

# Antibacterial Activity of Surfactin and Synergistic Effect with Conventional Antibiotics Against Methicillin-Resistant *Staphylococcus aureus* Isolated from Patients with Diabetic Foot Ulcers [Letter]

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## Dear editor

We are writing to express our interest and appreciation for the article “Antibacterial Activity of Surfactin and Synergistic Effect with Conventional Antibiotics Against Methicillin-Resistant *Staphylococcus aureus* Isolated from Patients with Diabetic Foot Ulcers” published in your journal. We found the article very informative and relevant to the current challenges of treating diabetic foot infections (DFIs) caused by drug-resistant bacteria.<sup>1</sup>

This article provides a comprehensive overview of the antibacterial properties and mechanism of surfactin, a natural antimicrobial peptide produced by *Bacillus subtilis*. The authors show that surfactin has potent activity against *Staphylococcus aureus* strains, including methicillin-resistant *S. aureus* (MRSA), isolated from patients with DFI. They also showed that surfactin can inhibit biofilm formation, disrupt bacterial cell membranes, and enhance the efficacy of conventional antibiotics through synergistic interactions and inhibition of penicillinase. In addition, they argue that surfactin may prevent or delay the emergence of resistance by narrowing the mutant selection window. These findings suggest the potential of surfactin as a promising therapeutic option for controlling diabetic foot ulcers caused by *S. aureus*, particularly MRSA. This study also provides valuable insights into the synergistic effects of surfactin with conventional antibiotics, offering a potential strategy to combat antibiotic resistance.

But despite the advantages, we have criticisms of this article, namely: 1) The article does not address potential limitations of the study, such as generalizability of the findings to clinical conditions and translational implications for patient care. 2) The mechanisms underlying the synergistic effects of surfactin with conventional antibiotics have not been fully elucidated, and further exploration of these mechanisms would enhance the impact of this study. 3) This article may benefit from a broader review of the existing literature regarding antimicrobial peptides and their application in diabetic foot ulcers to provide a broader context for the study.

For this reason, we provide recommendations for researchers and future researchers. The authors should consider discussing the clinical implications of their findings, including the potential development of new therapeutic approaches for diabetic foot ulcers. Further research into the mechanism of action of surfactin and its synergistic effects with conventional antibiotics would strengthen the scientific basis of this study and a more comprehensive review of the literature regarding antimicrobial peptides and their clinical application in diabetic foot ulcers would enhance the background and significance of this study.<sup>2</sup>

In conclusion, this article presents valuable research on the antimicrobial activity of surfactin and its potential synergistic effect with conventional antibiotics against MRSA in diabetic foot ulcers. Addressing recommendations for improvement will further enhance the impact and relevance of this study.

## Disclosure

The authors report no conflicts of interest in this communication.

## References

1. Li Z, Li T, Tang J, et al. Antibacterial activity of surfactin and synergistic effect with conventional antibiotics against methicillin-resistant *Staphylococcus aureus* isolated from patients with diabetic foot ulcers. *Diabetes Metab Syndr Obes*. 2023;16:3727–3737. doi:10.2147/DMSO.S435062
2. Pfalzgraff A, Brandenburg K, Weindl G. Antimicrobial peptides and their therapeutic potential for bacterial skin infections and wounds. *Front Pharmacol*. 2018;9:281. doi:10.3389/fphar.2018.00281

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