

**LIJEWELL™**



# **PATH TO PEPTIDES**

## **ANTIMICROBIAL PEPTIDES:**

### **YOUR BODY'S NATURAL DEFENSE**

**By 2050, antibiotic-resistant infections could kill 10 million people per year.**

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**FOR RESEARCH AND EDUCATIONAL PURPOSES ONLY**

# THE HOOK

Antibiotics are failing. Bacteria are evolving faster than we can make new drugs. The World Health Organization calls antibiotic resistance **one of the greatest threats to global health**. By 2050, drug-resistant infections could kill **10 million people per year** — more than cancer.

But your body already has a solution it's been using for millions of years: antimicrobial peptides (AMPs). These tiny molecules are part of your immune system's first line of defense. And scientists are now racing to turn them into the next generation of antibiotics.

## DID YOU KNOW?

Your body produces over 100 different antimicrobial peptides. They're found in your skin, lungs, gut, and saliva. They've been protecting living organisms from infection for over 2 billion years.

# THE SCIENCE: HOW AMPS KILL BACTERIA

Traditional antibiotics usually target one specific process inside bacteria — like building a cell wall or copying DNA. Bacteria can mutate that one target and become resistant. It's like changing a lock so the old key doesn't work anymore.

AMPs work differently. They attack the cell membrane itself — the outer skin of the bacteria. They punch holes in it, causing the bacteria to essentially burst. Because the membrane is fundamental to the bacteria's survival, it's much harder for bacteria to develop resistance.

Think of it this way: traditional antibiotics pick a lock. AMPs tear down the door.

## TYPES OF AMPS BEING STUDIED

Defensins are your body's most common AMPs. Found in skin, airways, and the gut lining. **Cathelicidins** (especially LL-37) fight bacteria and also help wounds heal. **Histatins** in your saliva protect your mouth — which is why oral wounds heal so quickly.

## WHAT THE RESEARCH SAYS

The research pipeline for AMP-based therapies is growing rapidly. There are currently over **30 AMP-based drug candidates** in various stages of clinical development. Several are in Phase 2 and Phase 3 trials for skin infections, wound healing, and drug-resistant bacterial infections.

AI and machine learning are accelerating discovery. Researchers are using artificial intelligence to design new AMPs that are more potent, more stable, and less likely to harm human cells. A 2024 study demonstrated AI-designed AMPs that were effective against multiple drug-resistant bacteria.

AMP Type	Found In	Key Function	Drug Pipeline
Defensins	Skin, gut, airways	Kill bacteria, activate immunity	Multiple Phase 2 trials
LL-37	Skin, immune cells	Kill bacteria, heal wounds	Wound healing trials active
Synthetic AMPs	Lab-designed	Drug-resistant infections	Phase 2-3 (30+ candidates)



# THE BIG PICTURE

Antimicrobial peptides represent one of the most promising strategies to fight the antibiotic resistance crisis. Nature has spent billions of years refining these molecules. Now, with modern science and AI, we're learning to harness and improve them.

## THE BOTTOM LINE

Antibiotic resistance is a global emergency. Antimicrobial peptides — your body's ancient defense system — offer a fundamentally different approach. With 30+ candidates in clinical trials and AI accelerating discovery, AMPs could be a critical part of the solution.

# REFERENCES

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This document is intended solely for educational purposes to increase awareness of emerging scientific research. It does not constitute medical advice.

**Regulatory Status:** No antimicrobial peptide drugs are currently FDA-approved. Multiple candidates are in clinical trials. This is an active area of research and drug development.



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