POST-DOCTORAL POSITION
INSTITUT PASTEUR, PARIS, FRANCE

A 36-months post-doctoral position is available in the Unit of Genetics of Biofilms at the Institut Pasteur (Paris) to work in an ambitious project focused on the understanding of the evolution of antibiotic tolerance and resistance in bacterial biofilms.

General Information
A 36-months post-doctoral position is available in the Unit “Genetics of Biofilms” [1] at the Microbiology Department of the Institut Pasteur to work with the group of Christophe Beloin [2]. The position is offered in the framework of the project “EvolTolAB” funded by the ANR (The French national research granting agency) in collaboration with the INSERM team “Quantitative Evolutionary Microbiology” of Olivier Tenaillon. The position is expected to start in early 2019.

One main focus of our group is the identification and characterization of biofilm specific properties that could modulate bacterial behavior in different in vitro and host context. Due to their high tolerance to antimicrobial agents, biofilms are known to be at the origin of recurrent chronic infections in clinical contexts. Whereas the potential link between biofilm formation and emergence of antibiotic resistance has been largely overlooked so far, formation of antibiotic tolerant biofilms is hypothesized to be an aggravating factor contributing to the emergence of antibiotic resistance.

The EvolTolAB project aims at exploring whether tolerance to antibiotics can evolve during treatment of biofilms and possibly promote the emergence of antibiotic resistance.

Project Description
The recruited post-doctoral fellow will use Adaptive Laboratory Evolution (ALE) experiments combined with next-generation sequencing analyses to determine the evolutionary trajectories that can lead to increased levels of tolerance and then resistance towards lethal concentration of different antibiotics in pathogenic E. coli biofilms. He will analyze, using DNA barcode tagging, the dynamic of dissemination of emerged tolerant/resistant clones and repopulation of biofilms during intermittent antibiotic treatment. This project should contribute to improve our understanding of the dynamic relationships between biofilm tolerance and emergence of antibiotic resistance, as well as of the dissemination of this tolerance/resistance in highly structured environments. This could lead to the design of innovative strategies or clinical treatment protocols to mitigate the emergence of high tolerance and subsequent antibiotic resistance in clinically relevant situations.

Application Details for Post-Doctoral Fellows
Candidates should be highly motivated and interested by bacterial genetics and evolution, and be willing to take on a scientific and technical challenge. A good background and practical experience in techniques of molecular biology, bacterial genetics, and possibly evolution biology will be an asset.

Applicants should send a motivation letter including a brief statement of research experience, technical expertise and interests, a CV, a list of publications and contact details of three referees to Christophe Beloin, christophe.beloin@pasteur.fr.