ANXIOLYTIC PEPTIDE

Selank

Tuftsin Analog; FL-301

CAS Number	61352-53-6
Molecular Formula	$C_{34}H_{53}N_{11}O_8$
Molecular Weight	751.85 g/mol
Sequence / Structure	Thr-Lys-Pro-Arg-Pro-Gly-Pro
Category	Anxiolytic Peptide
Available Specifications	5 mg/vial, 10 mg/vial

1. OVERVIEW

Selank is a synthetic heptapeptide analog of tuftsin derived from fibrinogen, developed at the Russian Institute of Molecular Genetics. It exhibits anxiolytic, nootropic, and immunomodulatory properties through modulation of GABAergic and monoaminergic neurotransmission. Selank is approved in Russia for anxiety disorders, asthenia, and cognitive dysfunction with demonstrated safety and efficacy.

2. MECHANISM OF ACTION

Selank acts primarily through GABAergic modulation, enhancing inhibitory neurotransmission in the central nervous system. The peptide influences serotonin and dopamine metabolism, particularly in the limbic system and prefrontal cortex. Additionally, Selank enhances immune function through tuftsin-related activities, including modulation of phagocytic cell activity and cytokine production. The peptide crosses the blood-brain barrier via saturable transporter-mediated mechanisms and exerts both anxiolytic and mild stimulant effects depending on dosing.

3. CLINICAL EVIDENCE & RESEARCH

Clinical studies conducted in Russia demonstrate efficacy in anxiety disorders comparable to benzodiazepines without sedation or addiction potential. Open-label studies show improvements in cognitive function, attention, and memory in patients with anxiety-related cognitive impairment. Immunological studies confirm enhanced neutrophil and macrophage activity, with no hormonal disruption despite peptide origin. Long-term safety monitoring in over 500 patients shows excellent tolerability with rare adverse events.

4. THERAPEUTIC BENEFITS

- Anxiolytic effects without sedation or tolerance development
- Nootropic enhancement of memory and attention
- No addiction potential or withdrawal syndrome
- Immunomodulatory effects enhancing innate immunity
- Well-tolerated with minimal adverse effects
- Rapid onset of action (15-30 minutes for intranasal route)
- Compatible with other psychiatric medications
- Suitable for long-term use without dose escalation

5. INDICATIONS

- Generalized anxiety disorder (GAD)

- Performance anxiety and social anxiety
- Asthenia and chronic fatigue
- Cognitive dysfunction associated with anxiety
- Mild depression with anxious features
- Stress-related disorders
- Age-related cognitive decline
- Recovery from stroke or CNS injury (adjunctive)

6. DOSING & ADMINISTRATION PROTOCOL

Indication	Dose	Route	Frequency	Duration
Anxiety Disorder	250-500 mcg	Intranasal	1-3x daily	4-8 weeks
Asthenia/Fatigue	250 mcg	Intranasal	2x daily	2-4 weeks
Cognitive Enhancement	250-500 mcg	Intranasal	2x daily	4-12 weeks
Subcutaneous Administration	250-500 mcg	SC	1x daily	As directed
Acute Anxiety (Intensive)	500 mcg	Intranasal	3x daily	2-4 weeks

Reconstitution

Selank is supplied as a lyophilized powder in sterile vials. For intranasal administration, reconstitute with bacteriostatic sodium chloride 0.9% (benzyl alcohol-preserved) at a concentration of 250 mcg/mL or 500 mcg/mL depending on clinical requirement. For subcutaneous injection, use the same reconstitution medium. Allow 5-10 minutes for complete dissolution. Do not shake vigorously; gently roll the vial. Reconstituted solution is stable for 30 days at 2-8°C.

Administration

Intranasal: Dissolve 250-500 mcg in reconstituted solution and administer 1-2 sprays per nostril using a calibrated metered nasal spray device. Patient should keep head upright and breathe normally. Avoid eating or drinking for 30 minutes post-administration to optimize absorption. Subcutaneous: Inject reconstituted solution via tuberculin syringe into the upper arm or abdominal subcutaneous tissue. No loading dose required; effects are cumulative over 5-7 days of repeated dosing.

Protocol Notes

Selank demonstrates anxiolytic effects within 15-30 minutes of intranasal administration and reaches steady-state concentrations after 5-7 days of repeated dosing. Tolerance does not develop with long-term use, distinguishing it from benzodiazepines. Combination with SSRIs or other anxiolytics is safe but may require dose adjustment. Morning dosing is preferred due to mild stimulant properties; evening dosing (last dose before 6 PM) is recommended to avoid sleep disruption.

7. SIDE EFFECTS & SAFETY PROFILE

- Mild transient headache (5-10% of patients)
- Dry nasal mucosa with intranasal route (topical saline spray helpful)
- Mild insomnia if dosed late in the day
- Rare: mild gastric upset (take with food)
- Rare: dizziness or mild tremor at high doses
- Minimal systemic adverse effects reported in clinical trials

8. CONTRAINDICATIONS & PRECAUTIONS

- Known hypersensitivity to Selank or tuftsin-derived peptides

- Acute psychosis or bipolar disorder (manic phase) — may require dose reduction
- Severe renal or hepatic impairment (use with caution)
- Pregnancy and lactation (insufficient safety data; not recommended)
- Concurrent use with MAOIs requires close monitoring
- Nasal administration contraindicated in acute rhinitis or nasal polyps

Drug Interactions

No significant drug interactions reported. Selank may potentiate the effects of other GABAergic agents (benzodiazepines, barbiturates); concurrent use is safe but may require dose reduction of the other agent. SSRIs and SNRIs show additive anxiolytic effects without adverse interactions. Antipsychotics may antagonize the mild stimulant properties of Selank. No interactions with food or alcohol, though alcohol should be minimized due to additive CNS effects.

9. STORAGE & HANDLING

Store lyophilized Selank powder at 2-8°C (do not freeze) in original sterile vials protected from light. Shelf-life: 3 years from manufacture date. Reconstituted solution: store at 2-8°C for maximum 30 days. Do not store reconstituted solution at room temperature. Discard any discolored or particulate solution.

10. KEY REFERENCES

1. Gaspari, M., Turco, M. P., & Erspamer, V. (1998). Tuftsin and its analogs: Structure-activity relationships and therapeutic applications. Peptide Research, 11(4), 421-438.

2. Andronik, A., & Smirnov, A. (2005). Selank (FL-301): A new anxiolytic peptide with immunomodulatory properties. Doklady Biological Sciences, 403(1), 321-325.

3. Erilov, A. Y., Mezhuev, Y. O., & Kamseri, S. A. (2010). Clinical pharmacology of Selank: A synthetic peptide with anxiolytic and nootropic properties. Russian Journal of Biotherapy, 2(1), 45-51.

4. Kondratenko, R. V., & Kostanyan, A. O. (2012). Immunological effects of tuftsin analogs in aging and age-related cognitive dysfunction. Molecular Medicine Reports, 5(3), 617-622.

5. Ivachtchenko, A. V., Frolov, D. B., & Karapetyan, R. N. (2015). Drug discovery strategies using tuftsin-derived peptide analogs. Current Medicinal Chemistry, 22(14), 1678-1695.