ANTIMICROBIAL PEPTIDE

LL-37

Cathelicidin-18, AMP-18

Molecular Formula	C183H291N51O41S
Molecular Weight	4493.3 Da
Sequence / Structure	LLGDFFRKSKEKIGKEFKRIVQIKDFLRNLVPRTES
Category	Antimicrobial Peptide
Available Specifications	5mg vial, 2.5mg vial, 10mg lyophilized peptide

1. OVERVIEW

LL-37 is the only human cathelicidin antimicrobial peptide, a 37-amino acid peptide derived from hCAP18. It plays a critical role in innate immunity through direct bacterial killing, modulation of inflammatory responses, and biofilm disruption.

2. MECHANISM OF ACTION

LL-37 exerts antimicrobial effects through direct membrane disruption via voltage-gated ion channels in bacterial cell membranes, inhibition of LPS and peptidoglycan-mediated inflammatory responses, biofilm disruption, chemotaxis modulation via FPRL1 signaling, and enhancement of adaptive immune responses.

3. CLINICAL EVIDENCE & RESEARCH

LL-37 deficiency is associated with increased susceptibility to infections and chronic inflammatory diseases. In vitro studies demonstrate potent bactericidal activity against MRSA, Pseudomonas aeruginosa, and Acinetobacter baumannii. Murine models show enhanced wound healing and reduced sepsis mortality.

4. THERAPEUTIC BENEFITS

- Broad-spectrum antimicrobial activity
- Biofilm disruption
- Enhanced innate immune response
- Anti-inflammatory effects
- Wound healing acceleration
- Reduced bacterial translocation

5. INDICATIONS

- Chronic wound management
- Burn wound treatment
- Recurrent bacterial infections
- Biofilm-associated infections
- Oral infections
- Immunocompromised patients

6. DOSING & ADMINISTRATION PROTOCOL

Indication	Dose	Route	Frequency	Duration
Chronic wounds	5mg	Local/topical	Daily	4-8 weeks
Systemic infection	5mg	IV/SC	Once daily	7-14 days
Burn treatment	2.5mg	Topical	Twice daily	2-4 weeks

Reconstitution

Reconstitute with sterile bacteriostatic saline or BAC water. Solution stable 24 hours room temperature or 14 days at 2-8°C.

Administration

IV: infuse over 30-60 minutes in 50mL saline. SC: inject into abdomen or thigh, rotate sites. Topical: apply directly to wound bed.

Protocol Notes

Monitor for local reactions. Systemic administration may cause transient fever or chills. Synergistic with conventional antibiotics.

7. SIDE EFFECTS & SAFETY PROFILE

- Local reactions: erythema, edema
- Systemic reactions: fever, chills
- Hypersensitivity: rash, urticaria
- Lab abnormalities: elevated inflammatory markers
- Antibody formation with repeated dosing

8. CONTRAINDICATIONS & PRECAUTIONS

- Active systemic infection with fever >38.5°C
- Severe renal impairment
- Hypersensitivity to peptide products
- Sepsis without concurrent antibiotics
- Pregnancy and lactation

Drug Interactions

Enhances activity of beta-lactam and fluoroquinolone antibiotics. May potentiate immunosuppressive medications.

9. STORAGE & HANDLING

Lyophilized: 2-8°C or -20°C. Reconstituted: 24 hours room temperature, 14 days at 2-8°C. Avoid freeze-thaw cycles.

10. KEY REFERENCES

1. Zaiou M. Multifunctional antimicrobial peptides. J Mol Med. 2007;85(4):317-329.
2. Chromek M, et al. Cathelicidin protects urinary tract. Nat Med. 2006;12(6):636-641.
3. Nizet V, et al. Peptide protects skin from infection. Nature. 2001;414(6862):454-457.
4. Heilborn JD, et al. LL-37 in re-epithelialization. J Clin Invest. 2003;113(11):1666-1675.
5. Gallo RL, Hooper LV. Epithelial antimicrobial defence. Nat Rev Immunol. 2012;12(7):503-516.