

Open position: **Post Doc**
 Institute of Biosciences and Biotechnologies, CEA Cadarache

Subject: Magnetotactic bacteria and their motion in complex environments

The institute focuses on interdisciplinary research in the field of environmental biology, biofuel, and health and environmental biotechnology. In particular, the team of molecular and environmental microbiology attempts to understand how microorganisms interact with their environment and to develop new actuators and sensors. In this context, the group working on magnetotactic bacteria invites applications for a:

Post-doctoral research associate (2 years extension possible to 3 years)

Magnetotactic bacteria orient in magnetic fields with the help of a dedicated organelle, the magnetosome chain, which acts as an intracellular compass needle. In this way, their swimming, powered by their flagella, is guided by the magnetic field; the bacteria can be understood as self-propelled compass needles. Magnetotactic bacteria often live in the sediments of aquatic environments and thus swim in a milieu characterized by pores and obstacles. However, their swimming behavior is mostly studied in bulk aqueous environments. In this project, we will use a combined theoretical and experimental approach for the quantitative characterization of magnetotactic motility in complex environments. We will investigate how directional motility is achieved in such an environment and how these bacteria balance robust control of directional motion with directional flexibility to navigate through such a medium.

The candidate will be responsible for the experimental part of the project. This includes growing the bacteria. She/he will develop microfluidic devices mimicking the environments the cells live in and will use a custom-design microscope to study the swimming behavior in controlled magnetic conditions. Image analysis is also typically based on custom-designed approaches. Special emphasis will be laid on interdisciplinary research so that close collaboration with scientists working on the theoretical aspects (group of S. Klumpp in Göttingen, Germany) of microswimmers will be expected.

Qualification:

Candidates should have a PhD or doctoral degree in biophysics, biotechnology, physics, materials science, chemistry or microbiology. Proficient English is required. Good theoretical and practical skills in the lab and for the redaction of scientific communications are expected. Skills in microfluidics, optical microscopy, and programming will be highly appreciated.

Recent papers on the subject:

Klumpp S. et al., 2019, Physics Reports, 789: 1-54.
Lefèvre C. et al., 2014, Biophysical Journal, 107: 527-538.

Contact: Dr. Damien Faivre
Address: CEA Cadarache
 13108 Saint Paul lez Durance Cedex
 France

E-mail: damien.faivre@cea.fr

Homepage: <http://biam.cea.fr/drf/biam/english/Pages/laboratories/lbc.aspx>

Documents: please include CV, publications' list, motivation letter and at least 2 names for reference letters to your application