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Interactions and Social Evolution in Biofilm Ecosystems

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Introduction

Biofilms are complex alliances of many bacterial species and other organisms such as amoeba, fungi, viruses, or micro-algae that interact in natural and man-made environments. Catia Carreira, for example, published research on the impact of viral infections on microphytobenthos population dynamics and the creation of marine microbial mats. Understanding biofilm function necessitates mechanistic insights into community diversity and assembly, highlighted the huge bacterial variety of distinct stream ecosystems and the reliance of taxonomic abundance on the environment during the meeting's closing conference [1,2].

Description

With He observed that biofilm diversity was lower in biofilms than in stream water communities, based on 454 pyro sequencing data from fluvial networks, and postulated that the local environment sorts biofilm formers from the bulk liquid. These findings imply that species sorting is a key factor in the formation of stream biofilms from the source population in the stream water. He also demonstrated that even very varied biofilms can build three-dimensional structures that are identical to single-species biofilms, implying that physical and demographic processes might lead to universal biofilm designs. The majority of biological processes in nature are multicellular and originate from microorganism interactions. Because of the close link between microbial interactions and the emergence of specific functions such as antimicrobial resistance, virulence, and toxic compound biodegradation, unravelling the complexity of the mechanisms governing social interactions in microbial communities has become an exciting and expanding field in microbiological research in recent years. It provided some intriguing findings on the function of polymicrobial interaction in Pseudomonas aeruginosa infections [3].

He demonstrated that when *P. aeruginosa* is co-cultured with Gram-positive bacteria, it increases pyocyanin synthesis, and that the presence of N-acetyl glucosamine, a significant component of Gram-positive species' peptidoglycan wall, is sufficient to induce pyocyanin production. Infection was studied using a *Drosophila melanogaster* model. He subsequently showed that when *P. aeruginosa* is co-cultured with Gram-positive bacteria, and even only in the presence of N-acetylglucosamine, it increases its virulence. Inactivation of a gene (PA0601) necessary for peptidoglycan sensing in *P. aeruginosa* resulted in a mutant with lower virulence, which is consistent with these findings. He also demonstrated that the ability to smell peptidoglycan resulted in *P. aeruginosa*-mediated decrease of Gram-positive flora in the infection site using a murine wound model. These findings imply that targeting Gram-positive bacteria could be a useful strategy for lowering the severity of *P. aeruginosa* polymicrobial infections. Some presented the use of two technologies for probing polymicrobial interactions in the second half of his presentation. The first method employs Scanning Electrochemical Microscopy (SECM) to quantify individual molecules' cues in local settings in order to track biofilm interactions [4].

The second method includes creating picoliterscale microcavities known as "bacterial lobster traps" using multi-photon lithography. Single trapped bacteria can grow into small clonal communities that can be phenotypically examined in real time in these traps, which are permeable to nutrients, waste products, and other small molecules. By putting bacteria from different species in chemically connected compartments, this method can be utilised to answer concerns about quorum sensing and antimicrobial resistance, as well as polymicrobial responses and interactions. Youhei Hashimoto's talk focused on the utilisation of quorum sensing molecules (N-acyl-homoserine lactones) to boost nitrification and the population of ammonium-oxidizing bacteria. The findings show that these signal molecules could be used to control nitrification. It demonstrated the impact of species interactions on biofilm growth and resistance using a three-species biofilm including *P. aeruginosa*, Pseudomonas fluorescens, and Klebsiella pneumonia. He noticed that three-species biofilms took longer to disperse than single-species biofilms, and that competition for nutrients changed the three-dimensional structure of mixed species biofilms [5].

Conclusion

The findings show that these signal molecules could be used to control nitrification. It demonstrated the impact of species interactions on biofilm growth and resistance using a three-species biofilm including *P. aeruginosa*, *Pseudomonas fluorescens*, and *Klebsiella pneumonia*. He noticed that three-species biofilms took longer to disperse than single-species biofilms, and that competition for nutrients changed the three-dimensional structure of mixed species biofilms.

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Conflict of Interest

The Author declares there is no conflict of interest associated with this manuscript.

References

1. Kumar, Vikas, Arun Kumar Tiwari and Subrata Kumar Ghosh."Effect of chevron angle on heat transfer performance in plate heat exchanger using ZnO/water nanofluid." *Res Rep Med Sci* 6 (2022): 142-154.
2. Hernádi, Zoltán and Gergely Kristóf. "Prediction of pressure drop and heat transfer coefficient in helically grooved heat exchanger tubes using large eddy simulation." *Res Rep Med Sci* 6 (2022): 317-327.
3. Walraven, Daniël, Ben Laenen and William D'haeseleer. "Optimum configuration of plate-type heat exchangers for the use in ORCs for low-temperature geothermal heat sources." *Res Rep Med Sci* 6 (2022): 220-233.

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4. Lakew, Amlaku Abie and Olav Bolland. "Working fluids for low-temperature heat source" *Res Rep Med Sci* 6 (2022): 1262-1268.

5. Sözen, Adnan, Theodora and John F.MacGregor. "Heat transfer enhancement of plate heat exchanger utilizing kaolin-including working fluid." *Res Rep Med Sci* 6 (2022): 626-634.

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