PhD student "computational regulatory genomics in diatoms"

Diploma

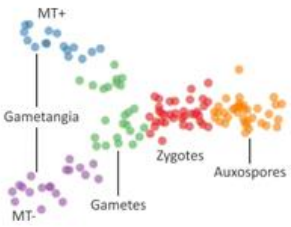
You hold a Master's degree in Sciences: Bioinformatics, Computational Biology, Bio-engineering, Biotechnology or equivalent diploma.

Job Description

The Laboratory of Comparative Network Biology (UGent-VIB Vandepoele lab) invites applications for a fully-funded **PhD project** for 1 year and extended with another 3 years (after positive evaluation) to study **computational regulatory genomics in diatoms**. Tentative starting date: April 2023 (can be discussed).

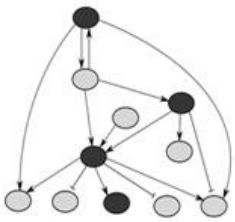
Our understanding of the molecular processes underlying the genetic/phenotypic diversity of diatoms and other microalgae remains very limited, yet it is of crucial importance to understand and predict their response to global change. The successful applicant will employ large-scale sequence analysis (genome, transcriptome, protein-DNA interactions), workflow development, and machine learning to **unravel the transcriptionally regulatory code controlling different facets of the diatom life cycle**, such as their peculiar size-dependent clock, their unique sexual reproduction pathway and cell cycle progression. Together with experimental co-workers, your computational predictions will be experimentally validated to further improve, using a systems biology approach, our understanding of genome biology in various diatom species.

Genomes



Single-cell gene expression profiling

Artificial Intelligence



Gene regulatory network analysis

The project includes:

- development and application of computational workflows to
    - process bulk and single-cell RNA-Seq data
    - process DAP-Seq protein-DNA interaction data
    - construct gene regulatory networks (using MINI-EX and related network inference tools)
- building machine learning models to predicting gene expression and learn the underlying regulatory code
- compare findings across diatom species with different life cycle strategies using state-of-the-art comparative genomics tools
- interacting with experimental molecular biologist to share, validate and refine your results
- publishing your research results in international journals (scientific writing)

We offer an intellectually stimulating, international and multi-disciplinary research environment, access to state-of-the-art tools and infrastructure, high-quality training to

develop hard and soft skills, opportunities to participate in (inter)national workshops and scientific conferences, and a competitive salary including a bicycle commuting reimbursement. Ghent University is among the top global universities according to several international rankings. The VIB-UGent Center for Plant Systems Biology is a world-leading science institution on Techlane Campus in Ghent, Belgium (more info below).

Job Profile

- You obtained excellent grades in your bachelor and MSc degree (i.e., you belong to the top 25% of your cohort).
- Good programming (Python) and Linux/Unix/command-line skills are a must; experience with R, Nextflow pipelines and Machine learning is an asset.
- You are enthusiastic about computational / systems biology and want to learn more about applying computational methods for single-cell and regulatory data analysis.
- You have good communication and writing skills and have an excellent knowledge of written and spoken English.
- You are highly motivated, self-critical, you work with rigor and attention for detail, and you work accurately.
- You combine being a team player with a strong sense of autonomy and responsibility.
- You are willing to apply for additional funding when eligible.

How to apply?

Submit your application to Klaas Vandepoele by sending a detailed CV (clearly mentioning your computational skills), a one-page Motivation letter, and contact info of 2 references (including e-mail addresses and phone numbers).

Contact E-mail

Klaas.vandepoele@psb.vib-ugent.be

Closing date:

31 January 2023

About the city of Ghent and Flanders

Ghent, the second largest city of Flanders, is a university city and cultural hub. Only half an hour away from Antwerp and Brussels by train, and centrally located in Europe, Ghent has a scenic yet cosy, well-preserved historical center and a lively multi-cultural atmosphere. Ghent and the greater region of Flanders is internationally-oriented and tech-minded with a strong biotechnology sector with spin-offs and start-ups, creating a natural home for researchers and their families. English is very widely spoken in the city and surrounding area.

Ghent is home to Ghent University, a top 100 university, founded in 1817 and one of the major universities in Belgium. The university credo is 'Dare to Think', challenging everyone to question conventional views and to dare to take a nuanced stand. Ghent University is a pluralistic university, which means it is open to all, regardless of ideological, political, cultural, or social background. Ghent and its surrounding area is a great place for young people and families to live and to raise children. There are many excellent day care centers and schools, including an international school.

About VIB Center for Plant System Biology

The VIB Center for Plant Systems Biology is one of the world leading centers for advanced plant sciences. The Comparative Network Biology lab, led by Klaas Vandepoele, of the VIB Center for Plant Systems Biology is home to an enthusiastic, diverse and international group of researchers in the field plant bioinformatics. Beyond our expertise in plant genomics, comparative genomics and scientific creativity, we are looking for a new team member to develop new computational approaches for integrative network biology in crops.