

# The microbial brain: Electrochemical signaling and higher-order coordination in bacterial communities

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**Abstract:**

Most bacteria on our planet reside in densely packed communities, yet we have little understanding of bacterial behavior in such communities. My laboratory has uncovered ion channel-mediated long-range signaling within such bacterial communities. This electrochemical cell-to-cell signaling gives rise to unexpected emergent behaviors that are organized in space and time. We are working to understand the underlying electrophysiology of bacterial communities that allows them to cope with stress (such as antibiotic exposure) as a collective. I will discuss our recent efforts to develop new devices, techniques and theoretical frameworks to understand and control the electrophysiology and behavior of bacterial communities.

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