# MOTS-C

## MITOCHONDRIAL SIGNALING & METABOLIC RESEARCH

A 16-amino-acid mitochondrial-derived signaling molecule under active investigation.

16 AMINO ACIDS

RESEARCH-STAGE

## WHAT RESEARCHERS ARE STUDYING

MOTS-C is encoded within mitochondrial DNA. Laboratory studies suggest it acts as a stress-responsive signal connecting mitochondrial activity with whole-cell metabolism.

### MECHANISTIC THEMES

- **AMPK signaling**
  Cellular energy sensing
- **Glucose handling**
  Skeletal-muscle metabolism
- **Stress adaptation**
  Mitochondria-to-nucleus signaling

## EVIDENCE REALITY CHECK

The strongest benefit claims come from cell and animal studies. A small human exercise experiment showed the body's own MOTS-C increased after cycling, but that does **not** establish that administered MOTS-C improves performance, weight, blood sugar, or longevity in people.

### BEST WAY TO DESCRIBE IT

A promising mitochondrial signaling target - not a proven human therapy.

**SCAN FOR THE LIVE GUIDE**

Opens the current printable PDF at rippedtidebiolabs.com.

QR and link point to the permanent Education Center resource.

## 1 METABOLIC HOMEOSTASIS

Cell and mouse studies report improved glucose use in skeletal muscle, better insulin sensitivity, and resistance to high-fat-diet metabolic disruption. These are preclinical findings, not proven treatment effects in humans.

## 2 EXERCISE + PHYSICAL CAPACITY

In 10 healthy young men, endogenous MOTS-C rose after exercise. Separate experiments found administered MOTS-C improved physical performance in young, middle-aged, and old mice. Human treatment benefit remains unproven.

## 3 CELLULAR STRESS ADAPTATION

Under metabolic stress, MOTS-C can move into the nucleus and influence gene expression through an AMPK-dependent pathway. This supports a signaling role; it does not establish a clinical outcome.

## 4 AGING + HEALTHSPAN RESEARCH

Late-life intermittent treatment increased physical capacity and healthspan measures in mice. There is no established evidence that MOTS-C extends human lifespan or prevents age-related disease.

## IMPORTANT SAFETY + REGULATORY NOTE

MOTS-C is experimental and is not FDA-approved to treat disease. Human dosing, long-term safety, interactions, and product quality are not established. FDA identifies potential immunogenicity and peptide-impurity concerns for compounded MOTS-C, particularly by injection. This guide is educational and not medical advice or a recommendation to use any product.



Sources: Lee et al., Cell Metab. 2015, PMID 25738459; Kim et al., Cell Metab. 2018, PMID 29983246; Reynolds et al., Nat Commun. 2021, PMID 33473109; FDA compounding safety-risk summary (accessed Sep. 2026).