***Spatiotemporal Characterization of Antagonistic Interactions Among Bacterial Population***

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In natural environments, bacteria live in communities, that provide opportunities for defense against other bacteria, access to nutrients, and other avenues for cooperation. To synthesize or modify bacterial communities to suit our needs, we need to learn more about how bacteria in a community interact with each other. Our study focuses on antagonistic interactions and looks at how toxin producing and toxin-susceptible populations interact over time and space. To study these communities at single-cell level, we employ time-lapse microscopy to address questions traditionally explored at the population level. We model the bacterial populations using an agent-based approach. Current work involves calibration of these system models using representation learning. Our long-term goal is to develop predictive models for the engineering of the microbial communities. These models are designed to predict the effects of engineering antagonistic interactions among bacteria, including predator-prey dynamics in gut microbiomes and the biological control of plant diseases.  [1][2].

References

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