

MOTS-C Lab Tested: Why Quality and Certificate of Analysis Matter

When evaluating MOTS-C for research, reputable suppliers should be able to provide clear answers regarding both product quality and peptide specifications. The MOTS-C amino acid sequence is well documented in scientific literature and serves as an important reference for researchers. Likewise, [MOTS-C lab tested](#) products supported by a Certificate of Analysis (COA) or independent analytical testing should be considered a standard expectation rather than an added benefit. Choosing research-grade peptides backed by transparent quality documentation helps researchers source reliable materials for laboratory investigations with greater confidence.



MOTS-C
PEPTIDE PURCHASE

PREMIUM RESEARCH PEPTIDE

High Purity • Lab Tested • Research Grade Quality

- LAB TESTED
- PREMIUM QUALITY
- RESEARCH GRADE
- CERTIFICATE OF ANALYSIS
- HIGH PURITY

MOTS-C 10MG
RESEARCH PEPTIDE
RESEARCH USE ONLY

MOTS-C 10MG
RESEARCH PEPTIDE
RESEARCH USE ONLY

LAB TESTED 100% QUALITY ASSURED

MOTS-C PEPTIDE FOR RESEARCH PURPOSES

- ✓ Designed for laboratory and research applications
- ✓ Third-party tested for purity and quality
- ✓ Certificate of Analysis (COA) available
- ✓ Consistent quality you can trust
- ✓ Not for human consumption

SCAN TO VIEW COA SAMPLE

RESEARCH GRADE
For scientific investigations only

RIGOROUS TESTING
Ensuring purity, potency & consistency

CERTIFICATE OF ANALYSIS

COA AVAILABLE
Transparency in every batch

SECURE SHIPPING
Discreet, safe & reliable delivery

SECURE ORDERING **DISCREET SHIPPING** **USA SUPPLIER** **EXCELLENT SUPPORT**

BUY MOTS-C PEPTIDE ONLINE
Trusted. Tested. Quality Assured.

agelessvitalitypeptides.com/product/mots-c/

RESEARCH USE ONLY. NOT FOR HUMAN CONSUMPTION. NOT FOR MEDICAL OR THERAPEUTIC USE.

This article walks through both in detail. We cover the MOTS-c exact amino acid sequence, explain what each residue contributes to the peptide's structure and behavior, and break down what a complete [MOTS-c certificate of analysis](#) should contain and how to verify it yourself. At Ageless Vitality Peptides, every batch of MOTS-c we sell is lab tested by independent third-party analysts, and all reports are accessible through our public COA Vault.

The MOTS-c Peptide Sequence: Exact, Confirmed, and Scientifically Documented

What Is the MOTS-c Peptide Sequence?

The MOTS-c peptide sequence consists of 16 amino acids arranged in a precise, biologically active order. This sequence is encoded by an open reading frame within the 12S ribosomal RNA gene of the human mitochondrial genome a finding that surprised the scientific community when it was first reported, since that region of mtDNA was long assumed to be non-coding.

This is the MOTS-c exact amino acid sequence as published in peer-reviewed literature and as it should appear confirmed by mass spectrometry in the certificate of analysis for any research-grade vial. If a vendor's documentation describes a sequence that deviates from this, the compound is not authentic MOTS-c.

The MOTS-c Amino Acid Sequence Exact: Position-by-Position Breakdown

Understanding what each residue in the MOTS-c amino acid sequence exact contributes gives researchers a clearer picture of why sequence integrity matters as much as purity percentage.

Position 1 — Methionine (M) The N-terminal methionine is the starting point of the chain. Methionine residues are sulfur-containing and susceptible to oxidation during storage or handling. Oxidized methionine changes the peptide's charge profile and can reduce bioactivity in cell-based assays. This is one reason proper lyophilization and cold storage are non-negotiable for MOTS-c.

Position 2 — Arginine (R) The first of three arginine residues in the sequence. Arginine is positively charged at physiological pH, and its presence early in the chain contributes to the peptide's overall charge distribution and solubility behavior.

Position 3 — Tryptophan (W) The single tryptophan residue is the bulkiest amino acid in the sequence and contributes to the peptide's hydrophobic character. Tryptophan is also the most UV-absorbent standard amino acid, which plays a role in how purity is assessed during HPLC analysis.

Position 4 — Glutamine (Q) A neutral, polar residue that contributes to the peptide's hydrogen bonding network and influences how the chain folds in aqueous solution.

Position 5 — Glutamic Acid (E) A negatively charged residue that partially offsets the cationic character of the surrounding arginine residues, contributing to the overall charge balance of the mid-chain region.

Position 6 — Methionine (M) The second methionine, again subject to oxidation risk during poor storage conditions. The presence of two methionines in the **MOTS-c amino acid**

sequence is one reason proper lyophilization and cold-chain handling are so critical to preserving compound integrity.

Position 7 — Glycine (G) The smallest amino acid, glycine introduces conformational flexibility into the chain. Its position at residue 7 allows the peptide to adopt the bend geometry needed for its downstream structural arrangement.

Positions 8 and 11 — Tyrosine (Y) The two tyrosine residues, spaced three positions apart, contribute to the aromatic character of the mid-chain region. Tyrosine residues can participate in hydrogen bonding and are sensitive to UV exposure — another argument for light-protective packaging.

Position 9 — Isoleucine (I) A branched-chain hydrophobic residue that contributes to the internal hydrophobic core of the folded peptide.

Position 10 — Phenylalanine (F) Another aromatic, hydrophobic residue. Together with tryptophan and the two tyrosines, phenylalanine completes an aromatic cluster that defines much of the peptide's structural rigidity in the central region.

Position 12 — Proline (P) Proline is structurally unique — its side chain loops back to bond with the backbone nitrogen, introducing a rigid kink in the chain. This proline at position 12 acts as a structural hinge, separating the aromatic mid-region from the highly basic C-terminal tail.

Position 13 — Arginine (R) The second arginine. Together with the lysine at position 14 and the arginine at position 16, this creates a strongly cationic C-terminal segment that facilitates nuclear localization — the key mechanism by which MOTS-c travels from the mitochondria into the nucleus to engage gene regulatory regions.

Position 14 — Lysine (K) Lysine carries a positive charge at physiological pH and contributes to the nuclear targeting signal formed by residues 12–16. This cluster of basic residues is structurally analogous to nuclear localization sequences found in other nuclear-targeted proteins.

Position 15 — Leucine (L) A hydrophobic residue that helps anchor the C-terminal tail's conformation while the surrounding charged residues interact with cellular structures.

Position 16 — Arginine (R) The third and final arginine, completing the basic C-terminal cluster. This residue is critical to MOTS-c's nuclear entry and its downstream engagement with gene promoter regions in the nucleus.

Why the Exact Sequence Matters in a Research Context

The MOTS-c exact amino acid sequence is not merely a product specification it is the molecular identity of the compound. A peptide that is missing a single residue, has one residue substituted for another, or contains a racemized amino acid may have an identical or near-identical

molecular weight to authentic MOTS-c while behaving completely differently in a biological assay.

This is why mass spectrometry alone is insufficient for full sequence verification, and why researchers working with MOTS-c in publications or institutional studies should seek suppliers who can provide amino acid analysis or peptide mapping alongside standard HPLC and MS confirmation.

What "Lab Tested" Should Mean — and Frequently Doesn't

The Gap Between "Lab Tested" Claims and Reality

Every peptide vendor in the market uses some version of the phrase [MOTS-c lab tested](#). The problem is that the phrase carries no enforced standard. Technically, even a single internal purity measurement by the manufacturer's own technician qualifies as "lab tested" and that in-house test carries an obvious conflict of interest.

MOTS-C LAB TESTED

PREMIUM RESEARCH PEPTIDE

QUALITY • PURITY • TRANSPARENCY

LAB TESTED **PREMIUM QUALITY** **RESEARCH GRADE** **CERTIFICATE OF ANALYSIS**

RIGOROUSLY TESTED FOR:

- ✓ Purity & Identity (HPLC & MS)
- ✓ Peptide Content
- ✓ Water Content
- ✓ Endotoxin Level
- ✓ Appearance
- ✓ Solubility

THIRD-PARTY TESTED **HIGH PURITY** **CONSISTENT QUALITY** **RESEARCH USE ONLY**

LAB TESTED

CERTIFICATE OF ANALYSIS

AGELESS VITALITY PEPTIDES

CERTIFICATE OF ANALYSIS

Product Name: MOTS-C
CAS Number: N/A
Molecular Weight: 1018.18 g/mol
Molecular Formula: $C_{49}H_{74}N_{10}O_{13}$
Sequence: MEQQRSSRRRGPWQGLRS

TEST	SPECIFICATION	RESULT
Appearance	White powder	Conforms
Purity (HPLC)	≥ 98.0%	99.35%
Identity (MS)	Conforms	Conforms
Peptide Content	≥ 95.0%	97.41%
Water Content (K.F.)	≤ 8.0%	4.2%
Solubility	Conforms	Conforms
Endotoxin (LAL)	≤ 1.0 EU/mg	< 0.1 EU/mg

Result: The product meets the specifications.
For Research Use Only. Not for Human Consumption.

QC Manager

QUALITY APPROVED

TRANSPARENCY YOU CAN TRUST
Every batch comes with a detailed Certificate of Analysis.
Quality. Every Batch. Every Time.

For researchers who need to trust their materials, the distinction that actually matters is not whether testing was done, but who did it, what they tested for, and whether the results are genuinely accessible.

Genuine **MOTS-c lab tested** material satisfies three conditions:

Independence. Testing is performed by a laboratory with no financial relationship to the manufacturer or vendor. The analyst has no incentive to report favorable results.

Comprehensiveness. The testing covers identity (mass spectrometry), purity (HPLC), and where relevant, contaminant screening (endotoxin, residual solvents). A test that only confirms approximate molecular weight without a purity percentage is not a complete quality assessment.

Accessibility. The results are available to researchers before purchase, tied to the specific batch being sold, and formatted as a formal analytical report — not a verbal assurance or a summary paragraph on a product page.

At [Ageless Vitality Peptides](#), our MOTS-c 10mg is tested by **BioRegen**, an independent third-party analytical laboratory, to a confirmed purity of **≥99% by HPLC**. That report is not locked behind a support request; it lives in our public COA Vault, where any researcher can review it before placing an order.

Reading the MOTS-c Certificate of Analysis: A Researcher's Walkthrough

What a Complete MOTS-c Certificate of Analysis Contains

A **MOTS-c certificate of analysis** is an analytical laboratory's formal written output confirming the identity, purity, and quality of a specific batch of material. Understanding how to read one — and what to look for when something's missing — is a skill that pays dividends across every peptide purchase a researcher makes.

Here is what every section of a complete CoA communicates:

Product identification block. Compound name, lot or batch number, synthesis date, and (ideally) a retest or expiry date. This block links the document to a specific production batch. If the lot number doesn't match what's printed on your vial, the CoA doesn't describe your product.

Purity by HPLC. Expressed as a percentage with a chromatogram. This figure tells you how much of the total material is the target compound versus process-related impurities, degradation products, or synthesis byproducts. For research use, the accepted floor is ≥98%; Ageless Vitality Peptides' MOTS-c is confirmed at **≥99%**, setting a higher standard that supports more rigorous assay work.

Molecular weight by mass spectrometry. The observed mass should match the theoretical mass derived from the **MOTS-c amino acid sequence** approximately 2,174.6 Da (daltons). The CAS number for MOTS-c is **1627580-64-6**, which should also appear in the identification section of a thorough report.

Appearance confirmation. Physical description of the material as received typically a white to off-white lyophilized powder. This confirms the material was properly freeze-dried and arrived in the expected physical state.

Testing laboratory identification. The name of the independent laboratory that conducted the analysis. For Ageless Vitality Peptides, this is BioRegen visible on every CoA in our vault.

Analyst signature and date. Confirms that a named analyst reviewed and certified the results, and that the testing was conducted at a documented point in time.

Where to Find the Ageless Vitality Peptides COA

Unlike many vendors who provide CoA documentation only upon request sometimes after purchase, sometimes not at all Ageless Vitality Peptides maintains a fully public COA Vault where every batch report is accessible to researchers at any time.

The vault currently includes confirmed CoA reports for MOTS-c 10mg, alongside documentation for [GHK-Cu](#), [NAD+ 500mg](#), [HCG 5000IU](#), [Melanotan II 10mg](#), [IGF-1 LR3 1mg](#), [AOD 9604](#), and other compounds from our research grade peptides for sale catalog. Every report is batch-specific and issued by BioRegen as an independent testing laboratory.

Researchers can visit the COA Vault directly to review documentation before placing any order.

What Makes Ageless Vitality Peptides Different

A Site Built Around Research Accountability

[Ageless Vitality Peptides](#) was founded on a straightforward premise: researchers deserve to know exactly what they're ordering, from a supplier they can hold accountable. That means:

≥99% HPLC purity on MOTS-c — not the 95–98% range commonly listed by less rigorous suppliers, but a documented analytical result above the standard floor.

Public CoA documentation — available to every visitor, not just paying customers. The COA Vault is open, searchable, and updated as new batches are tested.

BioRegen third-party testing — independent of our own supply chain, with no incentive to inflate results.

VitalPrep Sterile Reconstitution Solution — available alongside MOTS-c for researchers who need a properly prepared reconstitution vehicle. Our VitalPrep Sterile Solution is designed specifically to pair with lyophilized peptides like MOTS-c, supporting clean, contamination-free preparation.

Free domestic shipping on orders over \$150 — covering the continental United States, with temperature-appropriate packaging.

Multiple payment options — Credit, debit, and Zelle accepted for straightforward, accessible ordering.

MOTS-c in the Context of Ageless Vitality Peptides' Research Catalog

MOTS-c sits within a broader catalog of research-grade compounds that Ageless Vitality Peptides makes available to the research community. Understanding how it relates to other available compounds helps researchers design more comprehensive investigational programs.

[GHK-Cu](#) is a copper-binding tripeptide studied for its effects on tissue regeneration, collagen production, and anti-inflammatory signaling. Where MOTS-c targets mitochondrial metabolic signaling, GHK-Cu operates through extracellular matrix interactions and growth factor upregulation — a different but often complementary domain in age-related biology research.

[NAD+ 500mg](#) addresses mitochondrial function at the coenzyme level. NAD⁺ is required for the electron transport chain and serves as a substrate for sirtuin deacetylases involved in cellular aging. Researchers studying mitochondrial health alongside MOTS-c frequently incorporate NAD⁺ as a parallel variable, since the two operate through related but distinct mechanisms.

[AOD 9604](#) is investigated for its lipolytic effects on adipose tissue through beta-3 adrenergic and growth hormone receptor pathways. Researchers studying body composition and fat metabolism may find it a useful comparator or complement to MOTS-c's AMPK-mediated effects on glucose handling and lipogenesis.

[IGF-1 LR3 1mg](#) targets the insulin-like growth factor receptor system, influencing anabolic signaling, cellular proliferation, and nutrient uptake in muscle and connective tissue. For researchers interested in age-related changes across both metabolic and anabolic biology, it offers a distinct mechanistic lens alongside MOTS-c. Our [IGF-1 LR3 before and after](#) resource provides research-context detail.

For programs involving neural biology and cognitive resilience, [Semax 10mg](#) is an ACTH-derived neuropeptide studied for BDNF modulation and neuroprotection in ischemic models. Our dedicated [Semax peptide for research](#) page and [Semax peptide benefits](#) article offer full background for researchers new to this compound.

Researchers interested in growth hormone secretagogue biology will find our [CJC-1295 Ipamorelin research guide](#) a thorough reference for this widely studied combination, which works through pituitary pathways distinct from MOTS-c's mitochondrial mechanism but frequently appears in overlapping research programs.

[HCG 5000IU](#) and [Melanotan II 10mg](#) round out the catalog for researchers with interests in hormonal biology and melanocortin receptor research respectively both backed by the same BioRegen testing documentation visible in the [COA Vault](#).

Conclusion:

Knowing the MOTS-c amino acid sequence exact and knowing how to read a [MOTS-c certificate of analysis](#) are not separate skills they work together. The sequence tells you what authentic MOTS-c should be. The CoA tells you whether the material in your vial actually is it. Both pieces of information are necessary, and neither substitutes for the other.

At [Ageless Vitality Peptides](#), we have removed the friction from both. The science is documented here. The third-party testing is public in our [COA Vault](#). The MOTS-c product page has current pricing, availability, and specifications all confirmed to ≥99% HPLC purity by BioRegen.

If you are ready to order, or simply want to review the documentation before you decide, both are a single click away.

Frequently Asked Questions

What is the MOTS-c peptide sequence?

The MOTS-c peptide sequence is MRWQEMGYIFYPRKLR in single-letter amino acid notation — a 16-residue chain encoded by the 12S ribosomal RNA gene within human mitochondrial DNA. This sequence is the molecular identity of MOTS-c and should be confirmed by mass spectrometry in any legitimate certificate of analysis.

What is the MOTS-c amino acid sequence in full?

The MOTS-c amino acid sequence in three-letter code is: Methionine – Arginine – Tryptophan – Glutamine – Glutamic Acid – Methionine – Glycine – Tyrosine – Isoleucine – Phenylalanine – Tyrosine – Proline – Arginine – Lysine – Leucine – Arginine. This sequence has a molecular weight of approximately 2,174.6 Da and CAS number 1627580-64-6.

What is the MOTS-c exact amino acid sequence used for in quality verification?

The MOTS-c exact amino acid sequence serves as the reference point against which mass spectrometry results in a CoA are compared. A confirmed mass matching the theoretical value derived from this 16-residue sequence verifies that the compound is authentic MOTS-c, not a related peptide, degradation product, or mislabeled substitute.

What does MOTS-c lab tested mean at Ageless Vitality Peptides?

At Ageless Vitality Peptides, MOTS-c lab tested means each batch has been independently analyzed by BioRegen — a third-party laboratory unaffiliated with our company confirming HPLC purity at ≥99% and molecular identity via mass spectrometry. Reports are available publicly in our COA Vault.

Where can I find the MOTS-c certificate of analysis before buying?

The MOTS-c certificate of analysis from BioRegen is available in the [COA Vault](#) at Ageless Vitality Peptides — publicly accessible before purchase, not locked behind a support request. Researchers can review the full report including HPLC chromatogram and mass spectrometry data prior to ordering.

Why does the MOTS-c amino acid sequence exact matter for research integrity?

The MOTS-c amino acid sequence exact matters because even a single incorrect, missing, or chemically modified residue can alter the peptide's folding, charge profile, and biological activity in ways that make experimental results unreliable. Confirming sequence accuracy through CoA documentation before use protects the integrity of any data generated with the compound.

What purity level does Ageless Vitality Peptides' MOTS-c reach?

Ageless Vitality Peptides' MOTS-c 10mg is confirmed at ≥99% purity by HPLC, independently verified by BioRegen. This exceeds the standard 98% floor commonly cited in the research peptide industry and is documented in the batch-specific report available in the [COA Vault](#).

What is the MOTS-c amino acid sequence CAS number?

The CAS number for MOTS-c is 1627580-64-6. This registry number can be used to cross-reference the compound in chemical databases and should appear in the identification block of any complete certificate of analysis for authentic MOTS-c.

Is MOTS-c suitable for research use only?

Yes. MOTS-c is a research chemical intended strictly for laboratory and preclinical investigation. It is not approved by the FDA for human or veterinary therapeutic use and must be used in compliance with applicable institutional oversight and regulatory guidelines. All products at [Ageless Vitality Peptides](#) are labeled accordingly.