OCÉANE CASSAN

Currently searching for a postdoctoral position

CONTACT

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EDUCATION

2022 (defense planned) | 2019 — **University of Montpellier**
PhD in biostatistics for gene regulation - Integrative Biology, Diversity and Plant Improvement department
Lyon, France

2019 | 2018 — **University Claude Bernard (UCBL)**
MSc in Computer Science - Artificial Intelligence — Lyon, France

2019 | 2014 — **National Institute of Applied Sciences (INSA)**
Engineering degree in Bioinformatics and Modelling — Lyon, France

RESEARCH EXPERIENCE

2022 | 2019 — **PhD - Institute for Plant Sciences in Montpellier**
Predictive biology to learn the regulatory pathways in plants under climate change, SIRENE team
Montpellier, France

- **Statistical inference of the gene regulatory networks in Arabidopsis thaliana under elevated CO_2 and nutritional limitations**. Network reconstruction via ensembles of regression trees or penalized linear regression based using transcriptomic data and regulatory sequences information. **Computational and experimental validation** of network-derived hypotheses and candidate genes.
- **Genome Wide Association studies** to identify genetic determinants of mineral status repsonse under elevated CO_2
- **Developement of an interactive suite** for transcriptomic analyses and the inference of regulatory networks
- References : Antoine Martin and Sophie Lèbre

2019 — **6 months research internship - LIRMM, MAB team**
Supervised learning to predict chromosomic interactions in the human genome, based on CAGE data and 3C techniques
Montpellier, France

- Reference : Laurent Bréhélin

2017 — **1 month research internship - LIRMM, MAB team**
Sparse logistic regression to model transcription factor combinatorics for gene regulation in human
Montpellier, France

- Reference : Laurent Bréhélin

PROFESSIONAL EXPERIENCE

2018 — **4 months internship in quantitative biology - Nanolive SA**
Development of software tools for the 3D detection and tracking of biological objects in label free images
Lausanne, Switzerland

SKILLS

Pluridisciplinarity : ability to understand and articulate biology, statistics and computer science to generate knowledge

Statistics : statistical learning, machine learning, (sparse) regression and feature selection, mixed models, tree-based methods

Computer science : R (ggplot, tidyverse, package developement, Rmarkdown, Shiny) Python, LaTeX-beamer, Bash, calculation server administration and usage, web application deployment

Biology : gene regulation, (plant) systems biology, omics data analysis

TEACHING EXPERIENCE

2022 | 2021

Instructor of R for L3 plant biology students

Teaching material

University of Montpellier, France

- Good practices and scientific integrity around data analysis
- Data manipulation and visualisation in R

2022 | 2020

Instructor of Rmarkdown for M1 data science students

Teaching material

University Paul Valery of Montpellier, France

2022

Regulatory network inference for M1 plant biology students

Statistics and regression techniques for network inference.

University of Montpellier, France

2021 | 2022

Student supervision

- M2 intern in biostatistics appied to gene regulation and transcriptomics
- M1 data science students for an annual project on Genome-Wide-Association studies

PUBLICATIONS

2022 (In preparation)

A gene regulatory network reveals the effects of elevated CO2 on nutrient signaling pathways and mineral composition in Arabidopsis

Océane Cassan, Léa-Lou Pimparé, Antoine Beckers, Alain Gojon, Liên Bach, Christian Dubos, Sophie Lèbre, Antoine Martin. 2022

2022 (Submitted)

The decline of plant mineral nutrition under rising CO2: physiological and molecular aspects of a bad deal

Alain Gojon, Océane Cassan, Liên Bach, Laurence Lejay, Antoine Martin. 2022 Review article, Trends in Plant Science.

2022 (Submitted)

Loss of Polycomb proteins CLF and LHP1 leads to excessive RNA degradation in Arabidopsis

David Séré, Océane Cassan, Fanny Bellegarde, Cécile Fizames, Jossia Boucherez, Geoffrey Schivre, Jacinthe Azevedo, Thierry Lagrange, Alain Gojon, Antoine Martin. 2022 Journal of Experimental Botany.

2021

Inferring and Analyzing Gene Regulatory Networks from Multi-Factorial Expression Data: A Complete and Interactive Suite

Cassan Océane, Sophie Lèbre, and Antoine Martin. 2021 BMC Genomics 22 (1). See article

2019

Probing Transcription Factor Combinatorics in Different Promoter Classes and in Enhancers

Vandel Jimmy, Océane Cassan, Sophie Lèbre, Charles-Henri Lecellier, and Laurent Bréhélin. 2019 BMC Genomics 20 (1): 1–19. See article

TALKS

2022

Machine Learning in Montpellier, Theory & Practice

Speaker — University of Montpellier

- Discussing : Reconciling modern machine-learning practice and the classical bias–variance trade-off, Belkin et al, 2019.

2020

Netbio, biological networks inference

Speaker — Virtual

- Presenting the Dashboard for the Inference and Analysis of Networks from Expression data

CONFERENCE POSTERS

2022

Molecular responses of plants facing climate change

Organizer and presenter — Montpellier, France

- Poster presenting genetic determinants to mineral status response under elevated CO2 in Arabidopsis populations

2021

JOBIM

Presenter — Virtual

- Poster presenting the Dashboard for the Inference and Analysis of Networks from Expression data

2021

International Plant Systems Biology

Presenter — Virtual

- Poster presenting Gene Regulatory Network inference of Arabidopsis under eCO2 and nutritional limitations

ACADEMIC REFEREES

Antoine Martin, senior researcher in plant biology, head of SIRENE team, IPSiM, CNRS : antoine.martin@cnrs.fr

Sophie Lèbre, lecturer and researcher in statistics, IMAG, University of Montpellier, University Paul Valéry : sophie.lebre@umontpellier.fr

Laurent Bréhélin, senior researcher in computational biology, head of MAB team, LIRMM : brehelin@lirmm.fr