OCÉANE CASSAN

Currently searching for a postdoctoral position

EDUCATION

2022 (defense in december) | 2019 — **University of Montpellier**
PhD in biostatistics for gene regulation — Montpellier, 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**. Development of novel network reconstruction methods via ensembles of regression trees or penalized linear regression based on 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
- **Development of an interactive suite** for reproducible transcriptomic analyses and the inference of regulatory networks
- Supervisors : Antoine Martin, 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

- Supervisor : 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

- Supervisor : 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

CONTACT

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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, systems biology, omics data analysis, plant response to the environment, plant nutrition

TEACHING EXPERIENCE

2022 | 2021 — **Instructor of R for 3^{rd} year bachelor 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 Master data science students**
Teaching material — University Paul Valery of Montpellier, France

2022 — **Statistics and regression for network inference for Master plant biology students**
Lecture and practical session — University of Montpellier, France

2021 | 2022 — **Student supervision**
- Master intern in biostatistics appied to gene regulation and transcriptomics
- Master 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 CO_2 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 CO_2: 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**
Océane Cassan, 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 CO_2 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 elevated CO_2 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