BIOMOD LABS · RESEARCH PEPTIDE CO.

RESEARCH COMPOUND MONOGRAPH · SERIES 1 · NO. SOF-007

Pinealon + Epitalon (Softgel Preparation)

A two-component enteric-coated SEDDS softgel preparation combining the Khavinson Glu-Asp-Arg pineal tripeptide Pinealon with the Khavinson Ala-Glu-Asp-Gly tetrapeptide Epitalon — supplied in a pearl-white shell with pH > 6.0 enteric coating for distal small intestine release.

CATALOG REFERENCE	FORM FACTOR	PACK SIZE	DATE OF ISSUE
BM-SOF-007	Enteric-coated softgel · pH > 6.0 · Pinealon 1 mg + Epitalon 2.5 mg per capsule	30 capsules per bottle	May 2026

This research preparation is a two-component enteric-coated softgel formulation combining ***Pinealon*** *(a Khavinson Cytogen-class pineal tripeptide of sequence Glu-Asp-Arg) with* ***Epitalon*** *(a Khavinson tetrapeptide of sequence Ala-Glu-Asp-Gly, also spelled Epithalon). Both compounds were developed at the St. Petersburg Institute of Bioregulation and Gerontology and share the Khavinson short-peptide bioregulator design philosophy. The preparation is supplied at 1 mg Pinealon + 2.5 mg Epitalon per softgel capsule, 30 capsules per bottle in a pearl-white shell with pH > 6.0 enteric coating for release in the distal small intestine. The Epitalon dosage is confirmed per TrustWorks Invoice 1196.* ***This monograph summarises published cellular pharmacology and preclinical findings for laboratory research reference only.***

01 Component Composition

COMPONENT A — PINEALON	1 mg · Glu-Asp-Arg tripeptide · CAS 147551-89-5 · Khavinson Cytogen-class pineal short peptide
COMPONENT B — EPITALON	2.5 mg · Ala-Glu-Asp-Gly tetrapeptide · CAS 307297-39-8 · Khavinson tetrapeptide derived from Epitalamin pineal preparation
PACK SIZE	30 softgels per bottle
SHELL	Pearl-white softgel
ENTERIC COATING	pH > 6.0 trigger — releases contents in distal small intestine
VEHICLE	SEDDS lipid-based fill
ANALYTICAL SPECIFICATION	Component-level peptide ≥ 98 % purity by HPLC; content uniformity per softgel verified to USP standards

02 Rationale for Combined Composition

Both components are members of the Khavinson short-peptide bioregulator family developed at the St. Petersburg Institute of Bioregulation and Gerontology. **Pinealon** is a Glu-Asp-Arg tripeptide with reported tissue-specific effects on rat pineal explants in organotypic tissue culture preparations. **Epitalon** is a Ala-Glu-Asp-Gly tetrapeptide derived from the polypeptide pineal-gland preparation Epitalamin by chemical fractionation; the molecule has been characterised across approximately three decades of investigation as a putative telomerase activator (Khavinson 2003 PMID 12937682), 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 for Epitalon in human cell-line preparations. The combination consolidates two related Khavinson pineal compounds in a single enteric-coated softgel preparation.

03 Critical Chemistry-Handling Notes

KHAVINSON SHORT-PEPTIDE HANDLING CONSIDERATIONS

Both components are small, highly water-soluble acidic peptides. Neither contains an essential disulfide bond, methionine residue, or aromatic photo-oxidation-susceptible residue. Both are among the more handling-tolerant peptides in the BIOMOD catalog. The principal handling consideration is general: the enteric pH > 6.0 coating must be preserved intact to support distal small intestine release. The pearl-white shell colour provides modest light protection for the SEDDS lipid vehicle.

F Softgel Formulation Considerations

SEDDS-CLASS SOFTGEL CHEMISTRY

The softgel form factor employs a self-emulsifying drug delivery system (SEDDS) lipid-based vehicle inside a gelatin or modified-gelatin shell. SEDDS formulations consist of isotropic mixtures of oils, surfactants, co-surfactants, and the active compound, which spontaneously form fine oil-in-water emulsions upon contact with aqueous gastrointestinal fluids. This formulation strategy is particularly useful for poorly water-soluble actives, supporting dissolution and absorption from the gastrointestinal lumen. Key softgel-formulation considerations are (a) **shell composition** — gelatin shells are sensitive to moisture and temperature; modified-gelatin and plant-based shell alternatives are sometimes used; (b) **enteric coating** — pH-dependent polymer coatings (e.g., methacrylic acid copolymers) delay capsule disintegration until passage through the acidic stomach, releasing the contents in the more neutral environment of the small intestine; (c) **shell colour** — opacifiers and colourants protect light-sensitive actives and provide product identification; (d) **fill volume** — typical softgel fill volumes range from 0.3 to 1.5 mL per capsule, with corresponding shell sizes selected for the formulation.

04 Laboratory Handling and Storage

Sealed softgels held at controlled room temperature (15–25 °C), protected from moisture and direct light. The enteric coating is sensitive to mechanical damage; intact softgels should be preserved until use. Working quantities are determined by the investigator's experimental design.

05 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. 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
4. Anisimov VN, Khavinson VKh. Peptide bioregulation of aging: results and prospects. *Biogerontology.* 2010;11(2):139–149. PMID: 19898981