

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

Subject: Magnetotactic bacteria and magnetosomes-based theranostic systems

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

The goal of the research will be to use magnetotactic bacteria and the magnetic nanoparticles called magnetosomes that the bacteria synthesize intracellularly to develop swimmers with biotechnological potential. We will first focus on the reutilization of the bacteria as delivery tools. Alternatively, a second project will develop nanosized swimmers based on isolated magnetosomes to target smallest area.

The candidate will cultivate and chemically modify the bacteria such that drugs can be attached and detached from the cell surface. Using microfluidic devices, she/he will show a proof-of-principle of drug attachment at a loading station, transport through a channel, delivery at the targeted point, and swimming back to the original position. In addition, the work will include the isolation of magnetosomes from cultivated bacteria and the fabrication of self-propelled particles. The later will be obtained from the functionalization of the former based on bio-inspired techniques. In both projects, a variety of techniques will be employed, including microbial cultivation, chemical functionalization, optical microscopy and image analysis. Therefore, special emphasis will be laid on interdisciplinary research so that close collaboration with scientists working on the design of smart nano-bio-devices (in Barcelona, Spain) and theoretical aspects (in Göttingen, Germany) of microswimmers will be expected.

Qualification:

Candidates should have a PhD or doctoral degree in biophysics, biotechnology, 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 and fluorescent microscopy, as well as in magnetism will be highly appreciated.

Recent papers on the subject:

Klumpp S. et et al., 2019, Physics Reports, 789: 1-54.

Felfoul O., 2016, Nature Nanotechnology, 11: 941-947.

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>