

Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Bacteria dispersion in microchannel containing random obstacles¹

ADAMA CREPPY, HAROLD AURADOU, FAST, Universite Paris-Sud, CARINE DOUARCHE, LPS, Universite Paris-Sud, VERONICA D'ANGELO, FIUBA, Argentina, JACKY NGUYEN, FAST, Universite Paris-Sud, FLUIDE AUTOMATIQUE ET SYSTEMES THERMIQUES COLLABORATION, LABORATOIRE DE PHYSIQUE DU SOLIDE COLLABORATION, GROUPO DE MEDIOS POROSOS, FIUBA COLLABORATION — Dispersion of particles in porous media is a classical problem well studied where physical laws are well established and show good agreement with experimental observations. Recently, contrary to what is thought, observations revealed that self-propelled particles under flow, orient their swimming, what is designated by the term of rheotaxis. But less is known about what happen for self-propelled particles under flow in presence of obstacles. For this purpose, we developed a specific experimental setup in order to show the coupling of bacteria *E. Coli* RP437 strain swimming with the presence of obstacles in the dispersion process. We chose to develop a micro-fluidic device of rectangular section of $0.05 \mu\text{m}^2$ containing obstacles of different sizes ($10 - 150 \mu\text{m}$) when a bacteria size is about $1 \mu\text{m}$. Thanks to the transparency of the flow we can track hundreds of trajectories of bacteria, the analysis of which revealed that their swimming influences the dispersion when the flow velocity is of the order of their swimming velocity ($10 \mu\text{m}/\text{s}$).

¹Agence Nationale de la Recherche

Adama CREPPY
FAST, Universite Paris-Sud

Date submitted: 01 Aug 2016

Electronic form version 1.4