Peptide Perspectives™

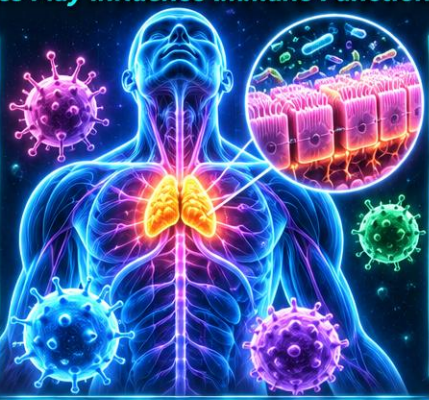
TRAINING THE IMMUNE SYSTEM

How Peptides May Influence Immune Function & Resilience

IMMUNE RESILIENCE = RESPONSE + RECOVERY

- A protective response against threats (e.g., viruses, bacteria).
- The ability to "remember" previous threats for a faster, stronger response (immune memory).
- A balanced immune system that can respond when needed and resolve inflammation when the threat is gone.

THE GOAL: IMMUNE BALANCE—NOT SIMPLY "BOOSTING" IMMUNITY.



FOUR IMMUNE PATHWAYS

INNATE IMMUNITY
The first line of defense (e.g., physical barriers, immune cells, antimicrobial peptides like LL-37).

ADAPTIVE IMMUNITY
Targeted, long-term defense involving T cells, B cells, and immune memory.

ANTIGEN PRESENTATION
Dendritic cells process and present threats, helping activate a coordinated immune response.

CYTOKINES & RESOLUTION
Signaling molecules that orchestrate immune activity, inflammation, and the return to balance after a threat.

SEVEN COMPOUNDS UNDER RESEARCH

THYMOSIN ALPHA-1

- Modulates T cells and dendritic cells, supporting coordinated immune responses.
- Human trials in infections, cancer, and sepsis (immunomodulatory).
- A large 2025 Phase 3 sepsis trial did not significantly reduce 28-day mortality.

EVIDENCE: HUMAN TRIALS | NOT FDA-APPROVED (IN USA)

THYMOGEN (Glu-Trp)

- A thymic dipeptide bioregulator studied for immune modulation and immune aging.
- Limited human research (small studies) and supportive lab data.

EVIDENCE: LIMITED HUMAN / LAB RESEARCH

VILON (Lys-Glu)

- A thymic dipeptide studied for thymocyte signaling and immune regulation.
- Research is chiefly preclinical (cell and animal studies).

EVIDENCE: PRECLINICAL (CELL / ANIMAL)

LL-37

- A natural antimicrobial peptide with broad activity against bacteria, viruses, and fungi.
- Also influences immune signaling and inflammation in a context-dependent way.
- Limited human research, mainly topical (e.g., wound healing); not proven for systemic infection prevention.

EVIDENCE: LIMITED HUMAN (TOPICAL) / PRECLINICAL

THYMULIN

- A thymic peptide that regulates immune cell activity and requires zinc for full activity.
- Physiological evidence of immune roles, but no proven benefit from injection use in humans.

EVIDENCE: PHYSIOLOGICAL / PRECLINICAL

KPV

- A tripeptide (Lys-Pro-Val) with research suggesting NF-κB–related inflammation modulation.
- Investigated for inflammatory and immune-regulating effects, especially in the gut.

EVIDENCE: PRECLINICAL (CELL / ANIMAL)

THYMOSIN BETA-4 (Full Length)

- A 43-amino acid thymic peptide that supports cell migration, tissue repair, and anti-inflammatory signaling.
- Limited human research (e.g., ophthalmic corneal healing); not a general immune booster.
- Distinct from TB-500, which is a shorter fragment with different use and evidence.

EVIDENCE: LIMITED HUMAN (SPECIFIC USE) / PRECLINICAL

WHAT STUDIES MUST MEASURE

- **Fewer confirmed infections** (e.g., respiratory illnesses).
- **Meaningful patient recovery** (e.g., shorter duration or less severity).
- **Immune function & inflammation** (e.g., immune cell activity, cytokine balance, biomarkers).
- **Safety & autoimmunity** (monitor for unwanted immune activation or flare-ups).

NEXT FRONTIER

- **Precision Immune Therapies** (tailored to individual immune profiles).
- **Thymic Aging** (how peptides may support immune function with age).
- **Targeted Tissue Barrier Defense** (e.g., gut, lung, and skin immune barriers).
- **Randomized Human Evidence** (larger, well-designed trials to confirm effectiveness and safety).

A STRONG IMMUNE SYSTEM KNOWS WHEN TO RESPOND AND WHEN TO REST.

Experimental peptides are not proven general immune boosters. Educational only, not medical advice.