

POSTDOC IN COMPUTATIONAL BIOLOGY

The VIB-UGent Center for Plant Systems Biology (PSB, www.psb.vib-ugent.be) is a world-leading plant science institute with the mission to unravel the biology of plants and use the insights gained to improve the sustainability of agriculture and the climate change resilience of crops. The Maere lab at PSB (<http://www.maerelab.be>) is active in the fields of computational biology, evolutionary genomics and plant systems biology. Current research topics include testing a novel experimental setup to unravel the molecular wiring of plant phenotypes under field conditions, studying dosage balance-sensitive genes in plants, and modeling the evolution of transcriptional systems *in silico*. We are currently looking for a talented postdoc to join our team in the context of the VIB Grand Challenge project 'Validating the use of endemic rhizobia for sustainable soybean cultivation in Northwestern Europe'.

Project description

Soybean (*Glycine max*) is one of the most important protein sources in human food and animal feed. Europe is highly dependent on the import of soybean, often from (sub)tropical areas where soybean cultivation is one of the main drivers of deforestation. Establishing European soybean production at scale may not only help curtail deforestation in crucial ecosystems such as the Amazon, Cerrado and Gran Chaco, but would also reduce Europe's dependence on soybean imports, reduce the associated carbon footprint and facilitate the ongoing transition to more plant protein and less animal protein in the European diets. Moreover, in symbiosis with nitrogen (N)-fixing bacteria (rhizobia) inside root nodules, soybean can manage its own N nutrition, reducing the need for N fertilization. In combination with a reduced import of soybean products (and the associated N) from overseas, local and circular soybean cultivation may help mitigating some of the N pollution issues in Europe. Although soybean is predominantly a (sub)tropical crop, soybean varieties that are better adapted to more temperate climates with cold springs, such as those found in Northwestern (NW) Europe, have already been bred. However, the current commercially available rhizobial inoculants needed to establish N-fixing nodules on soybean roots are based on non-endemic rhizobial strains that are poorly adapted to local environmental conditions, causing soybeans cultivated in NW Europe to have suboptimal and variable yield and protein content. The aim of this project is to assess whether using endemic rhizobia as soybean inoculants instead of exotic strains improves soybean yield, protein content and yield stability.

In the previous VIB Grand Challenge (GC) project 'Soy in Flanders' (<https://sojain1000tuinen.sites.vib.be/en>), we engaged 1000 citizens to grow soybean plants in their garden and trapped several endemic rhizobia that are able to nodulate soybean. In the present GC project, we will test the performance of the most promising of these endemic strains versus commercial strains in field trials and on farmers' fields across Belgium. In each field, we

will profile soil type, nutrient composition, soil and nodule microbiomes, nodule phenotypes, seed yield, seed protein content and biological nitrogen fixation for several combinations of soybean variety and rhizobial strain. Together with Steven Maere, you will be coordinating efforts across 8 participating labs from research institutes across Flanders. Additionally, you will be in charge of data integration and the construction of machine learning models to unravel which environmental factors influence rhizobial strain performance in the field.

Profile

- You have a PhD in Computational Biology, Biotechnology or Bioengineering.
- You have excellent project management and communication skills and you like to take initiative.
- You have solid expertise in machine learning, analysis of genomics data and data integration. Hands-on experience with microbiome data analysis is a plus.
- You are fluent in English (spoken and written) and master several programming languages.
- You found a good balance between working in a team and working independently.
- You are meticulous, well-organized, responsible and self-critical.
- You have a passion for science and you can think outside the box.

We offer:

- A 3-year postdoc position with an attractive salary.
- An exciting work environment in a top research institute.
- The opportunity to be part of a dynamic, interdisciplinary and international team.
- A challenging project with high societal value.
- Ample opportunity to learn new skills.

Please complete the online application procedure at <https://jobso.id/j2nv> and include a detailed CV, a letter of motivation and the contact details of two referees. Applications are accepted until the position is filled. For more information, contact Steven Maere (steven.maere@psb.vib-ugent.be).