



BIOINFORMATIC POST-DOCTORAL POSITION AT INSTITUT CURIE (PARIS) IN COLLABORATION WITH THE MAX PLANCK INSTITUTE (DRESDEN)

Project: studying mammary stem cell plasticity by in vivo barcoding and scRNAseq (24-36 months)

A two-year post-doctoral position (renewable up to 3 years) is available in the Group “Notch signalling in stem cells and cancer” headed by Silvia FRE in the “Genetics and Developmental Biology” Unit (UMR3215/U934) at Institut Curie in Paris, France.

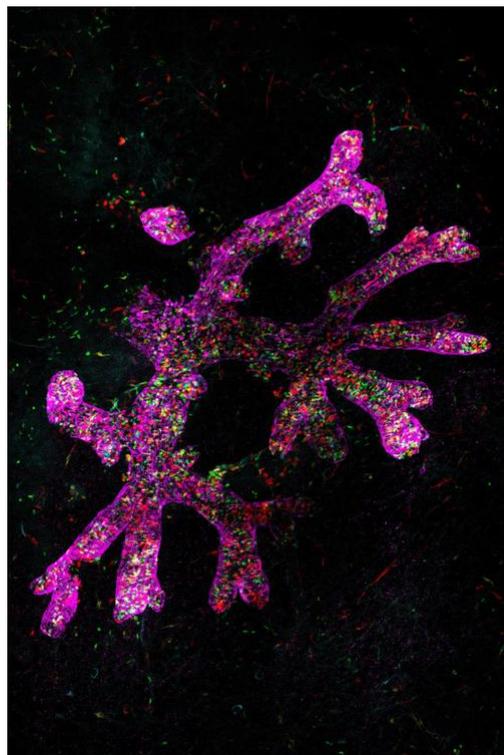
<https://science.institut-curie.org/team-fre>

The candidate will work in tight collaboration with the Group of Statistical Physics of Living Systems headed by Steffen Rulands at the Max Planck Institute in Dresden.

<https://www.pks.mpg.de/statistical-physics-of-living-systems/>

Project Description

Our research is focused on the dissection of *in vivo* stem cell behaviour both during physiological tissue development and homeostasis as well as in tumours, combining clonal analysis by lineage tracing with time-lapse analysis of 3D organotypic cultures and intravital imaging, whole mount immunofluorescence, single cell transcriptomics and mathematical modelling of clonal dynamics. Our approach relies on inducible genetic labelling approaches to mark and molecularly characterise tissue-specific stem cells. In the mammary gland, we have recently investigated the mechanisms underlying stem cell plasticity and directing lineage specification during embryonic development (Lilja et al, NCB 2018). The candidate will be involved in a) establishing a pseudo-timeline of the progressive reprogramming of mammary cells obtained by scRNAseq, to elucidate the molecular basis of lineage conversion; b) defining the transcriptional landscapes distinguishing multipotent and unipotent embryonic mammary stem cells and c) defining the developmental timing of the switch from multipotency to unipotency during embryonic mammary gland development using a novel barcode-based lineage tracing approach.



Techniques: the project will involve extensive bioinformatics and statistical analysis, analysis of index-sorted scRNAseq and barcode analysis and mathematical modelling to infer the clonal origin of each barcoded cell. The theoretical work will be performed in collaboration with the lab of Steffen Rulands at the Max Planck Institute in Dresden and the experimental work will be gathered by a post-doc in the lab.

Candidate requirements

- PhD, preferably in Computer Science, Mathematics or Bioinformatics or related fields, with at least one first author publication
- Enthusiastic and highly motivated researcher with strong interest in stem cell biology
- Ability to work independently

- Good communication skills, fluency in English
- Solid skillset and experience in bioinformatics: experience and proven track record in handling NGS datasets and developing analysis pipelines competence for single cell data.
- Good knowledge in biostatistics or machine learning techniques as well as experience in programming (bash, R, perl, C or python).
- Basic knowledge in stem cells and cancer biology and genetics would be an advantage but is not mandatory.

Work environment

The candidate will benefit from the top-level scientific environment of Institut Curie, and of state-of-the-art technological platforms, including a Bioinformatics Department located in our building. The lab is located in the heart of Paris, in a building devoted to Developmental Biology within the Curie campus, providing interdisciplinary expertise and a very friendly and international environment.

To apply, please send: curriculum vitae, cover letter clearly stating your motivation and future research interests/plans and the names/contact information of 2/3 referees to silvia.fre@curie.fr

Please indicate «Postdoc application» in the subject line.