LVL UP RX · CLIENT EDUCATION SERIES

Semax

ACTH(4-10) Analog · Neuropeptide

Focus · Memory · Neuroprotection · Stress Resilience

A complete research guide to Semax — the Russian-developed cognitive enhancement peptide that raises BDNF, sharpens focus, and protects the brain under stress.

FOR RESEARCH PURPOSES ONLY

LVL UP RX

Client Education Series

Everything you need to know about Semax and cognitive peptide research

> *Semax doesn't stimulate your brain like caffeine — it upgrades it. By directly stimulating BDNF and NGF production, it promotes the growth and resilience of neurons themselves. The difference between a stimulant and a neuropeptide is the difference between borrowing energy and building capacity.*

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ACTH(4-10) Analog — Russian Cognitive Neuropeptide

What Is Semax?

A neuropeptide developed in Russia — and used clinically there for decades

Semax is a synthetic heptapeptide — a chain of 7 amino acids — developed in the 1980s at the Institute of Molecular Genetics of the Russian Academy of Sciences. It is a modified analog of the ACTH(4-10) fragment — a portion of adrenocorticotropic hormone (ACTH) that has been known since the 1970s to influence cognitive function and memory, but which degrades rapidly in the body in its natural form.

Russian researchers modified the ACTH(4-10) fragment to create a more stable, more potent version that resists enzymatic breakdown. The result was Semax — a peptide with significantly extended biological activity that has been used in clinical medicine in Russia for decades, approved for use in stroke recovery, traumatic brain injury, cognitive decline, and optic nerve disease.

Unlike most cognitive supplements in the Western market, Semax has a genuine clinical history — it is not simply a research compound extrapolated from animal models. It is an approved pharmaceutical in Russia with decades of human use data. In research contexts outside Russia, it is studied as an investigational cognitive enhancement and neuroprotection compound.

7aa	1980s	BDNF	Nasal
AMINO ACIDS heptapeptide	**DEVELOPED** Russian Academy Sci.	**INCREASES** brain-derived factor	**OR SUBQ** dual delivery option

What Makes Semax Different From Typical Nootropics

Most cognitive supplements — whether caffeine, racetams, or herbal adaptogens — work by temporarily modulating neurotransmitter levels or blocking adenosine receptors. These approaches borrow from the brain's existing reserves. Semax works fundamentally differently:

Neurotrophin Induction

Semax directly stimulates the production of BDNF (Brain-Derived Neurotrophic Factor) and NGF (Nerve Growth Factor) — proteins that support the survival, growth, and maintenance of neurons. This is not a temporary neurotransmitter adjustment; it is a structural and functional enhancement of brain tissue itself.

Serotonin & Dopamine Modulation

Semax modulates the serotonergic and dopaminergic systems in a balanced way — improving mood, motivation, and executive function without the receptor downregulation or dependency risk associated with direct dopamine agonists.

Neuroprotection Under Stress

Semax has documented protective effects against neuronal damage from ischemia (reduced blood flow), oxidative stress, and excitotoxicity — the mechanisms underlying stroke, traumatic brain injury, and neurodegenerative disease. This is the basis of its clinical use in Russia.

Semax

ACTH(4-10) Analog — Cognitive Neuropeptide

No Tolerance or Dependency

Unlike stimulants or racetams, Semax does not produce receptor downregulation or dependency with typical research use. Its mechanism — neurotrophin induction — works through biological processes that do not desensitize in the same way.

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THE SCIENCE

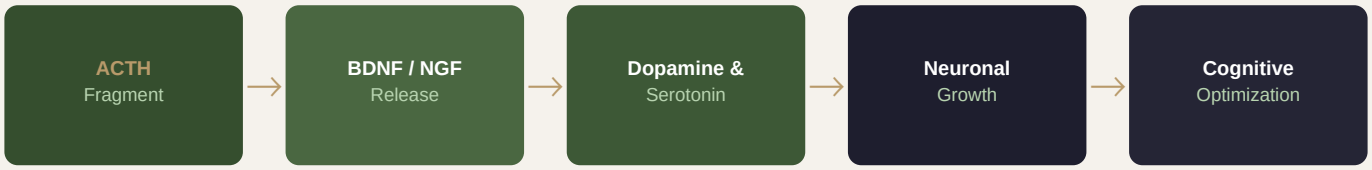
How Semax Works at the Neurological Level

The Science Behind Semax

Mechanism of action across multiple brain systems

The ACTH Fragment Connection

Semax is derived from ACTH(4-10) — the 4th through 10th amino acids of adrenocorticotropic hormone. This fragment was identified in the 1970s as the region responsible for ACTH's cognitive and behavioral effects, completely separate from its better-known role in cortisol regulation. The ACTH(4-10) fragment itself improves attention, memory consolidation, and adaptive behavior — but degrades in the body within minutes. Semax is a synthetic modification of this fragment engineered for stability and potency.



BDNF Upregulation — The Core Mechanism

BDNF (Brain-Derived Neurotrophic Factor) is sometimes called 'Miracle-Gro for the brain.' It is the primary driver of neuroplasticity — the ability of the brain to form new connections, strengthen existing ones, and adapt to learning and experience. BDNF supports the survival of existing neurons, promotes the growth of new neurons (neurogenesis in the hippocampus), and enhances synaptic plasticity — the cellular basis of memory formation. Semax has been shown to significantly upregulate BDNF expression in the hippocampus and frontal cortex — the brain regions most critical for memory and executive function.

NGF Release — Neuronal Maintenance

NGF (Nerve Growth Factor) supports the maintenance and survival of cholinergic neurons — the neurons that use acetylcholine, the neurotransmitter most directly linked to memory and attention. NGF decline is strongly associated with age-related cognitive decline and is implicated in Alzheimer's disease pathology. Semax's NGF-stimulating effects make it of particular interest in age-related cognitive protection research.

Dopaminergic & Serotonergic Modulation

Semax modulates activity in both the dopamine and serotonin systems — producing improvements in motivation, executive function, mood stability, and stress tolerance. Unlike direct dopamine agonists (which can cause receptor downregulation and dependency), Semax's influence on these systems appears to be modulatory rather than direct, making it significantly more sustainable for extended use.

Melanocortin Receptor Activity

As an ACTH analog, Semax interacts with melanocortin receptors (MC1-MC5) in the brain. Melanocortin receptor activation in the CNS is associated with improved attention, reduced anxiety, neuroprotection, and anti-inflammatory effects. This receptor system is distinct from the pathways targeted by most cognitive compounds, giving Semax a unique pharmacological fingerprint.

Semax

The Science — Mechanism of Action

Anti-Inflammatory Neuroprotection

Semax suppresses neuroinflammatory signaling — reducing the activity of pro-inflammatory cytokines in the CNS. Neuroinflammation is increasingly recognized as a key driver of cognitive decline, neurodegenerative disease, and post-injury brain damage. This anti-inflammatory mechanism contributes to Semax's protective effects and is the basis of its use in stroke research.

Sx

SEMAX

ACTH(4-10) Analog · Cognitive Enhancement

Focus · Memory · Neuroprotection · Stress Resilience

Key Benefits of Semax

Research-supported cognitive, neurological & psychological effects

Cognitive Performance & Focus

The most immediately reported and most extensively studied application:

- Enhanced working memory — improved ability to hold and manipulate information
- Increased sustained attention and resistance to distraction
- Faster information processing and improved reaction time
- Improved executive function — planning, decision-making, and mental flexibility
- Reduced mental fatigue — ability to maintain cognitive performance under workload
- Effects often reported as 'clarity' rather than 'stimulation' — more signal, less noise

Memory Formation & Learning

- Enhanced memory consolidation — better transfer from short-term to long-term memory
- Improved recall of both recently learned and previously stored information
- Facilitated learning in complex task acquisition
- BDNF upregulation in the hippocampus directly supports the cellular basis of memory
- Studied for potential in age-related memory decline and cognitive impairment research

Mood, Motivation & Stress Resilience

- Improved mood and emotional stability through serotonergic modulation
- Enhanced motivation and drive through dopaminergic influence
- Reduced anxiety and stress response under cognitively demanding conditions
- Improved stress tolerance — performance maintained under psychological pressure
- Particularly noted by users working in high-demand, high-stress environments

Neuroprotection

- Documented protective effects against ischemic neuronal damage in clinical research
- Reduces neuronal death following oxygen/glucose deprivation — basis of stroke research use
- Anti-inflammatory effects reduce chronic low-grade neuroinflammation
- NGF support preserves cholinergic neuron health — relevant to Alzheimer's research
- Used clinically in Russia for traumatic brain injury recovery and optic nerve disease

BENEFIT AREA	KEY MECHANISM	RESEARCH STATUS
Focus & Attention	Melanocortin receptor, BDNF	Human research + clinical use
Memory	BDNF/hippocampal plasticity	Preclinical + clinical data
Mood / Motivation	Serotonin & dopamine modulation	Human & animal research

Semax

Key Benefits — What the Research Shows

Stress Resilience	Adaptive neurochemistry	Human studies documented
Neuroprotection	Anti-inflammatory, NGF	Clinical use in Russia
Cognitive Recovery	BDNF, anti-ischemic	Stroke/TBI clinical protocols

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SEMAX VS OTHER NOOTROPICS

Why Peptide Cognition Is Different

Semax vs Other Nootropics

The fundamental difference between borrowing and building

The nootropics market is full of compounds that temporarily shift neurotransmitter balance or block adenosine — producing a feeling of enhanced cognition that fades as the compound clears. Semax operates at a fundamentally different level: it stimulates the production of proteins that literally grow and strengthen brain tissue.

Caffeine

- Alertness only
- Tolerance quickly
- Adrenal stress
- No neuroplasticity

Racetams

- Mild cognition
- Unclear mechanism
- Variable results
- No neuroprotection

Semax

- BDNF/NGF release
- Neuroplasticity
- Neuroprotection
- Stress resilience

COMPOUND	MECHANISM	TOLERANCE	NEUROPROTECTION	BDNF EFFECT
Caffeine	Adenosine block	Rapid	None	None
Modafinil	Dopamine reuptake	Moderate	Minimal	Minimal
Racetams	Acetylcholine mod.	Variable	Slight	Minimal
Lion's Mane	NGF precursor	None	Moderate	Moderate (indirect)
Semax	BDNF/NGF direct, melanocortin	None documented	Strong	Direct & significant

The BDNF Advantage

BDNF is to the brain what testosterone is to muscle — the primary anabolic signal that drives growth, adaptation, and resilience. Exercise raises BDNF. Fasting raises BDNF. Learning raises BDNF. Most nootropic compounds don't raise BDNF at all — they modulate neurotransmitters that already exist. Semax directly stimulates BDNF production, making it one of only a handful of research compounds that genuinely changes the structural capacity of the brain rather than just temporarily adjusting its chemistry.

Clinical note: Semax has been used in Russian hospitals since the 1990s for stroke recovery, transient ischemic attacks, cognitive decline, optic nerve atrophy, and peptic ulcer disease. This clinical history is the foundation of its research credibility — it is not merely a biohacker compound extrapolated from rodent studies.

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WHO IS IT FOR?

Ideal Candidates & Use Cases

Who Is Semax For?

Ideal research candidates across cognitive and neurological goals

High-Performance Professionals & Knowledge Workers

Executives, lawyers, physicians, researchers, programmers, and anyone whose professional output depends on sustained cognitive performance. Semax is not a stimulant — it doesn't create jitteriness or crash. It is reported to produce a state of clear, focused cognitive function that users describe as their 'best mental self.' Particularly relevant for high-stakes, high-demand work.

Students & Academic Performance

Those in demanding academic programs where memory consolidation, learning speed, and sustained attention are critical. Semax's BDNF-mediated enhancement of hippocampal plasticity directly supports the cellular mechanisms of learning and memory formation — making it uniquely relevant in educational performance research.

Cognitive Anti-Aging (45+)

Adults experiencing the early signs of age-related cognitive decline: tip-of-tongue phenomena, reduced processing speed, difficulty with multitasking, or reduced mental stamina. BDNF and NGF both decline with age — and their decline is strongly correlated with cognitive aging. Semax addresses this at the neurotrophin level.

Stress & Burnout Recovery

Individuals recovering from prolonged stress, burnout, or cognitive overload. Chronic stress suppresses BDNF and causes structural changes in the prefrontal cortex and hippocampus. Semax's BDNF-upregulating and neuroprotective properties may support recovery of cognitive function in these contexts.

Neuroprotection & Brain Health Focus

Biohackers and longevity-focused individuals who view brain health as a primary long-term investment. Semax's anti-inflammatory, BDNF-supporting, and NGF-stimulating properties make it one of the most evidence-backed neuroprotective research compounds available for long-term cognitive health maintenance.

Athletic Recovery & CNS Fatigue

High-volume athletes dealing with central nervous system fatigue — the mental exhaustion that accompanies overtraining. Semax's neuroprotective and neurorestorative properties may support CNS recovery alongside physical recovery, particularly when stacked with compounds like BPC-157 and TB-500.

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DELIVERY METHODS

Nasal vs Subcutaneous — How Each Works

Delivery Methods

Semax's two routes — and how to choose between them

Semax is unique among research peptides in that it is highly effective via both nasal and subcutaneous routes — with meaningfully different onset profiles, duration, and practical considerations. Understanding the difference is important for protocol design.

Intranasal (Nasal Spray) — The Most Common Delivery Method

Nasal administration is the most widely used and studied delivery route for Semax — including in its clinical use in Russia. The nasal mucosa offers direct proximity to the olfactory nerve, which provides a pathway to the CNS that partially bypasses the blood-brain barrier. This makes nasal delivery of peptides uniquely efficient for brain-targeted compounds.

- Fast onset: effects typically felt within 15–30 minutes of administration
- Direct CNS access via olfactory pathway — higher brain concentration relative to dose
- Convenient and needle-free — lowest barrier to consistent use
- Shorter duration than SubQ — typically 4–8 hours per dose
- Absorption can vary based on nasal mucosal condition
- Most commonly used for acute cognitive enhancement protocols

Subcutaneous (SubQ) Injection

SubQ injection provides more consistent and predictable bioavailability than nasal administration — systemic absorption is reliable regardless of nasal mucosal condition. It also tends to produce a longer duration of effect.

- Higher and more consistent bioavailability than nasal route
- Longer duration of action — typically 6–12+ hours
- Preferred for neuroprotective and therapeutic protocols
- Onset slightly slower than intranasal — typically 30–60 minutes
- Standard insulin syringe — abdomen, thigh, or deltoid
- Preferred route for users who want predictable, reproducible results

FACTOR	INTRANASAL	SUBCUTANEOUS
Onset	15–30 minutes	30–60 minutes
Duration	4–8 hours	6–12+ hours
Bioavailability	Good (variable)	High (consistent)
Convenience	High — needle-free	Moderate — injection
CNS Access	Direct (olfactory)	Systemic → BBB crossing
Best For	Acute cognitive enhancement	Neuroprotective protocols
Preparation	Nasal spray solution	Reconstituted SubQ

Delivery Methods

Nasal vs Subcutaneous — How Each Works

Many research subjects use both routes strategically — intranasal for acute cognitive performance days, and SubQ for sustained neuroprotective protocols. Both can be used in the same overall protocol with appropriate timing.

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PROTOCOLS & TIMING
Administration Strategy & Cycling

Protocols & Timing

How to structure a Semax research protocol

Semax protocols vary depending on the goal — acute cognitive performance enhancement or sustained neuroprotective use. The two approaches differ in frequency, timing, and delivery method preference.

Acute Cognitive Performance Protocol

Used on high-demand days — important presentations, demanding cognitive work, exams, or any situation requiring peak mental performance:

- Administer intranasally 20–30 minutes before the cognitive demand
- Morning administration preferred — aligns with natural cortisol curve and dopaminergic activity peak
- Can be re-dosed mid-day for extended cognitive demands if needed
- Does not need to be used daily — as-needed use is effective and reduces cumulative exposure

Sustained Neuroprotective Protocol

Used for ongoing cognitive enhancement, anti-aging neuroprotection, or recovery from stress/burnout:

- Daily or twice-daily SubQ or nasal administration
- Morning administration is standard; second dose early afternoon if twice-daily
- Typical research cycles: 2–4 weeks on, 1–2 weeks off to prevent tolerance build-up
- BDNF and neurotrophin effects are cumulative — sustained use produces progressively greater structural benefit
- Blood pressure and heart rate should be monitored — mild elevations are possible in some research subjects

PROTOCOL	DELIVERY	FREQUENCY	TIMING	CYCLE
Acute Performance	Intranasal	As needed	20–30 min before cognitive demand	No cycling needed
Sustained Neuroprotection	SubQ or nasal	Daily	Morning, or morning + afternoon	2–4 wk on 1–2 wk off
Anti-Aging Maintenance	SubQ	5 days on 2 days off	Morning	8 wk on 4 wk off

Reconstitution (SubQ): Add bacteriostatic water slowly to lyophilized powder. Swirl gently — do not shake. Refrigerate after reconstitution. Use within 30–60 days. Never freeze reconstituted Semax. For nasal use: Semax is typically prepared as a 0.1% or 1% solution in saline or bacteriostatic water for nasal spray delivery.

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STACKING SEMAX

Synergistic Combinations for Amplified Results

Stacking Semax

Intelligent combinations for enhanced cognitive and systemic outcomes

Semax pairs powerfully with compounds that address complementary systems — combining cognitive enhancement with physical recovery, longevity, or hormonal optimization for comprehensive protocols.

— The Brain & Body Recovery Stack

Semax + BPC-157

BPC-157 has documented neuroprotective properties alongside its well-known physical healing effects — modulating dopamine and serotonin systems, protecting neural tissue, and supporting gut-brain axis health. Combined with Semax's BDNF-driven cognitive enhancement and neuroprotection, this stack addresses both CNS and peripheral nervous system recovery. Particularly relevant for those recovering from injury, stress, or neurological challenge.

BEST FOR: *CNS recovery · Injury + brain health · Stress recovery · Athletes with CNS fatigue*

— The Cognitive Longevity Stack

Semax + NAD+

NAD+ supports neuronal energy production — the brain is one of the most energy-demanding organs and one of the first to show NAD+ decline. Semax provides BDNF-driven neuroplasticity and neuroprotection. Together they address both the energy substrate and the growth signal that neurons need to function and adapt optimally — a comprehensive cognitive anti-aging protocol.

BEST FOR: *Cognitive anti-aging · Brain longevity · Mental clarity · 40+ consumers*

— The Cognitive & Physical Peak Stack

Semax + CJC-1295 / Ipamorelin

CJC-1295 and Ipamorelin dramatically improve sleep quality — and sleep is when the brain consolidates memory, clears metabolic waste (glymphatic system), and restores cognitive reserves. Semax optimizes daytime cognitive performance. Together they create a complete 24-hour cognitive optimization protocol: sharp, neuroprotected daytime function and deep restorative sleep for consolidation and recovery.

BEST FOR: *Peak performance · Sleep + cognition · Anti-aging · High-performing professionals*

— The Comprehensive Brain Health Stack

Semax + NAD+ + BPC-157

The most complete neuroprotection and cognitive enhancement protocol in the LVL UP RX catalog. Semax provides BDNF/NGF-driven neuroplasticity and cognitive performance. NAD+ ensures optimal neuronal energy and sirtuin activation. BPC-157 provides anti-inflammatory neuroprotection and gut-brain axis support. Together, every major dimension of brain health is addressed simultaneously.

BEST FOR: *Comprehensive brain health · Longevity · Recovery · High-demand professionals*

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WHAT TO EXPECT

Timeline, Results & Realistic Outcomes

What to Expect

A realistic, research-grounded timeline for Semax

Semax produces effects across two time scales: acute effects felt within hours of administration, and cumulative neurotrophin-driven effects that build over weeks of consistent use. Both matter — the acute effect is what most users notice first, while the structural BDNF benefits accumulate over time.

TIMEFRAME	ACUTE (INTRANASAL)	CUMULATIVE (SUSTAINED USE)
Same day	Improved focus & clarity; reduced mental fog within 30 min	First administration — baseline neurotrophin induction begins
Days 3–7	Consistent focus enhancement; better stress tolerance on use days	Sustained BDNF elevation beginning; early mood improvements
Week 2–3	Reliable cognitive state on administration days	Memory consolidation improving; better recall and learning speed
Week 4–6	Users report tolerance to cognitive stress increasing	Structural neuroplasticity effects accumulating; mood stability
Week 8–12	Peak acute benefits well established	Full neuroprotective effects; cognitive baseline noticeably elevated
Ongoing	Consistent as-needed tool for high-demand days	Cycle off periodically; benefits persist post-cycle due to BDNF

KEY INSIGHT: *Because Semax raises BDNF — a protein that supports structural brain changes — some of its benefits persist after the protocol ends. Unlike stimulants where effects vanish when the compound clears, BDNF-driven neuroplasticity can outlast the administration period.*

Side Effect Profile

Semax has a well-characterized safety profile from decades of clinical use in Russia and extensive research use internationally:

- Generally very well tolerated — considered one of the safest cognitive research peptides
- Mild nasal irritation or runny nose possible with intranasal use — typically transient
- Injection site: mild redness or swelling with SubQ use; resolves quickly
- Mild blood pressure elevation possible — monitor in hypertensive individuals
- Some users report mild fatigue or mood shift after first few uses — typically resolves
- Rare reports of mild anxiety or overstimulation at higher doses — reduce dose if experienced
- No documented hormonal disruption, receptor downregulation, or withdrawal syndrome
- No dependency or tolerance documented with standard research protocols

As with all research compounds, individual responses vary. Consult a qualified healthcare provider before beginning any Semax protocol. Those with cardiovascular conditions, history of seizures, or taking psychiatric medications should discuss use with their provider before initiating.

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RESEARCH NOTES

Important Information & Compliance

Research Notes & Disclaimer

Please read carefully.

All products offered by LVL UP RX are sold strictly as research compounds for investigational use only. They are not intended for human consumption and are not approved by the FDA or any equivalent regulatory authority in the United States for therapeutic, preventive, or diagnostic use. Semax is an approved pharmaceutical in Russia — it does not hold FDA approval and is sold for research purposes only in this context.

The Research Landscape

Semax has an unusually strong research foundation for a cognitive enhancement peptide — combining decades of clinical use in Russia with peer-reviewed preclinical and clinical studies. Its BDNF and NGF-upregulating properties are well-documented. Its clinical use in stroke recovery, TBI, and cognitive decline is established in the Russian medical literature. Western research is more limited but rapidly expanding. This guide presents findings accurately and without exaggeration.

What We Will Never Claim

- That Semax treats, cures, or prevents any disease or medical condition in a US context
- That Semax is FDA approved or safe for human use as medicine in the United States
- That results are guaranteed — individual cognitive responses vary significantly
- That Semax replaces professional cognitive or psychiatric care
- That Semax is equivalent to prescription medications for any neurological condition

Selected Research References

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> *Semax is one of the most clinically validated cognitive neuropeptides available for research. At LVL UP RX, we're committed to bringing the science clearly to the people who need it — so every decision starts with knowledge.*

LVL UP RX · PEPTIDES · SCIENCE-BACKED. RESULTS-DRIVEN.

For research use only. Not for human consumption. Consult a qualified healthcare professional.

Research Notes

Important Information & Compliance