



Contribution ID: 290  
compétition)

Type: Oral (Student, Not in Competition) / Orale (Étudiant(e), pas dans la

## DSCG liquid crystal's viscosity: Insight into the motility of bacteria in an anisotropic liquid environment

Wednesday 18 June 2014 15:00 (15 minutes)

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The water solubility of lyotropic liquid crystals (LC) enables a variety of applications combining the physical symmetry breakdown with the aqueous host environment. More specifically, although knowledge of this type of LC is limited and their manipulation is rather delicate, their use for the study of biological phenomena is growing rapidly thanks to their biocompatibility. For example, they are used in the detection of biological molecules, viruses and in the study of the motility of bacteria in anisotropic liquid media. Several recent studies have shown a dramatic change in the behavior of *E. coli* bacteria when swimming in the lyotropic LC disodium cromolyn glycolated (DSCG). To improve our understanding of this phenomenon, we observed the movements of *E. coli* bacteria in DSCG-water solutions of different concentrations. In addition, we measured the effective one-dimensional viscosity along the axes parallel and perpendicular to the director by tracking the diffusion of microparticles in DSCG solutions with concentration between 0% and 13% (by weight). The results of our study shed light on the behavior of motile microorganisms in anisotropic media and show interesting characteristics of the biocompatible DSCG LC.

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**Session Classification:** (W2-9) Molecular Biophysics - DMBP / Biophysique moléculaire - DPMB

**Track Classification:** Medical and Biological Physics / Physique médicale et biologique (DMBP-DPMB)