Postdoc Offer (2025 – 2027)

Rewiring of cellular networks by *de novo* peptides

A postdoctoral position is available at the TAGC laboratory (Theories and Approaches of Genomic Complexity, Inserm-Aix-Marseille University, Marseille, France) in the Network Biology group (@NetBioinfoMRS).
De novo gene origination is a recently recognized process that describes the emergence of new genes from previously noncoding sequences via a series of mutational events. Although believed to be highly unlikely until recently, de novo gene birth has by now been described in many species, including several fungi, plants, insects, fishes and mammals.
However, the emergence of functional proteins from de novo genes is difficult to rationalize with our current understanding of molecular genetics and evolution. More precisely, little is known about how these new proteins behave in the interactome of their species of emergence, and how these interactions play a role in their fixation in a species.
This project stands in the context of an international collaborative project involving 3 research groups (in the US, Germany, and France). The project aims to detect and understand the emergence of human de novo genes. In Marseille, we will focus more precisely on the interactomics of the de novo peptides encoded by de novo genes.
The successful candidate will explore the interactome of de novo peptides (dnPEPs) using computational approaches. More particularly, how dnPEPs rewire cellular networks will be investigated. The project will include both data analysis and methodological development.

Required Qualification

- You have a PhD degree with a focus in Network Biology, Bioinformatics, Computational Biology, Complex Systems or related fields.
- You are an accurate and precise worker with strong analytical problem-solving skills (creative, critical, thinking out-of-the-box).
- You are proficient in data analysis utilizing cutting-edge computational methods, coupled with extensive experience in applying statistical techniques to biological data.
- You master R and Python programming languages, and you are familiar with Linux-based high-performance computing environments.
- You can communicate effectively and collaborate as part of an interdisciplinary team (bioinformaticians, biologists, computational scientists).
- You can compose and deliver comprehensive presentations at scientific meetings and prepare research articles for peer-reviewed publications.
- You can work independently to drive projects forward, yet you are also a team player.

Familiarity with FAIR principles and expertise in developing highly distributable software, including R packages, Python modules, and computational workflows, will be a valuable asset.

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Salary will be based on Inserm guidelines for Postdoctoral scholars and commensurate with qualifications and experience. Appointments — possibly starting in March 2025 — will be for up to 2 years.

For additional information about the research program and this opportunity, please contact Dr. Christine Brun (christine-g.brun@inserm.fr, https://tagc.univ-amu.fr/en/users/brun-christine). Send a CV, a motivation letter and the contact details of 3 referees

Deadline for application: end of December 2024.

About the lab

The TAGC laboratory (Theories and Approaches to Genomic Complexity, https://tagc.univ-amu.fr/, @TAGC_U1090), is a joint Inserm and Aix-Marseille University research unit located in the Luminy Campus, next to the well-renowned Calanques National Park (https://www.calanques-parcnational.fr/en). In the lab, we seek to decipher the biological mechanisms leading once disrupted, to pathologies such as cancer, cardiomyopathies, systemic inflammation or infectious diseases like malaria. Over the years, the Network Biology group has developed network-based approaches and algorithms to understand the organization of cellular processes and protein multifunctionality by exploiting molecular interaction networks (protein-protein and protein-RNA).

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