Deciphering the chemical dialogue between *Bacillus* and pathogenic fungi

Alicia I. Pérez-Lorente[1], Carlos Molina-Santiago[1], David Vela[1], Paolo Stincone[2], Abzer K Pakkir Shah[2,3], Antonio de Vicente[1], Daniel Petras[2,3], Diego Romero[1].

[1] Instituto de Hortofruticultura Subtropical y Mediterránea "La Mayora", Universidad de Málaga-Consejo Superior de Investigaciones Científicas (IHSM-UMA-CSIC), Departamento de Microbiología, Universidad de Málaga, Bulevar Louis Pasteur 31 (Campus Universitario de Teatinos), 29071 Málaga, Spain.

[2] University of Tuebingen, CMFI Cluster of Excellence, Interfaculty Institute of Microbiology and Infection Medicine, Tuebingen, Germany

[3] University of California Riverside, Department of Biochemistry, Riverside, USA

In nature, bacteria frequently form bacterial communities known as biofilms, where cells are embedded within an extracellular matrix (ECM) that provides protection against external aggressions or facilitates the efficient uptake and utilization of available resources. Interactions with other microbes can notably alter the community structure and, consequently, the nature of the relationship with the environment[1]. Previous studies of our laboratory have demonstrated the significance of biofilm formation in the antagonistic interaction between *Bacillus* and the phytopathogenic fungi *Botrytis* in the melon phyllosphere[2]. Our hypothesis is that the ECM plays a complementary role to the structural aspects of this antagonistic interaction.

In this study, we dissect how the different components of *Bacillus* ECM mediate the adhesion of bacterial cells to *Botrytis* hyphae, which could enhance the efficient release of antifungal metabolites. We also describe how several purified components of the ECM and specific secondary metabolites of *Bacillus* participate in the chemical communication between *Bacillus* and *Botrytis*, thereby altering the physiology and metabolism of *Botrytis*. Our findings unveil that during this antagonistic interaction, *Botrytis* secrets different oxylipins, defence molecules capable of killing *Bacillus*. In response, *Bacillus* increases the production of several secondary metabolites, which appears to have antifungal effects.

Our results underscore the urgency of further investigation of these interactions with the aim of identifying and describing adaptation processes that either lead to the exclusion or coexistence of two initially antagonistic microorganisms.

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This work was supported by grants from an ERC Starting Grant (BacBio 637971), Plan Nacional de I+D+i of the Ministerio de Ciencia e Innovación (PID2019-107724GB-I00), and Junta de Andalucía (P20_00479). A.I.P.L. is funded by the program FPU (FPU19/00289).