

# Dr. Ousmane DAO

PhD in Plant Science

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## Profile

**Postdoctoral researcher in plant biology**, I am interested in the resilience of photosynthetic organisms to environmental variations. My work aims to understand the adaptive mechanisms of the green microalga *Chlamydomonas reinhardtii* through an integrative approach combining physiology, molecular biology, genetics, and biochemistry. I am the author of publications in leading journals such as *Nature*, *Nature Communications*, *Plant Physiology*, and others, with recognized expertise in plant physiology. Recipient of several scientific awards.

## Education

**2019-2024**: PhD in Plant Biology, Aix-Marseille University, CEA Cadarache, **France**

- 5 scientific publications in top-ranked journals

**2017-2019**: Master in Plant Sciences, AgroParisTech/Univ-Paris-Saclay, Paris, **France**

- Top 5% of the class

**2014-2017**: Bachelors in Microbial Biotechnology, University of Oran 1 – Oran, **Algeria**

- Valedictorian

## Awards & Distinctions

- Winner of "Career Development Fellowship 2025 of the Royal Society"
- Corresponding author of a Plant Physiology article (IF: 7.7)
- Best Oral Presentation Award – French Bioenergetics Group Conference (2023)
- Best Poster Award – International Chlamydomonas Conference (2021)
- International PhD Scholarship – CEA France (2019)
- Gold Medal – iGEM Boston (2018)
- Excellence Scholarship Mali > Algeria (2014–2017)

## Academic Research Experience

**Research fellow of the Royal society** – Université de York (York, UK)

**10/2025 – (for 5 years)**

Project: Functional dissection of photorespiration in microalgae

Role: Project management and execution, scientific writing and grant writing, supervision of Master and PhD students.

Lab head : Pr. Luke Mackinder

**Postdoctoral Researcher** – Université de York (York, UK)

**04/2024 – 09/2025**

Project: Controlling the thylakoid lumen carbonic anhydrase localisation in *Chlamydomonas*

Role : Gestion et exécution de projet de recherche, rédaction d'articles scientifiques, et de demande de recherche, supervision des étudiants de master.  
Lab head: Pr. Luke Mackinder

**Visiting Researcher** – Heinrich Heine University (Düsseldorf, Germany)

**10/2021 – 12/2021**

Project: In vitro characterization of chloroplastic malate transporters in *Chlamydomonas*

Role: Project management and execution, data analysis, article writing

Lab Head: Prof. Andreas Weber

**Doctoral Researcher** – CEA & Aix-Marseille Univ. (Cadarache, France)

**10/2019 – 03/2024**

Project: Interactions between energy status and carbon storage in *Chlamydomonas reinhardtii*

Role: Project management and execution, student mentoring, result dissemination, article writing

Key Publications: Nature Communications, Plant Physiology, Nature

Supervisors: Dr. Yonghua Li-Beisson, Dr. Gilles Peltier

**Research Engineer** – INRA Versailles (Île-de-France, France)

**01/2019 – 06/2019**

Project: CRISPR/Cas9 to redirect lipid metabolism in *Camelina sativa*

Role: Project management and execution, data analysis, report writing

Supervisor: Dr. Jean-Denis Faure

**Research Assistant** – IBPC CNRS (Paris, France)

**04/2018 – 08/2018**

Project: Development of the RUSH system in *Chlamydomonas*

Role: Project management and execution, data analysis, report writing

Supervisor: Dr. Pierre Crozet

## Scientific Publications

**1 - Dao et al. (2025).** The green algae CO<sub>2</sub> concentrating mechanism and photorespiration jointly operate during acclimation to low CO<sub>2</sub>. **Nature Communications** doi: 10.1038/s41467-025-60525-7.

**2 – Dao et al. (2024).** Cyclic and pseudo-cyclic electron pathways play antagonistic roles during nitrogen deficiency in *Chlamydomonas reinhardtii*. **Plant Physiology** doi: 10.1093/plphys/kiae617

**3 – Peltier et al. (2024).** Alternative electron pathways of photosynthesis power green algal CO<sub>2</sub> capture. **Plant Cell** doi: 10.1093/plcell/koae143 (**5<sup>th</sup> auteur**)

**4 – Gissot et al. (2023).** E and M SARS-CoV-2 membrane protein expression and enrichment with plant lipid droplets. **Biotechnology Journal** doi: 10.1002/biot.202300512 (**4eme auteur**)

**5 – Burlacot et al. (2022).** Alternative photosynthesis pathways drive the algal CO<sub>2</sub>-concentrating mechanism. **Nature** doi: 10.1038/s41586-022-04662-9 (**2<sup>nd</sup> auteur**)

**6 - Dao et al. (2022).** Physiological functions of malate shuttles in plants and algae. **Trends in Plant Science** doi: 10.1016/j.tplants.2021.11.007

**7** – Briand *et al.* (**2018**) Degradation of the anticancer agent Methotrexate from the hospital wastewater. **Medecine Science** (Paris) doi: 10.1051/medsci/2018304 (**equal contribution from all authors**)

## Scientific Presentations

**2023 (Oral)** – "The crosstalk between Photorespiration and the CO<sub>2</sub>-concentrating mechanism in microalgae", 22nd French Bioenergetics Group Congress, Bédoin-Vaucluse, France

**2023 (Oral)** – "Deciphering the role of the chloroplast dicarboxylate transporter LCI20 during photorespiration in *Chlamydomonas*", 20th Int'l Conference on Cell and Molecular Biology of *Chlamydomonas*, Princeton University, USA

**2022 (Oral)** – "The regulation of photosynthetic electron flow during nitrogen starvation in microalgae", Photosynthesis 2022 Symposium, French Society of Photosynthesis, Gif-sur-Yvette, France

**2022 (Oral)** – Same talk, International Summer School XXVI in Photosynthetic Biochemistry and Biophysics, Venice, Italy

**2021 (Oral)** – "Photosynthetic adaptation to nutrient shortage in microalgae", 4th France-Japan IRN Webinar on Plant Biology

**2021 (Poster)** – "Alternative electron pathways of photosynthesis affect carbon storage during nitrogen deprivation in *Chlamydomonas*", 19th Int'l Conference on *Chlamydomonas* Cell and Molecular Biology

**2018 (Oral)** – "iGEM PARIS SACLAY 2018: METHOTREXIT, A heterogeneous cleaning factory", 3rd EUSynBioS Symposium, France

## Outreach & Public Engagement

- ✓ Co-organizer of CCM11 Conference – York 2025
- ✓ Member of the organizing team for EBEC 2022, 21st European Bioenergetics Conference, Aix-en-Provence
- ✓ Peer reviewer for an article in FEBS Letters
- ✓ Active member of MYRA – Young Malian Researchers
- ✓ Member of iGEM Paris-Saclay team – 🏆 gold medal (2018)

## Teaching & Supervision

**2023 (4 months)** – Supervised a Master 2 student – CEA Cadarache  
Topic: Lipid analysis of photosynthetic mutants in *Chlamydomonas reinhardtii*

**2022 (2 months)** – Co-supervised a BTS student – CEA Cadarache  
Topic: Analysis of photosynthetic proteins in *Chlamydomonas reinhardtii*

**2018 (1 year)** – Science tutoring – with Complétude, Paris  
Audience: High school students (final year and junior year)  
Subjects: Biology, earth sciences, physics-chemistry, mathematics  
Goals: Improved grades, baccalaureate preparation

## Interests

- **Amateur football:** weekly practice – team spirit, perseverance
- **Gym workouts:** discipline, consistency, self-improvement
- **Reading:** history of science and science popularization
- **Personal development:** exploring human values, intersections of science, history, ethics, and society

## Languages

- Bambara (**Native**)
- French (Advanced – **C1**)
- English (Advanced – **C1**)
- Arabic (Intermediate – **B1**)