SS-31

Fixing the energy system everything else relies on

Most performance tools add pressure. SS-31 reduces friction.

The Science Behind SS-31

Clinical Evidence

SS-31 (elamipretide) has been extensively studied across 18 human clinical trials and multiple preclinical models. In 2025, it received FDA approval for treating Barth syndrome, a rare mitochondrial disorder.

Key findings from peer-reviewed research:

- 268% improvement in exercise tolerance in aged mice (University of Washington, Free Radical Biology & Medicine, 2019)
- Improved mitochondrial respiration and ATP production efficiency (PNAS, 2020)
- Reverses age-related redox stress and mitochondrial dysfunction (Nature Scientific Reports, 2022)
- Enhances ADP sensitivity in aged mitochondria by improving uptake through the adenine nucleotide translocator (GeroScience, 2023)

How It Works

SS-31 binds specifically to cardiolipin, a phospholipid found exclusively in the inner mitochondrial membrane. This binding:

- Stabilizes cristae structure where ATP is produced
- Improves electron transport chain function
- Reduces pathogenic reactive oxygen species (ROS)
- Normalizes mitochondrial membrane architecture

The result: better energy conversion efficiency at the cellular level.

Sources: Stealth BioTherapeutics clinical trials database; Campbell et al., Free Radic Biol Med (2019); Sabbah et al., Biomedicine & Pharmacotherapy (2025); Russo et al., Scientific Reports (2022, 2024); Pharaoh et al., GeroScience (2023)

The Modern Problem

People aren't lazy. They're **running inefficient systems**.

Energy feels inconsistent. Recovery takes longer than it should. Output doesn't match effort.

The problem isn't your commitment or discipline. It's not even your programming. The issue runs deeper—at the cellular level where energy is actually produced. When that foundation is compromised, everything built on top of it becomes harder than it needs to be.

The Usual Response:

- More caffeine and stimulants
- Harder training
- More supplements
- Better meal timing

Why It Doesn't Work:

These approaches increase demand on an already inefficient system. They push harder without fixing the underlying conversion problem.

The Real Constraint

Every movement, thought, and recovery process runs on cellular energy.

That energy is produced inside **mitochondria**—the power plants of your cells. These organelles convert fuel into ATP, the universal energy currency your body actually uses.

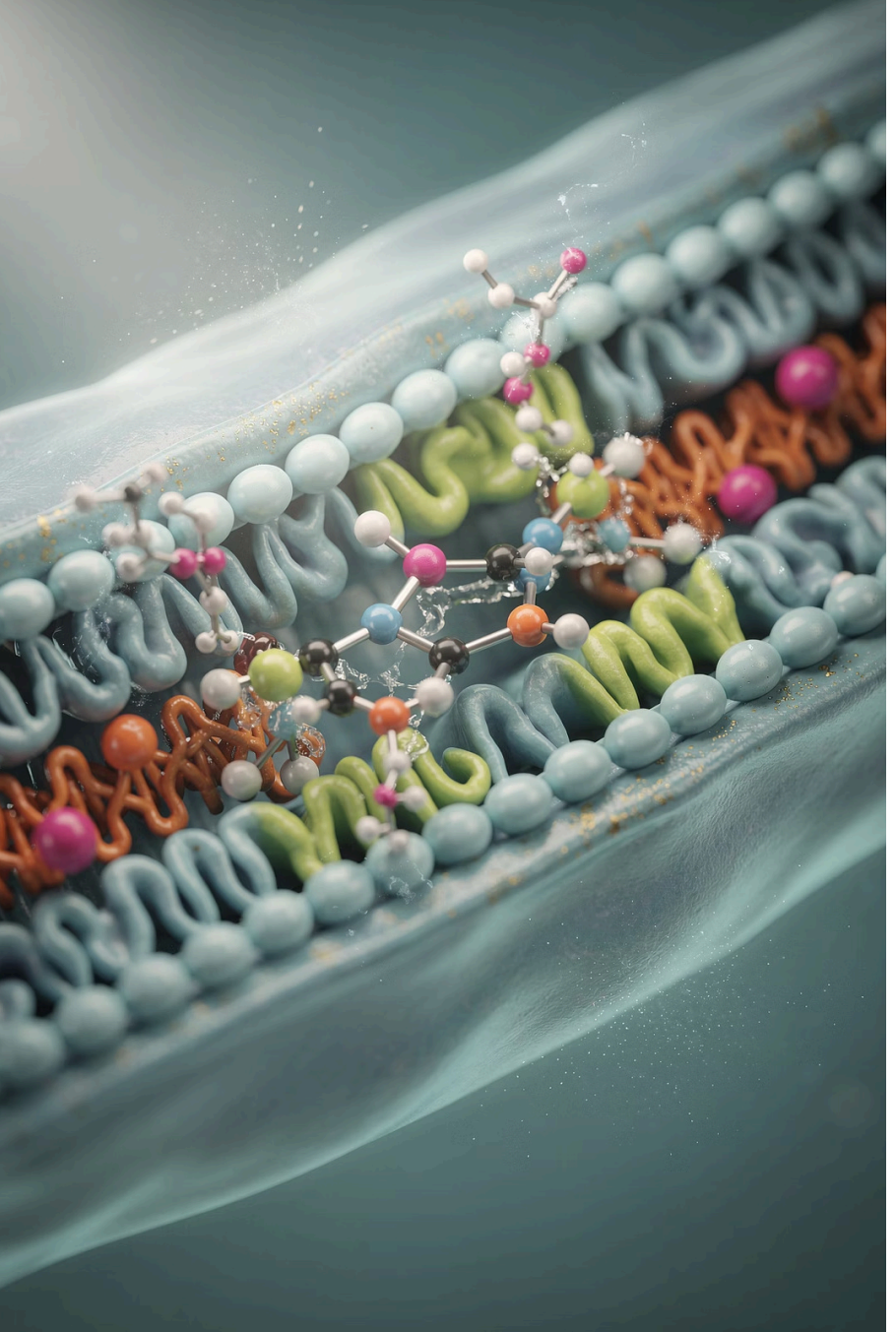
When mitochondria underperform, the entire system compensates—poorly. Everything downstream becomes harder: training adaptation, cognitive performance, recovery, resilience. The limitation isn't at the surface level. It's at the source.

What Decline Looks Like:

Not dramatic failure—gradual efficiency loss. Energy feels inconsistent. Recovery takes longer. The decline is subtle and often attributed to age or stress, but the root cause is mitochondrial membrane degradation.

The Leaky Engine:

Fuel is present. Macros are dialed in. But the conversion machinery is compromised. Like a car engine with worn seals—plenty of gas, but energy leaks out before it can be used. The problem isn't input, it's efficiency.



Enter SS-31

SS-31 is not about motivation or stimulation.

It's about **stabilization**.

This is a peptide designed to target the inner mitochondrial membrane—the exact site where energy production happens and where inefficiency begins. It doesn't override your system. It reinforces the infrastructure so your system can operate as designed.

What SS-31 Actually Does

SS-31 works at the mitochondrial membrane level. That's the critical boundary where fuel is converted into ATP and where structural integrity determines efficiency.

At this precise location, energy transfer either stays intact—or leaks away as wasted heat and oxidative stress. SS-31 binds to cardiolipin, a key phospholipid in the membrane, stabilizing the structure under metabolic stress.

In Plain English:

- Holds structure under stress - The membrane stays intact during high-demand periods
- Prevents energy waste - Less ATP leaks out during production
- Improves conversion efficiency - More usable energy from the same fuel

Think of it like reinforcing a power plant's infrastructure. The fuel supply doesn't change, but less energy is lost in transmission.

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What People Actually Notice

The effects are more subtle, but more valuable over time:

Steadier Energy

Less variance throughout the day. No dramatic peaks or crashes. Just consistent availability.

Fewer Crashes

The post-training fatigue doesn't hit as hard. Recovery doesn't feel like a burden.

Better Output with Same Effort

Training feels smoother. Work capacity improves without forcing it.

Less "Drag" in the System

Things that felt hard become manageable. The friction decreases.

Why Subtle Is the Point:

Foundational fixes don't shout. They quietly raise the floor so everything else works better. The baseline shifts—you're operating from a higher starting point. That's more valuable than any temporary spike.

SS-31 vs Traditional Performance Tools

Why Stacking Works Better:

SS-31 creates the foundation. When you add training, recovery protocols, or other interventions on top, they work more efficiently because the underlying energy system is optimized. You get better returns on everything else you're doing.

Traditional tools increase demand. They push the system to produce more, recover faster, or override fatigue signals. This works—until the system can't keep up.

SS-31 increases **conversion efficiency**. It improves how well the system uses what it already has. Same inputs, better output.

That distinction matters long-term. Demand-driven strategies have limits. Efficiency-driven strategies compound.

Who Benefits Most

This resonates with people who already do the work. SS-31 isn't for beginners looking for shortcuts. It's for individuals who:

Already Train

You have consistent programming and understand progressive overload

Already Eat Well

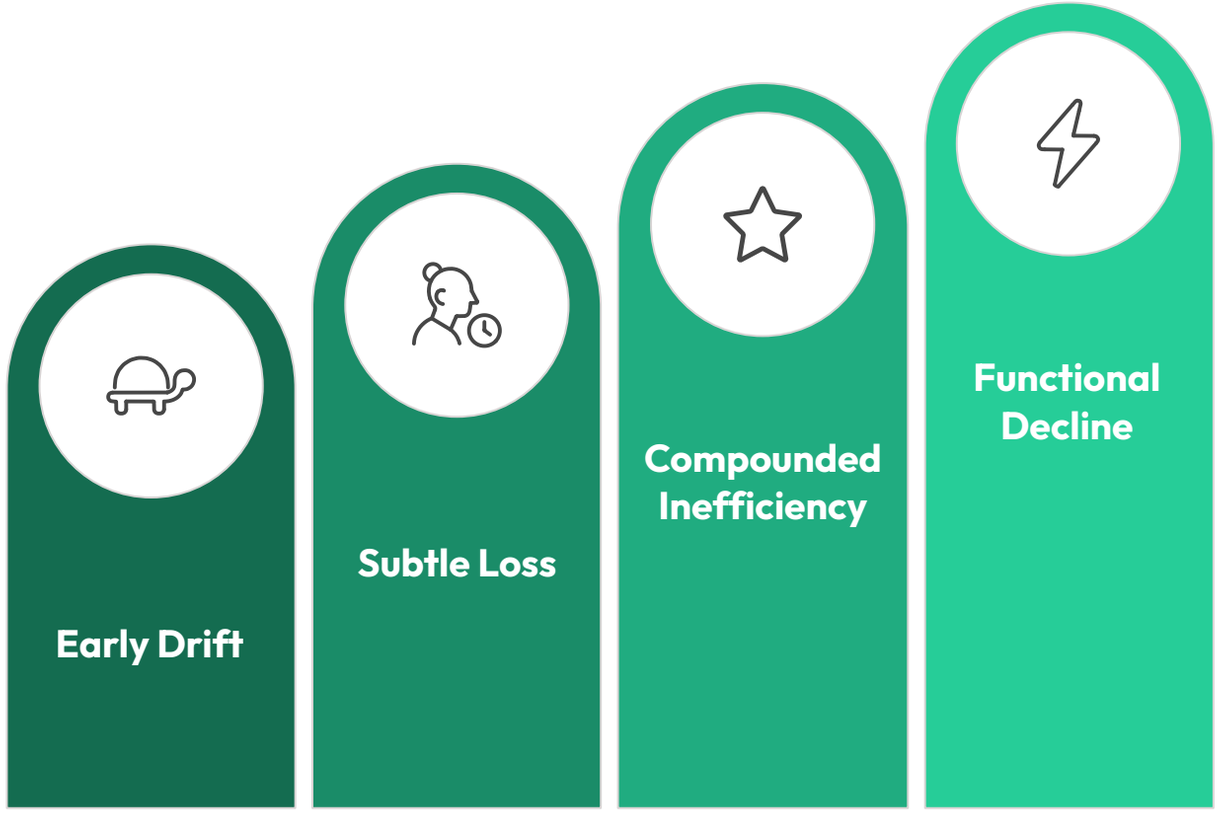
Your nutrition is dialed in, not guesswork

Already "Do the Work"

You're disciplined, consistent, and committed

But want **higher ROI on effort**. You've optimized the obvious variables. Now you're addressing the underlying constraint.

Why This Is a Longevity Conversation



Mitochondrial decline isn't sudden. There's no cliff. It's **cumulative inefficiency over years**—a slow erosion of energy production quality that compounds into dysfunction.

By the time symptoms are obvious, the decline is significant. SS-31 addresses the slope, not the cliff. It's a proactive intervention, not a reactive one.

This is about maintaining performance capacity as you age, not recovering it after it's gone.

The Strategic Shift:

Old Model: Push harder → crash → recover → repeat (unsustainable)
New Model: Optimize the foundation → sustainable output → compounding returns

This isn't about working harder. It's about making the system work better so effort compounds instead of depleting you.

What It's Not

Not a Stimulant

No caffeine-like effects. No jitters or crashes. SS-31 doesn't activate—it stabilizes.

Not a Hormone

It doesn't manipulate endocrine signaling or alter your hormonal profile. It works downstream of those systems.

Not a Shortcut

You still need training, nutrition, sleep, and recovery. SS-31 makes those inputs more effective—it doesn't replace them.

SS-31 is a **system upgrade**. It improves the infrastructure so everything you already do works better.

In Short...

SS-31 doesn't make you do more.

It helps your cells waste less doing it.

The Core Principle

Fix the energy system. Everything else gets easier.

This is infrastructure work—subtle, foundational, and compounding. The kind of intervention that raises your baseline instead of spiking your performance.

If you're already doing the work and want higher return on effort, SS-31 addresses the constraint you didn't know was there.