

# Pattern formation of Min proteins in cellular and open geometries

Lukas Wettmann<sup>1</sup> and Karsten Kruse<sup>2</sup>

<sup>1</sup>*Theoretische Physik, Universität des Saarlandes, Postfach 151150, 66041 Saarbrücken, Germany*

<sup>2</sup>*NCCR Chemical Biology, Departments of Biochemistry and Theoretical Physics, University of Geneva, 1211 Geneva, Switzerland*

The site of cell division in *Escherichia coli* bacteria is determined through the self-organization of the Min proteins. They exert pole-to-pole oscillations in wild-type cells but several other patterns have been found *in vivo* and by *in vitro* reconstitution. We use a model based on transient binding of MinE to the cytoplasmic membrane to analyze the dynamics of the Min proteins in different cell geometries, including basic geometric shapes and rectangles of varying length/width ratios. For open geometries, we are able to reproduce the observed spiral patterns and travelling waves.