


Morphologies of <i>Bacillus subtilis</i> Communities responding to Environmental Variation		
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Research Topics

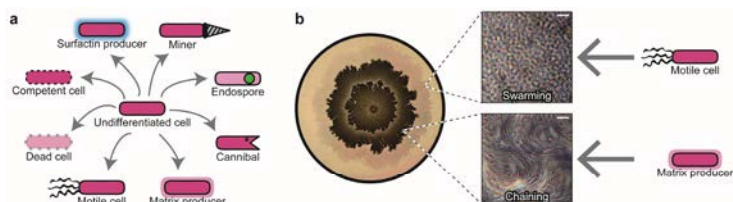
- Morphologies of *Bacillus subtilis* communities
- Mathematical model of colony formation
- Numerical simulation

Research Seeds

Spatiotemporal structures grown by bacterial communities exhibit diverse morphologies and functions. Studies of self-organization mechanisms and microbial population control strategies have reported on gene networks supporting cell differentiation. Conversely, isolated features of community morphology have been examined to assess the roles of individual genes in community development. However, morphological responses of bacterial communities to environmental variations are too diverse to be understood only at the molecular and cellular levels. The regulation of cell states affects macroscopic community morphology and the surrounding environment; the resulting environmental changes alter gene expression, dynamically defining cell properties.

Our recent work⁽¹⁾ reviews morphologies of *Bacillus subtilis* communities responding to environmental variations. We summarize how *B. subtilis* uses different cell types to adjust its macroscopic collective structure to a changing environment; we also discuss self-organization mechanisms and their underlying growth strategies. Finally, we introduce how observation of collective morphologies has been used in molecular biology assays, demonstrating the importance of interdisciplinary, multi-level investigations.

(1) Tasaki, S., Nakayama, M., Shoji, W. 2017. "Morphologies of *Bacillus subtilis* communities responding to environmental variation." *Develop. Growth Differ.* **59**, 369-378.



Related Technology

- Cell biology
- Environmental technology
- Food processing technology