

## Engineering Bacteria Cell Shape: Bacterial cells in confined micro-environments

*Dr. Lars Renner*

Leibniz Institute of Polymer Research Dresden, Max Bergmann Center of Biomaterials  
Dresden

### Abstract

Why bacteria have evolved and maintained their specific shapes is a central question in bacterial cell biology. Bacteria are remarkably successful in achieving a precise shape and tightly coordinating cellular processes such as DNA replication, protein production and cell division, yet the underlying biophysical cues and the evolutionary advantage for one shape over another are largely unknown. We explore how mechanical force changes bacterial morphology, affects bacterial shape, and the spatial localisation of biomolecules. We combine microfabrication tools and mathematical models to analyse cell shape recovery and growth of *E. coli* with intentionally modified cell morphology under mechanical stress.

### References:

1. *Nature Microbiology*, **2017**, 2:17115 (10.1038/nmicrobiol.2017.115)
2. *Nature Microbiology*, **2017** (10.1038/s41564-017-0082-6) (in press)
3. *PNAS*, **2011**, 108: 6264 (10.1073/pnas.1015757108)
4. *PLoS One*, **2013**, 8: e84143 (10.1371/journal.pone.0084143)