

Part A. Personal Information

DATE	14/05/2019
------	------------

Surname(s)	Florencio Bellido	
Forename	Francisco Javier	
Social Security, Passport, ID number	28455661S	
Sex	M	
Age	62	
Researcher codes	WoS Researcher ID (*)	K-7716-2014
	SCOPUS Author ID(*)	7004302600
	Open Researcher and Contributor ID (ORCID)	0000-0002-2068-7861

(*) At least one of these is mandatory

A.1. Current position

Post/ Professional Category	Full-Professor	
UNESCO Code	230225, 330290, 241407, 241501, 240902, 241502	
Key Words	Cyanobacteria, nitrogen metabolism, thioredoxins, heavy metals, carbon assimilation, oxidative stress	
Name of the University/Institution	University of Sevilla	
	Department/Centre	Plant Biochemistry and Photosynthesis
	Full Address	Avda Américo Vespucio, 49
	Email Address	floren@us.es
	Phone Number	34+954489509
Start date		

A.2. Education (title, institution, date)

Year	University	Degree	Title
1978	Sevilla	First degree	Biological Science
		Masters (if appropriate)	
1982		PhD	Biological Sciences

A.3. Indicators of Quality in Scientific Production (See the instructions)

6 research period recognized, last 2010-2015.

Total cites: Web of Science **4453**, last five years citations: **312 per year**. H-index: **41**.

Google Scholar: total citations **5509**, H-index: **49**.

Publications at Q1: **73/103**. Atendiendo al año de publicación.

Scholar Page: https://scholar.google.es/citations?user=jVt_QzwAAAAJ&hl=es&oi=ao.

Supervisor of 20 PhD Thesis.

Part B. Free Summary of CV (Max. of 3.500 characters, including spaces)

The most important achievements of my research activity can be summarized as follows: Predoctoral period. We reported the existence of two glutamine synthetases in the green alga Chlamydomonas. One cytosolic and the second one in the plastid, beside that we were able to produce ammonium from nitrate by inactivating GS activity in the same algae. My postdoctoral period was at the University of Berkeley (USA) with Prof. Bob Buchanan through a Fulbright Scholarship (1986-1988) I characterized for the first time the NTR-thioredoxin system, in plants, which determined the existence of thioredoxins in the cytosol of plant cells, named as thioredoxin h the corresponding publication has received more than 100 citations to date (ABB, 1988). In my time as PI began in 1989 up to the present, I have had continuous funding from national research plans. From this time my research

has been focused in cyanobacteria as the model organisms in the different studies carried out. The most relevant contributions in this long period include as main fields the assimilation of nitrogen where it is worth highlighting as fundamental works the dissection of the glutamine synthetase enzyme control system, defined by a new system different from the classic described in *E. coli* (PNAS, 1999).

This system has been exhaustively studied in my group with a large number of publications. Likewise, the second most important contribution made in this field was the discovery that the intracellular levels of 2-oxoglutarate acts as the sensor of the carbon-nitrogen status in cyanobacteria (JBC, 2001). Within this field indicate that the entire system of ammonium assimilation cyanobacteria has been characterized, with its enzymatic components described in the review (Photos Research, 2005). The second area of contributions is circumscribed to the field of redox systems, highlighting the study of the interactome of thioredoxin A in the cyanobacterium *Synechocystis*, (PNAS, 2003), as well as the studies of the different thioredoxins, glutaredoxins and peroxiredoxins of this cyanobacterium, described in different publications. The third area has been the contributions made in the field of heavy metal and metalloids resistance systems, particularly our studies on arsenic, nickel and copper have been very prominent (JB, 2003, Mol Microbiol, 2002, Plant Physiol , 2012, among others.

Also highlight my involvement in the area of microalgae biotechnology (including cyanobacteria), where I have responsible of different projects with the company (AlgaEnergy) aimed at the optimization and design of strains of cyanobacteria aimed at the production of biofuels (see section C.3).

Currently, part of my research is being reoriented towards the metabolism of carbon as the processes that determine its flow in cyanobacteria and that have a high biotechnological interest in the production of compounds of energetic interest and in the improvement of processes of capture and storage of CO₂. During the last years, I was also interested on the response of cyanobacteria to changes in their environment, in special the nutritional conditions including on it, carbon availability, nitrogen source and light conditions.

Part C. Relevant accomplishments

C.1. Publications (last five years)

Buey, R.M., Arellano, J.B., López-Maury, L., (...), Buchanan, B.B., Balsera, M. Unprecedented pathway of reducing equivalents in a diflavin-linked disulfide oxidoreductase. PNAS (2017) 114(48), pp. 12725-12730.

Giner-Lamia, J., Robles-Rengel, R., Hernández-Prieto, M.A., (...), Florencio, F.J., Futschik, M.E. Identification of the direct regulon of NtcA during early acclimation to nitrogen starvation in the cyanobacterium *Synechocystis* sp. PCC 6803. Nucleic acids research. (2017) 45(20), pp. 11800-11820.

Neira, J.L., Florencio, F.J., Muro-Pastor, M.I. The isolated, twenty-three-residue-long, N-terminal region of the glutamine synthetase inactivating factor binds to its target. Biophysical Chemistry (2017) 228, pp. 1-9.

Buey, R.M., Galindo-Trigo, S., López-Maury, L., (...), Buchanan, B.B., Balsera, M. A New Member of the Thioredoxin Reductase Family from Early Oxygenic Photosynthetic Organisms. Molecular Plant (2017) 10(1), pp. 212-215.

Cozza, C., Neira, J.L., Florencio, F.J., Muro-Pastor, M.I., Rizzuti, B. Intrinsically disordered inhibitor of glutamine synthetase is a functional protein with random-coil-like pKa values. Protein science (2017) 26(6), pp. 1105-1115.

Sánchez-Riego AM, Mata-Cabana A, Galmozzi CV, Florencio FJ. NADPH-Thioredoxin Reductase C Mediates the Response to Oxidative Stress and Thermotolerance in the Cyanobacterium *Anabaena* sp. PCC7120. Front Microbiol. (2016) Aug 18;7:1283. doi: 10.3389/fmicb.2016.01283.

Kadouche, D., Ducatez, M., Cenci, U., Tirtiaux, C., Suzuki, E., Nakamura, Y., Putaux, J.L., Terrasson, A.D., Diaz-Troya, S., Florencio, F.J., Arias, M.C., Striebeck, A., Palcic, M., Ball, S.G., Colleoni, C. (2016). Characterization of Function of the GlgA2 Glycogen/Starch Synthase in Cyanobacterium sp. Clg1 Highlights Convergent Evolution of Glycogen Metabolism into Starch Granule Aggregation. *Plant Physiol* **171**: 1879-1892.

Pantoja-Uceda, D., Neira, J.L., Saelices, L., Robles-Rengel, R., Florencio, F.J., Muro-Pastor, M.I., Santoro, J. (2016). Dissecting the Binding between Glutamine Synthetase and Its Two Natively Unfolded Protein Inhibitors. *Biochemistry* **55**: 3370-3382.

Galmozzi CV, Florencio FJ, Muro-Pastor MI. The Cyanobacterial Ribosomal-Associated Protein LrtA Is Involved in Post-Stress Survival in *Synechocystis* sp. PCC 6803. *PLoS One*. (2016) Jul 21;11(7):e0159346. doi: 10.1371/journal.pone.0159346.

Giner-Lamia J, López-Maury L, Florencio FJ. Ni interferes in the Cu-regulated transcriptional switch *petJ/petE* in *Synechocystis* sp. PCC 6803. *FEBS Lett.* (2016) **590**: 3639-3648.

Saelices L, Robles-Rengel R, Florencio FJ, Muro-Pastor MI. A core of three amino acids at the carboxyl-terminal region of glutamine synthetase defines its regulation in cyanobacteria. *Mol Microbiol.* (2015). doi: 10.1111/mmi.12950.

Giner-Lamia J, López-Maury L, Florencio FJ. CopM is a novel copper-binding protein involved in copper resistance in *Synechocystis* sp. PCC 6803. *Microbiology open*. (2015). 4:167-85. doi: 10.1002/mbo3.231.

Tripathy JN, Hirasawa M, Sutton RB, Dasgupta A, Vaidyanathan N, Zabet-Moghaddam M, Florencio FJ, Srivastava AP, Knaff DB. A loop unique to ferredoxin-dependent glutamate synthases is not absolutely essential for ferredoxin-dependent catalytic activity. *Photosynth Res.* (2015). 123:129-39. doi: 10.1007/s11120-014-0044-2.

Mehta A, López-Maury L, Florencio FJ. Proteomic pattern alterations of the cyanobacterium *Synechocystis* sp. PCC 6803 in response to cadmium, nickel and cobalt. *J Proteomics*. (2014), 6;102:98-112.

Sánchez-Riego AM, López-Maury L, Florencio FJ. Genomic responses to arsenic in the cyanobacterium *Synechocystis* sp. PCC 6803. *PLoS One*. (2014) 5;9(5):e96826.

Giner-Lamia J, López-Maury L, Florencio FJ. Global transcription profile of the copper response in the cyanobacterium *Synechocystis* sp. PCC 6803. *PloS One*. (2014). 9:e108912. doi: 10.1371/journal.pone.0108912.

Huertas MJ, López-Maury L, Giner-Lamia J, Sánchez-Riego AM, Florencio FJ. Metals in cyanobacteria: analysis of the copper, nickel, cobalt and arsenic homeostasis mechanisms. *Life (Basel)*. (2014). 4:865-86. doi: 10.3390/life4040865.

Díaz-Troya S, López-Maury L, Sánchez-Riego AM, Roldán M, Florencio FJ. Redox regulation of glycogen biosynthesis in the cyanobacterium *Synechocystis* sp. PCC 6803: analysis of the AGP and glycogen synthases. *Mol Plant*. (2014). 7:87-100.

Sánchez-Riego AM, López-Maury L, Florencio FJ. Glutaredoxins are essential for stress adaptation in the cyanobacterium *Synechocystis* sp. PCC 6803. *Front Plant Sci*. (2013), 4;4:428.

C.2. Research Projects and Grants

-Título del proyecto: Análisis de cambios nutricionales en cianobacterias: Respuesta a la fuente de nitrógeno, el estado redox intracelular y la disponibilidad de cobre.

Nombres investigadores principales (IP, Co-IP): Dr. F. J. Florencio- M. Isabel Muro-Pastor

Nº de investigadores/as: 5

Entidad/es financiadora/s: BIO2016-75634-P MINECO

Fecha de inicio: 30/12/2016 hasta 29/12/2019

Entidad/es participante/s: Universidad de Sevilla

Cuantía total: 193.600

-Título del proyecto: ¿Pueden las cianobacterias crecer igual en luz y oscuridad cerrando el ciclo de Krebs?

Nombres investigadores principales (IP): Dr. F. J. Florencio

Nº de investigadores/as: 3

Entidad/es financiadora/s: BIO2015-72466-EXPLORA- MINECO

Fecha de inicio: 01/05/2017 hasta 30/04/2019

Entidad/es participante/s: Universidad de Sevilla

Cuantía total: 54.450

-Título del proyecto: Interferencia Metabólica en Cianobacterias. Efecto del Control Redox en la Regulación del Metabolismo del Carbono, Nitrógeno y de Metales.

Entidad financiadora: MINECO, BFU2013-41712-P

Entidades participantes: UNIVERSIDAD DE SEVILLA

Duración 01/01/2014 hasta: 31/12/2016: Cuantía de la subvención: 169,400€

Investigador Principal: Dr. F. J. Florencio

Título del proyecto: Optimización de la Producción de Biocombustibles por Cianobacterias. Estudio de Mutantes en el Metabolismo del Carbono, del Nitrógeno y del Estado Redox Celular

Entidad financiadora: Junta de Andalucía, P12-BIO-1119

Entidades participantes: UNIVERSIDAD DE SEVILLA

Duración, desde: 30/01/2014 hasta: 31/12/2017. Cuantía de la subvención: 127,250€

Investigador Principal: Dr. F. J. Florencio

Número de investigadores participantes: 5

-Título del proyecto: Adaptación Molecular en Cianobacterias: Interacción entre el metabolismo del nitrógeno y el carbono con el estado redox celular via la acción de metales pesados

Entidad financiadora: MCINN, BFU2010-15708/BMC

Entidades participantes: UNIVERSIDAD DE SEVILLA

Duración, desde: 01/01/2011 hasta: 31/12/2013 Cuantía de la subvención: 223.850€

Investigador Principal: Dr. F. J. Florencio

C.3. Contracts

Investigador Responsable: Francisco J. Florencio

Referencia del Proyecto: PRJ201000873

Título: Selección y mejora genética de microalgas y cianobacterias para la producción de biodiésel.

Entidad financiadora: ALGAENERGY S.A.

Duración: 01/09/2010 hasta: 31/12/2013

Financiación recibida: 486.430€

Investigador Responsable: Mercedes García González

Referencia del Proyecto: LIFE10ENV/ES/496

Título: CO₂ Capture and Bio-fixation through microalgal culture

Entidad financiadora: European Union (LIFE+-ALgaenergy)

Duración: 01/09/2011 hasta: 30/06/2014

Financiación recibida: Total del proyecto 1,490.217€

Investigador Responsable: Francisco J. Florencio

Referencia del Proyecto: PRJ201101055

Título Investigación en Tecnologías avanzadas para la valoración integral de algas (VIDA).

Entidad financiadora: CENIT- ALGAENERGY S.A.

Duración: 05/07/2010 hasta: 31/12/2014

Financiación recibida: 459.249€

C.4. Patents and other IPR

C.5, C.6, C.7... Other

Member of the panel in the Molecular Biology section of the Agency ANECA (2012-actualidad).
President of the Committee for Evaluation of University Teacher of Science AQUIB (Islas Baleares) (2013-actualidad).

C.5

Reviewer of journals like, PNAS, JBC, Mol Microbiol, Plant Physiol, Mol Plant entre otras.
Evaluator of the Spanish Agency for Research (ANEP) and other Regional Agencies