

Novel antimicrobial peptide mixtures offer antibiotic-free solution for cultured meat production

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Researchers from The Hebrew University of Jerusalem, in collaboration with the Singapore-HUJ Alliance for Research and Enterprise (SHARE), have identified a promising antimicrobial alternative to antibiotics for cultured meat production. The study, led by PhD student Idan Yakir and Prof. Zvi Hayouka, explores the potential of Random Antimicrobial Peptide Mixtures (RPMs) as an effective and safe way to prevent bacterial contamination in cell cultures.

Antibiotics are typically used in lab-grown meat production to combat bacterial infections, but their presence raises concerns about antibiotic resistance and potential residues in the final product. To address these challenges, the research team investigated RPMs—synthetic peptide blends with broad-spectrum antibacterial properties—as a novel approach to safeguarding cultured meat cells.

The findings revealed that RPMs effectively eliminated Gram-positive bacteria like *Listeria monocytogenes* and Gram-negative bacteria like *E. coli* without harming the host cells. Importantly, mesenchymal stem cells (MSCs), critical for cultured meat growth, exhibited no significant toxicity when exposed to RPMs at bactericidal concentrations. Unlike conventional antibiotics, RPMs showed a minimal likelihood of bacterial resistance development, making them a sustainable long-term alternative. Additionally, digestion simulations demonstrated that RPMs degrade rapidly, ensuring no bioaccumulation or adverse health effects upon consumption.

This breakthrough represents a significant step toward scaling up cultured meat production while maintaining food safety and quality. As an emerging alternative to traditional livestock farming, cultured meat offers environmental benefits and lowers the risk of zoonotic diseases. However, microbial contamination remains a major obstacle to large-scale commercialization. The study suggests that RPMs could provide a scalable, cost-effective, and antibiotic-free solution for the cellular agriculture industry.

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partnership between The Hebrew University of Jerusalem and Singaporean research institutions is helping drive innovation in sustainable food technology to address global food security challenges.