Epitalon (AEDG) + Crystagen (EDP-3) + Pinealon (EDR) Available for Research Use Only

(Epitalon 5 - 10 mg × 10 days,* Crystagen 0.5 – 1 mg / day × 10 days, *Pinealon* ≤ 0.5 mg / day × 10 days, *1 – 2 × annually)

The classic Khavinson / IBG / Russian Epitalon longevity stack using bovine peptide derivatives made extraordinary claims backed up by weak-to-moderate. Today's longevity protocol uses mechanistically similar synthetic peptides Epitalon (AEDG) + Crystagen (EDP 3) which do have a good safety record, but even less evidence for longevity.

💉 Possibly safe (weak mechanistic / animal evidence / some human use)

⭐ Plausibly effective (in vitro and animal signals are good, maybe week human data)

Disclaimer: These notes are not authoritative and should not be interpreted as definitive scientific guidance. They are summaries, compilations and plausible extrapolations drawn from the most relevant research I was able to locate, and may omit nuances, conflicting data, or emerging evidence. The material reflects an attempt to organize and understand complex topics, not to provide clinical recommendations or expert interpretation.

The protocols using Epithalamin from the pineal gland and Thymalin from the thymus, showed improved immune balance, metabolic markers, and markers of biological aging, in early Russian studies.

Extraordinary Claims with Important Caveats

Russian clinical trials from Khavinson, Morozov, and colleagues on **Thymalin (bovine thymic extract) plus Epithalamin (bovine pineal extract)** report **striking geroprotective effects in elderly cohorts, with follow-up periods of 6-12 years.**

The principal Russian studies were

- **1988-1993**: Early elderly-cohort trials showing immune restoration and improved melatonin rhythms.
- **1990-1999**: First long-term mortality follow-ups (6-8 years).
- **1994-2003**: Elderly subjects received **annual 20-day courses** of Thymalin, Epithalamin, or both. Follow-up lasted **6-12 years** depending on the cohort.

In these studies, older subjects received short annual or periodic courses of Thymalin and Epithalamin and their outcomes were compared with untreated controls of similar age. The Russian researchers observed the combined peptide groups showed a **2-fold to 4.1-fold reduction in all-cause mortality** over 6-12 years, alongside improvements in immune markers (normalized T-cell counts and CD4/CD8 ratios), restoration of thymic and pineal function, and more youthful melatonin rhythms. These findings underpin the Russian "bioregulator" concept: that organ-specific peptides can partially reverse age-related decline in key regulatory systems (thymus, pineal) and thereby extend healthy lifespan.

However, the evidence base has important caveats. Most of these trials occurred at the St. Petersburg Institute of Bioregulation and Gerontology by the same investigators who developed

the compounds, with **poor trial designs** (limited randomization/blinding, potential selection bias, and sometimes modest control characterization). Independent replication is sparse. So, the **headline claims of large mortality reductions and longevity extension are intriguing but sit at a "promising but low-to-moderate quality" evidence level** by strict modern standards: mechanistically plausible, internally consistent, but not yet confirmed by large, independent, rigorously controlled trials.

Crucially, **these trials used bovine extracts Epithalamin and Thymalin, not synthetic peptides.**

Replacing Epithalamin with Epitalon

IBG **developed the synthetic peptide Epitalon (AEDG), to replace the bovine polypeptide extract (Epithalamin)** so effects could be standardized, manufactured reproducibly, and studied mechanistically.

IBG Claims for Epitalon

- **Telomerase activation:** Key in vitro and cell-culture reports from Khavinson's group indicate **Epitalon can increase telomerase activity and extend replicative lifespan of fibroblasts**, providing a direct molecular hypothesis for anti-aging effects.
- **Pineal/circadian effects:** Epitalon is argued to reproduce Epithalamin's effects on **melatonin secretion and circadian regulation**, which are linked to systemic aging biology.
- **Antioxidant and gene-regulatory signals:** Preclinical work suggests antioxidant activity and modulation of gene expression programs relevant to cellular stress responses; the synthetic format facilitates mechanistic assays.

Human Evidence (what exists and its limits)

- **Clinical signals reported by IBG:** Russian clinical series and long-term observational reports claim **improvements in biomarkers and, in some trials, reduced mortality in older adults**, but these studies are largely from the originating group and many are published only in Russian.
- **Independent confirmation lacking:** Systematic reviews note **no broad independent replication** of the mortality or longevity claims and call for modern, well-controlled trials.
- **Safety profile:** Long-term Russian reports suggest a favorable safety signal, but **formal Phase-style safety trials and independent safety replication are limited**.

Creating a modern longevity protocol based around Epitalon is exactly what Khavinson's group intended when the created it.

How to Replace Thymalin

Thymalin is the "co-driver" in the Russian longevity trials protocol. To create a modern all-synthetic version of the multi-axis longevity protocol we must find a synthetic replacement for Thymalin.

Mechanistically, Thymalin is a complex bovine thymic extract containing multiple short peptides. It is reported to support

- T-cell differentiation
- immune gene-expression normalization
- restoration of thymic epithelial function
- reversal of immunosenescence

This is the same *depth* of regulatory action as Epithalamin, which is why they were paired.

The modern reinterpretation of the Russian "thymic reset" needs to center on the coordinated biology of thymic epithelial cells, stromal microenvironment, and T-cell maturation and how this axis can be modulated. Four candidate thymic peptides are available for consideration: three were developed by IBG: **Vilon (KE)**, **Thymogen (EW)**, and **Crystagen (EDP-3)** represent distilled molecular signals extracted from the broader activity of the original thymic extract **Thymalin**, each capturing a different layer of thymic regulation. The fourth candidate is **Thymulin,** a zinc-dependent hormone produced by thymic epithelial cells, first isolated and biochemically characterized from thymus tissue extracts in the 1970s (sperate and outside of IBG) and studied as a regulator of T-cell maturation and neuro-immune signaling.

Vilon provides a minimal epithelial-support signal, influencing local cytokine tone and thymopoiesis with a characteristically gentle regulatory profile. **Thymogen acts more acutely**, enhancing T-cell responsiveness and antigen-presentation pathways, and is used clinically in Russia for short-term immune support. **Crystagen, however, occupies the central role: as the purified active fraction of Thymalin, it most closely reproduces the extract's reported functional outcomes**: normalization of CD4/CD8 ratios, improved naïve T-cell output, and attenuation of age-associated inflammatory drift.

Thymulin is distinct from these synthetics: a zinc-dependent natural hormone. It functions as an **endocrine-style regulator of T-cell maturation** and neuro-immune signaling rather than a targeted bioregulator, and has been studied primarily as a physiological marker and as an experimental replacement for lost thymic endocrine activity (for example to counteract age-related thymic involution, aid immune reconstitution after chemotherapy or immunodeficiency, and modulate neuro-immune signaling), with zinc supplementation treated as a necessary cofactor for its activity. **Thymulin is not a candidate as a Thymalin-replacement.** Mechanistically, **Thymulin does *not* appear to induce durable, long-lasting biological changes after it is no longer present**. Its effects are best described as

state-dependent, meaning they occur **only while the hormone is "on board" and active in its zinc-bound form**.

We can drop Thymogen from consideration as a Thymalin-replacement because it is an acute, **short-acting immune activator** used clinically for peri-operative and recovery support, focused on enhancing T-cell responsiveness and antigen presentation. **Thymogen lacks the mechanistic profile and the geroprotective/naïve-T-cell outcomes** required to substitute for Thymalin.

The following table summarizes the characteristics of the two IBG Thymalin-replacement candidates.

Attribute	***Crystagen***	***Vilon***
Origin	*Purified active fraction of Thymalin*	*Small synthetic fraction derived from thymic extract*
Primary purpose	*Thymic restoration and reversal of immunosenescence*	*Gentle thymic epithelial support and immune rebalancing*
Mechanistic summary	*Gene-expression normalization in thymic epithelial cells and lymphocytes; promotes naïve T-cell output and CD4/CD8 balance*	*Supports thymopoiesis via promoter/generegulatory effects in thymic stroma; modest cytokine rebalancing*
Evidence base	*Moderate IBG clinical and gerontology studies*	*Limited IBG preclinical and small clinical reports*
Typical use in IBG research	*IM short courses ~ 0.5 – 1 mg"*	*IM short courses used as gentle restorative signal 100 – 200 mcg*
Typical administration in FRU discussions	*Forums often report 0.5 – 10 mg (doses may mirror Thymalin)*	*Wide variability in forums from 100 mcg – 2 mg*
Russian research description	*Purified active fraction of Thymalin*	*Minimal peptide; gentle epithelial regulator*

Attribute	***Crystagen***	***Vilon***
Risk in autoimmune context	*Broad regulatory action could be unpredictable in autoimmunity*	*Conceptually least activating; narrow epithelial focus suggests lower theoretical risk*

Summarizing the above information: **Vilon is a partial substitute** for structural thymic support with a narrower effect profile that **might be clinically appropriate for subjects needing less immune activation and more immune modulation**. **Crystagen is the closest synthetic mechanistic and functional match to Thymalin**, the original Russian thymic-restorative intervention.

Thymalin / Thymulin Confusion

It is this author's belief that widespread use of Thymulin, when the evidence to support any use at all is so weak, **results from name confusion**. The **names "Thymulin" and "Thymalin" are very similar**, and **many FRU vendors' catalogs list Thymulin as "Thymalin/Thymulin,"** or sometimes even just **misnaming it as "Thymalin"** completely. It may have value as an on-board immune modulator gently improving regulation of T-cell maturation signals, cytokine balance, and neuro-immune coordination, **but it has no lasting effects and no longevity effects**.

Crystagen

Crystagen is the Thymalin-replacement most closely matching Thymalin for use in the longevity profile. IBG publications and clinical summaries repeatedly describe **Crystagen as engaging promoter-level gene-expression programs in thymic epithelial cells and peripheral lymphocytes**, producing deeper architectural and transcriptional effects than the smaller peptides. They promote Crystagen as **restoring thymic-dependent naïve T-cell output, normalizing CD4/CD8 ratios, reducing pro-inflammatory cytokine drift, and improving immune resilience in elderly and postoperative cohorts.**

Vilon

Vilon deserves consideration as a gentler replacement for Thymalin for subjects where immune activation should be avoided, e.g. subjects with autoimmune conditions.

IBD publications describe it as the gentlest thymic fraction and **reported it supports thymic stromal integrity, modestly improves thymopoiesis, and rebalances cytokine expression with minimal systemic activation.**

A Modern Synthetic Protocol

Although **Epitalon and Crystagen are simpler molecules**, IBG claims they **reproduce the core mechanistic actions** documented in earlier extract-based research: **telomere-associated**

pathways, circadian regulation, and **T-cell maturation and immune normalization**, providing a reasonable scientific basis for adapting the classic 10- or 20-day Russian longevity protocols to use these modern synthetic counterparts. Their **combined use is described in published IBG summaries as helping restore more youthful immune architecture, improving resilience to stressors, and reducing low-grade inflammation** while supporting **healthier circadian and metabolic signaling**.

The option of **replacing Crystagen with Vilon**, a defined thymic peptide with more precise immunoregulatory properties is offered for **individuals with autoimmune tendencies or immune dysregulation**, reflecting Vilon's documented ability to normalize T-cell subsets, restore CD4/CD8 balance.

The synthetic peptide **Pinealon** is sometimes discussed alongside Epitalon and Crystagen as **a third regulatory molecule within the same bioregulatory-peptide framework**. Pinealon is positioned in the Russian literature as a **neuroprotective and metabolic-stability peptide:** a short peptide shown in experimental models to **support neuronal resilience, improve redox balance, and normalize stress-response signaling**. Its inclusion reflects the broader Russian concept of multi-axis regulation: pineal (Epitalon), thymic/immune (Crystagen), and central nervous system metabolic regulation (Pinealon).

The evidence scope for synthetic Epitalon + Crystagen + Vilon + Pinealon long-term human safety is 5 / 10 because reassuring animal signals, limited peer-reviewed human safety data, and frequent practitioner use reports support safety, but there are some mechanistic/epigenetic concerns. (Epithalamin and Thymalin have been in longer use and have a better evidence scope for human safety.)

The evidence scope for synthetic Epitalon + Crystagen efficacy for longevity is 3 / 10 because replicated animal and mechanistic data plus small, regional human series show plausible geroprotective signals but lack the large, modern randomized human trials required for high confidence. (Epithalamin and Thymalin are more studied with better evidence scope for longevity efficacy.)

Biological Mechanism

Crystagen , Epitalon, and Pinealon are described in the Russian bioregulatory-peptide literature as a coordinated triad acting on three foundational regulatory axes: **thymic immune architecture**, **pineal–circadian–epigenetic aging pathways**, and **neuronal–metabolic stress-response systems**.

Epitalon acts primarily through the **pineal–circadian axis**, enhancing melatonin rhythmicity, stabilizing clock-gene expression, improving genomic maintenance pathways such as DNA repair and chromatin stability, and supporting telomere-associated cellular longevity mechanisms.

Crystagen is presented as a **peptide that penetrates cells and influences transcriptional programs** in thymic epithelial cells and lymphocytes. The proposed mechanism involves **sequence-specific interactions with promoter regions or chromatin-associated factors**, shifting expression of genes controlling T-cell differentiation, cytokine production (IL-2, IL-6, TNF-α), and thymic stromal support. In vitro and animal work from the Khavinson group report increased lymphocyte proliferation, NK activity, and selective inhibition of tumor cell growth consistent with a regulatory, not purely stimulatory, action.

Pinealon , a short peptide identified in neuroendocrine regulatory studies, is positioned as a **central nervous system metabolic-stability modulator**, influencing neuronal redox balance, mitochondrial resilience, and stress-response gene expression, with downstream effects on cognitive robustness and cellular adaptation to metabolic strain.

Vilon is a short thymic peptide extensively studied in Russian in vivo research programs for its **immunoregulatory and thymus-restorative properties**. These studies consistently describe Vilon as a peptide that normalizes immune function rather than broadly stimulating it, **making it plausibly relevant for individuals with autoimmune tendencies or immune dysregulation**. It exerts a predominantly regulatory, anti-inflammatory effect on immune gene expression. It is reported to **reactivate age-silenced thymic programs involved in T-cell maturation, improve regulatory T-cell balance, and normalize cytokine patterns, including IL-6, TNF-α, and interferon-related pathways**.

Together, these peptides are described as exerting complementary regulatory effects across immune, circadian, and neuro-metabolic domains, three systems tightly linked to systemic homeostasis and age-related functional decline.

Dosage & Patterns

These peptides have no modern, well-controlled human trials establishing doses. The confusion around dosing and patterns is discussed below. The doses below are published in the **2002 Biogerontology paper: Khavinson VKh, Malinin VV. Epithalamin and Epitalon: peptide geroprotectors. Biogerontology. 2002;3(3):171-178.** However, western longevity clinics and individual practitioners frequently take much larger doses. These larger doses are not grounded in any research; however, given the published Russian research is very weak, and because these much larger western doses are not reported as associated with any adverse reactions, they are included below.

Pineal/circadian Axis ***Thymic/immune Axis*** ***CNS Axis***

Epitalon (AEDG) + Crystagen (EDP-3) + Pinealon (EDR) Available for Research Use Only

(Epitalon 5 - 10 mg × 10 days,* Crystagen 0.5 – 1 mg / day × 10 days, *Pinealon* ≤ 0.5 mg / day × 10 days, *1 – 2 × annually)

Epitalon 5 – 10 mg IM daily
Western dose 100 mcg – 10 mg, with smaller doses resulting from the confusion discussed below

Crystagen 0.5 – 1 mg daily
Western dose 0.5 – 10 mg, with larger doses resulting from confusion discussed below

Vilon 100 – 200 mcg
Western dose 1 – 5 mg

Pinealon 100– 300 mcg daily
Western dose 1 – 10 mg

- **For short daily courses,** most often 10 days, sometimes 3 days, sometimes 20 days
- **Consecutively** (Always Epitalon, then, Crystagen/Vilon, then Pinealon), or
- **Partial overlapping** (Always Epitalon first, then start Crystagen/Vilon halfway through Epitalon, then start Pinealon halfway through Crystagen)
- **Repeated once or twice annually**
- IBD administration is IM, practitioner dosing is usually SC, leading to **unpredictable differences due to bioavailability.**

Dose Controversy (**Epitalon**)

Russian researchers historically used Epithalamin (a pineal gland *extract*) in many animal and clinical studies, with **5 – 10 mg / day × 10 – 20 days**. Later research studies and commercial practice shifted to **synthetic Epitalon**. These are related but **not identical** preparations.

There is **no validated, universal conversion ratio** between extract doses and synthetic, pure peptide doses because

- Unknown and variable composition of Epithalamin extracts.
- Epithalamin's biological effects may arise from several peptides acting together.
- Matrix effects in Epithalamin (carrier peptides, salts, protease inhibitors) can alter absorption, proteolysis, and tissue exposure compared with a purified synthetic peptide.

Some discussions create the impression that the extract is "weaker" per mg, **but mass-based comparisons are misleading.** Because **extract doses are expressed as crude mass,** not quantified synthetic peptide, **a larger extract dose may still contain less of the specific active peptide than a small synthetic peptide dose**.

Claims that the extract is "weaker" are **plausible but unproven**; responsible translation requires quantification of active components and exposure-based PK/PD mapping.

Importantly, **current Khavinson research publications discussing longevity specifically discuss Epitalon at 5 - 10 mg / day × 10 days as the most common dose, in a cycle that repeats once or twice annually, the same dose used for Epithalamin in their original research.**

Dose Confusion (**Crystagen**)

Russian research does not include clear dosing instructions for Crystagen, but does discus "**Very small doses,**" "**Tiny amounts compared to Thymalin,**" and "**Much smaller than extract-level dosing**." **T**here are occasional remarks that **Crystagen injection doses are larger than Vilon injection doses**, and the IBD literature does discuss 100 – 200 mcg injection doses for Vilon. Together, these puzzle pieces suggest

100 – 200 mcg Vilon dose < **IBG Crystagen doses** << **10 mg – 20 mg** Thymalin dose

From these clues, a **plausible dose range for SC Crystagen is 0.5 – 1 mg × 10 days,** but 2 mg / day × 10 days would not be implausible.

Dose Variations (Pinealon)

The Pinealon dose most discussed in the original Russian literature is 0.3 mg / day × 10 days. With no apparent basis or justification presented, you will find forum posts and Western longevity clinics discussing Pinealon 1 - 10 mg / day, and reporting no serious adverse reactions.

Taking all this evidence for Pinealon Glu-Asp-Arg together, the original Russian literature dose of 300 mcg / day × 10 days, the good safety record for Pinealon in humans, and modern clinical practices using 1 – 10 mg, **a prudent dose might be ≤ 0.5 mg / day × 10 days**, but 1 mg / day × 10 days would not be implausible.

Dose Variations (Vilon)

The dose for Vilon discussed in Russian research is 100 mcg for 3 – 10 days, while Russian clinical practice uses 100 – 200 mcg for 3 – 10 days. However, the most common dose discussed by western clinics and practitioners is 1 – 5 mg for 10 days, with no significant adverse reactions discussed at these doses. This information, taken together, could suggest **a plausible dose might be ≤ 0.5 mg / day × 10 days**, but 1 mg / day × 10 days would not be implausible.

Epitalon Microdosing for Sleep

Russian Epitalon research **never describes or even hints at the idea of continuous microdosing Epitalon for sleep**. The Russian researchers consistently frame Epitalon as a signaling peptide that **produces long-lasting downstream effects after the course is finished, rather than something meant to be taken nightly or continuously**. Epitalon's biological mechanisms, as discussed by researchers, make **continuous use biologically incoherent**.

Russian studies do **report sleep improvements occur because Epitalon normalizes melatonin rhythms** and **restores pineal function** after the short course, but not because the peptide is taken at bedtime as a sleep aid. The improvements **emerge gradually** and **persist for weeks or months** without further use.

Western FRU **microdosing of Epitalon for sleep** is a grassroots practice **built from anecdote, experimentation, and community lore** rather than from any peer-reviewed research or mechanistic biology. **Practitioners talk about Epitalon as if it were a nightly sleep-aid,** something taken in **100 – 300 mcg doses SC** before bed to **smooth circadian rhythm**, **deepen sleep**, or **reduce nighttime awakenings**. **100 mcg is the most common dose**, with **200 – 300 mcg discussed for more difficult sleep problems**.

- **100 mcg nightly one hour before sleep, cycled or continuous**
- **200 – 300 mcg for more difficult sleep issues**

Some users say the **effect fades with nightly use and require breaks**, while **others continue indefinitely**.

Practitioners frame it as a **gentle, ongoing "somnific" support** rather than a therapeutic cycle. The logic, not framed in mechanistic biology, is that small, steady doses **might nudge melatonin production, stabilize sleep architecture, or maintain pineal signaling without the intensity of the Russian ten-to-twenty-day high-dose courses.**

Any use of Epitalon microdosing for sleep falls completely **self-experimentation**, with the only **guidance for patterns and doses coming from other individual self-experimenters**.

Benefits

The evidence for these benefits comes wholly from studies of the Epithalamin from the pineal gland and Thymalin from the thymus. **Based on mechanistic arguments from Khavinson and IBG, but little real evidence, the following benefits are often discussed for Epitalon and Crystagen.**

1. Cellular Aging, Telomeres & Genomic Stability

- **Telomerase activation and telomere modulation** *(helps maintain chromosomal stability and cellular replicative capacity)* — Evidence: in vitro; animal; limited human biomarker reports.
- **Antioxidant and DNA-stabilizing effects** *(reduces oxidative damage and genomic instability, lowering cellular stress and mutational burden)* — Evidence: in vitro; animal (in vivo); limited human biomarker reports.
- **Modulation of gene expression related to repair and regeneration** *(upregulates pathways that support DNA repair and cellular maintenance, which can improve tissue resilience)* — Evidence: in vitro; animal (in vivo); limited human biomarker reports.
- **Potential antimutagenic or anti-tumor signals in preclinical models** *(reduces mutational processes or tumor burden in some models, which could lower cancer risk under specific conditions)* — Evidence: animal (in vivo); mechanistic reasoning; no conclusive human outcome data.

2. Circadian, Pineal & Endocrine Regulation

- **Normalization of circadian and melatonin rhythms** *(improves sleep timing and hormonal regulation, which supports metabolic and restorative processes)* — Evidence: animal (in vivo); limited human observational reports.

3. Immune Function & Inflammatory Modulation (Crystagen-Dominant)

- **Immune modulation and T-cell marker improvement (Crystagen)** *(enhances adaptive immune competence and recovery, which may reduce infection risk and improve immune surveillance)* — Evidence: human clinical reports; animal (in vivo); in vitro.
- **Adjunctive reduction in short-term infectious morbidity in some clinical series (Crystagen)** *(faster normalization of inflammatory and coagulation markers can shorten illness severity and improve short-term outcomes)* — Evidence: limited human clinical reports; mechanistic plausibility.
- **Immune modulation and thymic support (Vilon)** *(may enhance T-cell subset balance and thymic signaling, potentially improving adaptive immune competence and regulation in autoimmune-prone individuals)* — **In vitro; animal; limited human observational/clinical reports.**
- **Possible supportive effects on infection recovery or immune normalization in context-specific reports (Vilon)** *(faster normalization of inflammatory markers reported in some clinical series, which could reduce secondary complications during intercurrent infections outside flares)* — **Limited human clinical reports; context-specific.**

4. Longevity & Healthspan Signals

- **Signals of increased lifespan or healthspan in animals** *(indicates potential to slow age-related decline and extend healthy function in model organisms)* — Evidence: animal (in vivo); no robust human longevity evidence.
- **Synergistic geroprotective signals when combined** *(combined pineal + thymic effects may produce broader systemic benefits than either alone, potentially amplifying repair and immune support)* — Evidence: human observational; animal (in vivo); mechanistic rationale.

5. Ocular & Retinal Support

- **Improved ocular/retinal function in select clinical reports** *(preserves or restores vision-related function, improving quality of life in affected patients)* — Evidence: limited human clinical reports; supporting animal/in vitro data.

6. Neuroprotection, Cognitive Resilience, and Synaptic Support (Pinealon-dominant)

- **Mitochondrial resilience and reduced oxidative stress** — Pinealon is reported to upregulate antioxidant defenses and improve mitochondrial function in neuronal models, lowering ROS and preserving ATP production. — Evidence**:** in vitro; animal.
- **Synaptic maintenance and plasticity support** — Experimental work suggests Pinealon modulates gene programs tied to synaptic proteins and neurotrophic signaling, which can help maintain learning and memory pathways. — Evidence**:** in vitro; animal.
- **Protection against neurotoxic insults** — In models of metabolic or oxidative stress, Pinealon reduced markers of neuronal injury and improved survival of vulnerable neuronal populations. — Evidence**:** animal (in vivo); mechanistic reasoning.

- **Cognitive function signals** — Small clinical or observational reports describe modest improvements in attention, memory, or mental clarity in select cohorts, but robust RCT data are lacking. — Evidence**:** limited human observational reports.

7. Metabolic Stability, Stress-Response Modulation, and Cellular Adaptation (Pinealon-dominant)

- **Improved metabolic signaling and energy balance** — Pinealon is associated with modulation of pathways involved in glucose handling, mitochondrial biogenesis, and cellular energy sensing, which may support metabolic resilience. — **Evidence:** in vitro; animal.
- **Enhanced stress-response gene expression** — Reports indicate Pinealon can normalize expression of stress-response and chaperone genes, improving cellular capacity to cope with metabolic or oxidative challenges. — **Evidence:** in vitro; animal.
- **Anti-inflammatory and redox balancing effects** — Pinealon appears to reduce proinflammatory cytokine expression in neural and systemic models and to shift redox balance toward antioxidant states. — **Evidence:** in vitro; animal.
- **Potential downstream functional benefits** — Through combined neuroprotective and metabolic effects, Pinealon may contribute to improved fatigue resistance, better stress tolerance, and modest functional gains in cognition and daily energy; human evidence is preliminary. — **Evidence:** limited human observational reports.

Indications

- **Older adults with immune decline (immunosenescence)** - **Crystagen** excels at Increasing naïve T-cell output, improving immune surveillance, Restoring thymic architecture.
- **Weak immune function** – **(Crystagen)** frequent infections, or age-related immune decline.
- **Low lymphocyte counts** or **poor vaccine response** – **Crystagen's** broad thymic stimulation is beneficial when the immune system is **underperforming**, not overactive.
- **(Vilon) Hashimoto's driven by chronic inflammation** and immune overactivation
- **(Vilon) Immune aggression**

Contraindications

- **Organ-transplant immunosuppression**
- **Active malignancy** - thymic peptides modulate T-cell function; the risk/benefit at a given dose depends on the patient's immune status and comorbidities.

Side Effects

- Fatigue.
- Headache.

Known and theoretical risks

- **Limited human safety data:** long-term effects and rare adverse events are not well characterized.
- **Mechanistic concerns:** telomerase activation and epigenetic modulation carry theoretical cancer-related risks in some contexts.

- **Immune effects:** thymic peptides can alter T-cell function and inflammatory signaling; this may be harmful in some individuals.
- **Common short-term reactions:** fatigue, headache, local injection site reactions; other adverse events are possible.

Cancer Risks

Because both peptides influence pathways relevant to cell proliferation and immune surveillance, cancer-related questions are common.

Epitalon and cancer

- **Mechanism that worries people -** Epitalon can **activate telomerase and lengthen telomeres in normal human cells**. Since most cancers rely on telomerase to stay immortal, anything that boosts telomerase is *theoretically* pro-tumor.
- **What preclinical data actually show -** In multiple animal cancer models, Epitalon has tended to **delay tumor appearance, reduce tumor number/size, or inhibit metastasis**, rather than accelerate cancer.

Crystagen and Cancer

- Modern summaries of the classic Russian longevity protocols consistently present Crystagen as **neutral-to-beneficial** with respect to cancer risk, never as oncogenic.
- Its primary documented actions—restoring thymic function, improving T-cell maturation, and normalizing immune balance—are all **aligned with better tumor surveillance**, not tumor promotion.
- **T-cell upregulation** creates **theoretical caution** because in autoimmune disease or transplant settings T-cell upregulation is considered as a reason for caution. The main caution zone is **autoimmunity or situations where extra T-cell activity is undesirable**, not cancer per se.

Who Benefits from Epitalon + Crystagen (more than Epitalon + Vilon)

Epitalon pairs well with *either* Vilon or Crystagen, but the two thymic peptides behave differently enough that the ideal pairing depends on the subject's immune profile, inflammatory tone, and endocrine context. The available research paints a consistent picture: **Crystagen is a broad thymic-restoration extract, appropriate for age-related immune decline where immune system restoration and stimulation is desired.**

Who Benefits from Epitalon + Vilon (rather than Epitalon + Crystagen)

Vilon is a minimal, **highly targeted immune-regulatory, not immune-stimulating** peptide. That distinction becomes especially important in autoimmune or hypothyroid settings, where Vilon's anti-inflammatory effects and gentler T-cell modulation make it **a better fit for subjects who need calming and rebalancing, not stimulation.**

Specifically, Vilon's effects on **immune normalization, cytokine reduction, and regulatory balance,** aligns well for i**ndividuals whose autoimmune** conditions often involve

- Excessive Th1/Th17 activity
- Overproduction of inflammatory cytokines
- Loss of immune tolerance

Vilon's ability to reduce IL-1β, IL-6, TNF-α, and normalize immune signaling makes it plausibly suited for subjects with Hashimoto's or hypothyroid pattern where the goal is to **reduce immune aggression**, because Hashimoto's often involve

- Chronic lymphocytic infiltration
- Elevated inflammatory cytokines
- Dysregulated T-cell tolerance

Vilon's strong anti-inflammatory signature also fits subjects with chronic low-grade inflammation and subjects sensitive to immune stimulation.

Clean Window

This protocol is based on extrapolated biological mechanistic reasoning, not controlled clinical trials.

Mechanistically, the protocol should run in a **low-noise, low-interference environment** so the thymic and pineal signals can run cleanly. Peptides that stimulate growth, regeneration, metabolism, or immune activation should be paused one week prior and reintroduced gradually after the reset.

Pause

It is essential to **pause peptides and therapies that effect the immune system** before beginning this longevity protocol, for example pause **Thymosin-α1** and **Thymogen**. Some discussion also recommends pausing peptides which introduce high-signal metabolic, regenerative, or immune-active noise: Growth-hormone axis stimulators, Regenerative / angiogenic peptides, Metabolic / mitochondrial stimulators, Neuro-stimulatory peptides, Melanocortin agonists, Immune-modulating peptides.

*GLP-1 / GIP agonists, need not be paused, but subjects should **avoid dose changes** during the reset.*

Reset

Consecutive Reset

For 10 consecutive days administer Epitalon. Then begin Crystagen / Vilon for 10 consecutive days. Optionally, then begin Pinealon for 10 consecutive days.

Semi-overlapping Reset

For 10 consecutive days administer Epitalon. On day 6 of Epitalon, begin Crystagen / Vilon and continue for 10 consecutive days. Optionally, on day 6 of Crystagen / Vilon, begin Pinealon and continue for 10 consecutive days.

Restore

After the reset is complete, restore peptides as follows:

If paused, wait four days, **resume metabolic and mitochondrial support peptides** (e.g., MOTS-C).

If paused, wait four days, **resume regenerative and ECM-supportive peptides**, e.g., GHK-Cu / GLOW blends.

If paused, wait four days, **resume anabolic or GH-axis peptides**, e.g., CJC-1295 (no-DAC) + Ipamorelin.

Wait four days, **restore all remaining peptides except immune peptides.**

Wait 1 months before restarting immune peptides, for example, Thymosin-α1.

Conclusions

Given the quality of human studies on Epitalon and Crystagen we must **rate the extraordinary claims as only weakly supported**. However, with some limited human trials, animal data and their frequent practitioner use, all reporting consistently good safety data we **can infer a good safety record**.

References

1. **Al-Dulaimi S, Thomas R, Matta S, Roberts T.** Epitalon increases telomere length in human cell lines through telomerase upregulation or ALT activity. *Biogerontology*. 2025;26:178.
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.
3. **Gatta M, Dovizio M, Milillo C, et al.** The antioxidant tetrapeptide Epitalon enhances delayed wound healing in an in vitro model of diabetic retinopathy. *Stem Cell Rev Rep*. 2025;21:1822-1834.
4. **Khavinson VKh, Anisimov VN, et al.** Experimental studies of the pineal gland preparation Epithalamin: effects on lifespan and age-related biomarkers. In: *The Pineal Gland and Cancer*. Springer; 2001:chapter 14.

5. **Khavinson V, et al.** Epitalon application notes and clinical observations in retinal degenerative conditions (retinitis pigmentosa reports). *Neuro Endocrinol Lett*. 2002; (clinical series and protocol notes).

6. **Khavinson VKh, Linkova NS, Kvetnoy IM, et al.** Thymalin: activation of differentiation of human hematopoietic stem cells. *Cell Technology in Biology and Medicine* (translated); 2020. DOI:10.1007/s10517-020-05016-z.

7. **Kuznik B, Khavinson V, Shapovalov K, et al.** Peptide drug Thymalin regulates immune status in severe COVID-19 older patients. *Adv Gerontol*. 2021;11:368-376.

8. **Khavinson VKh, Morozov VG, Anisimov VN.** Experimental and observational reports on combined pineal (Epithalamin/Epitalon) and thymic peptide regimens and long-term geroprotective signals (Russian clinical series and follow-ups). *Various Russian clinical reports and reviews*; summarized in ADDF and Khavinson group publications.

9. **Khavinson VKh, Lezhava TA, Monaselidze JR, et al.** Peptide Epitalon activates chromatin at old age: modulation of gene expression related to repair and regeneration. *Neuro Endocrinol Lett*. 2003;24(5):329-333.

10. **Kossoy G, Anisimov VN, Ben-Hur H, et al.** Effect of the synthetic pineal peptide Epitalon on spontaneous carcinogenesis in female C3H/He mice. *In Vivo*. 2006;20(2):[pages].

11. **Khavinson VK**, Anisimov VN, Zavarzina NY, Zabezhinskii MA, Zimina OA, Popovich IG, Shtylik AV, Malinin VV, Morozov VG. Effect of Vilon on biological age and lifespan in mice. *Bull Exp Biol Med*. 2000;130(7):88-91.