

# Epitalon (Nasal Spray Preparation)

*A single-compound aqueous nasal spray preparation of the Khavinson pineal AEDG tetrapeptide Epitalon — formulated for intranasal mucosal delivery via a metered-dose 200-actuation bottle at 0.25 mg active per spray.*

**CATALOG REFERENCE**

BM-SPR-002

**FORM FACTOR**Nasal spray · 50 mg /  
bottle · 200 sprays ·  
0.25 mg per spray**STRENGTH**

50 mg active per bottle

**DATE OF ISSUE**

May 2026

**T**his research preparation is a single-component nasal spray formulation of **Epitalon** (also spelled Epithalon), a synthetic tetrapeptide with sequence Ala-Glu-Asp-Gly (AEDG) developed at the St. Petersburg Institute of Bioregulation and Gerontology by Vladimir Khavinson and colleagues. The molecule was derived from a polypeptide pineal-gland preparation (Epitalamin) by chemical fractionation and is identified as the active short-peptide component. Across approximately three decades of investigation, Epitalon has been characterised in cell-culture and rodent preparations as a putative telomerase activator, a modulator of circadian-rhythm gene expression including pineal melatonin-synthesis enzymes, and a candidate lifespan-extending compound in rodent longevity studies from the originating laboratory. A 2025 study by Brunel University researchers independently confirmed dual telomerase / alternative-lengthening-of-telomeres (ALT) activity in human cell-line preparations. The preparation is supplied at 50 mg total mass per bottle with 200 sprays per bottle at 0.25 mg per spray. **This monograph summarises published preclinical findings and nasal vehicle formulation considerations for laboratory research reference only.**

## 01 Active Compound Profile

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COMMON DESIGNATION	Epitalon · Epithalon · AEDG peptide
PRIMARY SEQUENCE	Ala-Glu-Asp-Gly (A-E-D-G)
CAS REGISTRY	307297-39-8
MOLECULAR FORMULA	$C_{14}H_{22}N_4O_9$
AVERAGE MOLECULAR MASS	390.35 g · mol <sup>-1</sup>
PROPOSED MOLECULAR ACTIONS	Telomerase enzymatic activation; ALT-pathway engagement (Brunel 2025); modulation of pineal melatonin-synthesis enzyme gene expression; circadian-rhythm gene modulation

## 02 Formulation and Delivery Specifications

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TOTAL MASS PER BOTTLE	50 mg Epitalon active
SPRAYS PER BOTTLE	200 sprays
ACTIVE PER SPRAY	0.25 mg Epitalon per spray
VOLUME PER SPRAY	0.1 mL per metered actuation
VEHICLE	Aqueous nasal-grade vehicle with preservative; intranasal mucosal delivery
PHYSICAL FORM	Clear aqueous solution in metered-dose nasal spray bottle
ANALYTICAL SPECIFICATION	Epitalon ≥ 99 % purity by HPLC; content uniformity per actuation verified to ± 10 % of label claim (BIOMOD Labs internal release specification)

## 03 Proposed Mechanisms in Preclinical Models

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THE DEFINING PRECLINICAL OBSERVATION FOR EPITALON IS TELOMERASE ACTIVATION. KHAVINSON AND COLLEAGUES (2003) reported that Epitalon exposure increased telomerase activity in cell-culture preparations of human somatic cells, with parallel telomere-elongation observations across multiple cell types. A 2025 study from Brunel University extended this characterisation in human cell-line preparations and confirmed both classical telomerase activation and engagement of the alternative-lengthening-of-telomeres (ALT) pathway. Beyond telomerase chemistry, the Epitalon literature documents preclinical effects on circadian-rhythm gene expression, particularly in pineal-gland tissue

preparations from rodents. The molecule has been reported to modulate the expression of melatonin-synthesis enzyme genes including arylalkylamine N-acetyltransferase (AANAT) and hydroxyindole-O-methyltransferase (HIOMT). Anisimov and colleagues have published a series of rodent lifespan studies reporting modest lifespan extension in animals exposed to Epitalamin / Epitalon.

## 04 Nasal Delivery Considerations

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### INTRANASAL BIOAVAILABILITY AND VEHICLE CHEMISTRY

The Epitalon tetrapeptide is small ( $390 \text{ g} \cdot \text{mol}^{-1}$ ), highly water-soluble, and chemically robust — no cysteine (no disulfide consideration), no methionine (no oxidation), and no aromatic residues (no photo-oxidation). These chemistry features make Epitalon among the more nasal-formulation-tolerant peptides in the BIOMOD catalog. The principal nasal-delivery considerations are (a) **small molecular size** supports relatively favourable nasal mucosa permeation compared with larger peptides; (b) **vehicle pH** — neutral pH (6.5–7.4) is optimal for both nasal mucosa tolerance and peptide bond stability; (c) **osmolarity** — approximate physiological isotonicity; (d) **preservative selection** — standard nasal-grade preservatives are compatible with the Epitalon chemistry.

## 05 Laboratory Handling and Storage

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THE SEALED NASAL SPRAY BOTTLE IS HELD AT 2–8 °C REFRIGERATED FOR LONG-TERM STORAGE AND MAY BE brought to room temperature for working use. The preservative content of the aqueous vehicle supports limited room-temperature stability during in-use periods. Working concentrations and actuation counts are determined by the investigator's experimental design (0.25 mg active per actuation at the specified formulation).

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## 06 References

- 1 Khavinson VKh, Bondarev IE, Butyugov AA. Epithalon peptide induces telomerase activity and telomere elongation in human somatic cells. *Bull Exp Biol Med.* 2003;135(6):590–592. [PMID: 12937682](#)
- 2 Khavinson VKh, Goncharova N, Lapin B. Synthetic tetrapeptide epitalon restores disturbed neuroendocrine regulation in senescent monkeys. *Neuro Endocrinol Lett.* 2001;22(4):251–254. [PMID: 11524634](#)
- 3 Anisimov VN, Khavinson VKh. Peptide bioregulation of aging: results and prospects. *Biogerontology.* 2010;11(2):139–149. [PMID: 19898981](#)
- 4 Costantino HR, Illum L, Brandt G, Johnson PH, Quay SC. Intranasal delivery: physicochemical and therapeutic aspects. *Int J Pharm.* 2007;337(1-2):1–24. [PMID: 17475423](#)

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