



CURRICULUM VITAE (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

Part A. PERSONAL INFORMATION

CV date 25-01-2023

First name	Antonio José		
Family name	Márquez Cabeza		
Gender (*)	Male	Birth date (dd/mm/yyyy)	18/07/1959
Social Security, Passport, ID number	29748424V		
e-mail	cabeza@us.es	grupo.us.es/proyectosbio163	
Open Researcher and Contributor ID (ORCID) (*)	0000-0001-7254-1496		

(*) Mandatory

A.1. Current position

Position	Full Professor (Catedrático de Universidad)		
Initial date	24/07/2009		
Institution	University of Seville		
Department/Center	Bioquímica y Biología Molecular / Facultad de Química		
Country	Spain	Teleph. number	+34954557145
Key words	Nitrogen utilization - Plants - Legumes - Lotus japonicus		

A.2. Previous positions (research activity interruptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause
1989-2009	Lecturer / Associate Professor (Profesor Titular) (permanent), University of Seville (Spain)
1987-1989	Associate Professor (Profesor Titular Interino / Encargado de curso) (non-permanent) (University of Seville, Spain).
1986-1987	EMBO post-doctoral fellowship (Rothamsted Experimental Station, UK)
1982-1985	Ph.D. student (FPU fellowship) (University of Seville, Spain)

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Ph.D. (Biological Sciences)	Seville, Spain	1985
M.Sc. (Biological Sciences)	Seville, Spain	1981

Part B. CV SUMMARY (max. 5000 characters, including spaces)

I started my scientific career with an FPU PhD fellowship from Spanish Ministry of Science working on glutamate biosynthesis enzymology, followed by a 2-year EMBO-funded postdoctoral stay at Rothamsted (Harpenden, UK), one of the oldest and most well known Agricultural Stations in the world. During my postdoctoral stay I applied molecular biology techniques to characterize photorespiratory mutants from barley. Later on I got a position as a member of the teaching staff of the Plant Biochemistry and Molecular Biology Department at University of Seville, first as Associate Professor (1987-1988), then as Lecturer (1989-2009) and finally as Full Professor of Biochemistry and Molecular Biology (from 2009 until now). Along this time I have been the project leader at University of Seville of a substantial



number of research projects including: 4 European Union funded projects; 11 projects from Spanish Ministry of Science, 2 projects of Excellence from Junta de Andalucía (Spain), 5 International cooperative projects with Southamerica or Japan, and others. I have also been the group leader of my own research group at the Chemistry Faculty of the University of Seville for more than 30 years. My research work has been dedicated basically to the study of the enzymes and genes involved in nitrogen assimilation in plants (particularly those involved in glutamine and asparagine metabolisms). In 1993 I started the work with the model legume *Lotus japonicus* as a result of the first european project granted to work on N-metabolism with this plant, a project which was later followed by other three additional european projects from other framework programmes of the EU in other to develop functional genomic tools for this plant. Most of the work carried out with *L. japonicus* in our group have analyzed the interconnection between nitrogen metabolism and photorespiration also in relation with other fundamental processes of legume plants such as nodulation and nitrogen fixation, abiotic stress, nitrogen remobilization for seed development, etc. Part of the work included the transfer of knowledge and technology from the model legume *L. japonicus* to other *Lotus* species of agronomic interest used for forage which are submitted to different types of abiotic stress (e.g. EU-funded LOTASSA project). Most of our most recent publications involve the use of transcriptomic and metabolomic tools in our studies. I have 99 publications in total (7 books and 92 articles plus book chapters). In the past years we have leadered a substantial number of publications in the first decile of the JCR ranking, some of them as joint publications with several of the top-scientists in our field (e.g. Prof. Stougaard, Udvardi, Kopka, Parniske, Wang, Gutiérrez, cf. part C.1). I have been the supervisor of 13 Ph.D. and 5 M.Sc. Theses, some of them defended at foreign universities, and I have been invited to give more than 14 talks at the most relevant congresses in our field. I have also been the main organiser of 3 international meetings and more than 25 relevant national and international scientific events. During 4 years (2013-2017) I was the coordinator of the N metabolism group from the Spanish Biochemical Society (SEBBM) and Plant Physiology Society (SEFV)

- **Awards:** Extraordinary Prize of M.Sc. University graduation (1981); Extraordinary Prize for Doctorate (1985); Prize of the Real Maestranza de Caballería de Sevilla to the best mark of University Graduation (1982); 5 Special honours for Excellence in Teaching at Seville University (1998,1999,2001,2002, 2005); Research award from University of Seville and Endesa enterprise to high impact research (2011), Bronze Medal of the Faculty of Science, Pavol Jozef Šafárik University (Košice, Slovakia) (2018); Maximum number of positive evaluations of research in Spain (six 6-year periods, called **sexenios**) (2018) plus 5 additional ones (maximum) at the regional level (Andalucía).

Part C. RELEVANT MERITS (sorted by typology) (last 10 years)

C.1. Publications (see instructions)

- 1) García-Calderón M, Pérez-Delgado CM, Pal'ove-Balang P, Betti M, **Márquez AJ** (2020) Flavonoids and isoflavonoids biosynthesis in the model legume *Lotus japonicus*; connections to nitrogen metabolism and photorespiration. *Plants* 9, 774 (article in the first quartile of JCR journal rankings)
- 2) Pérez-Delgado CM, García-Calderón M, Monje-Rueda MD, **Márquez AJ**, Betti M (2020) Transcriptomic analysis of *L. japonicus* symbiosis reveals new candidate genes for local and systemic regulation of nodule function. *Agronomy* 10, 819 (article in the first quartile)
- 3) Kaducová M, Monje Rueda MD, García-Calderón M ... Betti M, **Márquez AJ**, Pal'ove-Balang P (P.P-B corresponding author) (2019) Induction of isoflavonoid biosynthesis in *L. japonicus* after UV-B irradiation. *J. Plant Physiol.* 236, 88-95 (article in the first quartile)
- 4) García-Calderón M, Betti M, **Márquez AJ**, Ortega JM, Roncel M (2019) The afterglow thermoluminescence band as an indicator of changes in the photorespiratory metabolism of



- the model legume *Lotus japonicus*. *Physiol. Plant.* 166, 240-250 ([article in the first quartile, almost first decile](#))
- 5) Vega-Más I, Pérez-Delgado CM, Marino D, Fuertes-Mendizbal T, González-Murua C, **Márquez AJ**, Betti M, Estavillo LM, González-Moro MB (2017) Elevated CO₂ induces root defensive mechanisms in tomato plants when dealing with ammonium toxicity” *Plant Cell Physiol.* 58: 2112-2125 ([article in the first decile](#)).
- 6) García-Calderón M, Pérez-Delgado CM, Credali A, Vega JM, Betti M, **Márquez AJ** (2017) Genes for asparagine metabolism in *Lotus japonicus*: differential expression and interconnection with photorespiration *BMC Genomics* 18:781 ([article in the first quartile](#)).
- 7) Pérez-Delgado CM, Moyano TC, García-Calderón M, Canales J, Gutiérrez RA, **Márquez AJ**, Betti M (2016) Use of transcriptomics and co-expression networks to analyze the interconnections between nitrogen assimilation and photorespiratory metabolism *J. Exp. Bot.* 67, 3095-3108 ([article in the first decile](#)).
- 8) Yousfi S, **Márquez AJ**, Betti M, Araus JL, Serret MD (2016) Gene expression and physiological responses to salinity and water stress of contrasting durum wheat genotypes. *J. Integr. Plant Biol.* 58, 48-66 ([article in the first quartile](#)).
- 9) García-Calderón M, Pons-Ferrer T, Mrázova A, Pal'ove-Balang P, Vilková M, Pérez-Delgado CM, Vega JM, Eliášová A, Repčák M, **Márquez AJ**, Betti M (2015) Modulation of phenolic metabolism under stress conditions in a *Lotus japonicus* mutant lacking plastidic glutamine synthetase. *Front. Plant Sci.* 6:760. doi: 10.3389/fpls.2015.00760 ([article in the first decile](#)).
- 10) Pérez-Delgado CM, García-Calderón M, **Márquez AJ**, Betti M (2015) Reassimilation of photorespiratory ammonium in *Lotus japonicus* plants deficient in glutamine synthetase. *PLoS ONE* 10(6):e0130438, doi: 10.1371/journal.pone.0130438 ([article in the first quartile](#)).
- 11) Pal'ove-Balang P, García-Calderón M, Pérez-Delgado CM, Pavlovkin J, Betti M, **Márquez AJ** (2015) A *Lotus japonicus* mutant defective in nitrate uptake is also affected in the nitrate response to nodulation. *Plant Biol.* 17, 16-25 ([article in the first tertile](#)).
- 12) Betti M, García-Calderón M, Pérez-Delgado CM, Credali A, Pal'ove P, Estivill G, Repčák M, Vega JM, Galván F, **Márquez AJ** (2014) Reassimilation of ammonium in *Lotus japonicus*. *J. Exp Bot.* 65: 5557-5566 ([article in the first decile](#)).
- 13) Pérez-Delgado CM, García-Calderón M, Sánchez DH, Udvardi MK, Kopka J, **Márquez AJ**, Betti M (2013) Transcriptomic and metabolic changes associated to photorespiratory ammonium accumulation in the model legume *Lotus japonicus*. *Plant Physiol.* 162: 1834-1848 ([article in the first decile](#)).
- 14) Credali A, García-Calderón M, Dam S, Perry J, Díaz-Quintana A, Parniske M, Wang TL, Stougaard J, Vega JM, **Márquez AJ** (2013) The K⁺-dependent asparaginase, NSE1, is crucial for plant growth and seed production in *Lotus japonicus*. *Plant Cell Physiol.* 54: 107-118 ([article in the first decile](#)).
- 15) Betti M, Pérez-Delgado CM, García-Calderón M, Díaz P, Monza J, **Márquez AJ** (2012) Cellular stress following water deprivation in the model legume *Lotus japonicus*. *Cells* 1, 1089-1106 ([article in the first tertile](#)).
- 16) Betti M, García-Calderón M, Pérez-Delgado CM, Credali A, Estivill G, Galván F, Vega JM, **Márquez AJ** (2012) Glutamine synthetase in legumes: recent advances in enzyme structure and functional genomics. *Int. J. Mol. Sci.* 13, 7994-8024. ([article in the first tertile](#)).



17) Yousfi S, Serret MD, **Márquez AJ**, Voltas J, Araus JL (2012) Combined use of $\delta^{13}\text{C}$, $\delta^{18}\text{O}$ and $\delta^{15}\text{N}$ tracks nitrogen metabolism and genotypic adaptation of durum wheat to salinity and water deficit. *New Phytol.* 194, 230-234 ([article in the first decile](#)).

18) García-Calderón M, Chiurazzi M, Espuny MR, **Márquez AJ** (2012) Photorespiratory metabolism and nodule function: behavior of *Lotus japonicus* mutants deficient in plastid glutamine synthetase. *Mol. Plant-Microbe Interact.* 25, 211-219 ([article in the first decile](#))

C.2. Congress

Invited Speaker for the Second International Symposium of the Nitrogen Nutrition of Plants (Chile, 2013); Chairman of N-metabolism sessions at SEBBM meetings: Granada, 2014; Valencia, 2015; Barcelona, 2017; Vicepresident of Spanish N-metabolism meetings in Almonte and Badajoz, 2004, 2016, and Chairman of sessions at Cáceres, 2012; Bilbao, 2014, Córdoba 2022.

C.3. Research projects

-Ref.: ProyExcel_00177. "Sulfide-mediated redox regulation of photorespiration in Arabidopsis". Funding Agency: Junta de Andalucía. Project leader: M. Ángeles Aroca. Duration: 2022-2024

-Ref.: PID2021-122353OB-100. "Systemic signaling in legume-rhizobia symbiosis and nitrogen nutrition. Consequences for plant productivity". Funding Agency: Spanish Ministry of Science and Innovation, EU, AEI. Project leaders: 1) Marco Betti; 2) Antonio J. Márquez. Duration: 2022-2024. Amount: 184.736,75 €.

-Ref.: RTI-2018-093571-B-100. "Tackling the improvement of productivity and drought tolerance in legumes by the use of specific mutants in transcription factors and nitrogen metabolism enzymes". Funding Agency: Spanish Ministry of Science, Innovation and Universities, FEDER, AEI. Project leaders: 1) Marco Betti; 2) Antonio J. Márquez. Duration: 2019-2022. Amount: 139.150 €.

- Ref.. US-1256179. "Unravelling the transcriptomic footprint in legume plants. Identification and characterization of key nodule transporters and key transcription factors in the legume-rhizobia symbiosis". Funding Agency: FEDER-Junta de Andalucía-Universidad de Sevilla. Project leader: Marco Betti. Duration: 2020-2022. Amount 80.000 €.

- Ref.: US-1255781. "Regulation of photorespiration mediated by sulfide". Funding Agency: FEDER-Junta de Andalucía-Universidad de Sevilla. Project leader: Ángeles Aroca Aguilar. Duration: 2020-2022 (role as Tutor).

- Ref.: AGL2014-54413-R. "*Lotus japonicus* as a model for the identification of new genes involved in abiotic stress and productivity in legumes". Funding agency: Spanish Ministry of Economy and Competitiveness. Project leaders: 1) Marco Betti; 2) Antonio J. Márquez. Duration: 2015-2018. Amount 84.700 €.

- Ref: P10-CVI-6368. "Ammonium reassimilation in *Lotus japonicus*". Funding agency: Junta de Andalucía (Project of Excellence). Project leader: Antonio J. Márquez. Duration: 2011-2015. Amount 156.780 € .

C.4. Contracts, technological or transfer merits

- Ref.: FIUS 3185/0905 - Effect of fertilizers in the presence of mycorrhiza. Duration: 2017-2018. Project leader: Margarita García Calderón. Funding enterprise: Fertiberia.