Translational **I**nnovation in **M**edicine and **C**omplexity

Université Grenoble Alpes – CNRS (UMR 5525)

Postdoc position in Evolutionary Genomics & Molecular Evolution

"Natural selection does not work as an engineer works. It works like a tinkerer – a tinkerer who does not know exactly what he is going to produce." (F. Jacob, 1977).

Standing on the shoulders of François Jacob, among others, in our team we aim at understanding and predicting biological functions by rationalizing evolutionary properties that can be extracted from the immense resource of publicly available genome sequences.

Here, we are looking for a postdoc aiming at applying **phylogenomics and co-evolution approaches** to tackle the problem of the **emergence and evolution of enzyme functions**. Specifically, the recruited postdoc will investigate evolutionary properties of a specific class of enzymes that are involved in the **biosynthesis pathway of the ubiquinone** [1,2], a molecule that is key to the energy metabolism of bacteria and eukaryotes. The project, funded by the Agence National de la Recherche, consists of an interdisciplinary framework that combines comparative genomics (recruited postdoc), biophysical models of molecular dynamics (Isabelle André's team, Toulouse Biotechnology Institute) and biochemical experiments (our team). A major goal is to provide predictions of natural, artificial and ancestral enzymes (enzymes resurrection) that will be experimentally tested.

The post-doctoral contract is for **2 years** with extension possibilities. The recruited post-doc will benefit from a rich interdisciplinary environment provided i) by our computational group, which includes comparative genomics, machine/deep learning methods and biophysics, ii) by our team TrEE, which focuses on biology (from experimental evolution to biochemistry) and health questions and iii) Isabelle André's team in Toulouse.

Candidate's profile: we are looking for a highly motivated young scientist with a strong background in computational biology, evolutionary genomics or mathematical methods, with a strong interest to investigate evolution of biological functions.

Starting date: 2022 - Position open till filled

Contact: to apply, please send your CV, a motivation letter, and the names and contact information of two references to sophie.abby@univ-grenoble-alpes.fr and ivan.junier@univ-grenoble-alpes.fr. For more details, informal enquiries are also welcome.

References:

[1] Pelosi *et al*. "Evolution of Ubiquinone Biosynthesis: Multiple Proteobacterial Enzymes with Various Regioselectivities To Catalyze Three Contiguous Aromatic Hydroxylation Reactions". *mSystems*, 2016.

[2] Abby et *al.* "Advances in bacterial pathways for the biosynthesis of ubiquinone". *Biochimica et Biophysica Acta (BBA)-Bioenergetics*, 2020.