ESR5 - Driven motion in a complex environment

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Many bacteria have the ability to move in their environment in order to respond to their needs, be they nutrients or oxygen. Strikingly, bacteria exhibit a rich repertoire of swimming patterns, from run-and-tumble to run-reverse-flick. Which benefits come with a particular pattern however remains an open question. Besides, bacteria often have to perform those moves under mechanical constraints such as hydrodynamics or geometric constraints for which our understanding of bacteria motion is currently limited. Our goal is to explore those issues, using both a theoretical approach and an experimental investigation of magnetotactic bacteria.

In this project the ESR will study experimentally the motion of magnetotactic bacteria under mechanical constraints —that could be either hydrodynamic constraints or geometric constraints— and will investigate numerically the optimal swimming strategy in a complex environment for driven systems.

Salary: The PhD salary is based on the regulations of appointment and remuneration for Marie Skłodowska Curie Fellows in ITN networks. The successful candidate will also benefit from additional funding for several visiting trips (typically 1 month each) in the partner teams.
Requested profile: We welcome highly-motivated applicants holding a MSc and with excellent background in statistical physics, soft matter physics and/or biophysics.
Further obligations: The ESR is expected to travel to network partners for secondments and a mini-project for durations up to of 2-3 months. In addition, the ESR participates in outreach activities (social media, participation in public events), as well as dissemination to popular press.
Funding conditions: Candidates must not have resided or carried out their activities - work, studies, etc.- in France for more than 12 months in the 3 years immediately before starting the PhD.
Hiring procedure: Applications (CV, transcript of studies, statement of motivation and at least one letter of recommendation) should be sent by email to Cecille Cottin-Bizonne (cecile.cottin-bizonne@univ-lyon1.fr). The recruitment is taking place following the European Code of Conduct for Recruitment of Researchers, which all candidates are encouraged to study.
Selection process: PHYMOT is open to researchers regardless of gender, religion, ethnicity, disability, sexual orientation, political views, language, age and nationality. Applications from highly qualified applicants from outside the EU will thus be equally considered to other applicants. The integration of refugees is an EU priority and we will ensure equal opportunities to the researchers whose scientific careers have been interrupted. To ensure a gender balance in the project and work towards the Commission's own policies on narrowing the gap between the genders in research, should two applicants be found to be equally qualified the preference will be given to the one that will balance the gender distribution in the entire Network. All submitted applications will be checked against the defined admissibility and eligibility criteria (e.g. submitted electronically, readable, complete, in English, including grades and references), and applicants will be informed by email within two work weeks on the outcome. Evaluation criteria include: Scientific background previous publications, capacity for creativity and independent thinking and leadership, mentoring and presentation abilities.
Protection of personal data: The personal data of the applicants will be handled in compliance with applicable EU and national law on data protection (GDPR).