146: Interactions of *Pseudomonas aeruginosa* and *Staphylococcus aureus* in biofilm-related infections: insights through network reconstruction and creation of a new online database - *Jorge P*

Jorge P, Andreia Patrícia Magalhães A.P* and Pereira M.O*

CEB - Centre of Biological Engineering, LIBRO - Laboratory of Research in Biofilms Rosário Oliveira, University of Minho, Campus de Gualtar, 4710-057, Braga, Portugal

**equally contributing authors*

Introduction: Despite important advances in biofilm research, these consortia remain a critical concern for many biomedical applications. Their naturally occurring polymicrobial nature is characterised by the development of complex communities, where pathogen interactions can promote disease progression and severity. Intra- and inter-species communication within these consortia is majorly regulated by quorum-sensing, affecting the expression of virulence factors and biofilm formation, making it a promising target for new anti-infective strategies. *P. aeruginosa* and *S. aureus* are two major pathogens that co-occur in many biofilm-related infections and whose competitive interaction is highly related to infection resilience.

Hypothesis and aims: Information on *P. aeruginosa-S. aureus* interactions is currently scattered in the ever-growing scientific literature, making it difficult for researchers to grasp critical information. Therefore, this study aimed at systematically collecting and analysing experimental information presented in the biomedical literature on the molecular basis of *P. aeruginosa-S. aureus* interactions, identifying promising therapeutic targets, and making this data available to the research community.

Methodology: Full-text papers were optimally retrieved from PubMed and classified by their relevance. Interaction data was methodically annotated, reconstructed as networks to identify promising therapeutic targets, and integrated with specialized databases to identify promising antimicrobials. A new online database was created to deposit the gathered interaction data in searchable format.

Results: Network analysis revealed key entities regulating *P. aeruginosa-S. aureus* interactions, for instance the PqsABCDE/PqsR quorum-sensing system, which affects *S. aureus* growth and biofilm formation. By identifying the most reported *P. aeruginosa* virulence factors affecting *S. aureus*, e.g. HQNO and siderophores, a list of experimentally validated agents affecting those factors, ranging from synthetic drugs to natural plant extracts, was constructed.

Conclusion: The complex experimental data on *P. aeruginosa-S. aureus* interactions was for the first time thoroughly retrieved, systematized, and made publically available in the new Inter-Species CrossTalk Database (www.ceb.uminho.pt/ISCTD).