



**CURRICULUM VITAE**

**Fecha del CVA**

30-1-2022

**Parte A. DATOS PERSONALES**

Nombre	María del Carmen		
Apellidos	Muñoz Marín		
Sexo	Mujer	Fecha de nacimiento (dd/mm/yyyy)	08/12/1985
DNI, NIE, pasaporte	30979437-R		
Dirección email	B32mumam@uco.es	URL Web	<a href="http://www.uco.es/investigacion/proyectos/capitanavesy/index.php/es/">http://www.uco.es/investigacion/proyectos/capitanavesy/index.php/es/</a> <a href="https://www.uco.es/cyanotrans/Home.html">https://www.uco.es/cyanotrans/Home.html</a>
Open Researcher and Contributor ID (ORCID) (*)	ORCID: 0000-0001-5075-8619 Researcher ID: A-2195-2016		

**A.1. Situación profesional actual**

Puesto	Emergente tipo II UCO-FEDER 2020		
Fecha inicio	01/01/22		
Organismo/ Institución	Universidad de Córdoba		
Departamento/ Centro	Bioquímica y Biología Molecular		
País	Spain	Teléfono	957211075
Palabras clave	Cyanobacteria/ nitrogen/ carbon/ metabolism		

**A.2. Situación profesional anterior**

Periodo	Puesto/ Institución/ País / Motivo interrupción
15/04/2021- 31/12/2021	Interim Substitute Professor/ Universidad de Córdoba/Spain
15/04/2019 -14/04/2021	Marie Curie Postdoctoral Researcher Integration (Marie Curie IF-RI) /Universidad de Córdoba /Spain
01/12/2017-14/04/2019	Postdoctoral Researcher/Universidad de Córdoba/Spain
20/11/2016 - 20/11/2017	Marie Curie Posdoctoral Researcher (Marie Curie IF-IOF)/ Universidad de Córdoba/Spain.
20/05/2016 - 19/11/2016	Postdoctoral Researcher/University of Santa Cruz (California)/ USA
20/05/2014 - 19/05/2016	Marie Curie Posdoctoral Researcher (Marie Curie IF-IOF)/University of Santa Cruz (California)/USA.
01/07/2009-01/02/2014	PhD student at the Universidad of Córdoba/ Spain

**A.3. Formación Académica**

Grado/Master/Tesis	Universidad/Pais	Año
Bioquímica Degree	Universidad de Córdoba	2003-2008
Master in Biotecnología, Molecular, Celular y Genética	Universidad de Córdoba	2008-2009
Ph.D in Biochemistry	Universidad de Córdoba	2009-2013
Título de Experto en Docencia	Universidad de Córdoba	2017-2019
Título de Experto en Tratamiento y Gestión de Residuos Radioactivos	Universidad de Córdoba	2020-2021
Título de Experto en Investigación	Universidad de Córdoba	2021

**Parte B. RESUMEN DEL CV (máx. 5000 caracteres, incluyendo espacios)**

Degree in Biochemistry (2003-2008) at the University of Córdoba, Spain. I began my scientific career in 2004 as an undergraduate student at the Department of Biochemistry and Molecular Biology in the Faculty of Veterinary Medicine of the University of Córdoba. I did a Ph.D. with International Mention in the same Department (2009-2013). During my Ph.D. I made several stays: one at the National Oceanography Centre in Southampton (United Kingdom) for three months with the objective to study new techniques related to the Oceanography; an oceanographic cruise for two months in the Atlantic Ocean and finally 11 months at the Institute of Vegetal Biochemistry and Photosynthesis in Seville (IBVF). Thanks to these collaborations, I published the article "Prochlorococcus can use the Pro1404

transporter to take up glucose at nanomolar concentrations in the Atlantic Ocean” in one of the most prestigious international journals, Proceedings of the National Academy of Sciences of the USA (PNAS), in 2013. This article received an F1000 Prime Recommendation, and moreover, I got the research prize “Jacobo Cárdenas Torres 2014-2015” at the University of Córdoba. One month after I defended my Ph.D., I got the Individual Marie Curie International Outgoing Fellowship (IOF) to start a postdoc in Marine Microbiology at the University of Santa Cruz (California), under the supervision of Prof. J. Zehr, for two and a half years. During this period, I made several stays in other institutions in United States and I published four articles categorized in the first quartile and one in the first decile. Moreover, one of them as a corresponding author. The Marie Curie Fellowship gave me the opportunity to come back to the University of Córdoba for one year more to take advantage of the knowledge learned during my postdoc. One year later, I got another Individual Marie Curie Fellowship (RI), opening a novel research line on marine vesicles in *Synechococcus*. These European projects helped me gaining experience in the leadership and management of projects. I also promoted new international collaborations with Dr. S. Biller and Prof. S.W. Chisholm (Massachusetts Institute of Technology), where I was working for 2 months learning experimental approaches to study marine vesicles. Last year I got my first project as Principal Investigator working in my new line of research in marine vesicles and I started to work as an Interim Substitute Profesor at the University of Córdoba. Furthermore, I have mentored final projects of Master and Degree students since 2012 and reviewed an International PhD. From 2009 I am also carrying out outreach activities, organizing and attending to national and international conferences and I wrote 8 book chapters. Since 2017, I participate in the Multilingualism Plan in the University of Córdoba, teaching Biochemistry in English in the degrees of Veterinary Medicine and Food Science and Technology and attending innovative teacher training. Recently I got my second Project as PI and I have a Ph.D. student working in my own line of research.

### Parte C. LISTADO DE APORTACIONES MÁS RELEVANTES

C.1. Publicaciones más importantes en libros y revistas con “peer review” y conferencias.

1. López-Lozano, A; Gómez-Baena, G; **Muñoz-Marín, M.C**; Rangel, O.A; Díez, J; García-Fernández, J.M (AC). Expression of genes involved in nitrogen assimilation the C/N balance sensing in *Prochlorococcus* sp. strain SS120. *Gene Expression*. 14. pp.279. ISSN: 1052-2166.
2. **Muñoz-Marín, M.C**; Luque, I; Zubkov, M.V; Hill, P.G; Díez, J; García-Fernández, J.M (AC). *Prochlorococcus* can use the Pro1404 transporter to take up glucose at nanomolar concentrations in the Atlantic Ocean National Academy of Sciences. *Proceedings of the National Academy of Sciences USA, PNAS*. 110-21, pp.8597-8602. ISSN: 0027-8424.
3. **Muñoz-Marín, M.C**; Gómez-Baena, G; Díez, J; Beynon, J.R; Zubkov, M.V; García-Fernández, J.M (AC). Glucose uptake in *Prochlorococcus*: diversity of kinetics and effects on the metabolism. *Frontiers in Microbiology*. 8, 327. 2017. ISSN: 1664-302X.
4. Farnelid, H (AC); Turk-Kubo, K; **Muñoz-Marín, M.C**; Zehr, J.P. New insights into ecology of the globally significant uncultured nitrogen-fixing symbiont UCYN-A. *Aquatic Microbial Ecology*. 77, pp.125. 2016. ISSN: 0948-3055.
5. **Muñoz-Marín, M.C (AC)**; Shilova, I.N; Farnelid, H; Cabello, A.M; Zehr, J.P. The transcriptional cycle is suited to daytime N<sub>2</sub> fixation in the unicellular cyanobacterium "Candidatus Atelocyanobacterium thalassa" (UCYN-A). *mBio*, 10 (1). 2019. ISSN: 2150-7511.
6. Cornejo-Castillo\*, F.M; **Muñoz-Marín, M.C\* (\*Iqual Contribution and AC)**. Turk-Kubo, K.A; Royo-Llonch, M; Farneli, H; Acinas, S.G; Zehr, J.P. *Environmental Microbiology*, 21 (1) pp.111. 2019. ISSN: 1462- 2920.
7. Zehr, J.P (AC); Shilova, I; Farnelid, H; **Muñoz-Marín, M.C**; Turk-Kubo, K. Unusual marine unicellular symbiosis with the N<sub>2</sub>-fixing cyanobacterium UCYN-A. *Nature Microbiology* (2). 2017. ISSN: 1740-1526.
8. **Muñoz-Marín, M.C**; Gómez-Baena, G; López-Lozano, A; Moreno-Cabezuelo, J.A; Díez, J. García-Fernández, J.M (AC). Mixotrophy in marine picocyanobacteria: use of organic compounds by *Prochlorococcus* and *Synechococcus*. *The ISME Journal*, 14, 1065-1073. 2020. ISSN: 1751-7362.

**9. Muñoz-Marin, M.C (AC);** Duhamel, S; Björkman, K.M; Magasin, J.D; Díez, J; Karl, D.M; García-Fernández, J.M. Differential timing for glucose assimilation in *Prochlorococcus* and coexist microbial populations at the North Pacific Subtropical Gyre. in the North Pacific subtropical gyre. Submitted to *mBIO*. ISSN: 2150-7511. Available in bioRxiv: <https://www.biorxiv.org/content/10.1101/2021.10.04.462702v1.full>

**10. Biller, S.J\*;** **Muñoz-Marin, M.C\* (\*Iqual Contribution and AC);** Lima, S; Matinha-Cardoso, J; Tamagnini, P; Oliveira, P (AC). Isolation and Characterization of cyanobacterial Extracellular vesicles. 2021. *Journal of Visualized Experiments (JOVE)*. e63481, doi:10.3791/63481. ISSN: 1940-087X.

## **C.2. Congresos, indicando la modalidad de su participación**

### Oral Communication-International Conferences

**1. Muñoz-Marin, M.C;** Luque, I; Zubkov, M.V; Hill, P.G; Díez, J; García-Fernández, J.M. ESF-EMBO Symposium. Molecular Bioenergetics of cyanobacteria; shaping the environment. *Prochlorococcus* can use the Pro1404 transporter to take up glucose at nanomolar concentrations in the Atlantic Ocean. 15/04/2013. Pultusk, Poland.

**2. Muñoz-Marin, M.C,** Thompson, A; Zehr, J.P. ASLO Aquatic Sciences Meeting Management. Transcriptomic Analysis in the cyanobacterium UCYN-A. 22/02/2015. Granada (Spain).

**3. Muñoz-Marin, M.C;** Farnelid, H; Zehr, J.P. ASLO Aquatic Sciences Meeting Management. Transcriptomic analysis and microscopic observations in the cyanobacterium UCYN-A during diel cycles. 21/02/2016. New Orleans, Louisiana (USA).

**4. Muñoz-Marín, M.C,** Farnelid, H; Turk,K; Zehr, J. 12th Workshop on Cyanobacteria. Transcriptome of the N<sub>2</sub>-fixing cyanobacterium UCYN-A over diel cycles.19/05/2016. Tempe, Arizona.

**5. Muñoz-Marín, M.C;** Farnelid, H; Turk, K; Zehr, J.P. ISME16. Whole genome transcription over diel cycle in the uncultured cyanobacterium UCYN-A. 21/08/2016. Montreal (Canada).

**6. Muñoz-Marín, M.C;** Shilova I; Farnelid, H; Turk, K; Zehr, J. ASLO Aquatic Sciences Meeting Management. The symbiotic N<sub>2</sub> fixing cyanobacterium UCYN-A genes have unique diel transcription patterns. 26/02/2017. Honolulu (Hawaii).

**7. Muñoz-Marín, M.C,** Shilova, I; Shi, T; Farnelid, H; Turk, H; Zehr, J. 10th European Workshop on the Molecular Biology of Cyanobacteria. Unicellular cyanobacterial symbiosis facilitates aerobic nitrogen fixation. 20/08/2017. Cluj Napoca, Rumania.

**8. Muñoz-Marin, M.C;** Duhamel, S; Bjorkman, K; Karl, D.M; Díez, J; Garcia-Fernandez, J.M. Gordon Research Conference on Marine Microbes. Carbon assimilation in *Prochlorococcus* during diel cycles at Aloha Station, Hawaii. 01/07/2018. Lucca (Barga), Italia.

**9. Muñoz-Marin, M.C;** Duhamel, S; Bjorkman, K; Karl, D.M; Díez, J; Garcia-Fernandez, J.M. The 13th Workshop on Cyanobacteria. Effects of glucose addition to natural *Prochlorococcus* populations at Aloha Station, Hawaii. 06/06/2019. Boulder, Colorado, USA.

**10. Muñoz-Marín, M.C;** Biller, S.J; Angulo-Cánovas, E; Jiménez-Ulloa, Díez-J; García-Fernández, J.M. 11th European Workshop on the Biology of Cyanobacteria. Effect of stress in the production and content of *Synechococcus* marine vesicles. 07/09/20. Oporto (Portugal).

### C.3. Proyectos o líneas de investigación en los que ha participado.

#### Principal Investigator of the next projects:

1. P.P. 2021 Submod. 2.6, Interacciones de cianobacterias marinas mediadas por vesículas. 01/06/2021 to 31/05/2022. Universidad de Córdoba. 5000€.
2. 1380795-F, Comunicación entre bacterias marinas mediante vesículas. 01/02/22- 31/12/22. Junta de Andalucía-UCO-FEDER. 39.700 €.

#### Member of the team in the next projects:

3. BFU2016-76227-P, High affinity transport and other adaptive mechanisms in marine cyanobacteria Spanish Ministry of Economy and Competitiveness. (Universidad de Córdoba). 01/01/2017-31/12/2019. 139.150 €. PI: García-Fernández, J.M.
4. BFU2013-44767-P, Carbon and nitrogen metabolism in marine cyanobacteria: use of glucose and diversity of regulatory mechanisms Spanish Ministry of Economy and Competitiveness (Universidad de Córdoba). From 01/01/2014. 157.300 €. PI: García-Fernández, J.M.

#### Researcher in the next projects:

5. H2020-MSCA-IF- 2018-RI-844891, VESYNECH - Determination of bacterial vesicles interactions in the most abundant marine cyanobacteria and its potential applications European Commission, H2020-MSCA-IF- 2018-RI-844891. (Universidad de Cordoba (Spain). 15/04/2019-14/04/2021. 160.932,48 €. PI: García-Fernández, J.M
6. FP7-PEOPLE-2013-IOF proposal 625188, Analyzing metabolism in an unusual nitrogen fixing symbiosis using metatranscriptomics European Commission, FP7-PEOPLE-2013-IOF proposal 625188. (Universidad de Santa Cruz, California (UE) y Cordoba (Spain)). 19/05/2014-19/11/2017. 255.243 €. PI: García-Fernández, J.M
7. Evaluación de metales pesados Cu<sup>+2</sup>, Cd<sup>+2</sup>, Pb<sup>+2</sup>, Zn<sup>+2</sup> en músculo, agua, y sedimento, y microbioma del camarón de cultivo y silvestre (*Penaeus vannamei*) en el estuario del río Chone, cuenca baja del río Jama, y piscinas camaroneras de la zona sur del país Ines Malo Cevallos. (Universidad Politécnica Salesiana (UPS) y Universidad Técnica de Manabí (UTM), Ecuador). 01/05/2019-01/05/2020. PI: Inés Malo Cevallos.
8. P07-CVI-3055, Keys of the ecologic success of the marine cyanobacteria *Prochlorococcus*: proteome and gene expression studies focused on the nitrogen and carbon metabolism Junta de Andalucía-Excellence Projects. (Universidad de Córdoba). 01/02/2008- 2012. 84.000 €. PI: García-Fernández, J.M
9. BFU2009-08008, Glucose utilization and adaptive and control mechanisms in the metabolism of nitrogen and carbon in *Prochlorococcus*. Otros programas del Plan Nacional I+D, Ministerio de Ciencia y Tecnología. (Universidad de Córdoba). 01/01/2010- 2013. 151.250 €. PI: García-Fernández, J.M
10. P12-BIO2141, Organic carbon utilization and nitrogen and carbon metabolism in the marine cyanobacteria *Prochlorococcus* and *Synechococcus* Proyectos de Excelencia de la Junta de Andalucía, 2012. (Universidad de Córdoba). From 01/09/2014. 266.144 €. PI: García-Fernández, J.M.