



## Open position for a research technician in molecular and cellular biology

### IGH, CNRS Montpellier

#### Project: Systematic analysis of gene expression in single cells by high throughput imaging of single mRNAs

Characterizing gene expression at the level of single cells and in the context of the native cellular space is a challenge that is driving important scientific breakthroughs. Messenger RNAs are synthesized at their gene in the nucleoplasm and translated into proteins at specific cytoplasmic locations. Single molecule FISH (smFISH) identifies and localizes all mRNA molecules produced by a given gene, in every cell of large populations. SmFISH thus possesses unique advantages to study gene expression, mRNA localization and local translation. In this project, the candidate will use innovative smFISH methods to perform large scale smFISH screens. In particular, the candidate will image thousands of mRNA in neuronal cell culture to measure RNA localization in dendrites and axons, and determine how this is altered in neurodegenerative diseases such as Fragile X syndrome or spinal muscular atrophy. The candidate will also manipulate neurogenic iPS cells by CRISPR/Cas9 to create mutant cell lines mimicking these diseases. The candidate will work in an interdisciplinary environment with teams in computer vision and biophysics (Thomas Walter lab at the Ecole des Mines in Paris, <https://www.minesparis.psl.eu/Services/Annuaire/thomas-walter>; Florian Müller in Pasteur, <https://research.pasteur.fr/fr/member/florian-muller/>). These teams will analyze the images produced by the person hired.

**Requirements:** Master in Life Sciences. Theoretical and practical experience in molecular and cellular biology techniques. Skills in imaging and large scale screens will be a plus. The candidate should be interested to work within an inter-disciplinary environment, and to work autonomously while integrated in a team.

**Where:** Edouard Bertrand lab at the IGH/CNRS in Montpellier (<https://www.igh.cnrs.fr/en/>).

**When:** September 1<sup>st</sup>, 2022; 2 year contract with possibilities for extension.

**Application:** Please provide a motivation letter, CV and contact details of previous supervisors. Application should be sent to Dr. Edouard Bertrand ([edouard.bertrand@igh.cnrs.fr](mailto:edouard.bertrand@igh.cnrs.fr)). **Deadline: July 5<sup>th</sup>.**

#### Recent publications

- A computational framework to study sub-cellular mRNA localization. **Nat. Comm**, 2018, 9:4584. Samacoits, A., Chouaib, R., Safieddine, A., Traboulsi, A., Ouyang, W., Zimmer, C., Peter, M., **Bertrand, E.\***, Walter, T.\*, Mueller, F.\*
- FISH-quant v2: a scalable and modular tool for smFISH image analysis. **Imbert A**, Ouyang W, Safieddine A, Coleno E, Zimmer C, Bertrand E, Walter T, Mueller F. *RNA*. 2022; 28:786-795.
- Safieddine, A., Coleno, E., Salloum, S., Traboulsi, A., Kwon OS., Lionneton, F., Georget, V., Robert, MC., Gostan, T., Lecellier, C., Chouaib, R., Pichon, X., Le Hir, H., Zibara, K., Peter, M., and **E. Bertrand**. A conserved choreography of mRNAs at centrosomes reveals a localization mechanism involving active polysome transport. *Nat. Comm* (2021), 12:1352.
- Chouaib, R., Safieddine, A., Pichon, X., Kwon, OS., Samacoits, A., Traboulsi, AM., Tsanov, N., Robert, MC., Coleno, E., Poser, I., Zimmer, C., Hyman, A. A., Le Hir, H., Zibara, K., Peter, M., Mueller, F.\*, Walter, T.\*, and **E. Bertrand\***. A localization screen reveals translation factories and widespread co-translational protein targeting. *Developmental Cell*, 2020, 54:773-791. *See commentary in Dev. Cell doi:10.1016/j.devcel.2020.09.006*
- A growing toolbox to image gene expression in single cells: sensitive approaches for demanding challenges. **Mol. Cell**, 2018, 71:468-480. **Pichon, X.**, Lagha, M., Mueller, F. and **E. Bertrand**. *Invited review for the 20th anniversary of the journal; featured article of the issue*