

Post-doctoral position
**Single-cell study of the emergence of antibiotic resistance
using microfluidics**

Physical microfluidics and Bioengineering group
Institut Pasteur & Ecole Polytechnique joint research unit
Paris, France

In recent years our group has developed a range of microfluidic tools and approaches to study individual cells and small colonies of bacteria or mammalian cells (see e.g. [1,2]). We now want to address the emergence of antibiotic resistance on the scale of individual bacteria.

In particular we wish to understand the relationship between different stress responses to small doses of antibiotics (SOS response, stringent response, etc...) with the ability of the cells to adapt and form colonies. For this we are working in close collaboration with the group of Didier Mazel (<https://research.pasteur.fr/en/team/bacterial-genome-plasticity/>) to combine cutting-edge microbiology methods with our quantitative approaches.

The post-doc will join this interdisciplinary project and will work closely with members of both teams. He/she will be responsible for running the microfluidics experiments, which involve manipulating and observing single cells under precisely controlled conditions, using the techniques described in Ref. [1].

Skills. The ideal candidate will have a proven track record in quantitative biology or systems biology, with a special focus on bacteria. Particular technical skills that we are looking for include microscopy techniques, quantitative image analysis, data analysis, and modeling. A background in microfluidics would be useful.

Environment. The project will take place at the Institut Pasteur, in the newly founded research group on *Physical microfluidics and Bioengineering*. This is a joint research unit supported by Ecole Polytechnique and Institut Pasteur, directed by Charles Baroud. <https://research.pasteur.fr/en/team/physical-microfluidics-bioengineering/>

Conditions. The position is funded by the french national research agency (ANR). The monthly salary will correspond to the standards in France and will depend on candidate's experience. The initial contract will be for two years with possible extensions.

To apply. Please send your cover letter and CV, along with the contact information of three referees to Charles Baroud (charles.baroud@pasteur.fr)

References

- [1]. Amselem, G., Guermontprez, C., Drogue, B., Michelin, S. & Baroud, C. N. Universal microfluidic platform for bioassays in anchored droplets. *Lab Chip* 16, 4200-4211 (2016).
- [2]. Sart, S., Tomasi, R. F.-X., Amselem, G. & Baroud, C. N. Multiscale cytometry and regulation of 3D cell cultures on a chip. *Nat. Commun.* 8, 469 (2017).