
Paper:1

1. Title: Cross-species communication via agr controls phage susceptibility in *Staphylococcus aureus*
2. Authors: Jingxian Yang, Janine Zara Bowring, Janes Krusche, Benjamin Svejdal Bejder, Stephanie Fulaz Silva, Martin Saxtorph Bojer, Tom Grunert, Andreas Peschel and Hanne Ingmer.
3. Affiliation: Department of Veterinary and Animal Sciences, Faculty of Health and Medical Sciences, University of Copenhagen, Denmark.
4. Keywords: *Staphylococcus aureus*, Auto-inducing peptides, Cross-species communication, Phage therapy.
5. Urls: <https://doi.org/10.1101/2023.04.03.535347>
6. Summary:
 - (1): The study of bacterial communication has been popularized by quorum sensing, which coordinates individual activities to behave as a group. Auto-inducing peptides (AIPs) function as quorum sensing signals in *Staphylococcus aureus* to facilitate the transition from colonization to infection. Humans and animals also have non-aureus staphylococci (NAS) that release AIPs, which can inhibit *S. aureus* quorum sensing.
 - (2): In the past, some studies have tried to use phages as antimicrobials to treat bacterial infections. However, occasional failures occurred and their mechanisms remained elusive. This paper proposes that cross-species communication based on AIPs plays a critical role in the communication among different bacterial species and in their susceptibility to phages. The approach is well motivated, as it investigates the communication mechanism of bacteria and its implications for phage therapy.
 - (3): The research methodology employed in this paper involves studying the relationship among the three factors: quorum sensing, phage susceptibility, and cross-species communication in mixed bacterial communities.
 - (4): The research results highlight how the inhibition of quorum sensing blocks the phage binding process, which explains the occasional failure of phage therapies. The findings also suggest the importance of considering cross-species communication in phage therapy strategies. The performance supports the goal of understanding the importance of AIPs in bacterial communication and in phage susceptibility.
8. Conclusion:
 - (1): The significance of this work lies in the exploration of the role of cross-species communication through AIPs in the susceptibility of *S. aureus* to phage therapy. This provides new insights that

could contribute to the enhancement of phage therapy efficacy against bacterial infections.

- (2): Innovation point: The study proposes the idea of cross-species communication based on AIPs affecting the susceptibility of bacterial species to phages. This is an innovative approach to the use of phage therapy for bacterial infections.

Performance: The research methodology is rigorous and effective, enabling the authors to obtain meaningful results that highlight the importance of considering cross-species communication in phage therapy. The study also provides insights into the mechanism of phage therapy failures.

Workload: The article is well written and structured, making it easy to understand the research approach, methodology, and findings. However, some technical terms may be challenging for those not familiar with the field of bioinformatics.

Overall, this article provides valuable insights into the role of AIPs in bacterial communication and the implications for phage therapy. The innovative approach and rigorous methodology demonstrate the potential of the study for the improvement of phage therapy performance.