Detection and identification of factors involved in social interaction between *Bacillus subtilis* and *Dickeya solani*

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For bacteria to survive in the environment, it is necessary to successfully compete with other organisms – might it be for limited resources or ecological niche. Over time many bacteria species developed a way of intraspecies communication, quorum sensing, to prevail and thrive in their otherwise unfavourable habitat. Bacteria can use quorum sensing in various ways – while some species use it for enzyme and antibiotic secretion to fight off potential competitors, other use it is a signal to form biofilm or regulate their motility. Understanding those mechanisms in-depth can allow people to reproduce the. This approach might be used to biologically control plant pathogens causing economically significant diseases. One of those phytopathogens is *Dickeya solani* secreting enzymes degrading plants' cell walls and causing black-leg and soft-rot in potato plants.

Both of bacteria being the subject of my research, *Dickeya solani* IFB0102 and the environmental strain of *Bacillus subtilis* (MB73/2), exhibit coordinated quorum sense-based movement on a solid surface called swarming. Previous studies conducted in our laboratory showed that there is a significant interaction between *Dickeya solani* and the *Bacillus subtilis* MB73/2. In the presence of this environmental strain, *Dickeya*'s swarming pattern changes – instead of indiscriminate swarming over the whole plate's surface, its behaviour display reproducible directionality away from *Bacillus*.

In my research, I'm focused on factors secreted by both bacteria into the environment, which are the reason behind their interaction, and whether this interaction is just antagonistic or also bactericidal. As the cornerstone of my research, my approach uses mass spectrometry to identify and quantify the distribution of compounds released into the growth medium.

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