

# Post-doctoral position on structure learning of transcription factor network of heterosis in sunflower

**Domains :** bioinformatics, biostatistics, machine learning

**Team :** Statistique et Algorithmique pour la Biologie

**Laboratory :** Mathématiques et Informatique Appliquées de Toulouse, INRA

**Location :** 24 chemin de Borde Rouge, Auzeville-Tolosane (near Toulouse), France

**Supervisors :** Simon de Givry (simon.de-givry@inra.fr Tel : +33 (0)5 61 28 50 74), Brigitte Mangin (brigitte.mangin@inra.fr Tel : +33 (0)5 61 28 54 58), Nicolas Langlade (nicolas.langlade@inra.fr Tel : +33 (0)5 61 28 57 78)

The MIAT laboratory is seeking a highly-qualified post-doctoral researcher to work on a project assessing transcription factor network controlling heterosis of gene expression in sunflower. Heterosis is used by natural selection and mankind to adapt plant and animal organisms to new environments or needs. However, the genetic and molecular bases of heterosis are still poorly known. This project aims to study the role of transcription factor regulations in the heterosis of gene expressions. For this purpose, the data consists in gene expressions of sunflower on two genetic designs with one over 400 hybrids and their associated genotypes.

The main objective of this post-doctoral appointment will be to (i) select transcripts whose expression in hybrids is significantly superior to the parental mean, (ii) collect transcription factors homologous to known TF in Arabidopsis, and (iii) infer the gene regulatory network of heterosis between TFs and target genes by exploiting gene expressions and genotyping data, following a genetical genomics approach using state-of-the-art statistical structure learning methods.

The successful candidate should hold a PhD with a solid background in statistics or computer science, and also have experience in biostatistics, bioinformatics, or machine learning. Excellent written and spoken skills in English are a must. The project is part of the "Investment for the Future" SUNRISE program (<http://www.sunrise-project.fr/en/>). The successful candidate will join a group of three scientists working on the project and approximately ten scientists working on biostatistics and bioinformatics.

The appointment is for 2 years, with a provisional start date of March 2017. Basic gross salary ranges from 3500 to 3800 euros (approx. 2300 to 2500 euros net salary) depending on years of experience. Candidates that are eligible to apply for an AgreeSkills+ fellowship could benefit from attractive conditions that include monthly gross salaries, ranging from 4800 to 5500 euros, if their project proposal is successful. To find out more about the program and whether you are able to apply for an AgreeSkills+ fellowship, please visit <http://www.agreeskills.eu/>

A dynamic city in the South-West of France famous for its natural beauty and rich history, with about 100,000 students, Toulouse is among the ten fastest growing urban economies in Europe.

Please send your CV including a list of publications, cover letter, and (2-3) letters of reference before **February 3rd 2017** to :

simon.de-givry@inra.fr

Object: sunrise post-doctoral application

## Reference

Allouche, D., C. Cierco, S. de Givry, G. Guillermin, B. Mangin, T. Schiex, J. Vandell, and M. Vignes. *A Panel of Learning Methods for the Reconstruction of Gene Regulatory Networks in a Systems Genetics Context*. Gene Network Inference, Springer, 2014.