

MOTS-c

Patient Education Guide — What It Does, Why a Physician Would Prescribe It, and What the Evidence Says

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Important Disclaimer

This information is not medical advice and is provided only to help begin your research. All clinical and dosing decisions must be made with a licensed, experienced physician and a licensed, experienced compounding pharmacist, supported by published clinical studies. This material was compiled using Artificial Intelligence, statements from videos and websites by apparent qualified professionals, and available published research. Anyone starting a medication they have never taken before should take an extremely conservative approach. We are not affiliated with any of the doctors whose videos are referenced below.

MOTS-c

Investigational

Compounded

Category: Metabolic & Mitochondrial Support

How it works. MOTS-c is a mitochondrial-derived peptide encoded by mitochondrial DNA. It appears to function as a retrograde signaling molecule—sending messages from the mitochondria back to the nucleus—and is associated with AMPK activation, improved glucose handling, enhanced insulin sensitivity, mitochondrial biogenesis, antioxidant pathway upregulation, and possibly bone metabolism regulation through osteoblast signaling. In effect, it behaves like an exercise mimetic at the cellular level.

Where the evidence actually is. MOTS-c levels rise sharply in skeletal muscle after exercise, and observational human data show that plasma MOTS-c is negatively correlated with fasting insulin, HbA1c, and BMI. Animal studies in mice demonstrate metabolic improvements and obesity resistance. What does not exist, as of this writing, are completed human clinical trials of exogenous MOTS-c administration—not Phase 1, not a small pilot. That gap between mechanism and human evidence is what every patient conversation has to acknowledge. The science is genuinely interesting; the clinical trial base is not there yet.

Patient selection and expectations. A physician might discuss MOTS-c conceptually for metabolic dysfunction, insulin resistance, early sarcopenia, or patients who cannot exercise adequately but are still willing to combine investigational therapy with lifestyle modification. It should be positioned as an adjunct, not a replacement for diet, sleep, and strength training. The patient who thinks MOTS-c is "exercise in a bottle" has been misled. Effects, when reported, tend to be subtle—modest energy improvement, slightly better exercise tolerance, or perceived recovery changes over weeks. Do not expect dramatic appetite suppression or rapid weight loss.

Published Evidence: MOTS-c levels increase roughly 11.9-fold in skeletal muscle following exercise and 1.6-fold in circulation. In human cohorts, plasma MOTS-c levels are negatively correlated with fasting insulin, HbA1c, and BMI. Animal studies demonstrate that systemic MOTS-c administration restores levels in aged mice and reverses age-related insulin resistance. Muscle cells overexpressing MOTS-c show improved glucose uptake via AMPK activation. Human interventional trial data remains absent.

Key Study: Lu H, et al. "MOTS-c: A promising mitochondrial-derived peptide for metabolic disease." *PMC*. 2022;14:9905433.

Recommended Videos (educational, independent sources)

► **Quinn Stillson, MD** — MOTS-c (CB-4211): Exercise in a Vial? Full Deep Dive (Benefits, Risks & Dosing)

https://www.youtube.com/watch?v=_b9Av7aTqas

► **Dr. Kristi Sawicki, Ph.D.** — MOTS-c Explained: The Exercise-Activated Peptide Changing Metabolic Science

<https://www.youtube.com/watch?v=zR9P-QU8g68>

► **Dr. Alex Tatem, MD** — This Peptide Makes Your Cells Think You're Exercising

<https://www.youtube.com/watch?v=JI2jCDqCpi4>