Semaglutide slows stomach emptying. In some users, this becomes severe and persistent, even after stopping the drug. This is one of the more serious potential side effects and has generated lawsuits and FDA attention.

Gallbladder issues. Rapid weight loss is associated with increased gallstone risk, and semaglutide users have an elevated risk of gallbladder problems.

Pancreatitis. Inflammation of the pancreas has been reported. Anyone with a history of pancreatitis needs to be especially cautious.

Thyroid tumors (in animals). Animal studies have shown an increased risk of certain thyroid tumors with GLP-1 drugs. Whether this risk extends to humans is debated, but the drug carries a black-box warning, and people with a personal or family history of medullary thyroid cancer or related conditions should not use it.

Weight regain when stopping. As mentioned, weight tends to come back when the drug is discontinued.

Mood changes. Some users report increased anxiety, low mood, or other psychological changes. The pattern is not consistent, but it has been reported often enough to take seriously.

"Ozempic face." Rapid weight loss can leave the face looking gaunt and aged. This is not unique to semaglutide—it happens with any rapid weight loss—but the speed of loss with semaglutide makes it more noticeable.

A note on supply, sourcing, and compounding

When demand for semaglutide exploded, manufacturer Novo Nordisk could not keep up. The FDA declared the drug to be in shortage, which under U.S. law triggered a temporary allowance for

compounding pharmacies to produce their own versions to fill the gap. A massive industry of compounded semaglutide—often sold through telehealth platforms—sprang up around this allowance.

In 2025, the FDA declared the shortage over, which legally restricted compounding. The compounded supply has not disappeared overnight, but it has shifted significantly. The regulatory landscape continues to evolve.

For practical purposes: brand-name Ozempic and Wegovy are the gold standard but are expensive and may have insurance hurdles. Compounded versions from licensed pharmacies, where legally available, are typically less expensive. Versions sold from gray-market suppliers as "research chemicals" are a different category, with the usual concerns about purity, sterility, and accurate dosing.

Red flags when sourcing

- **"Generic Ozempic" from non-medical sources.** There is no FDA-approved generic semaglutide as of this writing. Anything labeled as such from a non-pharmacy source is suspect.

- **Pricing far below market.** If real semaglutide costs hundreds or thousands of dollars per month and something is being offered for a small fraction, it is almost certainly either fake, underdosed, or contaminated.

- **No medical involvement.** Legitimate compounded semaglutide is dispensed via licensed pharmacies, typically with a physician consultation. Bypass-the-medical-system offerings are riskier.

- **Vials with no labeling, batch information, or expiration date.** Standard.

FREQUENTLY ASKED QUESTIONS

Q: Is semaglutide a peptide?

Yes. It is a modified, longer-acting version of the natural peptide GLP-1.

Q: Will I have to take it forever?

For most users, weight loss is largely dependent on continued use. Stopping usually leads to significant weight regain. The current medical thinking treats this as a chronic medication, like blood pressure or cholesterol drugs, rather than a short-term intervention.

Q: How fast will I lose weight?

Most users lose weight steadily over months, not weeks. Clinical trials averaged about 15 percent of body weight over roughly 68 weeks (about 16 months). Individual results vary substantially.

Q: Do I need to diet and exercise on it?

You will lose weight even without major diet or exercise changes, because your appetite drops so much that you naturally eat less. That said, the people who do best long-term combine the drug with strength training (to preserve muscle), protein-rich eating (also for muscle), and reasonable lifestyle habits.

Q: What is the difference between Ozempic and Wegovy?

Same drug. Different dosing and different approved indications. Ozempic is for type 2 diabetes. Wegovy is for chronic weight management at a higher dose. Both contain semaglutide.

Q: What is Rybelsus?

An oral form of semaglutide. It is less effective than the injectable form and is mostly used for diabetes rather than weight loss.

Q: Can I drink alcohol on it?

Many users find that alcohol is less appealing on semaglutide—they just do not want to drink as much. If you do drink, watch for increased side effects, especially nausea and dehydration.

Q: Is it safe for people who are not overweight?

The drug is approved only for people meeting certain criteria. Use in people of normal weight is off-label and not well-studied. Concerns about muscle loss and malnutrition are amplified in this population.

Q: Will it interact with my medications?

Many possible interactions exist, particularly with other diabetes drugs and with medications that affect stomach emptying. Discuss with a prescriber.

Q: Is it addictive?

No. Semaglutide does not produce a drug-like euphoria or physical dependence. People may become dependent on the appetite-suppressing effects to maintain their weight, which is different from chemical addiction.

CHAPTER 9: TIRZEPATIDE — THE NEXT-GENERATION WEIGHT-LOSS PEPTIDE

If semaglutide was the breakthrough, tirzepatide is the upgrade. It is the drug that came next, building on what GLP-1 receptor agonists had taught the pharmaceutical industry and adding a second mechanism that, in clinical trials, has produced even more dramatic results. You know it by its brand names: Mounjaro (for type 2 diabetes) and Zepbound (for chronic weight management).

If semaglutide is one wave of the GLP-1 revolution, tirzepatide is the second wave. And as we will see in the next chapter, there is already a third wave on the horizon.

THE BACKSTORY

Tirzepatide was developed by Eli Lilly, Novo Nordisk's main pharmaceutical competitor in the diabetes and obesity space. Lilly had its own family of GLP-1 drugs, but their researchers wanted to build something better. They went looking for a way to engineer a peptide that would do more than just activate the GLP-1 receptor.

What they came up with is a single peptide that acts on two different receptors at the same time. In addition to the GLP-1 receptor that semaglutide targets, tirzepatide also activates the GIP receptor. GIP stands for "glucose-dependent insulinotropic polypeptide," which is another natural gut hormone involved in blood sugar regulation. Hitting both receptors at once produces a metabolic effect that turned out to be more than additive—the combination seems to produce greater weight loss and better blood sugar control than either mechanism alone.

Tirzepatide was approved by the FDA in 2022 for type 2 diabetes (as Mounjaro) and in 2023 for chronic weight management (as Zepbound). It is injected once weekly, similar to semaglutide. By the time it hit the market, it had already been generating buzz in the medical community because of the unusual size of the clinical trial results.

How it works, in plain English

Tirzepatide does everything semaglutide does—reducing appetite, slowing stomach emptying, stabilizing blood sugar, sending fullness signals to the brain. It just does all of it through two different signaling channels at the same time.

The practical effect for most users is a more pronounced version of the semaglutide experience. Appetite drops more. Cravings drop more. Weight comes off faster, in many cases. For people whose response to semaglutide was modest, tirzepatide often produces a stronger effect.

The GIP component, beyond just adding to the GLP-1 effect, may have additional metabolic effects that are still being characterized. There is some thinking that GIP receptor activation contributes to better preservation of lean tissue during weight loss, though this is still being studied.

WHY PEOPLE ARE INTERESTED

More weight loss. In head-to-head comparisons, tirzepatide tends to produce significantly more weight loss than semaglutide. In the SURMOUNT-1 trial, the highest dose of tirzepatide produced average weight loss of about 22 percent of body weight. For comparison, semaglutide averages around 15 percent. Twenty-two percent is approaching the kind of weight loss historically associated with bariatric surgery.

Better diabetes control. Tirzepatide also tends to outperform semaglutide for blood sugar control in head-to-head comparisons.

Slightly different side effect profile. Many users report that tirzepatide is somewhat better tolerated than semaglutide on the GI front—still significant nausea and other issues, but slightly less severe on average. This is not universally reported and varies by person.

The same general benefits as semaglutide. Cardiovascular protection, improvements in fatty liver, sleep apnea, kidney function, and many other obesity-related conditions.

Users who didn't respond well to semaglutide. People who had a disappointing response to semaglutide often try tirzepatide and find that it works better for them. The dual-mechanism approach seems to help some users where the single-mechanism approach didn't.

What the research actually says

The clinical trials are large, well-conducted, and have produced striking results. The SURMOUNT trials for obesity and the SURPASS trials for diabetes have built up an impressive evidence base. The cardiovascular outcomes data is more recent but generally favorable.

The drug is too new for long-term real-world data spanning decades, but it has been through proper FDA review and has met the bar for both diabetes and obesity indications.

THE OTHER SIDE OF THE COIN

The side effect profile is broadly similar to semaglutide's, with all the same general categories.

GI side effects. Nausea, vomiting, diarrhea, constipation, and other digestive issues are common, particularly when starting the drug or increasing the dose. As with semaglutide, these tend to be worst in the first few weeks and to fade for many users.

Loss of appetite that can become extreme. Some users find that tirzepatide kills their appetite so completely that they struggle to eat enough food, leading to fatigue, weakness, or other problems.

Muscle loss. Same concern as with semaglutide. Rapid weight loss without adequate protein and resistance training tends to result in muscle loss as well as fat loss.

Gastroparesis. Same risk. Slowed stomach emptying can become problematic in some users and persist beyond drug discontinuation.

Gallbladder issues. Rapid weight loss raises gallstone risk.

Pancreatitis. Reported, though uncommon.

Thyroid tumor warning. Same black-box warning as semaglutide. People with personal or family history of medullary thyroid cancer should not use it.

Weight regain on discontinuation. Same pattern as semaglutide. The weight comes back when the drug stops.

Cost. Brand-name tirzepatide is expensive and may not be covered by insurance for weight loss (though coverage is improving).

A note on compounded tirzepatide

The story of compounded tirzepatide parallels that of semaglutide. When demand exceeded supply, compounding pharmacies stepped in. As of late 2024 and into 2025, the FDA declared the tirzepatide shortage over, which restricted legal compounding. Many telehealth platforms that had been selling compounded tirzepatide had to adjust their offerings or stop entirely. The legal status of compounded versions continues to evolve and varies by jurisdiction.

Gray-market "research chemical" tirzepatide also exists. The same warnings apply as with any unregulated peptide: purity, dosing accuracy, and sterility cannot be assumed.

Red flags when sourcing

- **Suspiciously cheap "tirzepatide."** Real tirzepatide is expensive. Significantly underpriced product is suspect.

- **No medical involvement.** Legitimate compounded tirzepatide goes through licensed pharmacies and physician consultations.

- **Mislabeling as semaglutide or other GLP-1 drugs.** Some shady suppliers have sold mislabeled product. The drugs are not interchangeable in dosing or effect.

- **No COA, no batch information, no expiration date.** Standard concerns.

FREQUENTLY ASKED QUESTIONS

Q: Is tirzepatide better than semaglutide?

By most measures of effectiveness—weight loss, blood sugar control—yes, in clinical trial averages. Individual responses vary. Some people do better on one than the other. Tirzepatide is also slightly newer, so there is somewhat less long-term real-world experience.

Q: What is the difference between Mounjaro and Zepbound?

Same drug. Different dosing and different approved indications. Mounjaro is for type 2 diabetes. Zepbound is for chronic weight management.

Q: Can I switch from semaglutide to tirzepatide?

Yes, many people do. The transition needs to be managed carefully, particularly around dosing. A prescriber should oversee the switch.

Q: Is the cardiovascular protection as well-established as semaglutide's?

The cardiovascular outcomes data for tirzepatide is more recent and somewhat less mature than for semaglutide, but the available evidence is favorable.

Q: Do I have to inject it forever?

Same answer as semaglutide. For most users, stopping the drug leads to significant weight regain. Current medical thinking treats it as a long-term medication.

Q: How much weight will I lose?

On average, around 20 percent of body weight in the higher doses of clinical trials. Individual results range from much less to much more.

Q: What about side effects?

Similar to semaglutide. Most users have meaningful GI side effects, especially early on. Some users find it intolerable. Some adjust well. Whether tirzepatide is "easier" than semaglutide is debated and seems to vary by person.

Q: Can I drink alcohol on it?

Same caveats as with semaglutide. Many users find their interest in alcohol drops significantly. If you do drink, side effects may be more intense.

Q: How long does it take to see results?

Weight loss typically begins within the first few weeks and continues steadily. The full effect develops over many months. Clinical trials ran for over 70 weeks.

Q: Is it safe to use if I'm not overweight or diabetic?

Off-label use for cosmetic weight loss in people of normal weight is increasingly common but is not well-supported by clinical evidence and carries higher relative risks (particularly around muscle loss and excessive appetite suppression). A serious prescriber will hesitate to put a normal-weight person on these drugs without compelling reasons.

CHAPTER 10: RETATRUTIDE — THE NEXT-NEXT-GENERATION WEIGHT-LOSS PEPTIDE

The last chapter of this book is about a peptide that, as of this writing, is not yet approved for any indication. Retatrutide is in late-stage clinical trials, and based on the data so far, it appears to be the most powerful weight-loss compound ever studied in humans. If it lives up to its early promise—and it might not—it could become the dominant weight-loss drug of the next decade.

I am including it because, despite not yet being on the market, it is already being widely discussed, widely sold through gray-market channels, and widely speculated about. If you are paying attention to the peptide world, you are going to encounter retatrutide. Better to understand it now than to be surprised later.

This is also the chapter that most likely will need to be revised as new information emerges. Treat what follows as the picture as of the time of writing, with the understanding that things may change.

THE BACKSTORY

Retatrutide is another Eli Lilly creation, building on the success of tirzepatide. If tirzepatide is a dual-receptor agonist (activating GLP-1 and GIP receptors), retatrutide is a triple-receptor agonist. It hits the same two receptors as tirzepatide, plus a third one: the glucagon receptor.

This third mechanism is conceptually interesting. Glucagon, in normal physiology, is the hormone that raises blood sugar—essentially the opposite of insulin. You might think that activating the glucagon receptor in a weight-loss drug would be a bad idea. But it turns out that glucagon also has effects on energy expenditure (your metabolic rate) and on fat metabolism. By carefully balancing all three receptor activations, the drug can produce a metabolic state that combines the appetite-reducing effects of GLP-1, the metabolic benefits of GIP, and an actual increase in calorie burning from glucagon activation.

The early clinical results have been remarkable. In the Phase 2 trials, the highest dose of retatrutide produced average weight loss of around 24 percent at 48 weeks, with weight still declining at the end of the trial. Some participants lost more than 30 percent of their body weight. For comparison, this is in the range of what is achieved with bariatric surgery, and it is being achieved with a once-weekly injection.

The Phase 3 trials, which are the final stage before potential FDA approval, are underway as of this writing. If the Phase 3 results confirm the Phase 2 findings, retatrutide could reach the market in the next few years and could rapidly become the most potent prescription weight-loss option available.

How it works, in plain English

Imagine semaglutide as a one-instrument band, tirzepatide as a duet, and retatrutide as a trio. All three are playing the same general song—reducing appetite, improving blood sugar, promoting weight loss—but retatrutide is doing it with one more instrument.

The first two instruments (GLP-1 and GIP) are the same as in tirzepatide. They reduce appetite, slow stomach emptying, and improve metabolic parameters.

The third instrument (glucagon receptor activation) adds something genuinely different. It seems to increase the body's resting energy expenditure—the calories you burn just being alive—and to push the body toward burning fat for fuel. In effect, while the GLP-1 and GIP components are reducing the calories you take in, the glucagon component is increasing the calories you burn. This is part of why the weight loss is so dramatic.

The risk in adding glucagon receptor activation is that glucagon's natural job is to raise blood sugar, which is not what you want in a diabetes drug or in someone with prediabetes. The trick of retatrutide's design is the balance—the GLP-1 and GIP effects on insulin and glucose control are strong enough to overcome the glucagon effect on blood sugar, while the metabolic-rate-boosting effects of glucagon still contribute to weight loss.

If you find this clever, that is the point. The drug is a sophisticated piece of pharmacological engineering.

WHY PEOPLE ARE INTERESTED

The weight loss numbers. This is the headline. If you have been frustrated by the limitations of semaglutide or tirzepatide, retatrutide's numbers in Phase 2 are striking enough to feel like a different category of drug.

Potential for additional metabolic benefits. Beyond raw weight loss, retatrutide has shown effects on liver fat, blood pressure, cholesterol, and other metabolic markers that look at least as good as tirzepatide's.

The novelty premium. Anything new and powerful generates interest. Retatrutide currently has it.

Belief that it might be the "final answer." Some users have been waiting for a weight-loss drug powerful enough to produce surgery-like results without surgery. Retatrutide may be the closest thing yet.

What the research actually says

The Phase 2 data is impressive but, importantly, Phase 2 is not Phase 3. Many drugs have looked great in Phase 2 and disappointed in larger Phase 3 trials. The full safety profile only becomes clear after thousands of patients have been studied for longer periods.

It is also worth noting that retatrutide is not yet approved for anything. People using it today are getting it from gray-market sources, which means none of the quality assurance that comes with an FDA-approved pharmaceutical product applies.

THE OTHER SIDE OF THE COIN

The side effects so far look broadly similar to other GLP-1-family drugs, though some details are worth flagging.

GI side effects. Nausea, vomiting, diarrhea, constipation—the usual GLP-1 suite. In Phase 2 trials, these were dose-dependent and were generally more common at higher doses (where the dramatic weight loss also happens).

Loss of appetite that may become extreme. Same concern as with the other drugs in this family, possibly more pronounced because of the drug's potency.

Muscle loss. A bigger concern with retatrutide than with the other GLP-1 drugs, because the weight loss is faster and larger. Without serious attention to protein intake and resistance training, the muscle loss could be significant.

Heart rate increases. Some users in trials had small increases in resting heart rate. The clinical significance is being studied.

Blood sugar concerns. Because of the glucagon component, blood sugar control needs to be monitored carefully, particularly in people without diabetes. The balance of effects is positive in the trial population, but individuals can vary.

Long-term safety unknown. This is the biggest caveat. Retatrutide has not been in any human's body for that long. The drug is still in clinical trials. Real-world, decades-long safety data does not exist.

Cardiovascular risk profile is still being characterized. Earlier glucagon receptor agonists raised concerns about heart effects. Retatrutide's specific profile, in trials so far, looks acceptable, but the long-term cardiovascular outcomes data is not complete.

A particularly important warning about gray-market retatrutide

This is the chapter where I want to be especially direct.

Retatrutide is not approved. There is no licensed pharmacy that legally sells retatrutide in the United States for human use. Anything sold as retatrutide outside of a clinical trial is, by definition, a research chemical from a gray-market supplier.

This matters for several reasons.

First, the compound is new enough and complex enough that producing it at high purity is technically demanding. Not every supplier is going to be able to do it well. There have been reports of gray-market "retatrutide" that, on testing, turned out to be something else entirely—mislabeled semaglutide, mislabeled tirzepatide, or a generic GLP-1 analog of unknown identity.

Second, the dosing protocols people are using are essentially extrapolated from public clinical trial data. The doses being administered by users are best guesses. Mistakes in this category can be dangerous.

Third, the side effect profile of retatrutide includes some specific risks (around blood sugar and cardiovascular effects) that benefit from medical supervision, which gray-market use specifically lacks.

I am not going to tell you not to do something. But if you are interested in retatrutide, the most rational approach is probably to wait until it is approved and available through legitimate channels. The drug will be much better characterized, the supply will be reliable, and you will have a meaningful safety net.

Red flags when sourcing

- **Any source claiming "pharmaceutical grade retatrutide."** As of this writing, there is no FDA-approved pharmaceutical grade retatrutide. Such claims are marketing.

- **Wildly different prices.** Some gray-market suppliers are charging modest amounts; others are charging premiums. Quality is not necessarily correlated.

- **Mystery ingredients in "stacks."** Some suppliers sell retatrutide blended with other compounds. Avoid.

- **Pressure tactics.** "Get it before it goes prescription-only" is a sales pitch, not a quality signal.

FREQUENTLY ASKED QUESTIONS

Q: Is retatrutide approved?

Not as of this writing. It is in Phase 3 clinical trials. Approval, if it comes, will likely be sometime in the next few years.

Q: How much weight can I expect to lose?

In Phase 2 trials, the highest dose produced about 24 percent average weight loss at 48 weeks. Individual results vary. The Phase 3 data, when available, will give a more reliable picture.

Q: How is retatrutide different from semaglutide and tirzepatide?

Semaglutide hits one receptor (GLP-1). Tirzepatide hits two (GLP-1 and GIP). Retatrutide hits three (GLP-1, GIP, and glucagon). In broad strokes, more receptor coverage has produced more weight loss in trials.

Q: Why is glucagon receptor activation a good thing? Isn't glucagon supposed to raise blood sugar?

Glucagon has effects beyond blood sugar, including on metabolic rate and fat metabolism. The clever design of retatrutide balances all three receptor activations so that the appetite-reducing and insulin-supporting effects outweigh the blood-sugar-raising effects of glucagon, while preserving the metabolic-rate-boosting benefits.

Q: Is the weight regain pattern the same as with semaglutide and tirzepatide?

Probably. Long-term cessation data is limited, but the same general pattern is expected.

Q: Are there serious side effects to worry about?

The known side effect profile is similar to other GLP-1-family drugs, with the same concerns about GI effects, muscle loss, and gallbladder/pancreas issues. The unique concerns are around blood sugar and cardiovascular effects from the glucagon component. Long-term safety is still being established.

Q: Should I wait for FDA approval rather than buying from a gray-market source?

This is your decision, and I am not going to tell you what to do. But the practical answer is that waiting buys you a level of quality assurance and medical oversight that gray-market use does not provide.

Q: What about Eli Lilly's other drugs in this category?

Lilly has several candidates in the pipeline. The field is moving fast. Retatrutide may itself be improved upon within a few years.

Q: Is the field of weight-loss peptides going to keep getting more powerful?

Probably yes, for at least the next several years. We are early in what looks like an extended period of pharmaceutical innovation in this area.

CLOSING THOUGHTS: HOW TO THINK ABOUT PEPTIDES GOING FORWARD

You have just read about ten compounds that range from extensively studied, FDA-approved drugs to barely studied gray-market research chemicals. You have read about peptides for healing, for hormones, for hair, for libido, for body composition, and for the most consequential weight-loss revolution in modern medical history. If your head is spinning a little, you are paying attention.

Before you close the book, let me leave you with a small framework for how to think about peptides going forward—a way to evaluate the next compound you hear about, the next claim that catches your eye, and the next "have you tried this" conversation in a gym or wellness clinic.

Ask three questions every time

When you encounter a new peptide, ask yourself three questions in order.

One: What is the evidence? Not the marketing copy. Not the influencer testimonial. Not the supplier's website. The actual scientific evidence. Has this compound been studied in humans? In animals only? Are there clinical trials, or just laboratory results? If the answer is "there's a lot of buzz but very little research," treat that as a warning sign, not a feature.

Two: What is the risk? Every intervention has trade-offs. A peptide may help you with one thing while quietly making something else worse. The "what could go wrong" question deserves at least as much attention as the "what could go right" question. Be especially careful with compounds that affect cell growth, hormones, or the cardiovascular system.

Three: What does the supply chain look like? Even a perfectly safe compound delivered in a contaminated vial can hurt you. The legitimacy of where you are getting something from is often more important than the underlying molecule. If a supplier is unwilling to share certificates of analysis, batch testing, and basic quality information, walk away.

The hype-evidence gap

In every peptide community, you will find a gap between what people claim is happening and what the evidence supports. Sometimes the gap is small; sometimes it is enormous. Your job, as someone trying to make good decisions, is to learn to estimate that gap honestly.

A useful exercise: when someone makes a claim about a peptide, ask "what would have to be true for that claim to be right?" If the claim is that a compound cures everything from joint pain to depression to wrinkles, you would need to believe that one small molecule does many fundamentally different things to many different tissues, all of them positive. Possible? Maybe. Likely? Usually not.

The compounds with the most credible cases are usually the ones that do one or two things, do them measurably, and are upfront about what they do not do.

Working with a doctor (when you can find one)

A consistent theme in this book has been "talk to a doctor." I am aware that this advice is often unhelpful in practice. Many doctors are unfamiliar with peptides, dismissive of off-label use, or simply unwilling to engage with patients who are interested in compounds that have not been through FDA approval.

A few practical suggestions.

If you have a primary care doctor you trust, start with them. Even if they cannot prescribe what you are interested in, they can monitor blood work, flag medication interactions, and provide a baseline of medical oversight that protects you.

For more specialized guidance, look for physicians who explicitly work in the metabolic, longevity, or hormone-optimization spaces. These are doctors who, for better or worse, have decided to engage with this area of medicine. Quality varies—some are excellent, some are essentially marketing operations—but they exist.

Telehealth platforms specializing in metabolic health, weight loss, and peptide therapy have proliferated. Some provide reasonable medical oversight at affordable prices. Some are essentially online dispensaries with a doctor's signature attached. Vet carefully.

Whatever path you choose, do not skip medical involvement entirely. The peptides covered in this book interact with serious bodily systems. A second set of eyes—someone with medical training who knows your full health picture—is worth more than any guide, including this one.

A final word

I wrote this book because I think the conversation around peptides deserves better than what it currently has. The information that is out there tends to fall into two camps: scientific literature that the average reader cannot parse, and marketing material that has been carefully shaped to make you reach for your wallet.

What I hope I have given you, somewhere in the middle of those two extremes, is a starting point. A foundation. Enough understanding to read a podcast transcript, to scroll a Reddit thread, to hear someone at a party say "have you tried tirzepatide," and to know roughly what you are dealing with.

You will not become a peptide expert by reading this book. You will, hopefully, become a more competent skeptic, a more careful consumer, and a more curious learner. If a couple of years from now,

the field has moved on and half of what is in here is outdated, that is fine. The framework should still serve you.

Be careful out there. Be curious. Be honest with yourself about what you actually want and why. And remember: just because a compound is cool to talk about does not mean you need to put it in your body. Some of the best decisions in this space are decisions to wait, to skip, or to walk away.

Thanks for reading.

— Andy Davis

QUICK-REFERENCE CHEAT SHEET

A one-line summary of each peptide in this book. Tape it to your fridge if you want.

BPC-157 — Synthetic peptide derived from gastric juice; widely used for tendon, ligament, and gut healing. Strong animal data, limited human trials.

TB-500 — Fragment of natural protein thymosin beta-4; promotes tissue repair, often stacked with BPC-157 for soft-tissue healing.

CJC-1295 — Modified GHRH analog that tells the pituitary to produce more growth hormone; available with or without DAC modification for different durations of action.

Tesamorelin — FDA-approved GHRH analog originally for HIV-associated visceral fat reduction; the most evidence-supported GH-stimulating peptide.

NAD+ — Coenzyme essential for cellular energy and DNA repair; declines with age and is the basis of a major longevity-supplementation industry.

GHK-Cu — Copper-binding tripeptide; well-studied effects on skin collagen production, wound healing, and possibly hair follicle health.

PT-141 (bremelanotide) — FDA-approved peptide that acts on brain melanocortin receptors to influence sexual desire; useful for libido issues that drugs like Viagra do not address.

Semaglutide — GLP-1 receptor agonist; the breakthrough weight-loss and diabetes drug behind Ozempic, Wegovy, and Rybelsus.

Tirzepatide — Dual GLP-1/GIP receptor agonist; the next-generation weight-loss drug behind Mounjaro and Zepbound, with stronger effects than semaglutide on average.

Retatrutide — Triple GLP-1/GIP/glucagon receptor agonist in late-stage clinical trials; likely the most potent weight-loss compound ever studied if its results hold up.

GLOSSARY OF TERMS

Amino acid — One of the small molecular building blocks that link together to form proteins and peptides. There are 20 standard amino acids used in biology.

Anabolic — Building up. Anabolic processes build tissue (like muscle). Steroids that build muscle are called anabolic steroids.

Angiogenesis — The formation of new blood vessels. A normal part of healing but also exploited by tumors.

Bioavailability — How much of a compound, once administered, actually reaches the part of the body where it does its work. A drug with high oral bioavailability survives digestion well; one with low oral bioavailability is usually injected.

Black-box warning — The strongest warning the FDA can put on a prescription drug, indicating a serious safety risk.

Certificate of analysis (COA) — A document from a third-party laboratory confirming the identity, purity, and concentration of a compound. The minimum bar for verifying that what you are buying is what it claims to be.

Compounded — A medication that has been prepared by a licensed pharmacist (in a compounding pharmacy) for a specific patient or specific need, rather than mass-produced as a standard pharmaceutical product.

DAC (drug affinity complex) — A modification technology used to extend the half-life of certain peptides by allowing them to bind to a blood protein (albumin) and circulate longer.

Endogenous — Produced inside the body. Endogenous testosterone is the testosterone your body makes on its own.

Exogenous — Coming from outside the body. Exogenous testosterone is testosterone you receive as medication or supplementation.

FDA (U.S. Food and Drug Administration) — The U.S. federal agency that regulates the safety and efficacy of food, drugs, and medical devices.

GH (growth hormone) — A hormone produced by the pituitary gland that supports growth in childhood and various tissue maintenance functions in adulthood.

GHRH (growth hormone-releasing hormone) — A hormone produced in the hypothalamus that tells the pituitary to release growth hormone.

GIP (glucose-dependent insulinotropic polypeptide) — A gut hormone involved in regulating blood sugar after meals.

GLP-1 (glucagon-like peptide-1) — A gut hormone that signals fullness, slows stomach emptying, and stimulates insulin release. The target of the modern weight-loss drug revolution.

Glucagon — A hormone, produced in the pancreas, that raises blood sugar. The opposite of insulin in many respects.

Half-life — The time it takes for half of a drug or compound to be cleared from your body. A short half-life means the drug needs frequent dosing; a long half-life means less frequent dosing.

IGF-1 (insulin-like growth factor 1) — A hormone produced in the liver in response to growth hormone, and one of the main mediators of GH's effects on tissues.

Insulin resistance — A state in which the body's cells respond less effectively to insulin, leading to higher blood sugar and a tendency toward type 2 diabetes.

Lyophilized — Freeze-dried. Most research peptides are sold as lyophilized powder that must be reconstituted (mixed with sterile liquid) before use.

Off-label use — Use of an FDA-approved drug for a condition other than the one for which it was approved. Legal in the U.S. but variable in how doctors approach it.

Peptide — A short chain of amino acids. The smaller cousin of a protein.

Pituitary gland — A small gland at the base of the brain that produces many of the body's hormones, including growth hormone.

Reconstitution — The process of mixing lyophilized (freeze-dried) peptide powder with sterile liquid (typically bacteriostatic water) to produce a usable injectable solution.

Receptor — A molecular structure, usually on the surface of a cell, that binds to a specific signaling molecule and produces a response inside the cell. Many peptides work by activating specific receptors.

Research chemical — A compound sold for laboratory or research use, not approved for human consumption. The legal framework that allows many peptides to be sold without prescription.

Sirtuin — A family of proteins involved in cellular stress responses, DNA repair, and (according to some research) longevity. Activated by NAD+.

Subcutaneous (SubQ) — An injection given just under the skin, into the fat layer. Used for most peptides. Less painful and easier than intramuscular injection.

Synthetic peptide — A peptide produced in a laboratory, as opposed to one extracted from a natural source.

Thymosin beta-4 — A natural protein involved in tissue repair; the parent molecule of TB-500.

Tripeptide — A peptide consisting of just three amino acids. GHK is an example.

Visceral fat — Fat that accumulates around the internal organs in the abdomen. More metabolically dangerous than subcutaneous fat (the fat just under the skin).

WADA (World Anti-Doping Agency) — The international body that regulates banned substances in sports. Many peptides in this book are on the WADA prohibited list.

ABOUT THE AUTHOR

Andy Davis is a curious civilian, not a doctor or a scientist. He started learning about peptides several years ago out of personal interest and quickly realized that there was no good entry-level guide for people like him—or like you. The Peptide Field Manual is the book he wished he had when he started.

He continues to follow the field closely, and welcomes feedback, corrections, and questions from readers. The information in this book reflects the state of the field as of 2026. Future editions will update what has changed.

If you found this book useful, share it with a friend who has been Googling peptides at 2 a.m. and not finding plain-English answers.

FINAL DISCLAIMER

This book is for educational and informational purposes only. It is not medical advice. The peptides discussed in this book are, with limited exceptions, not FDA-approved for general human use and are sold as research chemicals. Use of these compounds carries risks that are not fully understood. Always consult a qualified medical professional before making decisions about your health or about any substance you are considering putting into your body. Laws governing the sale, possession, and use of these compounds vary by jurisdiction; you are solely responsible for understanding the laws that apply to you. The author and publisher disclaim any liability for any loss, injury, or damage arising from the use of, or reliance on, any information in this book.