MOTS-C

Mitochondrial-Derived Peptide | Metabolic Regulation & Longevity

What Is MOTS-C?

MOTS-C is a 16-amino acid peptide encoded within the 12S rRNA region of mitochondrial DNA (mtDNA) — making it one of the rare peptides of mitochondrial, not nuclear, origin.

It is measurable in plasma and multiple tissues including muscle, brain, and liver. MOTS-C levels are correlated with insulin resistance in lean individuals, and it plays an active role in bone and cardiovascular health.

MOTS-C holds significant potential as a target for treating metabolic signaling issues by regulating muscle and fat physiology — and may even support a healthy lifespan extension.

Areas of Clinical Relevance

Research highlights MOTS-C's involvement across several interconnected systems:

- Metabolic regulation and glucose homeostasis
- Insulin sensitivity in lean individuals
- Bone density and skeletal health
- Cardiovascular health and protection
- Mitochondrial function and energy production
- Inflammation modulation

Key Benefits

➔ Metabolic Regulation & Weight Loss

Enhances glucose metabolism and promotes insulin sensitivity. A valuable focus area for metabolic disorders including obesity and type 2 diabetes.

➔ Exercise Mimetic Effects

Mimics beneficial effects of exercise by influencing metabolic pathways that control fat and carbohydrate metabolism. Linked to improved endurance and protection against metabolic stress.

➔ Anti-Aging Properties

Evidence suggests MOTS-C may protect against age-related metabolic decline by improving mitochondrial function and reducing systemic inflammation.

➔ Mitochondrial Support

Directly supports mitochondrial function — the engine of cellular energy production — which declines with age and metabolic disease.

➔ Anti-Inflammatory

Modulates inflammatory pathways, potentially reducing chronic low-grade inflammation associated with metabolic syndrome and aging.

Clinical Pearls

Mitochondrial Origin

Unlike most proteins encoded by nuclear DNA, MOTS-C is encoded by mitochondrial DNA. This unique origin means it plays a direct role in mitochondrial function — the cellular process most critical for energy production and metabolic efficiency.

Metabolic Regulation

MOTS-C has been shown to regulate metabolism by enhancing glucose uptake and promoting insulin sensitivity. It activates the AMPK pathway — a master regulator of cellular energy balance — making it particularly relevant for patients with metabolic syndrome, prediabetes, or type 2 diabetes.

Exercise Mimetic Effects

Research suggests MOTS-C mimics some of the beneficial effects of exercise by influencing the metabolic pathways that govern fat and carbohydrate utilization. It has been linked to improved endurance capacity and protection against metabolic stress — without requiring physical exertion.

Anti-Aging Potential

Emerging evidence suggests MOTS-C may protect against age-related metabolic decline by improving mitochondrial efficiency and reducing chronic inflammation. Circulating MOTS-C levels naturally decline with age, making supplementation a compelling longevity strategy.

Dosing & Pricing

Concentration	Dosing Protocol	Investment	Supply
10mg/mL (5mL vial)	0.5mL (5mg) SubQ twice weekly x 1 month; may increase to 1mL twice weekly thereafter	**$450**	10 injections at 5mg dose

Subcutaneous injection | As directed by your provider

At Larrea Naturopathic Medicine, we prescribe peptides exclusively through **CLIA-certified, FDA-registered 503A compounding pharmacies.**

Every batch undergoes independent third-party testing for purity, potency, and safety. Our pharmacies are LegitScript-certified and held to rigorous regulatory standards.