



Post-doc position to study Redox signaling in stem cells in Paris



A funded 4-year post-doctoral position is available for an exciting and innovative project in collaboration between the Group “Notch signaling in stem cells and tumors” directed by **Silvia FRE** (<https://institut-curie.org/team/fre>) in the Department of Genetics and Developmental Biology (UMR3215/U934) at Institut Curie and the Group “Development and function of the vertebrate visual system” directed by **Filippo Del Bene** (<https://www.institut-vision.org/en/development-and-function-of-the-vertebrate-visual-system.html>) at the Institut de la Vision in **Paris, France**.

Our research is focused on understanding how tissue-specific stem cells engage in differentiation while retaining self-renewal potential and plasticity. We develop fundamental projects seeking to understand the mechanisms controlling cell fate specification in developing epithelia in embryogenesis as well as during adult homeostasis and more recently we started investigating how cell differentiation is coordinated with tissue morphogenesis. Our studies, combining clonal analysis by lineage tracing with time-lapse imaging of 3D organotypic cultures and intravital microscopy, single cell transcriptomics and mathematical modelling of clonal dynamics, aim to uncover the molecular circuitries driving stem cell behavior and linking specific stem cell states to cell dynamics during morphogenesis, advancing our understanding of how organs are formed and how tumors arise.

This project will explore the influence of Reactive Oxygen Species (ROS) and Redox signalling on the delicate choice of a stem cell to self-renew or differentiate.

Techniques: the project will involve zebrafish and mouse work, Flow Cytometry, optogenetics, image analyses, 3D organoid cultures, molecular biology and immunofluorescence analyses.

Candidate requirements

- PhD or MD/PhD with at least one first author publication
- Enthusiastic and highly motivated researcher with strong interest in stem cell biology
- Ability to work independently, good team spirit
- Good communication skills, proficiency in oral and written English
- Candidates with competence in image analyses as well as previous experience in mouse handling, developmental biology, molecular biology or 3D cultures will be prioritised.

Work environment

The candidate will benefit from the top-level scientific environment of Institut Curie and Institut de la Vision and of state-of-the-art technological platforms. 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 summarizing research interests, professional experience, and career goals and the names/contact information of 2/3 referees, one of which should be a previous employer to silvia.fre@curie.fr

Please indicate «Postdoc application» in the subject line.

Recent Publications of the lab

Jacquemin G, Wurmser A, Huyghe M, Sun W, Homayed Z, Merle C, Qasrawi F, Perkins M, Richon S, Dingli F, Arras G, Loew D, Vignjevic D, Pannequin J and Fre S. (2022). *Paracrine signalling between intestinal epithelial and tumour cells induces a regenerative programme*. **eLife** 11:e76541. doi: 10.7554/eLife.76541. PMID: 35543624.

Lloyd-Lewis B, Gobbo F, Perkins M, Jacquemin G, Huyghe M, Faraldo M and Fre S. (2022). *In vivo imaging of mammary epithelial cell dynamics in response to lineage-biased Wnt/ β -catenin activation*. **Cell Reports** 38 (10) 110461, ISSN 2211-1247, doi: 10.1016/j.celrep.2022.110461.

Jacquemin* G, Benavente-Diaz M, Djaber S, Bore A, Dangles-Marie V, Surdez D, Tajbakhsh S, Fre* S and Lloyd-Lewis* B. (2021). *Longitudinal high-resolution imaging through a flexible intravital imaging window*. **Science Advances** 7 (25), eabg7663
DOI: 10.1126/sciadv.abg7663. * co-corresponding authors.

Mourao L., Jacquemin G., Huyghe M., Nawrocki W.J., Menssouri N., Servant N. and Fre, S. (2019). *Lineage tracing of Notch1-expressing cells in intestinal tumors reveals a distinct population of cancer stem cells*. **Scientific Reports** 9(1):888

Lilja* A., Rodilla* V., Huyghe M., Hannezo E., Landragin C., Renaud O., Leroy O., Ruland S., Simons B.D. and Fre S. (2018). *Clonal analysis of Notch1-expressing cells reveals the existence of unipotent stem cells that retain long-term plasticity in the embryonic mammary gland*. **Nature Cell Biology** 20(6), p. 677–687.

Reviews

Lloyd-Lewis B, Mourikis P and **Fre S** (2019). *Notch signalling: sensor and instructor of the microenvironment to coordinate cell fate and organ morphogenesis*. Current Opinions in Cell Biology 61: 16-23. DOI: 10.1016/j.ceb.2019.06.003.

Rodilla V and **Fre S** (2018). *Cellular Plasticity of Mammary Epithelial Cells Underlies Heterogeneity of Breast Cancer*. Biomedicines 2018, 6, 103. DOI:10.3390/biomedicines6040103.