

PATIENT REFERENCE COLLECTION

TABLE OF CONTENTS

40 individual sheets | Alphabetical index

Click a title to open its sheet, or use the PDF bookmarks.

REFERENCE SHEET	PAGE	REFERENCE SHEET	PAGE
5-Amino-1MQ	2	Melanotan I	22
AHK-Cu	3	Melanotan II	23
AOD-9604	4	MOTS-c	24
BPC-157	5	NAD+	25
BPC-157 + TB-500 Blend	6	Pinealon	26
Cerebrolysin	7	PT-141	27
CJC-1295	8	Retatrutide	28
CJC-1295 + Ipamorelin	9	Selank	29
DSIP	10	Semaglutide	30
Epitalon	11	Semax	31
FOXO4-DRI	12	Sermorelin	32
GHK-Cu	13	SLU-PP-332	33
Glow Blend	14	Snap-8	34
Glutathione	15	SS-31	35
IGF-1 LR3	16	TB-500	36
Ipamorelin	17	Tesamorelin	37
Kisspeptin	18	Thymalin	38
KLOW Blend	19	Thymosin Alpha-1	39
KPV	20	Tirzepatide	40
LL-37	21	VIP	41

HOW TO USE THIS COLLECTION

Each sheet includes research highlights, evidence context and selected sources.
For education; research findings do not establish suitability for patient treatment.

PATIENT REFERENCE / PEPTIDE SCIENCE

5-AMINO-1MQ

NNMT inhibition • Fat-cell biology • Metabolic research

RESEARCH SPOTLIGHT | METABOLIC PATHWAYS & FAT-CELL BIOLOGY

WHAT IS 5-AMINO-1MQ?

5-Amino-1MQ is a small-molecule research compound, not a peptide. It inhibits nicotinamide N-methyltransferase (NNMT), an enzyme that processes nicotinamide, a form of vitamin B3. Researchers use it to explore how this pathway affects fat cells and metabolism. [1]

THE NNMT CONNECTION

NNMT links nicotinamide metabolism with cellular methyl-group use. Blocking this enzyme can change related metabolites. Laboratory work with 5-Amino-1MQ examined NAD⁺ and methyl-donor pathways in fat cells, offering insight into how metabolic resources are regulated. [1]

FAT-CELL & BODY-WEIGHT RESEARCH

An early study reported reduced body weight, fat-pad size and fat-cell size in mice with diet-induced obesity, without a significant change in food intake. These animal findings explain interest in NNMT inhibition as a metabolic research target. [1]

WHY RESEARCHERS ARE INTERESTED

The research asks whether changing an enzyme pathway can influence fat storage alongside diet. A later mouse study investigated 5-Amino-1MQ with a dietary change, examining body composition and the gut microbiome together. [2]

PRIMARY RESEARCH AREAS

- NNMT activity and nicotinamide metabolism
 - Fat-cell development and lipid storage
 - Body weight and fat mass in mouse models
 - Diet-associated gut microbiome changes
- These are investigation areas, not established benefits in patients. [1, 2]

DIET & MICROBIOME FINDINGS

In mice with diet-induced obesity, switching diets and adding NNMT inhibition influenced body weight, fat mass and gut microbial patterns. The study explores interactions between diet and the compound; it does not prove that a particular microbiome change benefits people. [2]

WHAT DOES THE EVIDENCE ESTABLISH?

The cited evidence comes from cells and mice. It supports further investigation, but does not establish reliable human weight loss, muscle preservation or diabetes treatment. Animal results cannot predict a patient's response, and human clinical effectiveness remains unestablished. [1, 2]

QUALITY & SAFETY CONTEXT

Human side effects, interactions and long-term safety remain unestablished. Batch testing helps verify identity and purity; it does not establish human suitability. Synapse products are for research use only. [1-3]

THE TAKEAWAY

5-Amino-1MQ offers a way to study NNMT and metabolic regulation. Promising animal findings require human validation. Synapse products are for laboratory research only, not human use.

SELECTED SOURCES • Reviewed October 7, 2026

- [1] Selective NNMT inhibitors in cells and diet-induced obese mice, 2018. PMID:29155147
[2] Reduced-calorie diet, NNMT inhibition and the mouse microbiome, 2022. PMID:35013352
[3] Synapse Peptide Sciences: synapsepeptidesciences.com — product listing & research-use terms

PATIENT REFERENCE / PEPTIDE SCIENCE

AHK-Cu

Copper-peptide biology • Hair follicles • Skin-cell research

RESEARCH SPOTLIGHT | THE CELLULAR ENVIRONMENT OF HAIR FOLLICLES

WHAT IS AHK-Cu?

AHK-Cu is a complex of copper with the three-amino-acid peptide alanine-histidine-lysine. Researchers use it to investigate copper-peptide interactions and cellular processes relevant to hair follicles and skin. [1]

THE HAIR-FOLLICLE CONNECTION

Dermal papilla cells at the follicle base help regulate hair growth. Isolated human follicle experiments show that contact with surrounding hair-producing cells is important, making the dermal papilla a research target. [2]

WHY RESEARCHERS ARE INTERESTED

A 2007 study reported increased growth of cultured dermal papilla cells and elongation of isolated human follicles exposed to AHK-Cu. These findings provide a biological rationale for further hair research; they do not establish regrowth in people using a finished product. [3]

PRIMARY RESEARCH AREAS

- Dermal papilla cell growth and signaling
 - Hair-follicle elongation in tissue models
 - Cell-survival pathways
 - Copper-peptide and skin-cell interactions
- These are areas of investigation, not established benefits of a commercial research vial. [1, 3]

WHAT DOES THE STUDY SHOW?

The experiment measured cell-survival proteins. Some markers shifted favorably, but the reduction in apoptotic (dying) cells was not statistically significant. This limits claims that AHK-Cu reliably prevents follicle-cell death. [3]

WHAT ABOUT HUMAN RESULTS?

The best-known study used human tissue outside the body and cultured cells. That is different from treating patients. Reliable clinical evidence for AHK-Cu improving hair density, reversing pattern hair loss or reducing wrinkles remains limited; a response timeline is not established. [3]

SKIN & COPPER-PEPTIDE RESEARCH

AHK-Cu is studied in cellular and extracellular-matrix research. The matrix is the supportive material around cells. Findings about other copper peptides or multi-ingredient cosmetics cannot automatically be attributed to AHK-Cu; the exact compound and formulation matter. [1]

QUALITY & SAFETY CONTEXT

Synapse lists third-party testing and batch Certificates of Analysis. Verify exact batch identity and purity. Human side-effect rates, interactions and long-term safety are not established. Testing does not establish suitability for human use. [1]

THE TAKEAWAY

AHK-Cu is a research focus for hair-follicle and skin-cell biology. Synapse products are for laboratory research only, not for use in or on humans. [1]

SELECTED SOURCES • Reviewed October 7, 2026

- [1] synapsepeptidesciences.com/product/ahk-cu/ — product description, testing and research-use terms
[2] Human follicle/dermal papilla culture study, 1990. PMID:2094744
[3] Pyo et al., The effect of tripeptide-copper complex on human hair growth in vitro, 2007. PMID:17703734

AOD-9604

Fat metabolism • Lipolysis • Body-composition research

RESEARCH SPOTLIGHT | FAT METABOLISM & ENERGY USE

WHAT IS AOD-9604?

AOD-9604 is a synthetic peptide based on a modified portion of human growth hormone (GH). It was developed to investigate fat-metabolism effects separately from the broader growth-promoting actions of full-length GH. [1]

HOW IS IT BEING STUDIED?

Researchers have explored lipolysis, the breakdown of stored fat, and fat oxidation, the use of fat for energy. Animal experiments found increased fat oxidation and reduced weight gain in obese mice. These findings provide a research rationale, not a proven human outcome. [1]

WHY RESEARCHERS ARE INTERESTED

The idea of influencing fat metabolism without reproducing all of GH's effects attracted interest in AOD-9604. Preclinical work suggests it does not act like full-length GH at the GH receptor; this does not establish that it is risk-free. [1]

PRIMARY RESEARCH AREAS

- Fat-cell metabolism and lipolysis
- Fat oxidation and energy balance
- Body weight in obesity models
- GH-fragment structure and activity

AOD-9604 is not an established appetite suppressant or a treatment for targeted fat loss.

THE TAKEAWAY

AOD-9604 remains a research compound for fat-metabolism questions. Synapse products are for laboratory research only, not for use in or on humans. [4]

WHAT DO HUMAN STUDIES SHOW?

Human obesity trials have been conducted. FDA's review describes a large placebo-controlled trial that found no significant weight-loss difference between AOD-9604 and placebo. Clinical effectiveness for weight loss has therefore not been established. [2]

COMMONLY DISCUSSED COMBINATIONS

AOD-9604 is sometimes grouped with GH-pathway or metabolic compounds in body-composition discussions. The proposed rationale involves different aspects of metabolism. Studies have not established added benefit or safety for these combinations.

QUALITY & TRANSPARENCY

Synapse lists AOD-9604 in its catalog and states U.S.-based manufacturing/testing, 99%+ purity and batch COA availability. Verify the testing documented for the exact product and batch. Analytical quality does not establish clinical effectiveness. [4]

EVIDENCE & CONSIDERATIONS

AOD-9604 is not FDA-approved. FDA notes limited safety information, possible immune reactions and peptide-impurity concerns. Serious adverse events have been reported with uncertain causality. Long-term safety and medication interactions remain incompletely understood. [3]

SELECTED SOURCES • Reviewed October 1, 2026

[1] Heffernan et al., 2001. PMID:11673763 • [2] FDA PCAC, Dec. 2024. /media/183891/download

[3] FDA: bulk substances safety risks (AOD-9604 entry)

[4] synapsepeptidesciences.com — homepage and catalog

PATIENT REFERENCE / PEPTIDE SCIENCE

BPC-157

Tissue repair • Recovery • Inflammatory signaling

RESEARCH SPOTLIGHT | TISSUE BIOLOGY & PROTECTIVE SIGNALING

WHAT IS BPC-157?

BPC-157 (Body Protection Compound-157) is a synthetic peptide made of 15 amino acids. Researchers are exploring how it influences the cellular signals involved in tissue repair and protection.

WHY RESEARCHERS ARE INTERESTED

Repair involves coordinated activity among cells, blood vessels and the surrounding tissue. Laboratory and animal findings suggest BPC-157 may influence several parts of this process, making it a subject of interest in recovery research.

PRIMARY RESEARCH AREAS

- Tendon, ligament and muscle injury models
- Wound healing and tissue remodeling
- Blood-vessel formation and signaling
- Gut lining and inflammatory injury models

These topics describe areas of investigation rather than established treatment uses.

A CLOSER LOOK AT CELL SIGNALING

In a laboratory tendon-cell study, BPC-157 supported cell migration and survival under stress. Researchers observed activation of FAK/paxillin signaling, a pathway involved in how cells attach and move during tissue repair. [1]

EARLY HUMAN RESEARCH

A small retrospective knee-pain study reported symptom improvement in some participants. This is an early signal worth investigating, but the study had no placebo group and relied on patient reports. Controlled trials are needed to determine whether BPC-157 produces meaningful clinical benefits. [2]

COMMONLY DISCUSSED COMBINATION

BPC-157 + TB-500 is discussed in tissue-repair research because the compounds may influence complementary cellular processes. That is a mechanistic rationale; clinical studies have not established that the combination works better than either compound alone.

QUALITY & TRANSPARENCY

Synapse states U.S.-based manufacturing/testing and 99%+ purity. Its BPC-157/TB-500 blend page describes four analytical checks: purity, net content, identity and endotoxins. Review the certificate of analysis (COA) for the exact product and batch. Analytical quality does not establish clinical safety or effectiveness. [4]

EVIDENCE & CONSIDERATIONS

Evidence is primarily preclinical, with limited human data. BPC-157 is not FDA-approved. Long-term safety and interactions remain uncertain; FDA notes possible immune reactions and peptide-impurity concerns. [3]

THE TAKEAWAY

BPC-157 is being studied for tissue-repair and protective signaling. Synapse products are for laboratory research only, not for use in or on humans. [4]

SELECTED SOURCES • Reviewed October 1, 2026

[1] Chang et al., 2011. doi:10.1152/japplphysiol.00945.2010 • [2] Lee & Padgett, 2021. PMID:34324435

[3] FDA: "Certain Bulk Drug Substances...Significant Safety Risks" (BPC-157 entry)

[4] synapsepeptidesciences.com — homepage and /product/bpc-157-tb-500/

PATIENT REFERENCE / PEPTIDE SCIENCE

BPC-157 + TB-500

Peptide blend • Tendon biology • Tissue-repair research

RESEARCH SPOTLIGHT | TENDON RESPONSES & CONNECTIVE-TISSUE BIOLOGY

WHAT IS THIS BLEND?

This laboratory formulation combines BPC-157 and TB-500, two compounds investigated in tissue-related research. Synapse supplies it for laboratory use. Combining them allows study of joint responses, but does not establish a treatment benefit. [1]

BPC-157: CELLULAR RESPONSES

BPC-157 research in rat tendon cells examined cell movement, spreading and survival under stress. A laboratory study found increased fibroblast migration and tendon-explant outgrowth. These findings help explain interest in the cells involved in connective-tissue repair. [2]

TB-500: TENDON RESEARCH

A 2026 rat Achilles-tendon study tested BPC-157, a preparation described as synthetic thymosin beta-4 (TB-500), and their combination. The TB-500 group showed improved tendon architecture and a statistically significant increase in load to failure versus controls. [3]

WHY RESEARCHERS ARE INTERESTED

The blend brings two experimental approaches into one formulation. Researchers can compare tendon structure, collagen organization and mechanical strength. Product identity matters: evidence for a specific thymosin preparation cannot automatically be applied to every vial labeled TB-500. [1, 3]

PRIMARY RESEARCH AREAS

- Tendon-cell migration and stress responses
 - Collagen organization and tissue architecture
 - Mechanical strength in animal tendon models
 - Combined versus individual peptide activity
- These are research areas, not proven benefits. [2, 3]

WHAT ABOUT COMBINED BENEFITS?

The rat study reported favorable findings for selected tissue measures, but the combination did not provide additional benefit over the individual agents. Complementary research interests are a rationale for testing a blend; they are not evidence of established synergy. [3]

WHAT DOES THE EVIDENCE ESTABLISH?

The cited repair evidence is preclinical. Reliable human trials of this exact blend are lacking. Faster injury recovery, pain relief and improved sports performance are not established outcomes. Animal tissue findings cannot predict a patient's response. [2-4]

QUALITY & SAFETY CONTEXT

FDA identifies limited human safety data and potential immune-reaction risks for BPC-157 and thymosin beta-4 fragments. Blend interactions and long-term safety remain unestablished. Verify ingredients and batch documents. Testing cannot establish human suitability. [1, 4]

THE TAKEAWAY

BPC-157 + TB-500 offers a way to investigate tissue responses together. Human benefits and added combination effects remain unestablished. Synapse products are not for human use.

SELECTED SOURCES • Reviewed October 8, 2026

[1] synapsepeptidesciences.com/product/bpc-157-tb-500/ — composition & research-use terms

[2] Tendon-cell/explant study, 2011. PMID:21030672 • [3] Rat Achilles-tendon comparison, 2026. PMID:42542926

[4] FDA: Certain Bulk Drug Substances for Use in Compounding that May Present Significant Safety Risks ([fda.gov](https://www.fda.gov))

CEREBROLYSIN

Peptide mixture • Neural-cell biology • Recovery research

RESEARCH SPOTLIGHT | NEUROLOGICAL RECOVERY & CELLULAR RESPONSES

WHAT IS CEREBROLYSIN?

Cerebrolysin is a mixture of small peptides and amino acids produced from processed porcine brain proteins. It is not a single defined peptide. Its clinical and laboratory research explores neural-cell responses and recovery after neurological injury. [1, 2]

NEURAL-CELL RESEARCH

Cell-culture studies have examined neuronal processes and protection under experimental stress. These findings support interest in neurotrophic activity: biological signals related to nerve-cell growth and maintenance. Laboratory effects do not establish nerve regeneration or cognitive improvement in patients. [1]

STROKE-RECOVERY FINDINGS

The CARS randomized trial reported improved arm-function scores after stroke when Cerebrolysin was used with rehabilitation. This is an encouraging result for a specific recovery outcome and protocol, rather than proof that every stroke patient will benefit. [2]

WHY RESEARCHERS ARE INTERESTED

Research connects experimental neural-cell responses with practical measures such as movement and daily function. Studies ask whether adding a biological treatment to structured rehabilitation can influence recovery. Cerebrolysin is not a substitute for emergency stroke care or rehabilitation. [1, 2]

PRIMARY RESEARCH AREAS

- Neural-cell survival and process growth
 - Arm and motor function after stroke
 - Recovery alongside rehabilitation
 - Formulation-specific neurological outcomes
- These are study areas, not guaranteed outcomes. [1-3]

HOW TO INTERPRET THE EVIDENCE

Clinical findings are mixed. A separate large Asian acute-stroke trial found a neutral result on its main combined outcome. Differences in timing, patients, rehabilitation and endpoints matter. A positive arm-function study does not establish improved survival or universal recovery. [2, 3]

PRODUCT & CLINICAL CONTEXT

Cerebrolysin is used as a prescription medicine in some countries but is not FDA-approved in the United States. Synapse offers a research preparation. Its composition and clinical equivalence cannot be assumed from the name alone or from studies of a manufactured medicine. [4-6]

QUALITY & SAFETY CONTEXT

Manufacturer contraindications include epilepsy, severe renal impairment and component hypersensitivity. Trial safety data concern the product studied. Research-product testing cannot establish clinical equivalence, sterility or human suitability. [4, 6]

THE TAKEAWAY

Cerebrolysin has neurological research with encouraging findings and important uncertainties. Clinical data cannot be transferred to research vials. Synapse products are not for human use.

SELECTED SOURCES • Reviewed October 8, 2026

- [1] Neuronal-culture study, 2001. PMID:11459078 • [2] CARS, 2016. PMID:26564102 • [3] CASTA, 2012. PMID:22282884
[4] EVER Neuro Pharma product monograph, 2021: cerebrolysin.com • [5] FDA/TMC unapproved-drug case, 2021: fda.gov
[6] synapsepeptidesciences.com/product/cerebrolysim-60mg/ — research preparation & terms

PATIENT REFERENCE / PEPTIDE SCIENCE

CJC-1295

GHRH signaling • GH and IGF-1 • Long-acting research formulation

RESEARCH SPOTLIGHT | GHRH SIGNALING & HUMAN HORMONE RESEARCH

WHAT IS CJC-1295?

CJC-1295 is a synthetic analogue of growth hormone-releasing hormone (GHRH). It stimulates GH release. These human studies tested the albumin-binding, long-acting form commonly called CJC-1295 with DAC. [1, 2]

HOW THE SIGNAL WORKS

GHRH signaling prompts the pituitary to release growth hormone, which helps regulate IGF-1 production. CJC-1295 research examines how extending that signal changes the hormone response. It stimulates an endocrine pathway rather than supplying growth hormone directly. [1, 2]

HUMAN HORMONE RESEARCH

Early randomized trials in healthy adults found sustained increases in GH and IGF-1 after the long-acting compound. Its estimated half-life was approximately six to eight days. These results describe the formulation studied, not every product bearing the CJC name. [1]

WHY RESEARCHERS ARE INTERESTED

A human study found that GH pulses persisted during prolonged stimulation. This helps explain how extended GHRH activity interacts with hormone rhythms, without establishing recovery or anti-aging benefits. [2]

PRIMARY RESEARCH AREAS

- GHRH-receptor and pituitary signaling
 - GH and IGF-1 responses over time
 - Hormone pulses during prolonged stimulation
 - Formulation-dependent duration of action
- These are study outcomes, not proven wellness benefits. [1, 2]

FORMULATION CHANGES THE TIMING

Products labeled “CJC-1295 without DAC” refer to a different, shorter-acting formulation. The multi-day findings on this sheet cannot be transferred to those products or their blends. Confirm the exact compound before applying any published timing claims. [1-3]

WHAT DOES THE EVIDENCE ESTABLISH?

Human studies demonstrate hormonal activity, but are limited in size and duration. They do not establish reliable benefits for muscle gain, fat loss, sleep, injury recovery or healthy aging. Increased GH or IGF-1 alone is not a meaningful patient outcome. [1-3]

QUALITY & SAFETY CONTEXT

FDA identifies limited clinical safety data, potential immune-reaction risks and reported serious events including increased heart rate and systemic blood-vessel dilation. Long-term safety remains uncertain. Research-product purity cannot establish human suitability. [3]

THE TAKEAWAY

CJC-1295 research shows that formulation can strongly affect GH and IGF-1 timing. Hormonal activity does not establish clinical benefit. Research-grade products are not for human use.

SELECTED SOURCES • Reviewed October 8, 2026

- [1] Long-acting CJC-1295 human trials, 2006. PMID:16352683 • [2] GH pulsatility study, 2006. PMID:17018654
[3] FDA: Certain Bulk Drug Substances for Use in Compounding that May Present Significant Safety Risks;
FDA CJC-1295 Pharmacy Compounding Advisory Committee briefing, December 2024 (fda.gov)

PATIENT REFERENCE / PEPTIDE SCIENCE

CJC-1295 + IPAMORELIN

Growth-hormone signaling • Body-composition research

RESEARCH SPOTLIGHT | GROWTH HORMONE & IGF-1 PATHWAYS

WHAT IS THIS COMBINATION?

CJC-1295 and ipamorelin are synthetic peptides studied for stimulating the body's release of growth hormone (GH). They target different receptors, which is why they are often discussed together in hormone-signaling research.

HOW THE PATHWAYS WORK

CJC-1295: acts through the growth hormone-releasing hormone (GHRH) receptor.

Ipamorelin: activates the ghrelin/GH-secretagogue receptor.

Both pathways can influence pituitary GH release. GH also promotes production of insulin-like growth factor-1 (IGF-1). [1, 2]

WHY RESEARCHERS ARE INTERESTED

GH and IGF-1 participate in protein turnover, growth and metabolism. This biology drives interest in muscle and body composition, but a change in hormone levels does not by itself demonstrate improved strength, recovery or fat loss.

WHY COMBINE THEM?

Two receptor pathways offer a rationale for studying combined GH responses. Added clinical benefits over either peptide alone remain unproven.

WHAT DO HUMAN STUDIES SHOW?

Controlled studies of long-acting CJC-1295 in healthy adults found increases in GH and IGF-1. Those studies evaluated hormone responses, not a CJC-1295/ipamorelin muscle-building program. Ipamorelin has also demonstrated GH release in human research. [1, 5]

TIMING & COMPLEMENTARY SIGNALS

In a human intravenous study, ipamorelin produced a GH peak at about 40 minutes, followed by a decline. CJC timing depends on its form: the long-acting DAC version increased GH for days. Different receptors and time courses explain the combination's research interest, but do not establish added clinical benefit. [1, 5]

QUALITY & TRANSPARENCY

Synapse states U.S.-based manufacturing/testing, 99%+ purity and batch COA availability. Confirm the exact CJC form, blend identity and applicable testing on the current product and batch documents. Analytical quality does not establish clinical effectiveness. [4]

EVIDENCE & CONSIDERATIONS

Neither peptide is FDA-approved. FDA notes limited safety data, possible immune reactions and reported serious adverse events; causality is uncertain for some reports. GH-related metabolic effects and long-term combination safety require further study. [3]

THE TAKEAWAY

Two pathways make this an interesting hormone-research combination. Synapse products are for laboratory research only, not for use in or on humans. [4]

SELECTED SOURCES • Reviewed October 1, 2026

[1] Teichman et al., 2006. PMID:16352683 • [2] Raun et al., 1998. PMID:9849822

[3] FDA: bulk substances safety risks (CJC-1295 and ipamorelin entries)

[4] synapsepeptidesciences.com (homepage) • [5] Gobburu et al., 1999. PMID:10496658

PATIENT REFERENCE / PEPTIDE SCIENCE

DSIP

Delta Sleep-Inducing Peptide • Sleep & stress research

RESEARCH SPOTLIGHT | SLEEP PATTERNS & NEUROENDOCRINE SIGNALING

WHAT IS DSIP?

DSIP stands for delta sleep-inducing peptide, also known as emideltide. It is a nine-amino-acid peptide first characterized in rabbit sleep experiments. Synthetic DSIP has since been studied in animals and small human trials. [1]

THE SLEEP CONNECTION

Its name comes from early experiments involving slow-wave brain activity. Human studies have examined sleep onset, time asleep, sleep efficiency and daytime function. The name itself does not establish that DSIP reliably increases deep sleep or treats insomnia. [1-4]

WHY RESEARCHERS ARE INTERESTED

DSIP offers a way to explore links between sleep and neuroendocrine signaling. An 11-person controlled study found reduced ACTH-like activity in blood, a marker related to stress signaling. Cortisol did not change, so this cannot be described as a demonstrated cortisol-lowering effect. [5]

PRIMARY RESEARCH AREAS

- Sleep onset and sleep efficiency
 - Sleep stages and nighttime awakenings
 - Daytime alertness and performance
 - ACTH-related neuroendocrine responses
- These are research topics, not established benefits of a commercial research vial. [2-5]

WHAT DOES HUMAN RESEARCH SHOW?

A 1987 double-blind study in 14 people with chronic insomnia reported improved sleep and daytime performance. In contrast, a 1992 study of 16 people found weak objective changes and no improvement in subjective sleep quality. Its authors judged major benefit unlikely. [2, 3]

WHAT ABOUT DEEP SLEEP?

A separate controlled insomnia study found no change in slow-wave sleep or REM sleep. Some sleep measures changed, but the authors considered the improvement of little clinical significance. Findings do not establish consistent deep-sleep enhancement. [4]

EVIDENCE & SAFETY CONTEXT

The human studies are small and mostly decades old. Long-term safety, medication interactions and effects across different routes remain uncertain. FDA notes insufficient safety information for proposed routes and potential immune reactions or peptide-quality concerns. [2-4, 6]

QUALITY & RESEARCH STATUS

Synapse states third-party testing and batch Certificates of Analysis for its research materials. Check the exact compound and batch documents. Testing does not establish human safety or effectiveness. Research materials are not for use in or on humans. [7]

THE TAKEAWAY

DSIP is an experimental peptide for sleep and neuroendocrine research. Synapse materials are for laboratory research only, not for use in or on humans. [7]

SELECTED SOURCES • Reviewed October 7, 2026

- [1] DSIP characterization, 1978. PMID:568769 • [2] Sleep trial, 1987. PMID:3622582
[3] Sleep trial, 1992. PMID:1299794 • [4] Controlled sleep study, 1987. PMID:3583493
[5] ACTH study, 1989. PMID:2554357 • [6] FDA: Bulk substances safety risks (Emideltide/DSIP)
[7] synapsepeptidesciences.com — testing and research-use terms

EPITALON

Telomere biology • Circadian rhythms • Aging research

RESEARCH SPOTLIGHT | CELLULAR AGING & BIOLOGICAL RHYTHMS

WHAT IS EPITALON?

Epitalon, also spelled Epithalon, is a synthetic four-amino-acid peptide: alanine, glutamate, aspartate and glycine (AEDG). It was developed in research on pineal-gland peptides and age-related changes in cellular and hormonal function. [1, 2]

THE TELOMERE CONNECTION

Telomeres protect chromosome ends; telomerase helps maintain them. A 2003 study reported increased telomerase activity and telomere length in cultured human fetal fibroblasts exposed to Epitalon. This was a cell experiment, not a human treatment trial. [1]

WHY RESEARCHERS ARE INTERESTED

Epitalon offers a way to explore two aspects of aging biology: cellular replication and daily hormonal rhythms. Work in older rhesus monkeys reported increased evening melatonin and changes in cortisol rhythms, prompting further investigation of pineal-related signaling. [2]

PRIMARY RESEARCH AREAS

- Telomerase activity and telomere maintenance
 - Replicative lifespan in cultured cells
 - Melatonin and circadian hormone patterns
 - Aging biomarkers and animal lifespan
- These are research topics, not established human treatment benefits. [1-3]

WHAT DOES LONGEVITY RESEARCH SHOW?

Animal findings vary. In one study of 108 female mice, Epitalon did not increase mean lifespan, although maximum lifespan and survival of the longest-lived subgroup increased. This does not establish longer life or slower aging in humans. [3]

WHAT ABOUT HUMAN EVIDENCE?

Older reports describe melatonin-related changes in people using pineal peptide preparations. Some involve Epitalon and some a different extract, Epithalamin. These reports do not establish that synthetic Epitalon improves sleep, reverses biological age or extends human lifespan. [4]

EVIDENCE & SAFETY CONTEXT

Epitalon is not FDA-approved. FDA notes insufficient safety information for proposed routes and possible immune reactions related to aggregation or peptide impurities. Reliable human side-effect rates, interactions and long-term safety are not established. [5]

QUALITY & RESEARCH STATUS

Synapse states third-party testing and batch Certificates of Analysis for its research materials. Verify the exact compound and batch documents. Purity testing does not establish clinical safety or effectiveness; research materials are not for use in or on humans. [6]

THE TAKEAWAY

Epitalon is an experimental peptide for telomere and circadian-rhythm research. Synapse materials are for laboratory research only, not for use in or on humans. [6]

SELECTED SOURCES • Reviewed October 7, 2026

- [1] Cell-culture telomerase study, 2003. PMID:12937682 • [2] Primate study, 2001. PMID:11524632
[3] Mouse aging study, 2003. PMID:14501183 • [4] Pineal peptide/human report, 2007. PMID:17969590
[5] FDA: Bulk substances safety risks (Epitalon) • [6] synapsepeptidesciences.com — testing & research terms

FOXO4-DRI

Senescent-cell biology • FOXO4-p53 signaling • Preclinical research

RESEARCH SPOTLIGHT | SENESCENT CELLS & TISSUE-FUNCTION RESEARCH

WHAT IS FOXO4-DRI?

FOXO4-DRI is an experimental peptide designed to disrupt an interaction between FOXO4 and p53, proteins involved in cell survival. Researchers investigate it as a senolytic: a compound intended to eliminate certain senescent cells. [1]

THE SENESCENT-CELL CONNECTION

Senescent cells have stopped dividing and can persist in tissues. The original study investigated how FOXO4 helps these cells resist programmed cell death. Disrupting its interaction with p53 promoted death of senescent cells under the tested conditions. [1]

ANIMAL TISSUE-FUNCTION RESEARCH

A 2017 study reported improvements in fitness, fur density and kidney function in selected mouse aging models. These findings helped establish interest in targeting senescent cells after functional decline. They do not demonstrate rejuvenation or longer life in people. [1]

WHY RESEARCHERS ARE INTERESTED

The approach explores whether removing a problematic cell population can influence tissue function. It also lets researchers investigate the FOXO4-p53 interaction. Human benefits require evidence beyond cell clearance or favorable outcomes in a mouse model. [1, 2]

PRIMARY RESEARCH AREAS

- FOXO4-p53 interactions and cell survival
 - Selective elimination of senescent cells
 - Tissue-function measures in animal models
 - Senescence in cultured cartilage cells
- These are research areas, not proven benefits. [1, 2]

CARTILAGE-CELL FINDINGS

Researchers have examined FOXO4-DRI in human cartilage cells expanded in culture. The study investigated removal of senescent cells and subsequent tissue characteristics. Experiments using human cells are not human treatment trials and do not establish relief of arthritis or joint pain. [2]

WHAT DOES THE EVIDENCE ESTABLISH?

Evidence remains preclinical. Robust human trials establishing benefits for longevity, frailty, joint disease or general wellness are lacking. The ability to eliminate cells in a model does not establish which patients might benefit or what effects repeated exposure would have. [1, 2]

QUALITY & SAFETY CONTEXT

Human side effects, interactions and long-term safety are unestablished. Cell-survival pathways require study of intended and unintended effects. Verify exact identity and batch documents; purity cannot establish clinical suitability. [1-3]

THE TAKEAWAY

FOXO4-DRI is a research tool for studying senescent-cell clearance and tissue function. Human anti-aging benefits remain unestablished. Synapse products are not for human use.

SELECTED SOURCES • Reviewed October 8, 2026

[1] Targeted senescent-cell apoptosis and mouse tissue homeostasis, 2017. PMID:28340339

[2] FOXO4-DRI in cultured human chondrocytes, 2021. PMID:33996787

[3] Synapse catalog (listed as "FOXO4-DRI") & research-use terms: synapsepeptidesciences.com/coa/

PATIENT REFERENCE / PEPTIDE SCIENCE

GHK-Cu

Skin • Connective tissue • Remodeling research

RESEARCH SPOTLIGHT | TISSUE BIOLOGY & PROTECTIVE SIGNALING

WHAT IS GHK-Cu?

GHK-Cu is a copper-binding peptide made from three amino acids: glycine, histidine and lysine. GHK occurs naturally in the body; when bound to copper, it forms a complex studied for its role in tissue biology and cellular signaling.

WHY RESEARCHERS ARE INTERESTED

Healthy tissue continually builds and renews its supporting framework. GHK-Cu has attracted interest because laboratory studies show effects on fibroblasts, the cells that produce collagen and other structural components of skin and connective tissue. [1]

PRIMARY RESEARCH AREAS

- Collagen production and matrix remodeling
- Skin and wound-repair biology
- Copper transport and cellular signaling
- Inflammatory and oxidative-stress pathways

Hair-related claims also draw interest, but convincing human evidence for hair regrowth remains limited.

A CLOSER LOOK AT REMODELING

Cell studies have reported increased collagen synthesis and changes in enzymes involved in breaking down and renewing tissue matrix. This suggests an influence on tissue turnover, rather than simply “making more collagen.” These are laboratory findings. [1, 2]

WHAT DO HUMAN STUDIES SHOW?

Human research is largely topical and limited. A small randomized study after laser resurfacing found greater patient satisfaction, but no significant objective improvement in redness, wrinkles or overall skin quality. Topical findings do not establish benefits of injectable GHK-Cu. [3]

COMMONLY DISCUSSED COMBINATIONS

GHK-Cu is grouped with BPC-157 and TB-500 in some research blends, combining interest in matrix remodeling with other repair pathways. Superior clinical outcomes or safety have not been established.

QUALITY & TRANSPARENCY

Synapse states U.S.-based manufacturing/testing and 99%+ purity. Its GHK-Cu page advertises four independent third-party analytical tests and COA availability. Review the exact batch documentation; quality testing does not establish clinical safety or effectiveness. [5]

EVIDENCE & CONSIDERATIONS

Evidence is primarily laboratory-based. Injectable GHK-Cu is not FDA-approved. FDA notes limited human safety data and possible immune reactions from aggregation or peptide impurities. Long-term safety remains uncertain. [4]

THE TAKEAWAY

GHK-Cu is a research focus in skin and connective-tissue remodeling. Synapse products are for laboratory research only, not for use in or on humans. [5]

SELECTED SOURCES • Reviewed October 1, 2026

- [1] Maquart et al., 1988. PMID:3169264 • [2] Siméon et al., 2000. PMID:11045606
[3] Miller et al., 2006. PMID:16847171 • [4] FDA: bulk substances safety risks (injectable GHK-Cu)
[5] synapsepeptidesciences.com — homepage and /product/ghk-cu-50mg/

PATIENT REFERENCE / PEPTIDE SCIENCE

GLOW BLEND

GHK-Cu • BPC-157 • Thymosin Beta-4

RESEARCH SPOTLIGHT | CONNECTIVE TISSUE & REPAIR SIGNALING

WHAT IS GLOW BLEND?

Glow is a multi-peptide laboratory research blend. Synapse's published batch report identifies GHK-Cu, BPC-157 and thymosin beta-4. The combination brings together compounds investigated in tissue-related pathways; its name does not establish a cosmetic or clinical benefit. [1]

GHK-Cu: MATRIX RESEARCH

GHK-Cu is a copper-peptide complex studied in connective-tissue biology. Rat wound experiments reported increased collagen and other matrix components. The matrix is the supportive material around cells. These findings help explain interest in skin and tissue research. [2]

BPC-157: TISSUE MODELS

BPC-157 has been investigated in experimental tendon, ligament and wound models. A rat Achilles tendon study reported improved functional and structural healing measures. Animal injury findings do not establish recovery benefits in human patients. [3]

THYMOSIN BETA-4: CELL RESPONSES

Thymosin beta-4 research includes cell movement, wound closure and tissue organization. Rat skin-wound experiments reported faster re-epithelialization, the process of covering a wound with new surface cells. These results support further study of tissue repair. [4]

WHY COMBINE THESE PEPTIDES?

The proposed rationale links matrix remodeling, tissue responses and cell movement. Studying multiple pathways together may be scientifically useful, but does not prove that the blend is more effective than its components. This is a research concept, not established synergy. [2-4]

PRIMARY RESEARCH AREAS

- Collagen and extracellular-matrix biology
 - Tendon and connective-tissue models
 - Wound closure and cellular responses
 - Combined peptide activity and stability
- These are investigation areas, not proven benefits of Glow in people. [2-4]

COMBINATION RESEARCH

A 2026 rat tendon study tested BPC-157 with TB-500 but did not find added benefit over the individual agents. It did not test the three-part Glow blend. Reliable human trials establishing Glow's effectiveness, interactions or long-term safety are lacking. [5]

QUALITY & RESEARCH STATUS

Synapse provides batch testing and a published Glow Certificate of Analysis. Verify composition, identity and purity for the exact batch. A COA establishes analytical findings, not clinical safety or effectiveness. Glow is supplied for laboratory research only. [1, 6]

THE TAKEAWAY

Glow combines three compounds of interest in tissue biology; human benefits of the blend are unproven. Synapse products are for research only, not for use in or on humans. [6]

SELECTED SOURCES • Reviewed October 7, 2026

- [1] Synapse Glow COA, lot GLO70-0526, May 16, 2026 • [2] GHK-Cu rat wound study. PMID:8227353
[3] BPC-157 rat tendon study. PMID:14554208 • [4] Thymosin beta-4 rat wound study. PMID:10469335
[5] BPC-157/TB-500 combination, 2026. PMID:42542926
[6] synapsepeptidesciences.com/product/glow-blend-50mg/ — product and research-use terms

PATIENT REFERENCE / PEPTIDE SCIENCE

GLUTATHIONE

Antioxidant biology • Cellular balance • Human research

RESEARCH SPOTLIGHT | ANTIOXIDANT DEFENSE & GLUTATHIONE STATUS

WHAT IS GLUTATHIONE?

Glutathione (GSH) is a naturally occurring tripeptide made from glutamate, cysteine and glycine. The body produces it inside cells. It is an important part of antioxidant defense, helping maintain the chemical balance needed for normal cellular function. [1]

THE ANTIOXIDANT CONNECTION

Glutathione helps cells manage oxidative stress. Research examines both the amount available and how efficiently the body makes it. This makes glutathione status a useful biological measure, while a change in that measure alone does not prove a clinical benefit. [1-3]

HUMAN SUPPLEMENTATION RESEARCH

A six-month randomized trial in 54 adults reported increases in glutathione levels in several sampled tissues with oral supplementation. These findings show that oral intake can influence body stores under study conditions; they do not establish broad disease prevention or treatment. [2]

WHY RESEARCHERS ARE INTERESTED

In a small study of adults with uncontrolled diabetes, reduced glutathione synthesis improved after supplementation with cysteine and glycine, its building blocks. This supports research into the body's own production. [1]

PRIMARY RESEARCH AREAS

- Glutathione synthesis and body stores
 - Oxidative-stress biomarkers
 - Oral supplementation and absorption
 - Precursor availability in metabolic disease
- Evidence depends on the population, formulation and outcome measured. [1-3]

WHY STUDY RESULTS CAN DIFFER

A four-week randomized trial in healthy adults found no significant change in glutathione status or oxidative-stress markers. Duration, participants and methods matter. Biomarker changes are distinct from improvements in symptoms or disease risk. [2, 3]

FORMULATION & ROUTE MATTER

Oral, liposomal and injectable products are different formulations. Findings from an oral study cannot establish the benefits or safety of an injection. Evidence for general "detox," anti-aging or wellness claims should be evaluated by the exact product and clinical outcome. [2-4]

QUALITY & SAFETY CONTEXT

FDA has reported serious reactions to endotoxin-contaminated glutathione injections. Purity alone does not establish sterility or acceptable endotoxin levels. Research-grade material is not suitable for human use. [4]

THE TAKEAWAY

Glutathione is central to antioxidant biology. Human research shows that some approaches can change body stores; clinical benefits and safety must be evaluated for the specific formulation.

SELECTED SOURCES • Reviewed October 7, 2026

- [1] Glutathione synthesis and precursors in uncontrolled diabetes, 2011. PMID:20929994
[2] Six-month oral supplementation trial, 2015. PMID:24791752 • [3] Four-week oral trial, 2011. PMID:21875351
[4] FDA: dietary-supplement-grade glutathione in injectables, 2026; sterile-injectable concerns, 2019 (fda.gov)

PATIENT REFERENCE / PEPTIDE SCIENCE

IGF-1 LR3

Growth signaling • Muscle metabolism • Cell biology

RESEARCH SPOTLIGHT | GROWTH SIGNALING & MUSCLE METABOLISM

WHAT IS IGF-1 LR3?

IGF-1 LR3 is a modified version of insulin-like growth factor-1, a signal involved in growth and metabolism. Its reduced binding to IGF-binding proteins makes it useful for studying how these proteins influence IGF activity. [1, 2]

HOW THE SIGNAL WORKS

IGF signaling helps cells coordinate growth and protein metabolism. LR3 allows researchers to explore these responses under different binding-protein conditions. Its activity depends on the tissue, experimental model and delivery method—not simply the amount present. [1, 2]

MUSCLE & PROTEIN RESEARCH

Rat studies examined body growth, nitrogen retention and muscle protein turnover. Some reported anabolic responses, but results varied. In one injection study, LR3 was only approximately as effective as native IGF-1 at reversing steroid-associated muscle loss. [1, 2]

WHY RESEARCHERS ARE INTERESTED

Comparing LR3 with native IGF-1 helps separate receptor signaling from the effects of binding proteins. This provides a way to investigate growth biology and tissue responses in controlled experiments. It does not establish a muscle-building benefit in people. [1, 2]

PRIMARY RESEARCH AREAS

- IGF signaling and cell growth
 - Muscle protein turnover and metabolism
 - Binding-protein regulation of IGF activity
 - Tissue responses in experimental models
- These are research areas, not established patient outcomes. [1–3]

WHAT DOES “LONG R3” MEAN?

The name describes structural changes to IGF-1. It does not establish a prolonged human half-life. In rat research, LR3 cleared from circulation faster than native IGF-1 because it bound poorly to binding proteins. Reliable human timing data are lacking. [2]

WHAT DOES THE EVIDENCE ESTABLISH?

The cited LR3 research is preclinical. Human benefits for strength, recovery or anti-aging are not established. Prescription mecasermin (Increlex) is a different IGF-1 product approved for specific pediatric growth disorders; its approval does not extend to LR3. [1–4]

QUALITY & SAFETY CONTEXT

Human LR3 safety is not established. IGF biology warrants attention to blood sugar and growth of tissues beyond muscle. Mecasermin labeling includes hypoglycemia and malignancy warnings; these inform caution but do not quantify LR3 risk. Batch purity cannot establish human safety. [3, 4]

THE TAKEAWAY

IGF-1 LR3 is a tool for exploring growth and muscle biology. Experimental findings are not proven human benefits. Synapse products are for laboratory research only, not human use.

SELECTED SOURCES • Reviewed October 7, 2026

- [1] Rat anabolic-response study, 1993. PMID:8371075 • [2] IGF analogue injection study, 1996. PMID:8708565
[3] LR3 tissue-growth study in suckling rats, 1997. PMID:9124573
[4] FDA Increlex prescribing information, 2025: [accessdata.fda.gov \(021839s033lbl.pdf\)](https://accessdata.fda.gov/drugsatfda_docs/label/2025/021839s033lbl.pdf)

PATIENT REFERENCE / PEPTIDE SCIENCE

IPAMORELIN

Ghrelin-receptor signaling • GH release • Endocrine research

RESEARCH SPOTLIGHT | GROWTH-HORMONE RELEASE & RECEPTOR SELECTIVITY

WHAT IS IPAMORELIN?

Ipamorelin is a synthetic five-amino-acid peptide studied as a growth-hormone secretagogue: a compound that stimulates GH release. It acts through the ghrelin receptor, giving researchers a way to explore endocrine signaling and pituitary responses. [1, 4]

HOW THE SIGNAL WORKS

Ipamorelin encourages the pituitary to release growth hormone rather than supplying GH directly. Human volunteer research measured a discrete episode of GH release after administration. This hormone response is a biological finding, not proof of a body-composition or recovery benefit. [2]

A MEASURED GH PULSE

An early intravenous study in healthy volunteers reported a GH peak at approximately 40 minutes and a subsequent decline. The compound's terminal half-life was about two hours. Drug half-life and the duration of GH release are different measures. [2]

WHY RESEARCHERS ARE INTERESTED

Early animal studies found comparatively selective GH release without significant ACTH or cortisol stimulation under the tested conditions. This supports interest in receptor selectivity, but does not establish the same hormone profile or long-term safety in every human setting. [1]

PRIMARY RESEARCH AREAS

- Ghrelin-receptor and pituitary signaling
 - Timing and magnitude of GH release
 - Selectivity across hormone responses
 - Pharmacokinetics in controlled studies
- These are investigation areas, not established patient outcomes. [1, 2]

TIMING DEPENDS ON THE STUDY

The human timing findings came from intravenous administration in a controlled experiment. They should not be assumed to describe a subcutaneous product or peptide blend. Formulation, route and experimental conditions can affect the measured response. [2]

WHAT DOES THE EVIDENCE ESTABLISH?

Evidence supports GH-releasing activity. It does not establish reliable human benefits for muscle gain, fat loss, sleep, anti-aging or injury recovery. A hormone change alone cannot show whether patients feel better or achieve a meaningful clinical outcome. [1-3]

QUALITY & SAFETY CONTEXT

FDA identifies potential immune-reaction risks from peptide aggregation or impurities and gaps in injectable-route safety data. Selectivity does not mean risk-free. Batch purity cannot establish human suitability. Synapse supplies ipamorelin strictly for laboratory research. [3, 4]

THE TAKEAWAY

Ipamorelin helps researchers study a GH-release pulse and receptor selectivity. Clinical benefits require more than a hormone response. Synapse products are for research only, not human use.

SELECTED SOURCES • Reviewed October 8, 2026

- [1] Selective GH-secretagogue study, 1998. PMID:9849822 • [2] Human PK/PD study, 1999. PMID:10496658
[3] FDA: Certain Bulk Drug Substances for Use in Compounding that May Present Significant Safety Risks (fda.gov)
[4] synapsepeptidesciences.com/product/ipamorelin/ — identity & research-use terms

PATIENT REFERENCE / PEPTIDE SCIENCE

KISSPEPTIN

Reproductive signaling • Sexual-desire research

RESEARCH SPOTLIGHT | REPRODUCTIVE HORMONES & BRAIN SIGNALING

WHAT IS KISSPEPTIN?

Kisspeptin is a family of naturally occurring peptides that helps regulate the reproductive system. Researchers study forms such as kisspeptin-10 and kisspeptin-54. Its hormone and brain-signaling roles attract interest in fertility and sexual-desire research.

HOW DOES IT WORK?

Kisspeptin activates KISS1 receptors and stimulates gonadotropin-releasing hormone (GnRH) signaling. This prompts pituitary release of luteinizing hormone (LH) and follicle-stimulating hormone (FSH), which influence reproductive function. It is an upstream signal, not testosterone replacement. [1]

WHY RESEARCHERS ARE INTERESTED

Kisspeptin connects reproductive-hormone regulation with brain networks involved in sexual and emotional processing. Researchers are investigating whether this connection can be useful in defined reproductive or sexual-function conditions. [2, 3]

PRIMARY RESEARCH AREAS

- LH and FSH release and hormone regulation
 - Sexual-stimulus processing in the brain
 - Arousal responses in people with low desire
 - Fertility and reproductive physiology
- These are research topics, not established treatments.

WHAT DO HUMAN STUDIES SHOW?

Small randomized crossover trials in men and women with hypoactive sexual desire disorder found changes in sexual-stimulus brain processing. The men's study also observed increased penile tumescence. These short laboratory studies did not establish sustained everyday improvement in libido. [2, 3]

THE FORM STUDIED MATTERS

The sexual-desire trials used kisspeptin-54 under controlled intravenous research conditions. Their results should not be assigned directly to a kisspeptin-10 vial or another route. Different forms have different time courses and supporting evidence.

COMMONLY DISCUSSED COMBINATIONS

Kisspeptin and PT-141 attract interest through different signaling pathways: reproductive regulation and melanocortin activity. Their mechanisms provide a conceptual rationale, but combined clinical benefit and safety have not been established.

QUALITY & CONSIDERATIONS

Synapse states U.S.-based manufacture/testing, 99%+ purity and batch COAs; confirm the exact peptide form. Kisspeptin is not FDA-approved as a treatment. FDA notes limited safety data and possible immune-reaction or impurity concerns for kisspeptin-10. Long-term effects remain uncertain. [4, 5]

THE TAKEAWAY

Kisspeptin is an emerging research focus in reproductive and sexual signaling. Synapse products are for laboratory research only, not for use in or on humans. [5]

SELECTED SOURCES • Reviewed October 1, 2026

- [1] Human reproductive-hormone study, 2025. PMID:40036336 • [2] Men's trial, 2023. PMID:36735255
[3] Women's trial, 2022. PMID:36287566 • [4] FDA: bulk substances safety risks (kisspeptin-10)
[5] synapsepeptidesciences.com — homepage, quality claims and research-use statement

PATIENT REFERENCE / PEPTIDE SCIENCE

KLOW BLEND

GHK-Cu • BPC-157 • TB-500 • KPV

RESEARCH SPOTLIGHT | TISSUE BIOLOGY & INFLAMMATORY SIGNALING

WHAT IS KLOW BLEND?

KLOW is a four-component laboratory research blend. Synapse lists GHK-Cu, BPC-157, TB-500 and KPV. Its research rationale brings tissue-related pathways together with inflammatory signaling; combining them does not establish a human treatment benefit. [1]

GHK-Cu: MATRIX BIOLOGY

GHK-Cu is a copper-peptide complex studied in connective-tissue biology. Rat wound experiments reported increased collagen and other matrix components. These findings explain interest in the supportive material around cells and its remodeling during repair. [2]

BPC-157 & TB-500: TISSUE MODELS

These compounds are investigated in experimental tissue-repair pathways. A 2026 rat Achilles tendon study reported favorable findings for selected measures, with TB-500 improving load to failure versus controls. The combination did not outperform the individual agents. [3]

KPV: INFLAMMATORY SIGNALING

KPV is a tripeptide studied in intestinal and immune-cell models. Experiments examined PepT1-mediated uptake and inflammatory pathways. Mouse colitis studies reported reduced inflammation, supporting further research. [4, 5]

WHY RESEARCHERS ARE INTERESTED

Adding KPV expands the blend's conceptual focus to inflammatory signaling alongside matrix and tissue biology. Researchers can explore overlapping responses within a formulation. Whether these components improve one another's effects must be tested rather than assumed. [1-5]

PRIMARY RESEARCH AREAS

- Collagen and extracellular-matrix biology
 - Tendon and connective-tissue responses
 - Intestinal inflammatory signaling
 - Combined peptide activity and stability
- These are investigation areas, not proven benefits of KLOW in people. [2-5]

WHAT DOES THE EVIDENCE ESTABLISH?

Most relevant findings concern individual ingredients in cells or animals. The BPC-157/TB-500 study did not test KLOW. Reliable human trials of the four-part blend are lacking; it is not established for injury recovery, IBS, inflammatory bowel disease or skin rejuvenation. [2-5]

QUALITY & SAFETY CONTEXT

Synapse lists batch testing and Certificates of Analysis. Verify all four ingredients in the exact batch documents. Combined side-effect rates, interactions and long-term safety are not established. Testing does not establish human suitability. [1]

THE TAKEAWAY

KLOW brings tissue and inflammatory pathways into one research formulation. Synapse products are for laboratory research only, not for use in or on humans. [1]

SELECTED SOURCES • Reviewed October 7, 2026

- [1] synapsepeptidesciences.com/product/klow-blend-50-10-10-10mg/ — composition & research terms
[2] GHK-Cu rat wound study. PMID:8227353 • [3] Rat BPC-157/TB-500 study, 2026. PMID:42542926
[4] KPV/PepT1 study, 2008. PMID:18061177 • [5] KPV mouse colitis study, 2008. PMID:18092346

PATIENT REFERENCE / PEPTIDE SCIENCE

KPV

Inflammatory signaling • Intestinal research

RESEARCH SPOTLIGHT | INFLAMMATORY SIGNALING & GUT BIOLOGY

WHAT IS KPV?

KPV is a three-amino-acid peptide made of lysine, proline and valine. Its sequence corresponds to the end of alpha-melanocyte-stimulating hormone (α -MSH). Researchers study whether this small fragment can influence inflammatory signaling. [1, 2]

HOW IS IT BEING STUDIED?

Cell studies suggest KPV can enter some intestinal and immune cells through the PepT1 transporter and influence inflammatory pathways. Researchers have examined effects on NF- κ B-related signaling and inflammatory mediators. These mechanisms are primarily preclinical. [1]

WHY RESEARCHERS ARE INTERESTED

A short peptide that influences inflammatory signals offers a way to explore targeted approaches to tissue inflammation. KPV's size and transporter interactions have also prompted research into delivery systems designed to reach inflamed intestinal tissue.

PRIMARY RESEARCH AREAS

- Inflammatory signaling in intestinal cells
- PepT1-mediated peptide transport
- Colitis and intestinal-injury models
- Targeted delivery to inflamed tissue

These are research topics, not established human treatment benefits.

THE TAKEAWAY

KPV is an early research compound for inflammatory and intestinal signaling. Synapse products are for laboratory research only, not for use in or on humans. [5]

WHAT DOES THE RESEARCH SHOW?

Studies have reported reduced inflammation in two mouse colitis models. Other experiments have used nanoparticles or gels to deliver KPV to the colon. These findings support further investigation, but do not prove that a commercial KPV vial treats human digestive symptoms. [1, 2, 3]

WHAT ABOUT HUMAN EVIDENCE?

Established human treatment evidence is lacking. FDA's safety assessment reports no identified human exposure data for KPV drug products. Laboratory effects do not establish relief of IBS, inflammatory bowel disease or "leaky gut." [4]

COMMONLY DISCUSSED COMBINATIONS

Synapse's KLOW blend combines KPV with GHK-Cu, BPC-157 and TB-500. The proposed rationale links inflammatory signaling with tissue-related pathways. Combined clinical effectiveness and safety have not been established. [5]

QUALITY & CONSIDERATIONS

Synapse states U.S.-based manufacturing/testing, 99%+ purity and batch COAs. Its KPV is supplied for research; verify exact batch documents. KPV is not FDA-approved. Human side-effect rates, medication interactions and long-term safety remain unknown. [4, 5]

SELECTED SOURCES • Reviewed October 1, 2026

- [1] PepT1/KPV study, 2008. PMID:18061177 • [2] Mouse colitis study, 2008. PMID:18092346
[3] Colon-targeted delivery, 2010. PMID:19909746 • [4] FDA: bulk substances safety risks (KPV)
[5] synapsepeptidesciences.com — /product/kpv-10mg/ and KLOW blend product page

PATIENT REFERENCE / PEPTIDE SCIENCE

LL-37

Host defense • Immune signaling • Wound research

RESEARCH SPOTLIGHT | THE BODY'S HOST-DEFENSE PEPTIDE

WHAT IS LL-37?

LL-37 is a 37-amino-acid peptide formed from the human cathelicidin precursor hCAP18. It belongs to the body's innate defense system—the rapid response that helps protect against microbial threats. Synthetic LL-37 is used to study these processes. [3]

HOW IS IT BEING STUDIED?

Researchers examine LL-37's interactions with microbial membranes and its influence on immune-cell signaling. This places it at the intersection of antimicrobial activity and the signals that shape local cellular responses. [3]

WHY RESEARCHERS ARE INTERESTED

LL-37 connects host defense with wound biology. That combination has inspired work on topical formulations for hard-to-heal wounds, including clinical trials in venous leg ulcers. It is an interesting research pathway rather than an established general immune booster. [1, 2]

PRIMARY RESEARCH AREAS

- Peptide-microbial membrane interactions
 - Innate immune signaling
 - Cellular responses in wound environments
 - Topical approaches to chronic ulcers
 - Biofilm prevention/disruption in lab models [5, 6]
- These topics describe areas of investigation, not proven benefits of a research vial. [1–3, 5, 6]

WHAT DOES HUMAN RESEARCH SHOW?

A small 34-person topical trial reported encouraging wound-healing signals. A later 148-person trial found no significant overall healing benefit versus placebo. An exploratory subgroup with larger ulcers suggested a possible benefit requiring confirmation. [1, 2]

WHY THE FORMULATION MATTERS

The ulcer trials tested specific topical formulations alongside wound care. Their findings do not establish effectiveness or safety for injectable LL-37, systemic infection treatment or commercial research vials. [1, 2]

EVIDENCE & SAFETY CONTEXT

LL-37 is not FDA-approved. FDA flags limited safety information, potential immune reactions and peptide-quality concerns. It also cites nonclinical signals involving male reproduction and tumor-promoting effects in some tissues; human relevance remains uncertain. [4]

QUALITY & RESEARCH STATUS

Synapse lists third-party batch testing and available Certificates of Analysis. Verify identity and purity against the exact batch documentation. Analytical quality does not establish clinical suitability, effectiveness or human safety. [3]

THE TAKEAWAY

LL-37 links antimicrobial and immune signaling with wound research. Synapse products are for laboratory research only, not for use in or on humans. [3]

SELECTED SOURCES • Reviewed October 1, 2026

- [1] Grönberg et al., 2014. PMID:25041740 • [2] Mahlapuu et al., 2021. PMID:34687253
[3] synapsepeptidesciences.com/product/ll-37/ — product description and research-use terms
[4] FDA: Bulk substances safety risks (LL-37) • [5] Overhage et al., 2008. PMID:18591225
[6] Kai-Larsen et al., 2010. PMID:20661475

MELANOTAN I

Afamelanotide • Pigment signaling • Photobiology

RESEARCH SPOTLIGHT | MELANIN BIOLOGY & LIGHT-EXPOSURE RESEARCH

WHAT IS MELANOTAN I?

Melanotan I (MT-I), also called afamelanotide, is a synthetic analogue of alpha-melanocyte-stimulating hormone. Researchers have studied how it activates pigment signaling. Synapse lists MT-I as a laboratory research peptide. [1, 2, 4]

HOW THE SIGNAL WORKS

Afamelanotide activates the melanocortin-1 receptor, encouraging production of eumelanin, a pigment in skin. This connects receptor signaling with pigmentation and responses to light. The biological mechanism underlies both laboratory research and disease-specific clinical development. [1]

HUMAN PIGMENTATION RESEARCH

Early studies in volunteers investigated changes in skin pigmentation after MT-I administration. Human research reported increased eumelanin expression. These findings establish interest in pigment biology, but do not demonstrate that research products are safe tanning treatments. [2]

WHY RESEARCHERS ARE INTERESTED

The pathway offers a way to study how pigment production affects light responses. Clinical development focused on erythropoietic protoporphyria (EPP), a rare disorder in which light exposure can cause severe pain, rather than routine cosmetic tanning. [1, 3]

PRIMARY RESEARCH AREAS

- Melanocortin-1 receptor signaling
 - Eumelanin synthesis and pigmentation
 - Light-exposure responses in EPP
 - Formulation-specific clinical outcomes
- Results depend on the population and product. [1-3]

A SPECIFIC APPROVED MEDICINE

Scenesse is an FDA-approved afamelanotide implant to increase pain-free light exposure in adults with EPP and a history of phototoxic reactions. Clinical trials evaluated controlled-release implants. Approval does not extend to research-grade MT-I vials or cosmetic tanning. [1, 3]

WHAT DOES THE EVIDENCE ESTABLISH?

There is human evidence for pigmentation effects and a disease-specific prescription indication. These findings cannot establish equivalent benefits or safety for a research vial, a different formulation or a different use. MT-I should not be confused with Melanotan II, a distinct compound. [1-4]

QUALITY & SAFETY CONTEXT

Scenesse can cause nausea, implant-site reactions and pigment changes. Serious allergic reactions have been reported. Its labeling recommends skin monitoring because existing moles may darken. Purity testing cannot establish a research product's clinical suitability. [1, 4]

THE TAKEAWAY

Melanotan I connects pigment biology with a specific clinical application. Research-grade vials are not interchangeable with Scenesse. Synapse products are for research only, not human use.

SELECTED SOURCES • Reviewed October 8, 2026

- [1] FDA Scenesse prescribing information, 2024: [accessdata.fda.gov \(210797s007lbl.pdf\)](https://accessdata.fda.gov/drugsatfda_docs/nda/210797s007lbl.pdf)
[2] Human eumelanin/pigmentation study, 2000. PMID:11045725 • [3] EPP randomized trials, 2015. PMID:26132941
[4] synapsepeptidesciences.com/product/melanotan/ — MT-I identity & research-use terms

MELANOTAN II

MT-II • Pigment signaling • Melanocortin biology

RESEARCH SPOTLIGHT | PIGMENTATION & MELANOCORTIN SIGNALING

WHAT IS MELANOTAN II?

Melanotan II (MT-II) is a synthetic cyclic peptide modeled on alpha-melanocyte-stimulating hormone, a natural signaling molecule. Early human studies explored its effects on pigmentation and sexual response. [1, 2]

HOW THE SIGNAL WORKS

MT-II engages the melanocortin signaling system. Its pigment effects reflect signaling that encourages melanin production. Human research also examined erections, illustrating that its biological activity extends beyond skin color. [1, 2]

HUMAN PIGMENTATION RESEARCH

A 1996 placebo-controlled pilot study enrolled three male volunteers. Two showed increased pigmentation after treatment. This provides an early human signal of pigment activity, but the study was too small to establish reliable outcomes or long-term safety. [1]

WHY RESEARCHERS ARE INTERESTED

MT-II helps researchers explore how a single peptide signal can influence skin pigmentation and other physiological responses. These pathways generated interest in both pigment biology and melanocortin-based approaches to sexual function. [1, 2]

PRIMARY RESEARCH AREAS

- Melanocortin signaling
- Melanin production and pigmentation
- Sexual response and erectile function
- Systemic effects and tolerability

These are study areas, not established treatment benefits. [1, 2]

SEXUAL-RESPONSE RESEARCH

A small placebo-controlled crossover study in ten men with psychogenic erectile dysfunction evaluated MT-II using objective erection monitoring. Findings supported further study of the pathway; they do not establish MT-II as a routine treatment. [2]

WHAT DOES THE EVIDENCE ESTABLISH?

Early human studies show biological activity. They do not establish a safe cosmetic tanning regimen or predictable results from commercial research products. Melanotan II is not an FDA-approved medicine; approval of afamelanotide does not extend to MT-II. [1-3]

QUALITY & SAFETY CONTEXT

Early research reported nausea and fatigue. FDA cites serious adverse-event case reports, including prolonged erections, and concerns about impurities and immune reactions. Long-term safety remains uncertain. Research-grade products are not intended for human use. [1, 3, 4]

THE TAKEAWAY

Melanotan II offers a window into pigment and melanocortin biology. Its early human findings remain exploratory, and research products are not established patient treatments.

SELECTED SOURCES • Reviewed October 8, 2026

[1] Dorr et al., pilot phase I study, 1996. PMID:8637402 • DOI:10.1016/0024-3205(96)00160-9

[2] Wessells et al., placebo-controlled crossover study, 1998. PMID:9679884

[3] FDA: Certain bulk drug substances that may present significant safety risks • [4] synapsepeptidesciences.com/coa/

MOTS-c

Mitochondrial signaling • Energy • Metabolic research

RESEARCH SPOTLIGHT | CELLULAR ENERGY & METABOLIC SIGNALING

WHAT IS MOTS-c?

MOTS-c is a 16-amino-acid peptide encoded within mitochondrial DNA. Mitochondria help cells produce usable energy; MOTS-c is studied as a signal connecting mitochondrial function with metabolism and cellular adaptation. [1]

HOW IS IT BEING STUDIED?

Laboratory research links MOTS-c to AMPK, a cellular energy-sensing pathway. Under metabolic stress, it can move into the cell nucleus and influence gene activity. Researchers are examining how this signaling helps cells adapt to changing energy demands. [1, 2]

WHY RESEARCHERS ARE INTERESTED

Animal studies have reported improvements in insulin sensitivity, metabolic regulation and physical performance. These findings have drawn interest in metabolic health, muscle function and aging biology. They do not establish the same benefits from administering MOTS-c to people. [1, 3]

PRIMARY RESEARCH AREAS

- Glucose handling and insulin sensitivity
- Cellular energy sensing and stress responses
- Muscle adaptation and physical performance
- Mitochondrial-to-nuclear communication

These are areas of investigation, not established treatment indications.

THE TAKEAWAY

MOTS-c offers an interesting window into mitochondrial and exercise biology. Synapse products are for laboratory research only, not for use in or on humans. [5]

SELECTED SOURCES • Reviewed October 1, 2026

- [1] Lee et al., 2015. PMID:25738459 • [2] Kim et al., 2018. PMID:29983246
[3] Reynolds et al., 2021. PMID:33473109 • [4] FDA: bulk substances safety risks (MOTS-C)
[5] synapsepeptidesciences.com — homepage and /product/mots-c/

WHAT DO HUMAN STUDIES SHOW?

In a small study, exercise increased naturally occurring MOTS-c in muscle and circulation in young men. This supports a role in exercise-related biology, but the participants were not treated with MOTS-c. It does not prove that a research product improves energy or endurance. [3]

COMMONLY DISCUSSED COMBINATIONS

MOTS-c is often grouped with NAD⁺ in cellular-energy discussions. MOTS-c concerns signaling, while NAD⁺ is a coenzyme involved in metabolism. Their related roles provide a conceptual rationale; added clinical benefits of combining them have not been established.

QUALITY & TRANSPARENCY

Synapse states U.S.-based manufacturing/testing, 99%+ purity and batch COA availability. Its MOTS-c page lists checks for purity, net content, identity and endotoxins; verify the exact batch COA. Analytical quality does not establish clinical safety or effectiveness. [5]

EVIDENCE & CONSIDERATIONS

MOTS-c is experimental and not FDA-approved. Human observations of the body's own peptide differ from treatment studies. FDA notes insufficient human exposure data for proposed compounded products and possible immune-reaction and impurity concerns. Long-term safety remains uncertain. [4]

PATIENT REFERENCE / PEPTIDE SCIENCE

NAD+

Cellular energy • Metabolism • Cellular maintenance

RESEARCH SPOTLIGHT | CELLULAR ENERGY & METABOLIC SIGNALING

WHAT IS NAD+?

NAD+ (nicotinamide adenine dinucleotide) is a coenzyme found in living cells. It is not a peptide. Cells use it in energy-producing reactions and as a resource for enzymes involved in cellular maintenance and stress responses.

HOW DOES IT WORK?

NAD+ and NADH carry electrons between metabolic reactions, helping cells convert nutrients into usable energy. NAD+ also supports enzymes such as sirtuins and PARPs, which participate in gene regulation and DNA-repair processes.

WHY RESEARCHERS ARE INTERESTED

Researchers are exploring how NAD metabolism changes with age, illness and metabolic stress. The goal is to understand whether altering NAD availability can influence health. An essential role inside cells does not guarantee that administered NAD+ improves energy or longevity.

PRIMARY RESEARCH AREAS

- Cellular energy production and redox balance
- NAD turnover and metabolic regulation
- DNA-repair and stress-response pathways
- Age-related changes in cellular function

These are research areas, not proven treatment benefits.

WHAT DO HUMAN STUDIES SHOW?

A small intravenous pilot study measured changes in NAD+ and related metabolites in blood and urine. It studied how the body handles administered NAD+, not whether it improves fatigue, cognition or lifespan. Clinical benefits require larger controlled trials. [1]

NAD+ VS. ITS PRECURSORS

NR and NMN are precursors the body can use to make NAD+. Studies of oral precursors cannot be assumed to prove benefits of injected NAD+. A human NR study changed NAD-related metabolites; that is distinct from demonstrating better energy or performance. [2]

COMMONLY DISCUSSED COMBINATIONS

NAD+ is often discussed alongside MOTS-c because both relate to cellular metabolism. NAD+ functions as a coenzyme; MOTS-c is a signaling peptide. Their related biology offers a conceptual rationale, but added clinical benefit from combining them is unproven.

QUALITY & CONSIDERATIONS

Synapse states U.S.-based manufacturing/testing, 99%+ purity and batch COAs. NAD+ is not FDA-approved for wellness infusions. FDA has reported severe chills, shaking, vomiting and fatigue after NAD+ injectables and highlights endotoxin concerns. Purity testing alone does not establish sterile suitability. [3, 4]

THE TAKEAWAY

NAD+ is central to cellular energy biology; treatment benefits remain under study. Synapse products are for laboratory research only, not for use in or on humans. [4]

SELECTED SOURCES • Reviewed October 1, 2026

[1] Grant et al., 2019. PMID:31572171 • [2] Elhassan et al., 2019. PMID:31412242

[3] FDA: "FDA reminds compounders to use ingredients suitable for sterile compounding"

[4] synapsepeptidesciences.com — homepage and /product/nad-500mg/

PINEALON

Tripeptide research • Neural-cell responses • Oxidative stress

RESEARCH SPOTLIGHT | NEURAL-CELL RESILIENCE & OXIDATIVE-STRESS BIOLOGY

WHAT IS PINEALON?

Pinealon is a synthetic tripeptide made from glutamate, aspartate and arginine. It has been studied in cellular and animal experiments involving oxidative stress and neural-cell responses. Synapse lists it as a research compound. [1, 3]

OXIDATIVE-STRESS RESEARCH

A laboratory study reported reduced accumulation of reactive oxygen species and decreased cell death under experimental stress. The experiments included neural-cell models. These findings support investigation of cellular resilience, rather than establishing an antioxidant benefit in patients. [1]

ANIMAL COGNITIVE RESEARCH

A rat study examined offspring exposed to elevated homocysteine before birth. Pinealon was associated with improved cognitive-test performance and increased resistance of cerebellar neurons to oxidative stress. This specialized developmental model does not demonstrate memory enhancement in healthy adults. [2]

WHY RESEARCHERS ARE INTERESTED

The research connects cellular stress responses with animal behavior. It asks whether protecting neural cells under experimental stress influences function. Human testing is needed before patient benefits can be established. [1, 2]

PRIMARY RESEARCH AREAS

- Reactive oxygen species in cell models
 - Neural-cell survival under stress
 - Cognitive outcomes in experimental rats
 - Cellular signaling and stress adaptation
- These are investigation areas, not proven benefits in people. [1, 2]

CELL SIGNALING: AN EARLY CLUE

Laboratory work also examined changes in ERK signaling and the cell cycle. These observations offer clues to possible mechanisms. They do not establish that Pinealon repairs human DNA, reverses aging or regenerates nerves. [1]

WHAT DOES THE EVIDENCE ESTABLISH?

The cited findings come from cells and rats. Robust human trials establishing effectiveness for memory, focus, brain fog or neurological disease are lacking. Results from an experimentally stressed animal cannot predict the response of a patient with everyday symptoms. [1, 2]

QUALITY & SAFETY CONTEXT

The cited preclinical studies do not establish human side-effect rates, medication interactions or long-term safety. Exact identity and batch quality matter for research. Purity testing cannot establish sterility, clinical effectiveness or suitability for human use. [1-3]

THE TAKEAWAY

Pinealon offers an early research window into neural-cell stress responses. Human benefits and safety remain unestablished. Synapse products are for laboratory research only, not human use.

SELECTED SOURCES • Reviewed October 8, 2026

- [1] Cell viability, reactive oxygen species and signaling study, 2011. PMID:21978084
[2] Rat prenatal hyperhomocysteinemia study, 2012. PMID:22567179
[3] Synapse catalog and research-use terms: synapsepeptidesciences.com/coa/

PATIENT REFERENCE / PEPTIDE SCIENCE

PT-141

Bremelanotide • Sexual desire • Brain signaling

RESEARCH SPOTLIGHT | SEXUAL DESIRE & MELANOCORTIN SIGNALING

WHAT IS PT-141?

PT-141, also called bremelanotide, is a synthetic peptide that activates melanocortin receptors. The prescription formulation Vyleesi is FDA-approved for a specific type of low sexual desire in premenopausal women. Synapse's research product is not that approved formulation. [1]

HOW DOES IT WORK?

Bremelanotide acts on melanocortin receptors, including MC4 receptors involved in brain signaling. Its precise mechanism for improving desire is not fully understood. This differs from medications such as sildenafil that primarily affect blood-flow pathways. [1]

WHY RESEARCHERS ARE INTERESTED

Sexual desire involves motivation, arousal and brain signaling as well as physical response. Bremelanotide provides a way to study melanocortin pathways in this process. It is not testosterone replacement and does not address every cause of low libido.

PRIMARY RESEARCH AREAS

- Sexual desire and associated distress
- Melanocortin receptor signaling
- Central nervous system aspects of arousal
- Sexual-function outcomes in defined groups

Research interest is broader than the approved medical indication.

THE TAKEAWAY

Bremelanotide has human evidence for a specific sexual-desire disorder. Synapse products are for laboratory research only, not for use in or on humans. [1, 3]

SELECTED SOURCES • Reviewed October 1, 2026

- [1] FDA: Vyleesi prescribing information (bremelanotide)
[2] Kingsberg et al., 2019. RECONNECT phase 3 trials. PMID:31599840
[3] synapsepeptidesciences.com — homepage, quality claims and research-use statement

WHAT DO HUMAN STUDIES SHOW?

Two randomized phase 3 trials in premenopausal women with hypoactive sexual desire disorder (HSDD) found improvements in desire and reduced related distress versus placebo. There was no significant improvement in the number of satisfying sexual events. Individual responses vary. [1, 2]

WHO WAS THE APPROVED USE FOR?

Vyleesi is indicated for acquired, generalized HSDD causing marked distress in premenopausal women, when not explained by illness, medication or relationship problems. It is not approved for men, postmenopausal women or enhancement of sexual performance. [1]

COMBINATIONS & QUALITY

Pairing PT-141 with other libido-related compounds has not established added clinical benefit or safety. Synapse states U.S.-based manufacture/testing, 99%+ purity and batch COAs. Verify the exact product documentation; analytical quality does not confer drug approval. [3]

EVIDENCE & CONSIDERATIONS

Nausea, flushing and headache are common with prescription bremelanotide. It can temporarily raise blood pressure and cause skin pigmentation changes. Vyleesi is contraindicated with uncontrolled hypertension or known cardiovascular disease; medication interactions require review. [1]

PATIENT REFERENCE / PEPTIDE SCIENCE

RETATRUTIDE

Triple-receptor signaling • Weight management • Human trials

RESEARCH SPOTLIGHT | WEIGHT MANAGEMENT & METABOLIC HEALTH

WHAT IS RETATRUTIDE?

Retatrutide is an investigational peptide that activates three hormone receptors: GLP-1, GIP and glucagon. Researchers are studying how this combined signaling influences body weight and metabolism. It is a single compound, not a mixture of three medications. [1]

THE THREE-RECEPTOR APPROACH

GLP-1 and GIP pathways contribute to appetite and glucose regulation. Glucagon signaling adds a pathway of interest for energy expenditure and fuel metabolism. This combination is designed to address several aspects of metabolic biology at once. [1]

HUMAN WEIGHT-LOSS RESEARCH

A published 2026 phase 3 trial in adults with obesity without diabetes evaluated retatrutide over 80 weeks. Mean weight loss reached 25.0% in the highest treatment group versus 3.9% with placebo under the intention-to-treat analysis. Individual results varied. [2]

WHY RESEARCHERS ARE INTERESTED

The magnitude of weight reduction and effects on obesity-related conditions have made triple-receptor activation a major research focus. The phase 3 study also evaluated knee osteoarthritis pain and obstructive sleep apnea in participants with those conditions. [2]

PRIMARY RESEARCH AREAS

- Body-weight reduction in adults with obesity
 - Glucose regulation and metabolic health
 - Obesity-associated knee pain and sleep apnea
 - Long-term treatment outcomes and safety
- Benefits must be evaluated for each population and outcome. [1, 2]

HOW TO INTERPRET THE RESULTS

Trial averages describe a defined study population using a controlled investigational medicine. They are not guaranteed outcomes or evidence that commercial research vials perform the same way. Cross-trial percentages cannot establish superiority to another drug. [2, 4]

CURRENT CLINICAL STATUS

As of this review, retatrutide remains investigational and is not FDA-approved. FDA states that it cannot be used in compounding under federal law. Published trial results support development; they do not make it an available approved treatment. [4]

QUALITY & SAFETY CONTEXT

Gastrointestinal effects were the most common adverse events in the phase 3 study. An earlier trial also reported increases in heart rate. Research-product purity does not establish clinical equivalence, sterility or human suitability. [2-4]

THE TAKEAWAY

Retatrutide has promising human evidence for weight management through three-receptor signaling. It remains investigational; research-grade products are not for human use.

SELECTED SOURCES • Reviewed October 8, 2026

- [1] Triple-agonist discovery and clinical proof of concept, 2022. PMID:35985340
[2] Phase 3 obesity trial, 2026. PMID:42814954 • [3] Phase 2 obesity trial, 2023. PMID:37366315
[4] FDA: Concerns with Unapproved GLP-1 Drugs Used for Weight Loss (fda.gov; current review)

SELANK

Stress-response signaling • Calm • Cognitive research

RESEARCH SPOTLIGHT | STRESS RESPONSES & NEURAL SIGNALING

WHAT IS SELANK?

Selank is a synthetic seven-amino-acid peptide based on tuftsin, a naturally occurring immune-related peptide, with an added stabilizing sequence. Researchers study its effects on stress-related behavior, neural signaling and immune processes.

HOW IS IT BEING STUDIED?

Cell and animal research suggests Selank influences genes involved in GABAergic signaling. GABA is a major inhibitory neurotransmitter that helps regulate neural activity. Researchers have also explored effects on enkephalin breakdown. [1, 2]

WHY RESEARCHERS ARE INTERESTED

Stress responses involve coordinated brain and body signals. Selank offers a way to investigate how regulatory peptides may influence these networks. Its proposed calming effects have generated interest, but healthy-person focus, sleep and resilience benefits are not well established.

PRIMARY RESEARCH AREAS

- Anxiety-related symptoms and behavior
 - GABA-associated neural signaling
 - Enkephalin metabolism
 - Immune and inflammatory gene activity
- These are research questions, not proven benefits.

WHAT DO HUMAN STUDIES SHOW?

Small clinical reports in people with anxiety-related disorders describe symptom improvements and comparisons with other treatments. One randomized study examined generalized anxiety and neurasthenia. Broader, well-controlled replication is needed to establish reliable effectiveness. [3]

WHAT DOES “CALM” MEAN HERE?

Interest centers on anxiety-related signaling, rather than simply making someone sleepy. Claims that Selank is consistently non-sedating, dependence-free or superior to standard care need stronger evidence. It is not an established treatment for insomnia.

COMMONLY DISCUSSED COMBINATIONS

Selank is often grouped with Semax in cognitive and stress-related discussions. The proposed rationale links stress-response research with neurotrophin signaling. Clinical evidence has not established superior outcomes or safety for the combination.

QUALITY & CONSIDERATIONS

Synapse states U.S.-based manufacturing/testing, 99%+ purity and batch COAs. Verify the current product and batch documentation. Selank is not FDA-approved. FDA notes insufficient human safety information and possible immune reactions or peptide impurities. Long-term safety and interactions remain uncertain. [4, 5]

THE TAKEAWAY

Selank is an emerging research focus in stress-related neural signaling. Synapse products are for laboratory research only, not for use in or on humans. [5]

SELECTED SOURCES • Reviewed October 1, 2026

- [1] GABA-related gene study, 2016. PMID:26924987 • [2] Enkephalin study, 2001. PMID:11550013
[3] Human anxiety study, 2008. PMID:18454096 • [4] FDA: bulk substances safety risks (Selank)
[5] synapsepeptidesciences.com — homepage, quality claims and research-use statement

SEMAGLUTIDE

GLP-1 signaling • Appetite regulation • Clinical evidence

RESEARCH SPOTLIGHT | APPETITE REGULATION & WEIGHT MANAGEMENT

WHAT IS SEMAGLUTIDE?

Semaglutide is a peptide that activates the GLP-1 receptor, a hormone pathway involved in appetite and glucose regulation. Large clinical trials have examined its effects on body weight and health outcomes using specific prescription formulations. [1-3]

HOW THE SIGNAL WORKS

Semaglutide reduces calorie intake through effects on appetite. It also increases insulin release in a glucose-dependent manner and delays stomach emptying. These actions help explain its role in weight management and glucose regulation. [1]

HUMAN WEIGHT-LOSS RESEARCH

STEP 1 studied 1,961 adults with obesity or overweight and a weight-related condition, without diabetes. At 68 weeks, mean weight loss was 14.9% with injectable semaglutide versus 2.4% with placebo, alongside lifestyle intervention. Individual responses varied. [2]

BEYOND THE SCALE

SELECT studied people with established cardiovascular disease and overweight or obesity, without diabetes. Semaglutide reduced major cardiovascular events versus placebo. This supports a clinical benefit in that defined population; it does not establish the same benefit for every patient. [3]

PRIMARY CLINICAL AREAS

- Long-term weight reduction and maintenance
 - Appetite and glucose regulation
 - Cardiovascular outcomes in eligible patients
 - Response to specific formulations
- Uses depend on the medicine and population. [1-3]

APPROVED MEDICINE CONTEXT

Wegovy indications include weight management and cardiovascular-risk reduction in eligible adults with established cardiovascular disease and overweight or obesity. Approval covers prescription products; lifestyle measures remain part of treatment. [1, 4]

HOW TO INTERPRET THE EVIDENCE

Trials provide averages for defined populations. STEP 1 findings concern an injectable formulation; they cannot automatically be applied to oral or other products. Cross-trial percentages cannot determine the best medicine for an individual. [2, 3]

SAFETY & PATIENT SELECTION

Common effects include nausea, diarrhea, vomiting and constipation. Important risks include pancreatitis, gallbladder problems and dehydration. It is contraindicated with a personal or family history of medullary thyroid carcinoma or MEN2. Review pregnancy, medications and the full prescribing information with the prescriber. [1]

THE TAKEAWAY

Semaglutide has strong clinical evidence for weight management and specific cardiovascular benefits. Outcomes depend on the patient and medicine; research-grade products are not for human use.

SELECTED SOURCES • Reviewed October 8, 2026

[1] FDA Wegovy prescribing information, 2026: [accessdata.fda.gov \(215256s031/b1218316s003lbl.pdf\)](https://accessdata.fda.gov/drugsatfda_docs/nda/215256s031/b1218316s003lbl.pdf)

[2] STEP 1 trial, 2021. PMID:33567185 • [3] SELECT cardiovascular trial, 2023. PMID:37952131

[4] FDA: Concerns with Unapproved GLP-1 Drugs Used for Weight Loss ([fda.gov](https://www.fda.gov); current review)

PATIENT REFERENCE / PEPTIDE SCIENCE

SEMAX

Brain signaling • Neuroplasticity • Cognitive research

RESEARCH SPOTLIGHT | NEUROTROPHINS & BRAIN FUNCTION

WHAT IS SEMAX?

Semax is a synthetic seven-amino-acid peptide developed from a portion of adrenocorticotrophic hormone (ACTH), with a stabilizing peptide extension. Researchers study its effects on neural signaling, stress responses and brain function.

HOW IS IT BEING STUDIED?

Animal and cell studies report changes in brain-derived neurotrophic factor (BDNF) and related signaling. BDNF helps support neurons and synaptic plasticity, the ability of connections between neurons to adapt. These findings are primarily preclinical. [1]

WHY RESEARCHERS ARE INTERESTED

Researchers are exploring whether Semax-related changes in neurotrophin and inflammatory signaling can influence brain responses to injury or stress. This has generated interest in memory, attention and recovery biology; it does not establish cognitive enhancement in healthy people.

PRIMARY RESEARCH AREAS

- BDNF and other neurotrophin signaling
- Learning and memory in animal models
- Brain responses to ischemic injury
- Cellular stress and inflammatory pathways

These describe research questions, not proven treatment benefits.

THE TAKEAWAY

Semax is a research focus in neural signaling and brain adaptation. Synapse products are for laboratory research only, not for use in or on humans. [4]

WHAT DO HUMAN STUDIES SHOW?

Published human reports have examined Semax as an adjunct in ischemic-stroke care and rehabilitation, with some reported improvements in neurological outcomes. These studies concern specific clinical settings; they do not establish better focus or memory in healthy adults. [2]

MECHANISM VS. EVERYDAY BENEFIT

A change in BDNF or an animal learning task is not the same as a meaningful improvement in human cognition. Stronger controlled trials are needed to define who might benefit, how large any benefit is and how long it lasts.

COMMONLY DISCUSSED COMBINATIONS

Semax is sometimes grouped with Selank in cognitive and stress-related discussions. The proposed rationale involves different neural signaling processes. Clinical studies have not established added benefit or safety from combining them.

QUALITY & CONSIDERATIONS

Synapse states U.S.-based manufacturing/testing, 99%+ purity and batch COAs. Verify the current Semax product and batch documentation. Semax is not FDA-approved; FDA notes limited safety data and possible immune-reaction or impurity concerns. Long-term safety and interactions remain uncertain. [3, 4]

SELECTED SOURCES • Reviewed October 1, 2026

[1] Semax and BDNF/TrkB in rat hippocampus, 2006. PMID:16996037

[2] Human ischemic-stroke study, 2018. PMID:29798983 • [3] FDA: bulk substances safety risks (Semax)

[4] synapsepeptidesciences.com — homepage, quality claims and research-use statement

PATIENT REFERENCE / PEPTIDE SCIENCE

SERMORELIN

Growth-hormone signaling • Metabolism research

RESEARCH SPOTLIGHT | GROWTH HORMONE & IGF-1 PATHWAYS

WHAT IS SERMORELIN?

Sermorelin is a synthetic 29-amino-acid peptide corresponding to the active portion of growth hormone-releasing hormone (GHRH). It acts as a signal to the pituitary gland to release growth hormone (GH), rather than supplying GH directly.

HOW DOES IT WORK?

Sermorelin activates GHRH receptors on GH-producing pituitary cells. Released GH influences tissue metabolism and stimulates insulin-like growth factor-1 (IGF-1). The response depends on pituitary function and the body's other regulatory signals. [1]

WHY RESEARCHERS ARE INTERESTED

GH and IGF-1 participate in growth, protein turnover and metabolism. Researchers have explored whether stimulating this pathway can influence age-related hormonal changes and body composition. Higher hormone levels alone do not establish better strength, energy or recovery.

PRIMARY RESEARCH AREAS

- Pituitary GH-release responses
 - Changes in circulating IGF-1
 - Hormone patterns in older adults
 - Body composition and metabolic function
- These are research questions, not guaranteed results.

WHAT DO HUMAN STUDIES SHOW?

Small human studies of GHRH(1-29) have demonstrated increases in GH and IGF-1 in older men. These findings establish hormonal activity and a rationale for further study; they do not establish a broadly effective anti-aging or muscle-building treatment. [1]

COMMONLY DISCUSSED COMBINATIONS

Sermorelin and ipamorelin target different receptors involved in GH release. This provides a rationale for studying complementary responses. Superior clinical outcomes from the combination have not been established. CJC-1295 and sermorelin both target the GHRH pathway.

QUALITY & TRANSPARENCY

Synapse states U.S.-based manufacturing/testing and 99%+ purity. Its sermorelin page describes four analytical checks: purity, net content, identity and endotoxins. Review the exact batch COA; analytical testing does not establish clinical safety or effectiveness. [3]

EVIDENCE & CONSIDERATIONS

Former FDA-approved GERE products were discontinued for reasons other than safety or effectiveness. That history does not establish approval of Synapse's product or adult wellness claims. Long-term safety and benefits for these goals remain uncertain. [2, 3]

THE TAKEAWAY

Sermorelin has documented GH-stimulating activity in humans. Synapse products are for laboratory research only, not for use in or on humans. [1, 3]

SELECTED SOURCES • Reviewed October 1, 2026

- [1] Corpas et al., 1992. PMID:1379256 (human GHRH 1-29 study)
[2] FDA, 2013. GERE withdrawal determination. Federal Register document 2013-04827
[3] synapsepeptidesciences.com — homepage and /product/sermorelin/

PATIENT REFERENCE / PEPTIDE SCIENCE

SLU-PP-332

Cellular energy • Oxidative metabolism • Endurance research

RESEARCH SPOTLIGHT | ENERGY METABOLISM & EXERCISE-RELATED SIGNALING

WHAT IS SLU-PP-332?

SLU-PP-332 is a synthetic small-molecule research compound, not a peptide. It activates estrogen-related receptors (ERRs), proteins that regulate metabolic gene activity. Researchers use it to investigate cellular energy pathways and responses associated with aerobic exercise. [1]

HOW THE SIGNAL WORKS

The compound activates ERR alpha, beta and gamma, with greatest potency for alpha in the original study. In a skeletal-muscle cell line, it increased mitochondrial function and cellular respiration, processes that help cells generate usable energy. [1]

ENDURANCE & MUSCLE RESEARCH

In mice, SLU-PP-332 increased oxidative muscle fibers and improved exercise endurance. These findings support interest in the biological programs behind aerobic performance. They do not demonstrate increased strength, muscle size or endurance in people. [1]

METABOLIC RESEARCH

Mouse studies reported increased energy expenditure and fatty-acid oxidation, accompanied by less fat-mass accumulation. Selected obesity models also showed improved insulin sensitivity. These findings support further metabolic research. [2]

PRIMARY RESEARCH AREAS

- Mitochondrial function and cellular respiration
 - Oxidative muscle fibers and mouse endurance
 - Energy expenditure and fat metabolism
 - Insulin sensitivity in mouse obesity models
- These are investigation areas, not established patient benefits. [1, 2]

WHAT DOES “EXERCISE MIMETIC” MEAN?

The term describes activation of some molecular responses associated with exercise. It does not mean the compound reproduces every benefit of training or replaces physical activity. The cited evidence concerns experimental cell and mouse models. [1, 2]

WHAT DOES THE EVIDENCE ESTABLISH?

Preclinical findings support continued research into ERR signaling. Human benefits for weight loss, stamina or metabolic disease remain unestablished. Newer work examines related compounds and chemical optimization; findings about those compounds cannot automatically be assigned to SLU-PP-332. [1-3]

QUALITY & SAFETY CONTEXT

Reliable human side-effect rates, medication interactions and long-term safety are not established. Batch testing can verify identity and purity but cannot establish clinical suitability. Synapse lists SLU-PP-332 strictly for laboratory research use. [4]

THE TAKEAWAY

SLU-PP-332 helps researchers explore energy metabolism and exercise-related signaling. Findings remain experimental. Synapse products are for laboratory research only, not human use.

SELECTED SOURCES • Reviewed October 7, 2026

[1] Synthetic ERR agonist and mouse exercise capacity, 2023. PMID:36988910

[2] ERR agonism in mouse metabolic syndrome, 2024. PMID:37739806 • [3] Chemical optimization, 2026. PMID:41850449

[4] synapsepeptidesciences.com/product/slu-pp-332-10mg/ — product listing & research-use terms

SNAP-8

Acetyl Octapeptide-3 • Expression-line & cosmetic research

RESEARCH SPOTLIGHT | PEPTIDE SIGNALING & EXPRESSION LINES

WHAT IS SNAP-8?

Snap-8 is acetyl octapeptide-3, a synthetic eight-amino-acid peptide studied in cosmetic and laboratory research on cellular communication and neurotransmitter release. [1]

THE SIGNALING CONNECTION

The proposed mechanism involves the SNARE complex, a group of proteins that helps cells release chemical messengers. Manufacturer laboratory tests report effects on complex formation and messenger release. Demonstrating this in cells does not establish the same effect after application to skin. [2]

WHY RESEARCHERS ARE INTERESTED

Expression lines are associated with repeated facial movement. Snap-8 was developed to explore whether peptide-based modulation of signaling could influence their appearance. Research interest includes both the peptide's activity and how a finished formulation delivers it. [2, 3]

PRIMARY RESEARCH AREAS

- SNARE-associated protein interactions
 - Neurotransmitter release in cell models
 - Appearance of facial expression lines
 - Cosmetic formulation and skin delivery
- These are research topics, not proven benefits of a commercial research vial. [1-3]

WHAT DOES HUMAN TESTING SHOW?

Lipotec's technical sheet describes a cream study in 17 women over 28 days. It reports a maximum wrinkle-depth reduction of 63%. This is a manufacturer-reported maximum, not an average or a guaranteed result; independent confirmation remains limited. [2]

WHAT ABOUT PUBLISHED STUDIES?

A 2024 study in 24 people found improvements with a microneedle patch containing acetyl octapeptide-3 and other ingredients versus a hyaluronic-acid patch. A 2019 study also reported favorable findings for a multi-ingredient patch. Neither isolates Snap-8's contribution. [3, 4]

WHY THE FORMULATION MATTERS

A cream, a microneedle patch and a research powder are different products. The vehicle, other ingredients and delivery method can affect results. Available cosmetic findings do not establish injection safety or a benefit equivalent to botulinum toxin treatment. [2-4]

QUALITY & SAFETY CONTEXT

Synapse lists third-party testing and batch Certificates of Analysis. Confirm exact batch identity and purity. Human side-effect rates and long-term safety for its research vial are not established. It is supplied for laboratory research, not for use in or on humans. [1]

THE TAKEAWAY

Snap-8 is a research focus for signaling and cosmetic expression-line effects. Synapse products are for laboratory research only, not for use in or on humans. [1]

SELECTED SOURCES • Reviewed October 7, 2026

- [1] synapsepeptidesciences.com/product/snap-8/ — product description, testing and research-use terms
[2] Lipotec SNAP-8 technical sheet (Ed. 10B), hosted by COSSMA — manufacturer testing
[3] Comparative microneedle patch study, 2024. PMID:39082657
[4] Multi-ingredient microneedle patch study, 2019. PMID:31134751

SS-31

Elamipretide • Mitochondrial membranes • Cellular energy

RESEARCH SPOTLIGHT | MITOCHONDRIAL FUNCTION & CELLULAR ENERGY

WHAT IS SS-31?

SS-31, also called elamipretide, is a four-amino-acid peptide that targets mitochondria. It interacts with cardiolipin, a lipid in the inner mitochondrial membrane. This makes it a useful tool for investigating how membrane function affects cellular energy production. [1]

THE CARDIOLIPIN CONNECTION

Cardiolipin helps organize the membrane where cells produce ATP, their usable energy currency. Laboratory studies found that SS-31 protected electron-transfer activity and supported ATP synthesis. This work examines energy production within cells. [1]

HUMAN ENERGY RESEARCH

A randomized study in 39 older adults with impaired mitochondrial function reported improvement in a measure of muscle ATP-producing capacity after elamipretide. This short-term physiological finding does not establish lasting improvements in daily energy, performance or healthy aging. [2]

WHY RESEARCHERS ARE INTERESTED

SS-31 links membrane biology with cellular energy. Its development has progressed from laboratory experiments to human trials and a disease-specific prescription approval, illustrating the potential of mitochondrial drug research. [1-4]

PRIMARY RESEARCH AREAS

- Cardiolipin and mitochondrial membranes
 - Electron transport and ATP production
 - Muscle function in mitochondrial disorders
 - Disease-specific clinical responses
- Results depend on the condition and outcome being studied. [1-4]

A SPECIFIC FDA APPROVAL

In September 2025, FDA granted accelerated approval to Forzinity (elamipretide) to improve muscle strength in adults and children with Barth syndrome weighing at least 30 kg. Muscle-strength findings supported approval; a confirmatory trial must verify clinical benefit. [4]

WHAT DOES THE EVIDENCE ESTABLISH?

Findings differ across conditions. In MMPOWER-3, 218 people with primary mitochondrial myopathy were studied for 24 weeks. Elamipretide did not improve the primary walking-distance or fatigue outcomes versus placebo. General wellness, anti-aging and athletic benefits remain unestablished. [2, 3]

QUALITY & SAFETY CONTEXT

Forzinity can cause injection-site reactions and serious allergic reactions. Approval does not cover research-grade SS-31. Purity testing cannot establish clinical equivalence, sterility or human suitability. [4]

THE TAKEAWAY

SS-31 is a mitochondrial peptide with human research and a specific prescription indication. Research-grade products are not interchangeable with the approved medicine and are not for human use.

SELECTED SOURCES • Reviewed October 7, 2026

- [1] Cardiolipin, electron transport and ATP synthesis, 2014. PMID:24134698
[2] Older-adult muscle ATP trial, 2021. PMID:34264994 • [3] MMPOWER-3 trial, 2023. PMID:37268435
[4] FDA Forzinity approval announcement & Drug Trials Snapshot, 2025: fda.gov (Forzinity)

PATIENT REFERENCE / PEPTIDE SCIENCE

TB-500

Tissue biology • Cell migration • Recovery research

RESEARCH SPOTLIGHT | TISSUE BIOLOGY & PROTECTIVE SIGNALING

WHAT IS TB-500?

TB-500 is related to thymosin beta-4, a naturally occurring peptide involved in cell structure and movement. Much of the repair research involves full-length thymosin beta-4, so those findings do not directly establish benefits for TB-500. [1, 2]

WHY THIS PEPTIDE FAMILY?

Thymosin beta-4 helps regulate actin, a protein that supports cell structure and movement. This biology has attracted interest in how cells migrate, blood vessels form and tissues respond to injury. These processes are central to repair biology.

RELATED RESEARCH AREAS

- Cell movement and wound repair
- Blood-vessel formation
- Tissue remodeling and inflammatory signaling
- Skin and other tissue-injury models

These are areas of investigation across this peptide family.

A CLOSER LOOK AT CELL MOVEMENT

Actin helps cells change shape and move during tissue repair. Thymosin-related peptides are studied for their connection to this biology. These mechanisms are research concepts, not proven recovery outcomes.

WHAT DO HUMAN STUDIES SHOW?

Full-length thymosin beta-4 has been studied in people, including a randomized topical study involving 73 participants with venous leg ulcers. That study explored wound healing; it did not test the TB-500 fragment or establish benefits for sports injuries. [2]

COMMONLY DISCUSSED COMBINATION

BPC-157 + TB-500 is marketed as a tissue-research blend. Interest centers on potentially complementary cellular processes. This is a proposed rationale; clinical studies have not established improved recovery or superiority of the combination.

QUALITY & TRANSPARENCY

Synapse states U.S.-based manufacturing/testing and 99%+ purity. Its blend page describes checks for purity, net content, identity and endotoxins. Verify the exact TB-500 sequence and batch certificate of analysis (COA). Quality testing does not establish clinical safety or effectiveness. [4]

EVIDENCE & CONSIDERATIONS

TB-500 is experimental and not FDA-approved. FDA reports no identified human exposure data for the fragment and notes possible immune reactions related to aggregation or peptide impurities. Long-term safety and interactions remain uncertain. [3]

THE TAKEAWAY

TB-500 is linked to interest in tissue and cell-migration biology. Synapse products are for laboratory research only, not for use in or on humans. [4]

SELECTED SOURCES • Reviewed October 1, 2026

- [1] Esposito et al., 2012. doi:10.1002/dta.1402 • [2] Guarnera et al., 2010. PMID:20536470
[3] FDA: "Certain Bulk Drug Substances...Significant Safety Risks" (TB-500 fragment entry)
[4] synapsepeptidesciences.com — homepage and /product/bpc-157-tb-500/

TESAMORELIN

Visceral fat • Body composition • Metabolic research

RESEARCH SPOTLIGHT | GROWTH HORMONE & VISCERAL FAT

WHAT IS TESAMORELIN?

Tesamorelin is a synthetic analog of growth hormone-releasing hormone (GHRH). It stimulates the pituitary to release growth hormone (GH). Prescription tesamorelin has an established use for excess abdominal fat in adults with HIV-associated lipodystrophy. [1]

HOW DOES IT WORK?

Tesamorelin activates GHRH receptors, increasing GH release and circulating insulin-like growth factor-1 (IGF-1). These signals influence metabolism. Its research particularly focuses on visceral fat, the fat around internal organs. [1]

WHAT DO HUMAN STUDIES SHOW?

In a randomized trial of 412 adults with HIV and excess abdominal fat, visceral fat decreased by 15.2% with tesamorelin over 26 weeks, versus a 5.0% increase with placebo. This describes that population, not an expected result for every patient. [2]

WHY VISCERAL FAT MATTERS

Visceral fat differs from fat beneath the skin. Research shows preferential reductions in visceral fat, making tesamorelin interesting for body-composition research even when body weight changes little. [1, 2]

BROADER METABOLIC RESEARCH

A trial in adults with obesity and reduced GH secretion reported lower visceral fat and improvements in selected metabolic markers. This supports further research beyond HIV-associated lipodystrophy, but does not establish a general weight-loss indication. [3]

COMMONLY DISCUSSED COMBINATIONS

Tesamorelin is sometimes paired with ipamorelin because they target different GH-release receptors. This is a proposed rationale; added clinical benefit and safety have not been established. Tesamorelin alone has stronger indication-specific evidence.

QUALITY & TRANSPARENCY

Synapse states U.S.-based manufacturing/testing and 99%+ purity. Its tesamorelin page advertises four independent analytical tests and batch COAs. Its research product is not the FDA-approved prescription formulation. [4]

EVIDENCE & CONSIDERATIONS

Prescription tesamorelin is not indicated for weight-loss management. Risks include elevated IGF-1, glucose intolerance, fluid retention and allergic reactions. Contraindications include pregnancy, active cancer and disruption of the hypothalamic-pituitary axis. Prescriber monitoring is required. [1]

THE TAKEAWAY

Tesamorelin has human evidence for a specific visceral-fat indication. Synapse products are for laboratory research only, not for use in or on humans. [1, 4]

SELECTED SOURCES • Reviewed October 1, 2026

[1] FDA: EGRIFTA WR prescribing information, 2025 • [2] Falutz et al., 2007. PMID:18057338

[3] Metabolic effects in obese adults, 2012. PMID:23015655

[4] synapsepeptidesciences.com — homepage and /product/tesamorelin/

PATIENT REFERENCE / PEPTIDE SCIENCE

THYMALIN

Thymic peptide biology • T-cell signaling • Immune research

RESEARCH SPOTLIGHT | IMMUNE-CELL DEVELOPMENT & REGULATION

WHAT IS THYMALIN?

Thymalin refers to thymus-related peptide preparations studied for immune regulation. Published research commonly uses a thymus-derived polypeptide mixture. Synapse describes its product as a synthetic peptide research preparation. [1, 2]

THE T-CELL CONNECTION

T lymphocytes help coordinate immune responses. Researchers study whether Thymalin can influence their development and activity. A laboratory study reported changes in markers associated with human blood-forming stem-cell differentiation, including increased CD28 expression. [1]

WHY RESEARCHERS ARE INTERESTED

Thymalin offers a way to explore how immune cells mature and communicate, including changes during illness and aging. Laboratory markers provide clues for further research; they do not establish general immune protection. [1, 3, 4]

PRIMARY RESEARCH AREAS

- T-cell development and functional activity
 - Immune-cell differentiation markers
 - Immune responses during illness
 - Aging-related immune regulation
- These are areas of investigation, not proven benefits of a commercial research vial. [1, 3, 4]

WHAT DOES HUMAN RESEARCH SHOW?

A 1989 study of 35 patients with lung diseases compared standard care with care plus Thymalin. Researchers reported changes in lymphocyte counts and T-cell subsets, but not all immune measures improved. Its small size and limited reporting restrict the conclusions. [3]

WHAT ABOUT AGING RESEARCH?

A report following 266 older adults described favorable health and mortality findings with Thymalin and/or Epithalamin. These findings need independent confirmation and do not establish that a research vial extends life or prevents illness. [4]

FORMULATION & SAFETY CONTEXT

Results from a thymus extract cannot be assumed to apply to a synthetic preparation with different composition. Reliable safety and interaction data for Synapse's product are lacking. An animal study reported allergic sensitization, a reason to investigate immune effects carefully. [1, 2, 5]

QUALITY & RESEARCH STATUS

Synapse lists third-party testing and batch Certificates of Analysis. Confirm composition, identity and purity in the exact batch documents. Testing does not establish human safety or effectiveness. This is a laboratory research product. [2]

THE TAKEAWAY

Thymalin is a research focus for immune-cell development and regulation. Synapse products are for laboratory research only, not for use in or on humans. [2]

SELECTED SOURCES • Reviewed October 7, 2026

- [1] Human cell differentiation study, 2020. PMID:33237528
[2] synapsepeptidesciences.com/product/thymalin-2/ — product description and research-use terms
[3] Lung disease study, 1989. PMID:2741122 • [4] Older-adult follow-up, 2003. PMID:14523363
[5] Guinea-pig sensitization study, 1994. PMID:8067074

THYMOSIN ALPHA-1

Immune regulation • T-cell biology • Clinical research

RESEARCH SPOTLIGHT | IMMUNE REGULATION & HOST DEFENSE

WHAT IS THYMOSIN ALPHA-1?

Thymosin Alpha-1 (Tα1) is a 28-amino-acid peptide associated with immune regulation. Its synthetic form is also called thymalfasin. It has been studied in people with specific infections and immune-related illnesses, as well as in laboratory immune-cell models.

HOW IS IT BEING STUDIED?

Researchers examine its effects on T cells, antigen-presenting cells and signaling between immune cells. The aim is to understand how it may alter host-defense responses, rather than simply increase every aspect of immune activity.

WHY RESEARCHERS ARE INTERESTED

Effective immunity requires both a response to threats and control of excessive inflammation. Thymosin Alpha-1 attracts interest because it may influence this coordination. A plausible immune mechanism does not establish prevention of routine infections in healthy people.

PRIMARY RESEARCH AREAS

- T-cell activity and antigen presentation
- Immune responses in chronic infections
- Adjunct treatment in critical illness
- Immune and inflammatory signaling

Evidence depends on the condition and study; “immune boosting” is too broad a description.

THE TAKEAWAY

Thymosin Alpha-1 is studied for immune regulation in specific clinical settings. Synapse products are for laboratory research only, not for use in or on humans. [4]

WHAT DO HUMAN STUDIES SHOW?

Human trials include chronic hepatitis B and sepsis. Results vary by setting. In the 2025 TESTS phase 3 sepsis trial, 28-day mortality was 23.4% with thymosin Alpha-1 versus 24.1% with placebo, without a significant difference. This highlights why clinical outcomes matter alongside immune markers. [1, 2]

HOW TO INTERPRET THE EVIDENCE

Thymosin Alpha-1 has more human clinical research than many experimental peptides, but studies in hospitalized or infected patients do not establish general wellness benefits. It is not FDA-approved in the United States.

COMMONLY DISCUSSED COMBINATIONS

It is sometimes grouped with KPV or other immune-related peptides. Different signaling targets offer a conceptual rationale, but clinical benefits and safety of these wellness combinations have not been established.

QUALITY & CONSIDERATIONS

Synapse states U.S.-based manufacture/testing, 99%+ purity and batch COAs. Verify exact product and batch documents. FDA notes inadequate safety information for proposed compounded thymosin Alpha-1 and possible immune-reaction or impurity concerns. Immune-modulating medicines and medical history need review. [3, 4]

SELECTED SOURCES • Reviewed October 1, 2026

- [1] TESTS phase 3 trial, 2025. PMID:39814420 • [2] Hepatitis B trial, 1998. PMID:9581695
[3] FDA: bulk substances safety risks (thymosin-alpha 1)
[4] synapsepeptidesciences.com — homepage, catalog and research-use statement

TIRZEPATIDE

GIP + GLP-1 signaling • Weight management • Clinical evidence

RESEARCH SPOTLIGHT | APPETITE REGULATION & WEIGHT MANAGEMENT

WHAT IS TIRZEPATIDE?

Tirzepatide is a peptide that activates GIP and GLP-1 receptors. These hormone pathways help regulate glucose and food intake. Researchers have studied this dual-receptor approach in large human trials of obesity and metabolic disease. [1, 2]

HOW THE TWO PATHWAYS WORK

Tirzepatide lowers calorie intake through effects on appetite and increases insulin release in a glucose-dependent manner. It also delays stomach emptying. Together, these actions help explain its role in weight management and glucose regulation. [1]

HUMAN WEIGHT-LOSS RESEARCH

SURMOUNT-1 studied 2,539 adults with obesity or overweight and a weight-related condition, without diabetes. At 72 weeks, mean weight reduction reached 20.9% in the highest treatment group versus 3.1% with placebo. Results were averages, not guarantees for individuals. [2]

WHY RESEARCHERS ARE INTERESTED

Substantial weight reductions have prompted research into obesity-related health conditions. A separate trial in adults with obesity and type 2 diabetes also found meaningful weight loss, illustrating why results must be interpreted for the population being treated. [2, 3]

PRIMARY CLINICAL AREAS

- Long-term weight reduction and maintenance
 - Appetite and glucose regulation
 - Obesity-associated obstructive sleep apnea
 - Outcomes in people with type 2 diabetes
- Uses depend on the medicine and condition. [1-3]

APPROVED MEDICINE CONTEXT

Zepbound is FDA-approved for weight management in eligible adults and for moderate-to-severe obstructive sleep apnea in adults with obesity. It is used with a reduced-calorie diet and increased activity. Approval applies to the regulated prescription product. [1]

WHAT DOES THE EVIDENCE ESTABLISH?

Large trials support meaningful weight reduction. Response varies; cross-trial percentages cannot identify the best medicine for an individual. Research-grade vials are not equivalent to clinically evaluated medicines. [2-4]

SAFETY & PATIENT SELECTION

Common effects include nausea, diarrhea, vomiting and constipation. Important risks include pancreatitis, gallbladder problems and dehydration. It is contraindicated with a personal or family history of medullary thyroid carcinoma or MEN2. Review pregnancy, medications and the full prescribing information with the prescriber. [1]

THE TAKEAWAY

Tirzepatide has strong human evidence for weight management in appropriate patients. Benefits apply to clinically evaluated medicines; research-grade products are not for human use.

SELECTED SOURCES • Reviewed October 8, 2026

[1] FDA Zepbound prescribing information, 2026: [accessdata.fda.gov \(217806s037lbl.pdf\)](https://accessdata.fda.gov/drugsatfda_docs/nda/217806s037lbl.pdf)

[2] SURMOUNT-1, 2022. PMID:35658024 • [3] SURMOUNT-2, 2023. PMID:37385275

[4] FDA: Concerns with Unapproved GLP-1 Drugs Used for Weight Loss ([fda.gov](https://www.fda.gov); current review)

PATIENT REFERENCE / PEPTIDE SCIENCE

VIP

Vasoactive Intestinal Peptide • Gut, immune & lung signaling

RESEARCH SPOTLIGHT | COMMUNICATION BETWEEN NERVES & TISSUES

WHAT IS VIP?

VIP stands for vasoactive intestinal peptide, a naturally occurring 28-amino-acid signaling molecule. Despite its name, its activity extends beyond the intestine. Synthetic VIP, also called aviptadil, has been studied in clinical and laboratory research. [1, 2]

HOW DOES IT SIGNAL?

VIP activates the VPAC1 and VPAC2 receptors, increasing a cellular messenger called cAMP. These pathways help researchers explore communication among nerves, immune cells and smooth muscle, as well as vascular responses. [1, 3]

WHY RESEARCHERS ARE INTERESTED

VIP links several systems involved in tissue function: intestinal physiology, immune regulation and lung biology. Its broad signaling activity creates opportunities to study how local cellular responses can be influenced. Formulation and the disease model strongly affect results. [2, 4, 5]

PRIMARY RESEARCH AREAS

- Intestinal secretion and motility
 - Immune-cell and inflammatory signaling
 - Lung responses to injury
 - Smooth-muscle and vascular physiology
- These are research topics, not established benefits of a commercial research vial. [1, 2, 4, 6]

WHAT DOES HUMAN RESEARCH SHOW?

Aviptadil has been tested in respiratory disease. In the 2023 TESICO trial, 471 patients with COVID-19 respiratory failure were randomized. IV aviptadil did not significantly improve clinical outcomes versus placebo through day 90. [2]

WHAT ABOUT GUT RESEARCH?

Some mouse colitis studies reported reduced inflammation and improved tissue findings. Other experiments found no improvement or suggested pro-inflammatory effects. The results are model-dependent and do not establish treatment for human IBS or inflammatory bowel disease. [4, 5]

FORMULATION & SAFETY CONTEXT

VIP breaks down rapidly, prompting research into protected delivery systems. Clinical infusion studies report effects such as diarrhea and blood-pressure changes. Hospital trial formulations do not establish safety or benefit for a research vial or another route. [2, 6, 7, 8]

QUALITY & RESEARCH STATUS

Synapse lists third-party batch testing and available Certificates of Analysis. Verify the exact batch's identity and purity. Analytical quality does not establish human safety or treatment effectiveness. Synapse supplies VIP for laboratory research only. [1]

THE TAKEAWAY

VIP is a research focus for gut, immune and lung signaling. Synapse products are for laboratory research only, not for use in or on humans. [1]

SELECTED SOURCES • Reviewed October 7, 2026

- [1] synapsepeptidesciences.com/product/vip/ • [2] TESICO, 2023. PMID:37348524
[3] Receptor study. PMID:10801840 • [4] Colitis model. PMID:33405317
[5] Contrasting colitis findings. PMIDs:15730386, 24395090 • [6] Human gut physiology. PMID:15745085
[7] VIP delivery study. PMID:28991483 • [8] VIP stability/receptors. PMID:15994369