

RESEARCH MONOGRAPH . COMPOUND PROFILE

NA-Selank

N-terminal-acetylated and amidated variants of the heptapeptide anxiolytic Selank, designed to extend plasma and central nervous system exposure beyond the parent peptide.

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COMPOUND CLASS	N-acetylated Selank derivatives with extended pharmacokinetics

ABSTRACT

NA-Selank (N-acetyl-Thr-Lys-Pro-Arg-Pro-Gly-Pro) and NA-Selank Amide (the same N-acetylated heptapeptide with C-terminal amidation, Pro-NH₂) are N-terminal-modified derivatives of Selank, the seven-residue peptide anxiolytic developed at the Russian Academy of Sciences as an analog of the endogenous tetrapeptide tuftsin (Thr-Lys-Pro-Arg). The parent Selank is registered as a medicine in the Russian Federation as an intranasal anxiolytic at 0.15 percent solution; the principal pharmacological signature is anxiolysis without sedation, modest pro-cognitive activity, and immunomodulation through tuftsin-receptor binding on monocytes and natural killer cells. Selank itself has a short plasma half-life of minutes and is administered intranasally to leverage direct olfactory and trigeminal transport to the central nervous system; the N-acetyl modification at the threonine N-terminus blocks the principal aminopeptidase cleavage site and extends plasma half-life by approximately 5-fold, while the C-terminal amidation in the Amide variant similarly blocks carboxypeptidase cleavage at the proline C-terminus. The combined modifications produce a heptapeptide with substantially extended exposure suitable for parenteral administration with central nervous system effect. Mechanism includes BDNF transcriptional upregulation, GABAergic and serotonergic modulation, and tuftsin-receptor immunomodulation. Both NA-Selank and NA-Selank Amide are research-grade peptides without regulatory approval; published characterization is principally in Russian-language journals and is dominated by the originating Institute of Molecular Genetics RAS research group. Investigators should treat the extended-PK

variants as research tools for studying parenteral Selank pharmacology and should consider that the immune-modulatory profile may be more pronounced with extended exposure than with the brief intranasal pulse achieved by the parent.

1. Compound Identification

NA-Selank is described as n-acetylated selank derivatives with extended pharmacokinetics. N-terminal-acetylated and amidated variants of the heptapeptide anxiolytic Selank, designed to extend plasma and central nervous system exposure beyond the parent peptide.

1.1 Class summary

N-acetylated Selank derivatives with extended pharmacokinetics

1.2 Subtitle

N-terminal-acetylated and amidated variants of the heptapeptide anxiolytic Selank, designed to extend plasma and central nervous system exposure beyond the parent peptide.

2. Abstract

NA-Selank (N-acetyl-Thr-Lys-Pro-Arg-Pro-Gly-Pro) and NA-Selank Amidate (the same N-acetylated heptapeptide with C-terminal amidation, Pro-NH₂) are N-terminal-modified derivatives of Selank, the seven-residue peptide anxiolytic developed at the Russian Academy of Sciences as an analog of the endogenous tetrapeptide tuftsin (Thr-Lys-Pro-Arg). The parent Selank is registered as a medicine in the Russian Federation as an intranasal anxiolytic at 0.15 percent solution; the principal pharmacological signature is anxiolysis without sedation, modest pro-cognitive activity, and immunomodulation through tuftsin-receptor binding on monocytes and natural killer cells. Selank itself has a short plasma half-life of minutes and is administered intranasally to leverage direct olfactory and trigeminal transport to the central nervous system; the N-acetyl modification at the threonine N-terminus blocks the principal aminopeptidase cleavage site and extends plasma half-life by approximately 5-fold, while the C-terminal amidation in the Amidate variant similarly blocks carboxypeptidase cleavage at the proline C-terminus. The combined modifications produce a heptapeptide with substantially extended exposure suitable for parenteral administration with central nervous system effect. Mechanism includes BDNF transcriptional upregulation, GABAergic and serotonergic modulation, and tuftsin-receptor immunomodulation. Both NA-Selank and NA-Selank Amidate are research-grade peptides without regulatory approval; published characterization is principally in Russian-language journals and is dominated by the originating Institute of Molecular Genetics RAS research group. Investigators should treat the extended-PK variants as research tools for studying parenteral Selank pharmacology and should consider that the immune-modulatory profile may be more pronounced with extended exposure than with the brief intranasal pulse achieved by the parent.

3. Mechanism of Action

Tufts-in-receptor partial agonism on monocytes and NK cells. BDNF transcriptional upregulation; GABAergic and serotonergic modulation. N-acetyl and C-terminal amidation block aminopeptidase and carboxypeptidase cleavage, extending plasma half-life.

The mechanistic profile described above represents the consensus position from peer-reviewed literature where available; for compounds with sparse formal characterization, this section reflects vendor-grade reports and structurally-related class pharmacology and should be interpreted with appropriate caution.

4. Pharmacokinetics and Routes of Administration

Pharmacokinetic data are summarized within the abstract for compounds with formal Phase 1 records. Compounds without published human pharmacokinetic studies are noted as such; investigators should treat the absence of data as a research limitation.

5. Reported Research Dose Ranges

Research administration 0.1 to 0.5 mg/kg subcutaneous or intranasal. No human clinical data for the modified variants.

Doses are scaled from clinical use where the compound is approved as a medicine, from Phase 2/3 trials where development advanced, or from rodent dose-response data scaled by allometric assumptions where the compound has no human clinical record. Investigators should treat dose ranges from research-chemical-grade vendors as starting points for their own pharmacokinetic and tolerability characterization rather than validated dosing recommendations.

6. Sourcing and Quality Verification

Investigators should obtain analytical confirmation of identity (mass spectrometry; for peptides, additionally amino acid analysis or N-terminal sequencing) and purity (HPLC area-percent, ideally greater than 95 percent) on every lot. Vendor certificates of analysis vary in quality; third-party analytical confirmation through independent laboratories (e.g., Janoshik Analytical, Anabolic Lab) is the gold standard for research-grade peptides and small molecules.

For compounds with established pharmaceutical-grade marketing in any jurisdiction, sourcing from the marketed product (where legal and accessible) provides the highest quality assurance.

7. Reconstitution and Handling

Peptides should be reconstituted in bacteriostatic water or sterile water for injection in the volume appropriate to the desired concentration; lyophilized peptides should be allowed to come to room temperature before reconstitution to minimize precipitation. Reconstituted peptides should be stored refrigerated and used within the timeframe specified by the manufacturer (typically 14 to 30 days for bacteriostatic water reconstitutions, shorter for sterile water).

Small molecules: storage conditions vary by compound; consult the certificate of analysis for the specific product. Most are stable at room temperature in dry, dark conditions; oxidation-sensitive compounds (e.g., catecholamine precursors) require cool storage and protection from light.

8. Stack Interaction Considerations

Investigators combining this compound with other research substances should consider receptor-level interactions (additive effects at shared targets), enzyme-level interactions (CYP-mediated drug-drug interactions where applicable), and pharmacodynamic interactions (additive sedation, additive serotonergic activity, additive hemodynamic effects).

The stack interaction section in published monographs of well-characterized compounds is necessarily incomplete for any specific combination; investigators should treat novel combinations with elevated caution and titrate gradually.

9. References

1. Kolomin TA, et al. Effects of N-acetylated peptide analogs of Selank on behavior and gene expression. Bull Exp Biol Med 2011.
2. Kozlovskaya MM, et al. Selank: from primary structure to clinical use. Eksp Klin Farmakol 2003.
3. Andreeva LA, et al. Synthesis and biological activity of regulatory peptide analogs. Russ J Bioorg Chem 2010.

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