PEPTIDE PERSPECTIVES

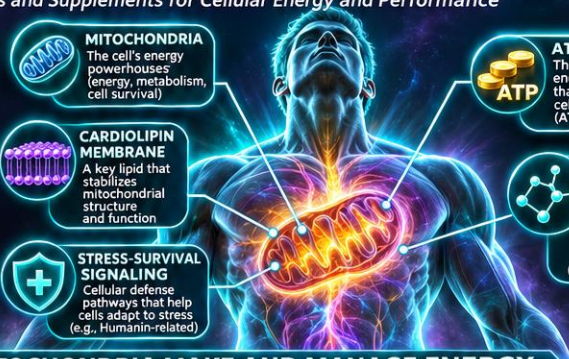
Peptide Stacking & Synergy Series | Educational overview

THE MITOCHONDRIAL ENERGY STACK

Peptides and Supplements for Cellular Energy and Performance

WHY MITOCHONDRIAL STACKS ARE DISCUSSED

- Energy is more than feeling awake; mitochondria power movement, repair, and cell signaling.
- Different compounds target different parts of the system: metabolic adaptation, membrane integrity, and stress resilience.
- The biology is exciting, but combination benefit in humans is unproven.
- Sleep, nutrition, training, and correcting deficiencies often have stronger practical evidence.



HOW MITOCHONDRIA MAKE AND MANAGE ENERGY

ATP PRODUCTION / ELECTRON TRANSPORT CHAIN
Converts nutrients into ATP through a series of energy-transfer steps.

CARDIOLIPIN & MEMBRANE INTEGRITY
A unique mitochondrial lipid that helps maintain membrane structure, organization, and efficiency.

AMPK & METABOLIC FLEXIBILITY
An energy sensor that shifts the cell between fuel use, conservation, and adaptation.

STRESS SIGNALING / APOPTOSIS
Cellular pathways that respond to stress and can promote survival or programmed cell death (apoptosis) when needed.

MITOCHONDRIAL QUALITY CONTROL / MITOPHAGY
Identifies, recycles, and removes damaged mitochondria to help maintain a healthy, efficient network.

THE 3 STACKS RESEARCHERS ARE EXPLORING

STACK 1: MOTS-C + SS-31

Most conceptually complementary

Logic: Metabolic signaling + membrane protection

EVIDENCE LEVEL
- **MOTS-C:** investigational, mainly preclinical / limited human-observation research.
- **SS-31 / elamipretide:** human trials; FDA-approved product only for eligible Barth syndrome patients.

DOSING / RESEARCH CONTEXT
- **MOTS-C:** No established human therapeutic dose. Research/community context often: 2.5–5 mg subQ 2× weekly OR 5 mg subQ 3× weekly. Investigational only.
- **SS-31 / elamipretide:** Approved product (Forzinity) label: 40 mg subQ once daily for Barth syndrome patients ≥30 kg. This does NOT validate the stack.

⚠ No controlled human trial proves stack benefit, schedule, or interaction safety.

STACK 2: SS-31 + HUMANIN

Membrane biology + cell-survival signaling

Logic: Protect the organelle while studying stress-response pathways

EVIDENCE LEVEL
- **SS-31:** specific clinical advance in Barth syndrome.
- **Humanin:** cell and animal data; no established therapeutic human efficacy.

DOSING / RESEARCH CONTEXT
- **SS-31 / elamipretide:** 40 mg subQ once daily on the approved Barth syndrome label only.
- **Humanin:** No validated human interventional dose. No controlled clinical dosing standard exists.

⚠ Cytoprotection is context-dependent; anti-apoptotic signaling is not always desirable.

STACK 3: MOTS-C + HUMANIN

Two mitochondria-derived signals

Logic: Metabolic adaptation + stress resilience research

EVIDENCE LEVEL
- Both remain investigational for this use.
- No established clinical evidence for improved stamina, ATP, or resilience as a pair.

DOSING / RESEARCH CONTEXT
- **MOTS-C:** Research/community context often: 2.5–5 mg subQ 2× weekly OR 5 mg subQ 3× weekly. No validated human therapeutic dose.
- **Humanin:** No validated human interventional dose.

⚠ Naturally produced does not mean injected forms are proven safe or effective.

SUPPLEMENTS THAT MAY COMPLEMENT MITOCHONDRIAL HEALTH

CoQ10
- **100–200 mg/day** (some studies use higher doses).
- **Best fit:** fatigue-focused research; performance effects inconsistent.

PQQ
- 10–20 mg/day.
- Exploratory signaling adjunct; not a proven mitochondrial builder.

CREATINE MONOHYDRATE
- 3–5 g/day maintenance; optional loading 20 g/day split into 4 doses for 5–7 days.
- Strongest practical performance support.

NR or NMN
- Often studied around 250–500 mg/day.
- Biomarker effects clearer than functional benefits.

B VITAMINS
- Replace deficiency / individualize.
- More is not automatically better.

WHAT TO MONITOR

- Fatigue / energy perception
- Strength and exercise tolerance
- Sleep and nutrition adequacy
- Hydration / body weight changes
- Glucose / metabolic markers when relevant
- Renal / hepatic safety and adverse effects

EVIDENCE TAKEAWAY



- No clinical evidence proves any peptide pair works better than one peptide alone.
- Dosing for mitochondrial peptide stacks is not clinically validated.
- Supplements have more support for practical performance than experimental peptide combinations.
- Educational overview only — not individualized medical advice.

Most peptide-stack dosing shown here is research-context or label-context information, not a personal recommendation.