Position : **Lab instructor for students of Ecole Polytechnique**
Field: **Molecular and cellular biology**
Funding: **5-year** funding available (1+4), Position available now and until filled
Salary: 2000-2500 €/month ('salaire net', equivalent to the salary of a post-doc or a research engineer from CNRS).
Laboratory: École Polytechnique/CNRS UMR7654 - BIOC
Location: Plateau de Saclay, 25 km South of Paris (91120 Palaiseau)
Research team: Alexis Gautreau "Cytoskeleton and cell morphogenesis"
https://portail.polytechnique.edu/bioc/en/gautreau

Job description:

The job consists in **developing research projects** with students of Ecole Polytechnique, who would be hosted in the research lab during the academic year. The goal is to **teach them biology through research**. The instructor should teach them how to plan, design and perform experiments. Reagents for the project are funded by a budget line that is independent from the general resources of the research team. In addition, the instructor should be motivated to help students to mature their scientific thinking, by reading research papers, preparing presentations and participating in the strategy of publication. The goal is to **publish studies with students** to promote their future education. The instructor is expected to be creative in designing original research projects that take full advantage of hosting many students in the lab during the academic year (possibility of parallelizing the work, transmission of the work from a student generation to the next one).

Project : **Personalized Reconstitution of the Tumoral Process**

The overall theme is to **use mutations found in patients to identify and validate novel cancer genes**. To this end, potential novel oncogenes will be expressed in untransformed cell lines and potential novel tumor suppressor genes will be invalidated using CRISPR mediated knock-outs. To connect the work with the rest of the research team, we will focus on breast cancer and melanoma, where the RAC1-WAVE-Arp2/3 pathway is particularly important.

The project consists in **predicting driver mutations** from all the mutations found in a single tumor from a single patient. 10 patients with advanced breast cancers with either single cell or collective invasion were selected and their tumors have been sequenced in collaboration with national reference cancer centers of Russia, in Moscow and in Tomsk in Siberia, through an International Associated Laboratory of CNRS. The predicted driver mutations will be sequentially reintroduced in the genome of an untransformed cell line in order to **reconstitute the stepwise transformation process** that is responsible for the development of this particular tumor. Samples from each patient are available to validate future *in vitro* findings.

Profile requested:

- Recent PhD in Molecular and Cellular Biology

The ideal lab experience would be in mammalian cell cultures, plasmid constructions, transfections, selection of stable clones, genome edition using CRISPR-Cas9, microscopy, videomicroscopy, phenotypic assays such as migration, invasion, proliferation, differentiation, etc.

- Creativity, ease of personal interactions, motivation and ability to transmit it are equally important.

- One publication as a first author is requested.

- Ability to work in French or in English, ideally both.

Russian would facilitate interactions with our collaborators.

Application: send an email with [Instructor] as object to
alexis.gautreau@polytechnique.edu
attach CV, motivation letter and 2 letters of recommendation.

Publications from the research team relevant to the topic:

Molinie N, Rubtsova SN, Visweshwaran SP, Rocques N, Polesskaya A, Schnitzler A, Vacher S, Denisov EV, Tashireva LA, Perelmuter VM, Cherdyntseva NV, Bièche I, Gautreau AM. 2019. A Cell Cycle Checkpoint Monitors Cortical Branched Actin. *Cell Res 29:432-45.*

Visweshwaran SP, Thomason PA, Guerois R, Vacher S, Denisov EV, Tashireva LA, Lomakina ME, Lazennec-Schurdevin C, Lakisic G, Lilla S, Molinie N, Henriot V, Mechulam Y, Alexandrova AY, Cherdyntseva NV, Bièche I, Schmitt E, Insall RH, Gautreau A. 2018. The trimeric coiled-coil HSBP1 protein promotes WASH complex assembly at centrosomes. *EMBO J.* 37:e97706.

Molinie N, Gautreau A. 2018. The Arp2/3 Regulatory System and its Deregulation in Cancer. *Physiol. Rev.* 98:215-238. Review.

Lomakina ME, Lallemand F, Vacher S, Molinie N, Dang I, Cacheux W, Chipysheva TA, Ermilova VD, de Koning L, Dubois T, Bièche I, Alexandrova AY, Gautreau A. 2016. Arpin down-regulation in breast cancer is associated with poor prognosis. *Brit J Cancer*. 114 :145-63.

Couderc C, Boin A, Fuhrmann L, Vincent-Salomon A, Mandati V, Kieffer Y, Mechta-Grigoriou F, Del Maestro L, Chavrier P, Vallerand D, Brito O, Dubois T, De Koning L, Bouvard D, Louvard D, Gautreau A, Lallemand D. 2016. AMOTL1 promotes breast cancer progression. *Neoplasia.* 18 :10-24.