

**CURRICULUM VITAE ABREVIADO (CVA)**

**Part A. PERSONAL INFORMATION**

|                                                |                     |                         |            |
|------------------------------------------------|---------------------|-------------------------|------------|
| First name                                     | María Agustina      |                         |            |
| Family name                                    | Domínguez Martín    |                         |            |
| Gender (*)                                     | Female              | Birth date (dd/mm/yyyy) | 04/09/1985 |
| Social Security, Passport, ID number           | 48953347-D          |                         |            |
| e-mail                                         | b32domam@uco.es     |                         |            |
| Open Researcher and Contributor ID (ORCID) (*) | 0000-0002-3500-2052 |                         |            |

**A.1. Current position**

|                   |                                                                                                                         |                |              |
|-------------------|-------------------------------------------------------------------------------------------------------------------------|----------------|--------------|
| <b>Position</b>   | <b>Profesora Contratada Doctora (Associate Professor)</b>                                                               |                |              |
| Initial date      | 19/09/2023                                                                                                              |                |              |
| Institution       | University of Córdoba (UCO)                                                                                             |                |              |
| Department/Center | Department of Biochemistry and Molecular Biology                                                                        |                |              |
| Country           | Spain                                                                                                                   | Teleph. number | +34644622526 |
| Key words         | cyanobacteria, light-harvesting, photoprotection, structural biology, nitrogen metabolism, regulation of C/N metabolism |                |              |

**A.2. Previous positions (research activity interruptions, indicate total months)**

| Period                  | Position/Institution/Country/Interruption cause                                          |
|-------------------------|------------------------------------------------------------------------------------------|
| 31/10/2022 - 31/12/2022 | Visiting Scientist at Biozentrum (Switzerland)                                           |
| 01/04/2022 - 18/09/2023 | Postdoctoral Fellow at the UCO (Spain)                                                   |
| 01/04/2021 - 31/03/2022 | Marie Curie Postdoctoral Fellow at the UCO (Spain)                                       |
| 01/06/2020 - 09/03/2021 | Postdoctoral Fellow at the LBNL (USA)                                                    |
| 01/10/2019 - 31/05/2020 | Marie Curie Postdoctoral Fellow at the Lawrence Berkeley National Laboratory (LBNL, USA) |
| 01/06/2018 - 30/09/2019 | Marie Curie Postdoctoral Fellow at the MSU (USA)                                         |
| 01/10/2016 - 31/05/2018 | Postdoctoral Fellow at the Michigan State University (MSU, USA)                          |
| 01/02/2016 - 30/09/2016 | Postdoctoral Fellow at the UCO (Spain)                                                   |
| 01/09/2015 - 23/12/2015 | Postdoctoral Fellow at the University of Freiburg (Germany)                              |
| 01/04/2015 - 31/08/2015 | Postdoctoral Fellow at the UCO (Spain)                                                   |

**A.3. Education**

| PhD, Licensed, Graduate | University/Country            | Year |
|-------------------------|-------------------------------|------|
| PhD                     | University of Córdoba (Spain) | 2014 |
| Master Biotechnology    | University of Córdoba (Spain) | 2010 |
| Degree in Biochemistry  | University of Córdoba (Spain) | 2008 |

**Part B. CV SUMMARY.** *OA = Open Access; IC = International Collaboration.*

After my Degree in Biochemistry (UCO), I gained a **European Erasmus fellowship** for an external Master's thesis at Nordlund's lab (Stockholm University, Sweden) studying the N regulatory protein PII in *Rhodospirillum rubrum* (Teixeira, Domínguez-Martín, et al. 2012). During this experience, I developed an interest in how photosynthetic microorganisms balance C and N metabolisms. Hence, I started my PhD under the supervision of Prof. Diez and Garcia-Fernandez studying C/N balance in marine cyanobacteria. During my PhD, I was awarded a **UCO fellowship** for a stay at the Burkovski's group (FAU, Germany) to study transcription factor-promoter interactions involved in balancing C/N metabolism (Domínguez Martín et al 2018). A **second grant I obtained (Proteomics Society, 2013)** allowed me to do a stay at the Beynon's lab (University of Liverpool, UK) to study changes in the proteome of *Prochlorococcus* under nitrogen starvation (Domínguez-Martín et al. 2017). During my PhD I published in total **8 peer-review articles (6 as 1<sup>st</sup> author, 7 OA, 3 IC)**, and my thesis was evaluated with "*Sobresaliente Cum Laude*" and honored with an *International Mention*. After my PhD, I studied RNA regulation of the ICDH enzyme in *Prochlorococcus* at the Hess lab



(University of Freiburg, Germany) through fellowships I was awarded from **FEBS and DAAD**. In 2016 I joined the Kerfeld lab (MSU/LBNL, USA) as a postdoctoral fellow. In 2017, I won a prestigious and highly competitive **Global Marie Skłodowska-Curie Fellowship** with an interdisciplinary research program synergistically combining my expertise in marine cyanobacteria with structural biology and biophysical methodology to set up my independent academic career. This line involved studying how cyanobacteria balance light harvesting and photoprotection, shielding the photosynthetic organism from toxic overabsorption of light energy. **My Postdoctoral results were published in 12 peer-reviewed articles (4 1<sup>st</sup> author, 1 last author, 7 OA, and 10 from IC)**. Most notably, I obtained the structure of a cyanobacterial phycobilisome in light-harvesting and photoprotective state (Domínguez-Martín et al 2022). This research marked a breakthrough in the field and I was invited to speak at international conferences (International Photosynthesis Conference, 2022, New Zealand; OCP workshop, 2023, Paris, and European Photobiology, 2023, Lyon). Additionally, I was invited to give talks at several international institutions, such as Biozentrum (2022, Switzerland), Tübingen University (2022, Germany), Kaiserslautern University (2022, Germany), Freiburg University (2022, Germany), Carnegie Stanford (2023, USA), GMI (2023, Vienna), IBVF (2023, Sevilla). Moreover, I gave a **keynote lecture** at the SEBBM conference (2023, Zaragoza).

I have **supervised** 2 TFM, 5 TFGs, 3 laboratory technicians, and 1 TFG from an exchange program. In the US, 3 undergraduate students (1 from an NSF program and 1 from an Exchange program), and 2 PhD candidates at MSU. Currently, I am supervising 3 TFMs, 5 TFGs, 3 volunteer students and 2 exchange students from France. I also served as an external supervisor for a master project and participated in an evaluation committee for TFGs and two thesis committees.

I was a **Chair of the International Gordon Research Seminar on Photosensory Receptors and Signal Transduction** (2022, Ventura, USA), I was invited as an expert to chair the International Conference-CIMIF-21 (2021, UCO). I'm co-founder and organizer of the *UCO-BRSeminars*. I'm currently a Guest Editor at the JoVE journal and belong to the Editorial Board of Frontiers in Photobiology. I am also serving as a reviewer for ISME J, Plant Physiol, or Plant Cell.

I was awarded the **I3 certificate (2023), Ramón y Cajal Grant (2022), Profesora María Teresa Miras Award**, and I am currently serving as a member of the Research Committee at UCO. I participated throughout my career in many **outreach activities** such as Fascination Plant Day (2018, MSU, USA) and The European Research Night (2021-2023, Córdoba, Spain). Additionally, I strive to be a vibrant role model for young female students, and I gave presentations to spark their interest in a scientific career at high schools (2023, IES Colonial; 2022, IES Ipagro) for the 11F and I am a board member of the *Asociación Mujeres y Tecnólogas de España* (AMIT) association.

I am an **Associate Professor at the Department of Biochemistry and Molecular Biology** at UCO and the **principal investigator** of *Research Consolidation Projects*. Recently, I submitted a paper as a **senior author** to the Journal *Current Research in Structural Biology*.

In summary, **I have a track record of attracting funding for my research to develop my international research career (7 laboratories in 5 countries). I became a recognized expert in cyanobacterial light-harvesting and photoprotection, giving 15 invited lectures at high-profile institutions and conferences.**

## **Part C. RELEVANT MERITS** (sorted by typology)

### **C.1. Publications**

1. García-Oneto TM, Moyano-Bellido C, **Domínguez-Martín MA**. (2024) Structure and function of the light-protective Orange Carotenoid Protein families. **Current Research in Structural Biology**. *Accepted*.

2. Paul V Sauer, Lorenzo Cupellini, Markus Sutter, Mattia Bondanza, **María Agustina Domínguez Martín**, Henning Kirst, David Bina, Adrian Fujiet Koh, Abhay Kotecha, Basil J Greber, Eva Nogales, Tomáš Polívka<sup>7</sup>, Benedetta Mennucci, Cheryl A Kerfeld. (2024) Structural and quantum chemical basis for OCP-mediated quenching of phycobilisomes. **Science Advances**. 10 (14), eadk7535

3. Díez J., López-Lozano A., **Domínguez-Martín M.A.**, Gómez-Baena G., Muñoz-Marín M.C., Melero-Rubio Y., García-Fernández J.M., (2023) Regulatory and metabolic adaptations in the nitrogen assimilation of marine picocyanobacteria, **FEMS Microbiology Reviews**, Volume 47, Issue 1, fuac043, <https://doi.org/10.1093/femsre/fuac043>

4. Sil, S., Tilluck, R.W., Mohan T. M., N. Chase H.L., Rose J.B., **Domínguez-Martín MA**, Lou W., Kerfeld CA & Beck WF. (2022) Excitation energy transfer and vibronic coherence in intact phycobilisomes. **Nature Chemistry** <https://doi.org/10.1038/s41557-022-01026-8>
5. **Domínguez-Martín MA\***, Sauer PV\*, Kirst H, Sutter M, Bina D, Greber BJ, Nogales E, Polivka T & Kerfeld CA (2022). Structures of a phycobilisome in light-harvesting and photoprotected states. **Nature** 609, 835-845 <https://doi.org/10.1038/s41586-022-05156-4>
6. Rosi M, Russel B, Kristensen LG, Farquhar ER, Jain R, Abel D, Sullivan M, Costello SM, **Dominguez-Martín MA**, Chen Y, Marquise S, Petzold CJ, Kerfeld CA, DePonte DP, Farahmand F, Gupta S & Ralston CY (2022). An automated liquid jet for fluorescence dosimetry and microsecond radiolytic labelling of proteins. **Communications Biology** 5, 866. DOI 10.1038/s42003-022-03775-1.
7. **Domínguez-Martín MA\***, López-Lozano A\*, Melero-Rubio Y, Gómez-Baena G, Jiménez-Estrada JA, Kukil K, Díez J & García-Fernández JM (2022) Marine *Synechococcus* sp. Strain WH7803 shows specific adaptative responses to assimilate nanomolar concentrations of nitrate. **Microbiology Spectrum**. DOI 10.1128/spectrum.00187-22.
8. Kahn T, Kuznetsova V, **Dominguez-Martín MA**, Kerfeld CA and Polivka T (2021) Uv excited of carotenoid binding proteins OCP and HCP: Excited-state dynamics and product formation. **ChemPhotoChem** e2021000194.
9. **Dominguez-Martín MA**, Michal Hammel, Sayan Gupta, Sigal Lechno-Yossef, Markus Sutter, Daniel J. Rosenberg, Yan Chen, Christopher J. Petzold, Corie Y. Ralston, Tomáš Polívka & Cheryl A. Kerfeld (2020). Structural analysis of a new carotenoid-binding protein: The C-terminal domain homolog of the OCP. **Scientific Reports** 10, 1-11.
10. Khan T, **Dominguez-Martín MA**, Šimová I, Fuciman M, Kerfeld CA, Polívka T (2020). Excited state properties of canthaxanthin in cyanobacterial carotenoid-binding proteins HCP2 and HCP3. **Journal of Physical Chemistry B**, 124, 24, 4896-4905.
11. Kuznetsova V, **Dominguez-Martín MA**, Bao H et al. (2020). Comparative ultrafast spectroscopy and structural analysis of OCP1 and OCP2 from *Tolypothrix*. **BBA-Bioenergetics** 1861(2), 148120.
12. Gupta S, Sutter M, Remesh SG, **Dominguez-Martín MA**, Bao H et al. (2019). X-ray radiolytic labeling reveals the molecular basis of orange carotenoid protein photoprotection and its interactions with fluorescence recovery protein. **Journal of Biological Chemistry** 294(22), 8848-8860.
13. **Dominguez-Martín MA** & Kerfeld CA. (2019) Engineering the orange carotenoid protein for applications in synthetic biology. **Current Opinion in Structural Biology** 57, 110-117.
14. **Dominguez-Martín MA**, Polivka T, Sutter M, Ferlez B, Lechno-Yossef S, Montgomery B & Kerfeld CA. (2019) Structural and spectroscopic characterization of HCP2. **BBA-Bioenergetics** 1860(5), 414-424.
15. **Domínguez-Martín MA**, López-Lozano A, Rangel-Zúñiga OA, Díez J & García-Fernández JM. (2018) Distinct features of C/N balance regulation in *Prochlorococcus* sp. strain MIT9313. **FEMS Microbiology Letters**. 365. DOI 10.1093/femsle/fnx278.
16. **Domínguez-Martín MA**, López-Lozano A, Claveria R, Velázquez-Campoy A, Seidel G, Burkovski A, Díez J & García-Fernández JM. (2018) NtcA responsiveness to 2-oxoglutarate has been reduced in *Prochlorococcus* in adaptation to more stable environments. **Frontiers in Microbiology**. 8:2461 DOI 10.3389/fmicb.2017.02641.
17. Gurchiek JK, Bao H, **Dominguez-Martín MA**, McGovern SE, Marquardt CE, Roscioli JD, Ghosh S, Kerfeld CA & Beck WF (2018). Fluorescence and Excited-State Conformational Dynamics of the Orange Carotenoid Protein. **J. Phys. Chem. B**, 122(6), pp 1792-1800.

18. Kerfeld CA, Melnicki M, Sutter M & **Domínguez-Martín MA** (2017). Structure, Function and Evolution of the cyanobacteria Orange Carotenoid Protein and its Homologs. **New Phytologist** 215: 937–95 DOI: 10.1111/nph.14670.

19. **Domínguez-Martín MA**, Gomez-Baena G, Diez J, López-Grueso MJ, Byenon RJ & García-Fernández J (2017). Quantitative proteomics shows extensive remodeling induced by N limitation in *Prochlorococcus marinus* SS120. **mSystems** 2 (3): e0008-17. DOI 10.1128/mSystems.00008-17.

20. **Domínguez-Martín MA**, Diez J & García-Fernández JM (2016). Physiological studies of Glutamine Synthetases I and III from *Synechococcus* sp. WH7803 reveal differential regulation. **Frontiers in Microbiology** 7:969. DOI: 10.3389/fmicb.2016.00969.

21. Gómez-Baena G, **Domínguez-Martín MA**, Donaldson RP, Garcia-Fernandez JM & Diez J (2015). Glutamine synthetase sensitivity to oxidative modification during nutrient starvation in *Prochlorococcus marinus* PCC 9511. **PLOS ONE**. DOI 10.1371/journal.pone.0135322.

22. **Domínguez-Martín MA**, López-Lozano A, Diez J, Gómez-Baena G, Rangel-Zúniga OA & García-Fernández JM (2014). Physiological regulation of isocitrate dehydrogenase and the role of 2-oxoglutarate in *Prochlorococcus* sp. strain PCC 9511. **PLOS ONE** 9 (7):e103380.

23. Teixeira PF, **Domínguez-Martín MA** & Nordlund S (2012). Molecular basis for the distinct divalent cation requirement in the uridylylation of the signal transduction proteins GlnJ and GlnB from *Rhodospirillum rubrum*. **BMC Microbiology**.12: 136.

24. McDonagh B, **Domínguez-Martín MA**, Gómez-Baena G, López-Lozano A, Diez J, Bárcena JA & García-Fernández JM (2012). Nitrogen starvation induces extensive changes in the redox proteome of *Prochlorococcus* sp. strain SS120. **Environmental Microbiology Reports**. 4(2): 257-267.

**C.2. Congress**, indicating the modality of their participation (invited conference, oral presentation, poster)

### **1. Keynote lectures**

**2023. Dominguez-Martin MA.** *Structural insights into how cyanobacteria harvest light energy and prevent self-destruction of the engine of life.* (Zaragoza, Spain). 45° Congreso SEBBM. **Award María Teresa Miras.** (September, 2023).

### **2. Invited Conferences (by the organizers)**

**2023. Dominguez-Martin MA, et al** *Light-harvesting and photoprotection mechanism in cyanobacteria.* 20<sup>th</sup> Congress of European Society for Photobiology. (Lyon, France) (27<sup>th</sup>- 31<sup>st</sup> August 2023)

**2023. Dominguez-Martin MA, Paul V. Sauer, Henning Kirst, Markus Sutter, David Bina, Basil J. Greber, Eva Nogales, Tomáš Polívka & Cheryl A. Kerfeld.** *Cyanobacterial Phycobilisome Structures in Light-harvesting and photoprotected states.* International Workshop: a journey on Orange Carotenoid Protein. (Paris, France). (25<sup>th</sup>/01/2023)

**2022. Dominguez-Martin MA, Paul V. Sauer, Henning Kirst, Markus Sutter, David Bina, Basil J. Greber, Eva Nogales, Tomáš Polívka & Cheryl A. Kerfeld.** *Structures of the cyanobacteria phycobilisome in the light-harvesting and photoprotected states.* International Congress on Photosynthesis Research (Dunedin, New Zealand). (03/08/2022)

### **3. Invited Seminars**

**2023. Dominguez-Martin MA.** *Structural insights into the light-harvesting antenna and photoprotection mechanism in cyanobacteria.* Gregor Mendel Institute (GMI) (Vienna, Austria). (31/03/2023).

**2023. Dominguez-Martin MA.** *Structural basis of light-harvesting and photoprotection in cyanobacteria.* Carnegie Institution for Science at Stanford (California, USA). (07/03/2023).

**2023. Dominguez-Martin MA.** *Structural insights into the Function of the Phycobilisome and the Orange Carotenoid Protein.* Instituto de Bioquímica Vegetal y Fotosíntesis- IBVF/CSIC/US (10<sup>th</sup>/02/2023).



**2022. Dominguez-Martin MA.** *Structures of the cyanobacterial phycobilisome in the light-harvesting and photoprotected states.* Freiburg University (Germany).

(16/12/2022).

**2022. Dominguez-Martin MA.** *Structures of the cyanobacterial phycobilisome in the light-harvesting and photoprotected states.* Technische Universität Kaiserslautern (Germany).

(08/12/2022).

**2022. Dominguez-Martin MA.** *Structures of the cyanobacterial phycobilisome in the light-harvesting and photoprotected states.* The Center for Plant Molecular Biology (ZMBP), University of Tubingen (Germany)

(25/11/2022).

#### **4. Selected Oral presentations**

**2023.** García-Oneto, T.M., Dumas, P., Alfaya-Martínez, V., Díez, J., García-Fernández, J., & **Domínguez-Martínez, M.A.** *Characterization of photosynthesis and photoprotection mechanisms in marine cyanobacteria (2023)* | 20th Congress of the European Society for Photobiology, Agosto 2023.

### **C.3. Research projects**

#### **Principal Investigator**

1. Elucidating the structure of the light-harvesting antenna and the role of the carotenoid-binding proteins from marine cyanobacteria (PHYCO-CYANO-CAR). **PI: MA Dominguez-Martin.** Call = *Incentivacion de la Consolidacion Investigadora. Spanish Minister of Science and Innovation.*

#### **User proposal**

2. **Proposal No. 5376 at the European XFEL.** Title: Single-Particle X-ray Imaging of biomolecules in solution at high repetition rate. **Role: Part of the team, an international collaboration.**

3. **Molecular Foundry proposal #7220,** "Elucidating the structural mechanism of the phycobilisome quenching by the Orange Carotenoid Protein (OCP)". **Role: Primary researcher.**

#### **Awarded Grant**

4. PHOTO-CY-APPs—Photosynthesis and photoprotection regulation in marine cyanobacteria and its potential applications. H2020-MSCA-IF-2017-GF-795070. Comisión Europea. 239.191,20 €. PI: JM García Fernández & Cheryl A Kerfeld. **Researcher: MA Domínguez Martín.**