

# OCÉANE CASSAN

Currently searching for a postdoctoral position

## EDUCATION

- 2022 (defense in december) | 2019 • **University of Montpellier**  
PhD in biostatistics for gene regulation - Integrative Biology, Diversity and Plant Improvement department  
📍 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<sub>2</sub> 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 response under elevated CO<sub>2</sub>
  - **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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🐙 [github.com/OceaneCsn](https://github.com/OceaneCsn)

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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 development, 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 Valéry of Montpellier, France
- 2022 • **Statistics and regression for network inference for M1 plant biology students**  
**Lecture and practical session**  University of Montpellier, France
- 2021 | 2022 • **Student supervision**
  - M2 intern in biostatistics applied 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 CO<sub>2</sub> 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<sub>2</sub>: 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 CO<sub>2</sub> 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<sub>2</sub> and nutritional limitations



## ACADEMIC REFEREES

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

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

Laurent Bréhélin, senior researcher in computational biology, head of MAB team,  
LIRMM : [brehelin@lirmm.fr](mailto:brehelin@lirmm.fr)