



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	18/01/2022
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First name	Jorge		
Family name	Rodríguez Celma		
Gender (*)	Male	Birth date	11/06/1983
Social Security, Passport, ID number	72986569W		
e-mail	j.rodriquez.celma@csic.es	URL Web	Plant Stress Physiology
Open Research and Contributor ID (ORCID)(*)	0000-0002-7967-5136		

(*) Mandatory

A.1. Current position

Position	Staff Scientist (Científico Titular)		
Initial date	16/11/2021		
Institution	Aula Dei Experimental Station – CSIC (EEAD-CSIC)		
Department/Center	Plant Nutrition		
Country	Spain	Teleph. number	(+34) 976 716057 (+34) 675 723330
Key words	Plant metal homeostasis, Iron homeostasis, Iron sensing, Iron uptake, abiotic stress, E3 ligases, proteomics, transcriptomics		

A.2. Previous positions (research activity interruptions, art. 45.2.c))

Period	Position/Institution/Country/Interruption cause
2019-2020	CLIA unit research manager / Certest Biotec / Spain
2018-2019	Post-doctoral researcher / John Innes Centre / United Kingdom
2017-2018	Senior Research Associate / University of East Anglia / United Kingdom
2015-2017	Marie S.Curie Fellow / University of East Anglia / United Kingdom
2014-2015	Post-doctoral researcher / John Innes Centre / United Kingdom
2012-2014	AS Post-doctoral Fellow / Academia Sinica / Taiwan
2012-2012	Post-doctoral researcher / Academia Sinica / Taiwan
2007-2012	PhD Student I3P-CSIC / Aula Dei Experimental Station – CSIC / Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Science	University of Zaragoza / Spain	2012
BSc in Biochemistry	University of Zaragoza / Spain	2006

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

I am a young researcher (PhD obtained in 2012) with an outstanding track record focused on iron (Fe) homeostasis in plants. After my PhD at the Aula Dei Experimental Station (EEAD-CSIC), I did two post-doctoral stays in the Institute of Plant and Microbial Biology in Taiwan (2012-2014) and the John Innes Centre (JIC) in the United Kingdom (2014-2019). Currently, I am a newly appointed staff scientist at the EEAD-CSIC. During my career I have successfully walked the path from systems biology and high throughput technologies to molecular biology

and biochemical characterization. Combining results from my PhD in Spain and my first post-doctoral stay in Taiwan, and using an integrative -omics approach, I uncovered a new key component of iron uptake in dicotyledonous plants that was overlooked for decades: the production and secretion of specialized secondary metabolites, which is crucial for the mobilization of poorly soluble iron hydroxides. Such discovery has had a great impact in the Fe homeostasis community, changing the paradigm of iron uptake in plants. An efficient regulatory system that senses the iron status of the plant, and adjusts homeostasis accordingly, is crucial for ensuring enough iron reaches the tissues where it is needed without accumulating to toxic levels. Using co-expression analysis, I identified a small gene family, the BTS/L family, in the transcriptional networks of Fe homeostasis. To study the function of these putative E3 ligases, I moved to a new lab at the John Innes Centre (JIC), bringing my own research line and obtaining a Marie S.Curie fellowship as funding. There, I gained expertise in protein expression, molecular biology, and protein ubiquitination and led a number of collaborative experiments between groups in China, Taiwan and Germany. Together, we performed physiological studies combined with protein-protein interaction and ubiquitination-degradation techniques and finally unravelled the biochemical function of BTSL proteins in plants. BTSL1 and BTSL2, two hemerythrin E3-ligases, are responsible to mediate FIT turnover and are able to bind iron, providing the long searched link between intracellular iron levels and the direct regulation of its uptake (published in PNAS). Also, together with the other two international groups working in the BTS/L family of proteins (based in USA and Japan), I led the only perspectives review published on the key scientific actors in ubiquitination and Fe homeostasis. Currently, I am therefore at the vanguard of the developing protein ubiquitination research field in plants.

I have also been able to develop tools and products which have been interesting for industry. I have optimized the ferritin extraction from pea for its use as treatment for iron deficiency anaemia in humans. Bioavailability tests are positive and have generated the interest of the industry for its mass production as food supplement (generating an R&D contract with Miracon Science under a non-disclosure agreement, and IP protection patent under discussion with PBL). I have also developed reporter plants that emit light when they suffer from iron deficiency. The so-called sensor plants are being developed in cooperation with the company Orion FT and have been already applied to compare the efficiency in correcting iron chlorosis of two different fertilizer formulations. I have also participated in several dissemination programs aimed at attracting the general public to science and research. I have supervised university students in summer stays in the JIC (3 students through its Summer School) and in Taiwan (2 students through TIGP program). I also participated as a tutor for the Nuffield Research Placement program, which brings high school students to a research center for their first work experience with science.

During my whole research career training the next generation of scientist has been key. During the final stage of my PhD, as the proteomics expert in the lab, I trained the next three PhD students working on proteomics in the group, leading to joint publications along the subsequent years. During my stay at the JIC, I supervised one BSc thesis and one MSc thesis, and I was part of the supervisory committee of a PhD student. At CerTest Biotec I started from zero the whole R&D department of the newly created CLIA unit, being in charge of training all the staff. The unit (formed by 10 staff) is currently running and selling their own developed products. I have also been vocal of two PhD panels, one for the Polytechnic University of Madrid and another for the University of Zaragoza. I am often reviewing articles for SCI journals, such as Journal of Proteomics, Plant and Soil, Frontiers in Plant Science, Proteomes... etc.; and I recently edited (together with Drs. Ping Lan, Javier Romera and Rafael Pérez-Vicente) the research topic: Nutrient Interactions in Plants for the journal Frontiers in Plant Science.

Part C. RELEVANT MERITS (sorted by typology, the ten most relevant, last ten years)

C.1. Publications

1. **Rodríguez-Celma J**, Connorton JM, Kruse I, Green RT, Franceschetti M, Chen YT, Cui Y, Ling HQ, Yeh KC & Balk J (2019) Arabidopsis BRUTUS-LIKE E3 ligases negatively regulate iron uptake by targeting transcription factor FIT for recycling. *PNAS* 116, 17584-17591. IF (2018) 9.58 **Q1**
2. **Rodríguez-Celma J**, Chou H, Kobayashi T, Long TA & Balk J (2019) Hemerythrin E3 ubiquitin ligases as negative regulators of iron homeostasis in plants. *Frontiers in Plant Science* 10, 98. IF (2017) 3.677 **Q1**
3. Tsai HH, **Rodríguez-Celma J**, Lang P, Wu YC, Vélez-Bermúdez IC & Schmidt W (2018). Scopoletin 8-hydroxylase-mediated fraxetin production is crucial for the mobilization of iron. *Plant Physiology* 177, 194-207. IF (2017) 5.949 **Q1**
4. Connorton JM, Balk J & **Rodríguez-Celma J**. (2017). Iron homeostasis in plants - a brief overview. *Metallomics* 9, 813-823. IF (2017) 4.069 **Q1**
5. **Rodríguez-Celma J**, Tsai YH, Wen TN, Wu YC, Curie C & Schmidt W (2016) Systemwide analysis of manganese deficiency-induced changes in gene activity of Arabidopsis roots. *Scientific Reports* 6, 35846. IF (2016) 4.259 **Q1**
6. **Rodríguez-Celma J**, Lattanzio G, Villarroya D, Gutierrez-Carbonell E, Ceballos-Laita L, Rencoret J, Gutiérrez A, del Río JC, Grusak MA, Abadía A, Abadía J & López-Millán AF (2016) Effects of Fe deficiency on the protein profiles and lignin composition of stem tissues from *Medicago truncatula*. *Journal of Proteomics* 140, 1-12. IF (2016) 3.914 **Q1**
7. **Rodríguez-Celma J** & Schmidt W (2013) Reduction-based iron uptake revisited: on the role of secreted iron-binding compounds. *Plant Signalling Behaviour* 8, e26116. IF (2017) 1.395 **Q3**
8. **Rodríguez-Celma J**, Pan IC, Li W, Lan P, Buckhout TJ & Schmidt W (2013) The transcriptional response of Arabidopsis leaves to Fe deficiency. *Frontiers in Plant Science* 4, 276. IF (2013) 3.637 **Q1**
9. **Rodríguez-Celma J**, Lin WD, Fu GM, Abadía J, López-Millán AF & Schmidt W (2013) Mutually exclusive alterations in secondary metabolism are critical for the uptake of insoluble iron compounds by Arabidopsis and *Medicago truncatula*. *Plant Physiology* 162, 1473-1485. IF (2013) 7.394 **Q1**
10. **Rodríguez-Celma J**, Lattanzio G, Jiménez S, Briat JF, Abadía J, Abadía A, Gogorcena Y & López-Millán AF (2013) Changes induced by Fe deficiency and Fe resupply in the root protein profile of a peach-almond hybrid rootstock. *Journal of Proteome Research* 12, 1162-1172. IF (2013) 5.001 **Q1**

C.2. Congress

1. Invited Speaker: **Rodríguez-Celma J**, Connorton JM, Kruse I, Green RT, Franceschetti M, Chen YT, Cui Y, Ling HQ, Yeh KC, Balk J. XX *International Symposium on Iron Nutrition and Interaction in Plants (ISINIP)*. Reims (France). 2020 (postponed to 2022)
2. Invited Speaker: **Rodríguez-Celma J**. IX *International BIFI 2020 Conference*. Zaragoza (Spain). 2020
3. Invited Speaker: **Rodríguez-Celma J**, Connorton J, Balk J. *Mini-symposium on the role of crops providing micronutrients (Fe, Zn, Se) for human health*. Grasmere (United Kingdom). 2016
4. Oral communication: **Rodríguez-Celma J***, Connorton JM, Kruse I, Green RT, Franceschetti M, Chen YT, Cui Y, Ling HQ, Yeh KC, Balk J. XXVII *CNB Workshop "Advances in Molecular Biology by young researchers abroad"*. Madrid (Spain). 2019
5. Oral communication: **Rodríguez-Celma J***, Bradley JM, Le Brun NE, Balk J. XIX *ISINIP*. Taipei (Taiwan). 2018
6. Oral communication: Tsai HH*, **Rodríguez-Celma J**, Lan P, Wu YC, Vélez-Bermúdez I, Schmidt W. XIX *ISINIP*. Taipei (Taiwan). 2018

7. Oral communication: **Rodríguez-Celma J***, Connorton J, Balk J. *XVIII ISINIP*. Madrid (Spain). 2016
8. Oral communication: **Rodríguez-Celma J***, Tsai HH, Lan P, Schmidt W. *XVII ISINIP*. Gatersleben (Germany). 2014
9. Oral communication: **Rodríguez-Celma J***, López-Millán A-F, Abadía J, Lin WD, Schmidt W. *XVI International Conference on Arabidopsis Research*. Sydney (Australia). 2013
10. Oral communication: **Rodríguez-Celma J***, López-Millán A-F, Abadía J, Lin W and Schmidt W. *I International Symposium Root Systems Biology*. Taipei (Taiwan). 2013

C.3. Research projects

1. The root metabolome: an avenue to control metal stress in crops (ROOTMET) (PID2020-115856RB-I100). MCIN - Agencia Estatal de Investigación. PI: Ana Álvarez Fernández, Javier Abadía. Aula Dei Experimental Station – CSIC (2021-2024): 233530€. Participation: Research Team member
2. Finding the iron sensing proteins in crop plants (655043). European Commission - Marie S.-Curie Action Individual Fellowship. PI: Jorge Rodríguez Celma. University of East Anglia (2015-2017): 183455€. Participation: Principal Investigator
3. Functional characterization of Iron Regulator Sensor (IRS) proteins in plants (BB/N001079/1). Biotechnology and Biological Sciences Research Council (BBSRC). PI: Janneke Balk. John Innes Centre (2016-2018): 630000€. Participation: Post-doctoral researcher in charge
4. Exploring genetic variety in ferritin abundance and iron content in old landraces of pea, *Pisum sativum*. Knowledge Exchange and Commercialization for innovation funding. PI: Janneke Balk. John Innes Centre (2014-2015): £31694. Participation: Post-doctoral researcher in charge
5. Manganese uptake in Arabidopsis: genomic analysis and regulatory networks (ANR-11-ISV6-0001). French National Research Agency. PI: Catherine Curie and Wolfgang Schmidt. IPMB - Academia Sinica (2012-2015): 240426€. Participation: Post-doctoral researcher
6. Integrated analysis of disparate omics data sets to decipher regulatory networks controlling cellular nutrient homeostasis in Arabidopsis. Academia Sinica Thematic Grants. PI: Wolfgang Schmidt. IPMB-Academia Sinica (2012). Participation: Post-doctoral researcher
7. Metalómica vegetal: una aproximación a la homeostasis de metales en plantas mediante espectrometría de masas integrada (AGL2010-16515). PI: Javier Abadía. Aula Dei Experimental Station – CSIC (2011-2014). 254100€. Participation: PhD Student
8. HOT IRON – PLANT PROGROW (Homeostasis and Transport of Iron – improving Plant Productivity) (EUI2008-03618). PI: Katrin Philipar, Javier Abadía. Aula Dei Experimental Station – CSIC (2009-2012). Participation: PhD Student
9. Consolidated group Fisiología de estrés abiótico en plantas (A03). PI: Javier Abadía. Aula Dei Experimental Station – CSIC (2003-2017). Participation: PhD Student

C.4. Contracts, technological or transfer merits

Contract with Industry: Development of pea ferritin as an oral iron supplement, including medium-scale production for a clinical trial to test iron absorption in human volunteers. Miracon Science (Salzburg, Austria, <https://miraconscience.com/>). PI: Janneke Balk. John Innes Centre (2019-2020): £60000. Participation: Coordinator and researcher in charge.

Intellectual property in discussion phase: Extraction procedure of ferritin from pea flour for its use as iron supplement. Authors: Janneke Balk, Jorge Rodríguez-Celma and Marina Franceschetti. In discussion with Plant Bioscience Limited (PBL, pbltechnology.com).