

Pinealon + Selank + DSIP + Oxytocin (Nasal Spray Preparation)

A four-component aqueous nasal spray preparation combining a Khavinson pineal tripeptide, a Russian Academy of Sciences tuftsin-Pro-Gly-Pro heptapeptide, the Delta Sleep Inducing Peptide, and the posterior-pituitary cyclic nonapeptide Oxytocin — assembled to engage four mechanistically distinct sleep-architecture and circadian-biology pathways in a single nasal-delivery preparation.

CATALOG REFERENCE

BM-SPR-009

FORM FACTORNasal spray · 110 mg /
bottle**STRENGTH**110 mg total active
(Pinealon 30 mg +
Selank 30 mg + DSIP 30
mg + Oxytocin 20 mg)**DATE OF ISSUE**

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This research preparation is a four-component nasal spray formulation combining **Pinealon** (a Khavinson Cytogen-class pineal tripeptide), **Selank** (a Russian Academy of Sciences tuftsin-Pro-Gly-Pro heptapeptide), **DSIP** (Delta Sleep Inducing Peptide), and **Oxytocin** (the neurohypophysial posterior-pituitary cyclic nonapeptide). The four components span four mechanistically distinct molecular-target families converging on sleep-architecture and circadian biology: a Khavinson short-peptide bioregulator with reported effects on pineal melatonin-synthesis enzyme expression, a Russian Academy of Sciences neuropeptide with anxiolytic-class effects, an endogenous nonapeptide neuromodulator of sleep-state biology, and a posterior-pituitary peptide hormone engaging the oxytocin receptor. The preparation is supplied at 110 mg total mass per bottle (Pinealon 30 mg + Selank 30 mg + DSIP 30 mg + Oxytocin 20 mg). **This monograph summarises published cellular pharmacology and preclinical findings for laboratory research reference only.**

01 Component Composition

COMPONENT A — PINEALON	30 mg · Glu-Asp-Arg tripeptide · CAS 147551-89-5 · Khavinson Cytogen-class pineal short peptide
COMPONENT B — SELANK	30 mg · Thr-Lys-Pro-Arg-Pro-Gly-Pro heptapeptide · CAS 129954-34-3 · Russian Academy of Sciences tuftsin-Pro-Gly-Pro analogue
COMPONENT C — DSIP	30 mg · Delta Sleep Inducing Peptide · WAGGDASGE nonapeptide · CAS 62568-57-4 · endogenous sleep-state-associated peptide
COMPONENT D — OXYTOCIN	20 mg · CYIQNCPLG cyclic-disulfide nonapeptide · CAS 50-56-6 · neurohypophyseal posterior-pituitary peptide hormone
TOTAL MASS PER BOTTLE	110 mg total active
VEHICLE	Aqueous nasal-grade vehicle with preservative
ANALYTICAL SPECIFICATION	Component-level ≥ 95 % purity by HPLC; composition verified by HPLC quantification of each component

02 Rationale for Combined Composition

THE FOUR-COMPONENT PREPARATION CONSOLIDATES FOUR MECHANISTICALLY DISTINCT SLEEP-ARCHITECTURE research compounds. **Pinealon** is a Khavinson Glu-Asp-Arg short tripeptide bioregulator with reported tissue-specific effects on rat pineal explants and modulation of melatonin-synthesis enzyme gene expression. **Selank** engages tuftsin-receptor and GABAergic pathways with characterised anxiolytic-class preclinical effects. **DSIP** is the Delta Sleep Inducing Peptide originally characterised by Schoenenberger and Monnier in rabbit cerebral venous blood during electrical thalamic stimulation; the molecule is associated with delta-wave sleep architecture in EEG preparations. **Oxytocin** engages the oxytocin receptor (OXTR) with documented effects on social-bonding neurobiology and indirect sleep-related neurohypophyseal pathway engagement. The combination enables laboratory study of these mechanistically diverse axes in a single nasal-delivery experimental system.

03 Critical Chemistry-Handling Notes for the Combined Preparation

CRITICAL: OXYTOCIN DISULFIDE PRESERVATION

The most critical handling consideration for this four-component preparation is preservation of the Oxytocin Cys1-Cys6 disulfide. Reducing agents (DTT, β -mercaptoethanol, TCEP) must be excluded from all vehicles, buffers, and laboratory glassware in contact with the preparation. Disulfide reduction destroys Oxytocin's bioactive cyclic conformation while leaving the other three components largely unaffected — but the resulting preparation is no longer the intended four-component combination. **Additional handling considerations:** (a) DSIP contains a Trp1 residue with photo-oxidation susceptibility; light protection is recommended throughout; (b) DSIP also has an Asp-Gly hydrolysis vulnerability at the Asp5-Gly6 sequence position; (c) the four components span substantial molecular-size diversity (Pinealon $416 \text{ g}\cdot\text{mol}^{-1}$ vs. Oxytocin $1007 \text{ g}\cdot\text{mol}^{-1}$), which may affect comparative nasal mucosa permeation kinetics.

04 Nasal Delivery Considerations

INTRANASAL BIOAVAILABILITY AND VEHICLE CHEMISTRY

The intranasal route provides direct access to systemic circulation through the rich vascularisation of the nasal mucosa, bypassing first-pass hepatic metabolism characteristic of oral administration. For peptide-class compounds, the principal nasal-delivery considerations are (a) **mucosal residence time** — aqueous nasal vehicles produce relatively short mucosal contact, with peptide permeation governed by molecular size, lipophilicity, and chemistry of the active; (b) **vehicle pH** — neutral-to-slightly-acidic pH (5.5–7.0) is optimal for both nasal mucosa tolerance and peptide bond stability; (c) **osmolarity** — formulation osmolarity is targeted to approximate physiological isotonicity to minimise mucociliary disruption; (d) **preservative selection** — benzalkonium chloride or similar quaternary ammonium preservatives are standard for nasal aqueous formulations; (e) **permeation enhancers** may be incorporated in some formulations to support peptide passage across the nasal epithelium without disrupting mucosal integrity.

05 Laboratory Handling and Storage

THE SEALED NASAL SPRAY BOTTLE IS HELD AT 2–8 °C REFRIGERATED FOR LONG-TERM STORAGE, LIGHT-PROTECTED, and may be brought to room temperature for working use. Reducing agents must be excluded throughout to preserve the Oxytocin disulfide. Working concentrations are determined by the investigator's experimental design.

06 References

- 1 Khavinson VKh, Linkova NS, Tarnovskaya SI, et al. Short peptides stimulate serotonin expression in cells of brain cortex. *Bull Exp Biol Med.* 2014;157(1):77–80. PMID: 24913577
- 2 Kozlovskii II, Danchev ND. The anxiolytic spectrum of Selank and its effects on monoamine neurotransmission. *Eksp Klin Farmakol.* 2003;66(5):3–7. PMID: 18988498
- 3 Schoenenberger GA, Monnier M. Characterization of a delta-electroencephalogram (-sleep)-inducing peptide. *Proc Natl Acad Sci USA.* 1977;74(3):1282–1286. PMID: 265572

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