

Population Dynamics Virtual Seminar



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Spatial Interaction networks in microbial communities

Communities of interacting microbes perform fundamental processes on Earth, such as cycling the elements and shaping the health of animals and humans. The processes that these microbial communities perform arise from a dense network of interactions between individual cells. Most microbial communities are spatially structured systems, where cells move little, thus interactions occur mostly between cells close in space. Therefore, the spatial arrangement of different species can affect the processes that the whole community performs. Our goal is to uncover how the local interactions between cells determine community-level processes. To do so, we look at synthetic bacterial communities under the microscope at a resolution that allows me to observe both the individual cells and the community as a whole. I will show how we can properties of the single cells, like their growth and their phenotype, and use mathematical modelling to uncover how these individual-level properties determine community-level properties.

Suggested reading: Dal Co, A., van Vliet, S., Kiviet, D.J. et al. *Short-range interactions govern the dynamics and functions of microbial communities*. Nat Ecol Evol 4, 366–375 (2020). <https://doi.org/10.1038/s41559-019-1080-2>
<https://www.nature.com/articles/s41559-019-1080-2>