Open postdoctoral position

Regulation of telomere length in natural yeast strains

Project overview

Telomeres are the repeated sequences found at chromosome extremities. They are essential for genome integrity and control of cell proliferation. Telomere length (TL) at one chromosome end is a dynamic parameter subject to both shortening and elongation during cell divisions, thus resulting in a population-level distribution. The overarching questions of this project are therefore: How are the TL distributions at individual chromosome ends regulated? What are the genetic determinants in *trans* and *cis* that control the natural diversity of TL?

To address these questions, the project will leverage the natural diversity of *Saccharomyces cerevisiae* strains and Oxford Nanopore Technologies (ONT) long-read sequencing technology, which enables the measurement of TL distributions at each chromosome end. We recently documented the large diversity of TL distributions across 100 natural yeast strains and uncovered several aspects of TL regulation (Garrido et al., 2026). In particular, we found that the subtelomeric Y' element shows opposing regulatory effects in *cis* and in *trans*, possibly mediated by a specific subset of long Y' elements (Dudragne et al., 2025).

The candidate will (i) investigate the molecular mechanism of TL regulation by Y' elements by engineering lab strains and natural yeast strains with different Y' contents, and manipulating the structure of their subtelomeres, (ii) extend the characterization of TL distributions to a larger panel of strains, and (iii) uncover new genetic determinants of TL by tapping into the variants found in the extended panel of natural strains. Overall, we anticipate that the project will advance our understanding of telomere regulation in natural yeast strains.

Profile

The candidate must hold a PhD degree in biology and have lab experience in molecular biology, genetics, genomics or microbiology. An expertise in programming and bioinformatics is strongly recommended. The candidate must be proficient in English. To apply please send your CV, a cover letter describing your interests and previous work, and contact information of 2 references to Zhou Xu: zhou.xu@sorbonne-universite.fr

Context and funding

The project will be performed in the Telomere & Genome Stability team headed by Zhou Xu (https://www.ibps.sorbonne-universite.fr/fr/Recherche/umr-7238/telomere-genome-stability), Laboratory of Computational, Quantitative and Synthetic Biology (CQSB UMR 7238), Institut de Biologie Paris-Seine, at Sorbonne Université (Paris, France).

The postdoc position is funded for up to 2 years through an ANR (Agence Nationale de la Recherche) grant, in collaboration with the teams of **Gilles Fischer** (Sorbonne Université, Paris) and **Gianni Liti** (IRCAN, Nice). The postdoc can **start as early as possible in 2026**.

References:

- Garrido C, Gómez-Muñoz C Kornobis E, Agier N, Ilioaia O, Fischer G*, Xu Z* (2026) Natural diversity of telomere length distributions across 100 Saccharomyces cerevisiae strains. *Genome Res.* Jan 16:gr.281132.125. doi: 10.1101/gr.281132.125. and *bioRxiv* 2025.05.13.653712.
- Dudragne L, Silva Bernardes J*, Xu Z* (2025) Diversity and distribution of the subtelomeric Y' elements across Saccharomyces cerevisiae strains. *bioRxiv* 2025.11.13.688250.