

LL-37

PEPTIDES

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LL-37 (aka Human Cathelicidin Antimicrobial Peptide or CAMP), is produced by many cell types including natural killer (NK) cells, white blood cells, and skin cells. In addition, different body systems such as the respiratory system, gastrointestinal tract, testes, and ocular surface also produce LL-37. Its immune-modulating activities have the potential to accelerate tissue recovery and significantly improve the survival rate of patients with chronic debilitating medical conditions. It serves a critical role in the innate immune system by defending against bacterial infections. LL-37 can interact with the molecules of the cell wall and perforate cytoplasmic membranes resulting in bacterial cell death. In addition, LL-37 helps promote wound closure by stimulating the formation of new blood vessels (angiogenesis).

BENEFITS

- Anti-inflammatory properties Lowers the risk of heart disease
- Antimicrobial properties: helps to combat bacterial, viral, and fungal infections
- Wound Healing : promotes wound healing by stimulating tissue regeneration and reducing inflammation
- LL-37 has the ability to inhibit the formation of bacterial biofilms (densely packed communities of microbial cells
- Is deadly against *Staphylococcus aureus*, the most common cause of upper respiratory tract infections
- Can kill a broad spectrum of bacteria
- Boosts immune response by attracting immune cells including T-cells, monocytes, neutrophils, and mast cells to the site of the infection
- Beneficial when treating patients with sepsis
- Fights inflammation by modulating the immune response; it does this by binding to specific cell receptors and signalling pathways that regulate inflammation. Encourages pro-inflammatory cytokine release, prevents excessive immune cell activation, and encourages the production of anti-inflammatory molecules. Through these actions, LL-37 helps maintain immune balance, reduces chronic inflammation and promoting healing in inflamed tissues. Protects against collagen damage from inflammatory arthritis
- Prevents cancer progression by modulating the immune response and affecting tumor cell behavior. It can inhibit tumor cell proliferation, migration, and invasion by interfering with signaling pathways essential for cancer growth. Promotes an anti-tumor immune environment by activating immune cells that target cancer cells, helping to reduce metastasis and tumor expansion
- In various human cancer cell lines, LL-37 exhibited anti-cancer effects similar to chemotherapeutic drugs
- Accelerates wound healing by promoting angiogenesis (the formation of new blood cells)
- LL-37 stimulates keratinocytes and fibroblasts (cells involved in wound closure) and enhances cell migration and proliferation at the wound site
- Lowers the risk of heart disease
- Protects against atherosclerosis (plaque build-up within the arteries)
- Helps prevent lung injury by modulating immune responses and reducing inflammation in lung tissue. Inhibits pro-inflammatory cytokines while promoting anti-inflammatory pathways, limiting excessive immune reactions that can damage lung cells
- Promotes bone repair by enhancing the recruitment and activity of osteoblasts, the cells responsible for bone

formation. Stimulates the production of growth factors and cytokines that aid in bone regeneration.

POSSIBLE SIDE EFFECTS Injection site reaction (redness, swelling, itching, pain, histamine) Fever or flu-like symptoms Fatigue Nausea Headache Cytokine release Skin irritation with topical use Worsening of inflammatory conditions Autoimmune flare-ups Exacerbation of psoriasis Excessive angiogenesis Scar tissue formation if overused Abnormal immune tissue remodeling Systemic inflammatory response at high doses

USE WITH CAUTION/UNDER CLOSE MEDICAL SUPERVISION IF YOU ANY OF THE FOLLOWING APPLY TO YOU Inflammatory Bowel Disease Severe asthma Chronic inflammatory conditions

CONTRAINDICATIONS (AVOID OR USE EXTREME CAUTION) Rheumatoid arthritis Do not use if you have had an organ transplant Pregnancy/breastfeeding Lupus Multiple Sclerosis Psoriasis Active Cancer (Can cause proliferation of tumor cells in breast, ovarian, and lung cancers)

LL-37: 5MG RECONSTITUTION AND DOSING 8-12 week cycle followed by 4-8 week washout period Dose 7 days a week for the first 4 weeks, then move to 5 days a week starting week 5 through the end of cycle May be taken with or without food May be taken anytime, day or night

Subcutaneous Administration RECONSTITUTION Add 2.5mL (250 units) of BAC water

DOSING Week 1: 3 units (50mcg), 1x/day Weeks 2: 5 units (100mcg), 1x/day Week 3: 8 units (150mcg), 1x/day Week 4: 10 units (200cg), 1x/day Week 5: 13 units (300mcg), 1x/day Week 6: 15 units (350mcg) 1x/day Week 7: 18 units (400mcg), 1x/day Weeks 8-12: 20 units (450mcg), 1x/day

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