Contribution ID: **273** Type: **Poster (+) Presentation**

The Influence of Motility on Bacterial Accumulation in a Microporous Channel

Monday, 31 May 2021 19:35 (1 hour)

Swimming microorganisms are often encountered in confined, porous geometries where also an external flow is present, e.g. in filters or inside the human body. To investigate the interplay between microswimmer motility, confinement and external flows, we developed a model for swimming bacteria based on point coupling to an underlying lattice Boltzmann fluid. With this implementation, straight swimming motion interrupted by random reorientation events reproduces the motility pattern of the run-and-tumble bacterium E. coli.
We present the application of the model to the study of bacterial dynamics in a simplified porous geometry: A rectangular channel with a single cylindrical obstacle. In accordance with experimental measurements, the results show asymmetric accumulation behind the obstacle only when the bacteria are active and an external flow is present[1]. We quantitatively compare bacterial densities from simulations to the experiments and investigate the physical mechanisms that lead to accumulation.

[1] M. Lee *et al.*: The Influence of Motility on Bacterial Accumulation in a Microporous Channel, Soft Matter advance article, 2021, DOI: 10.1039/D0SM01595D

Time Block Preference

Time Block B (14:00-17:00 CET)

References

M. Lee et al.: The Influence of Motility on Bacterial Accumulation in a Microporous Channel, Soft Matter advance article, 2021, DOI: 10.1039/D0SM01595D

Acceptance of Terms and Conditions

Click here to agree

Newsletter

I do not want to receive the InterPore newsletter

Student Poster Award

Yes, I would like to enter this submission into the student poster award

Primary authors: LOHRMANN, Christoph (University of Stuttgart); Mr LEE, Miru (University of Göttingen); HOLM, Christian (University of Stuttgart, Institut für Computerphysik)

Presenter: LOHRMANN, Christoph (University of Stuttgart)

Session Classification: Poster +

Track Classification: (MS5) Biochemical processes and biofilms in porous media