

HERITAGE HAVENS

NUTRITION & PEPTIDE WELLNESS COHORT

Anti-Aging Peptide Reference

Epithalon, Semax, Selank, and the longevity peptide landscape —
mechanisms, evidence, and protocols

Nutrition & Peptide Wellness Cohort · Month 6

Educational Reference Only

All content is for educational purposes. Anti-aging peptides discussed here are not FDA-approved for longevity or cognitive enhancement. Protocols require physician prescription and supervision. Published research is referenced throughout — use it as a starting point for conversations with your healthcare provider.

THE SCIENCE OF AGING

Hallmarks of Aging — Where Peptides Intervene

The 'Hallmarks of Aging' (Lopez-Otin et al., Cell 2013) identified 9 primary mechanisms of cellular aging. Anti-aging peptides target specific hallmarks — understanding which ones helps you understand why these interventions are so compelling.

Hallmark	What Happens	Intervention Approach
Telomere shortening	Each cell division shortens telomeres. When critically short: senescence or apoptosis.	Epithalon — activates telomerase enzyme to extend telomere length
Epigenetic alterations	Gene expression patterns drift with age, silencing longevity genes.	Epithalon — restores gene expression patterns; NAD+ supports sirtuin activation
Loss of proteostasis	Damaged proteins accumulate — aggregates like amyloid in Alzheimer's	Autophagy (fasting); Semax — reduces oxidative neuronal damage
Mitochondrial dysfunction	Energy production declines; ROS output increases with age	NAD+ precursors; CoQ10; Epithalon's antioxidant upregulation
Cellular senescence	'Zombie cells' — non-dividing, secreting pro-inflammatory signals	Senolytics research; caloric restriction; Epithalon potentially anti-senescent
Stem cell exhaustion	Stem cell regenerative capacity declines — tissue repair slows	GH peptides (CJC/Ipamorelin); Thymosin Alpha-1
Altered intercellular communication	Chronic inflammation (inflammaging); declining hormones	Anti-inflammatory nutrition; all peptides targeting hormonal axes

EPITHALON

Epithalon — The Telomere Peptide

Epithalon (also spelled Epitalon) is a synthetic tetrapeptide — just four amino acids (Ala-Glu-Asp-Gly) — developed by Russian researcher Vladimir Khavinson at the St. Petersburg Institute of Bioregulation and Gerontology. It has more than 40 years of published research behind it, making it one of the most extensively studied longevity peptides available.

Telomerase Activation

Epithalon activates the enzyme telomerase, which adds nucleotide sequences to the ends of chromosomes (telomeres). In multiple published studies — including human cell culture and animal longevity studies — Epithalon has been shown to extend telomere length, potentially extending cellular lifespan.

Pineal Gland Regulation

Epithalon normalizes melatonin synthesis in the pineal gland. The pineal gland controls circadian rhythms, and its melatonin output declines significantly with age — contributing to age-related sleep disruption, reduced antioxidant status, and circadian fragmentation.

Antioxidant Upregulation

Epithalon upregulates superoxide dismutase (SOD) and other endogenous antioxidant systems, reducing the accumulation of reactive oxygen species (ROS) that damage DNA, proteins, and cell membranes — a central mechanism of cellular aging.

Immune Modulation

Epithalon has demonstrated immune system restoration in aged animal models — restoring thymic function (the organ that produces T-cells) and improving NK cell activity. Khavinson's work showed reduced cancer incidence in treated aged animals.

Gene Expression Normalization

Multiple studies demonstrate Epithalon's ability to restore more youthful gene expression patterns in aged cells — effectively 'resetting' certain epigenetic markers of aging.

Parameter	Details
Structure	Tetrapeptide: Ala-Glu-Asp-Gly (4 amino acids)
Half-life	Short — typically 2–3 hours; effects persist far longer via gene regulation
Route	Subcutaneous injection (most common); IV in clinical settings; intranasal (some use)
Studied dose range	5–10 mg per course; 10–20 day courses
Typical cycle	10–20 day course, 1–4 times per year depending on protocol
Monitoring	No specific lab monitoring required; consider telomere length testing (commercial labs)
Key published works	Khavinson VK et al., Bulletin Exp Bio Med 2003; Anisimov VN et al., multiple 2001–2010

Parameter	Details
Safety	No significant adverse events reported across 40+ years of research; long-term human RCT data limited

SEMAX

Semax — The Cognitive Peptide

Semax is a heptapeptide — 7 amino acids — derived from the ACTH (adrenocorticotrophic hormone) fragment. It is clinically registered in Russia and Ukraine for treatment of stroke, ischemic events, and cognitive dysfunction. It is one of the few peptides with actual clinical drug registration outside of the United States.

Parameter	Details
Structure	ACTH 4-10 analog: Met-Glu-His-Phe-Pro-Gly-Pro
Registration	Registered drug in Russia (Semax brand); used clinically for stroke recovery, optic nerve disease, cognitive impairment
Primary mechanism	Dramatically increases BDNF (Brain-Derived Neurotrophic Factor) — the key growth factor for new neuron formation, synaptic strengthening, and neuroprotection
Secondary mechanisms	Modulates dopaminergic and serotonergic neurotransmission; increases NGF (Nerve Growth Factor); anti-inflammatory in CNS; enhances cerebral blood flow
Route	Intranasal spray — crosses blood-brain barrier efficiently; also available SubQ
Studied dose	200–600 mcg intranasal daily (clinical range); some protocols use 2x daily
Cycle	2 months on / 1 month off (typical); shorter courses also used
Clinical evidence	Multiple Russian clinical trials for stroke, optic neuropathy, and cognitive decline; growing Western research interest
What users report	Improved focus, working memory, mental stamina; reduced anxiety; enhanced motivation; mood stabilization
Safety	Well-tolerated in clinical use; no significant adverse events in published trials; monitor for overstimulation at high doses

SELANK

Selank — The Anxiolytic Cognitive Peptide

Selank is a synthetic analog of tuftsin, a naturally occurring peptide involved in immune regulation. It was developed at the Institute of Molecular Genetics in Moscow and has a unique profile: anxiolytic (anti-anxiety) effects comparable to benzodiazepines without dependence, sedation, or cognitive blunting.

Parameter	Details
Structure	Tuftsin analog: Thr-Lys-Pro-Arg-Pro-Gly-Pro
Mechanism	Modulates GABAergic neurotransmission; increases BDNF; regulates IL-6 and other cytokines; enhances enkephalin stability
Primary effects	Anxiolytic (anti-anxiety); mood stabilization; cognitive enhancement; working memory improvement; immune modulation
Semax vs. Selank	Semax = more stimulating; better for focus/energy/cognitive tasks. Selank = more calming; better for anxiety, sleep support, emotional balance
Route	Intranasal spray (most common); SubQ also available
Studied dose	250–500 mcg intranasal 1–2x daily
Cycle	2 months on / 1 month off
Safety	No dependence, withdrawal, or addiction potential in studies; well-tolerated; no cognitive blunting (unlike benzodiazepines)
Best use case	Anxiety without sedation; cognitive enhancement alongside stress management; sleep quality support; immune modulation

OTHER LONGEVITY PEPTIDES

Additional Peptides in the Longevity Research Landscape

Peptide	Primary Research Focus	Protocol Status
Thymosin Alpha-1	Immune restoration; thymic function; antiviral and anti-tumor activity; used clinically in hepatitis B/C treatment	SubQ; 1.6mg 2x/week typical
MOTS-c	Mitochondrial peptide; activates AMPK (longevity enzyme); improves metabolic function and exercise performance	SubQ; emerging research — 5–10mg/week
Humanin	Mitochondria-derived peptide; neuroprotective; reduces Alzheimer's pathology in animal models; anti-inflammatory	Research stage; limited human protocols
SS-31 (Elamipretide)	Mitochondrial membrane targeting; reduces ROS production; improves mitochondrial efficiency; heart failure research	Research stage; compounding pharmacy in some protocols

Peptide	Primary Research Focus	Protocol Status
Klotho peptides	Anti-aging protein (Klotho) declining with age; research shows cognitive and metabolic protection	Experimental; no established clinical protocols yet

Key Principles for Anti-Aging Peptide Use

- Anti-aging peptides work synergistically with — not instead of — excellent nutrition, sleep, exercise, and stress management
- Epithalon is the most research-backed longevity peptide available with 40+ years of published work
- Semax is the most evidence-backed cognitive peptide with actual clinical registration
- Discuss all protocols with a practitioner — blood and telomere testing can help personalize longevity interventions
- The goal is not to max IGF-1 or other markers — mid-range optimization with monitoring is the evidence-based approach
- Lifestyle remains the foundation: the Blue Zone evidence consistently shows longevity emerges from how people live, not what they inject