



AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2017

Turno de acceso general

Nombre: PALOMARES RIUS, JUAN EMILIO

Referencia: RYC-2017-22228

Área Científica: Agricultura

Correo Electrónico: juapariu@hotmail.com

Título:

Molecular plant-nematode interaction and integrative diagnostics of plant-parasitic nematodes

Resumen de la Memoria:

My work is focused in plant-parasitic nematode interactions as a fundamental research for further application in Integrated Management, species identification, genomic analysis and agricultural ecosystem management. Plant-parasitic nematodes are one of the major biological constraints for many crops. Plant-parasitic nematode interactions with plants have been studied with new rootstocks, resistant maintenance/and breaking lines and in some cases with the interaction with other soil-borne pathogens using classical and new research tools (proteomics, gene expression and massive sequencing). Nematodes are very difficult to identify, because of their similarity and phenotypic plasticity. For this reason, integrative diagnostic is the best combination of classical morphological-morphometrical identification complemented with molecular characterization for unequivocal species diagnostic. Other main achievement is the ecological and biodiversity studies in crops regarding their interaction with plant, soil and climatic factors in order to provide accurate management tools for plant-parasitic nematodes into the ecosystem and kept them at non-damaging levels for crops. Currently, I have developed and led the molecular plant-nematode interaction and integrative diagnostics of plant-parasitic nematodes at the Institute of Sustainable Agriculture-CSIC in order to discover new methods for control them in cultivated crops. I am contracted as a postdoctoral researcher in a short Intramural Project. To this end, I am applying next generation sequencing and classical nematology. To develop my scientific skills, I profited from five research stays to internationally recognized centers, in addition to two-year stay in the James Hutton Institute (UK) and almost two-year stay in Forestry and Forest Products Research Institute (Japan). Currently, I am contributing with my ideas and management skills to the research projects where I have been integrated and being scientific responsible for workpackages in competitive international projects (ARIMNET, CRUSA), and the study of genomes of the Pine Wilt Nematode differing in their pathogenicity (Japan). I also have co-supervised one PhD in Spain, and another one as tutorial committee in Portugal from 2017, one MSc project in the University of Abertay Dundee (UK) and technicians.

Resumen del Currículum Vitae:

My scientific career has been developed in the field of Plant Protection, mainly in plant-parasitic nematodes and how these organisms interact with the plants and other microorganisms in the soil in order to design effective Integrated Management in the agrosystem. Plant-parasitic nematodes could be a major limiting biological constrains for many crops. I have developed five main research lines during my scientific career: i) Study of the interaction plant-nematodes including the plant resistance characterization: the interaction of plant-parasitic nematodes (*Meloidogyne artiellia*) with the plant root system and the maintenance/breakdown the resistant to other pathogens (*Fusarium oxysporum* f. sp. *ciceris*) in chickpea lines using gene expression and proteomics was the main objective of my PhD. Later on, I have included more plant resistances in potato, grapevine, olive and Aloe vera; ii) Integrative diagnostics and molecular characterization of plant-parasitic nematode species (including description of new species and group phylogenies): plant-parasitic nematodes are very difficult to identify because of their similarity and intraspecific plasticity in morphological characters. This point is very important in order to preform good quarantine programs and get unequivocal identification results based on molecular techniques in the Integrated Management Programs. This point has been done with genera as important as *Meloidogyne*, *Pratylenchus*, *Xiphinema* or *Longidorus* among others; iii) Soil ecological relationships in order to understand the nematode biodiversity in olive. The nematode biodiversity will help to unravel the complex relationships between organisms in the soil helping us in the selection for the best agronomical practices for a sustainable crop; iv) Genetic population structure and molecular diversity of nematodes and plant-viruses vectored by nematodes: The knowledge of this diversity is important for determining the evolutionary mechanisms and possible ways of introduction; v) Genome sequencing and analysis: I have acquired a wide experience in this field during my postdoctoral stays with the publication of the genome of the Potato Cyst Nematode (PCN), *Globodera pallida*, and the comparison between several populations of the Pine Wilt Nematode, *Bursaphelenchus xylophilus*. Nowadays I am exploring the sequencing of nematode endosymbionts in order to find novel ways to control them in field. I have got financial competitive support for five stays in centers of recognized international prestige and two



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postdoctoral stays in order to get experience in the above research lines. The first postdoctoral stay during two years was conducted in The James Hutton Institute in Dundee (U.K.) studying several ecological and genomic traits of PCNs. The second stay was in the Forestry and Forest Products Research Institute (Japan) studying the genomes of several *Bursaphelenchus* species and among populations of the Pine Wilt Nematode differing in their pathogenicity. Nowadays I am working in the Institute for Sustainable Agriculture-CSIC (Spain) in a short Intramural project in order to unravel the diversity and new control methods of plant-parasitic nematodes in olive and other Mediterranean crops.



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Nombre: GRAMAJE PEREZ, DAVID
Referencia: RYC-2017-23098
Área Científica: Agricultura
Correo Electrónico: dagrape@hotmail.com

Título:

Improving the sustainability of grapevine and fruit crops by implementing novel integrated management strategies

Resumen de la Memoria:

Over the last 10 years, my research experience has allowed me to gain abilities in identifying, characterizing, and managing grapevine pest and diseases with an emphasis on fungal diseases of grapevines as well as in other economically important crops such as almond and olive.

During my doctorate (2006-2011) (UPV, Valencia, Spain), my research focused particularly on young grapevine decline, a currently common problem in wine-producing countries around the world. I studied the etiology and characterization of the associated fungal pathogens, their epidemiology and disease management. In this period, I was trained in world-class international research institutions (Australia, New Zealand and South Africa) with short stays (nearly 10 months) that were the foundation of future successful collaborations.

In 2011, I was appointed to a competitive postdoctoral position (JAE-Doc) at IAS-CSIC (Córdoba, Spain), to investigate Verticillium wilt of olive trees. My research activity focused on the detection and quantification of Verticillium dahliae infection in soil and olive plants using conventional and molecular methods. In 2015, I was appointed to a competitive research position (Doc-INIA) at ICVV (CSIC-UR-CAR) (Logroño, Spain) which allowed me to establish my own research line in Spain being currently the responsible of the research group "Interactions of grapevine with the biological environment" (BIOVITIS).

To further develop my specialization on soil-borne pathogen detection and quantification, I conducted a four-month visit at Cornell University (USA) funded by a fellow from the FULBRIGHT program (2016). In addition, I also spent one month at Mendel University (Czech Republic) in 2015 to learn the latest techniques on microbial ecology.

My experience in proposal writing as principal investigator (PI) and/or co-PI has resulted in over 1.2 M € awarded to our research program in the past 3 years (two R&D&I national projects, four regional projects and five contracts with private companies). The main research line carried out by our group in these projects is related to the biology, epidemiology and control of fungal pathogens associated with grapevine trunk diseases (GTDs), with emphasis on i) the genetic diversity and population structure of GTD pathogens, ii) the development of integrated management strategies of GTDs in grapevine nurseries, and iii) the development of rapid and reliable methodology to identify sources of resistance to GTD pathogens.

Resumen del Currículum Vitae:

1 - MÉRITOS CURRICULARES

1.1. Aportaciones:

54 artículos SCI (1er autor: 25, Senior autor: 4, Autor corresp.: 18)

1er cuartil: 25 artículos

2º cuartil: 24 artículos

3er cuartil: 5 artículos

- Índice H: 14 (WOS); 17 (Google Scholar); 14 (Scopus)

- 1 libro: (ISBN: 979-10-91799-60-7, ©OIV publications)

- 53 comunicaciones en congresos internacionales y 25 en nacionales

1.2. Participación en actividad internacional

- Participante en 1 proyecto Europeo (WINETWORK)

- Colaborador externo en 1 proyecto financiado por el Gobierno de Australia

- Estancias predoctorales: 10 meses en varios centros (Stellenbosch University - Sudáfrica, SARDI Australia, Lincoln University - Nueva Zelanda)

- Estancias postdoctorales: Beca FULBRIGHT en la Universidad de Cornell, USA. (4 meses), beca COST en la Universidad de Mendel, Rép. Checa (1 mes) y beca José Castillejo en el INRA de Burdeos, Francia (6 meses - en evaluación, resolución Mayo 2018)



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- Nº de coautores internacionales en artículos SCI: 134.

1.3. Resto de méritos curriculares

- 13 artículos de divulgación nacionales y 2 internacionales
- 15 ponencias en jornadas de divulgación nacionales
- Comité de gestión de la Acción Europea COST FA1303 y líder del WG4
- Comité de gestión del Consejo Internacional de las Enfermedades de la Madera (ICGTD)
- Miembro de la Delegación Española de la OIV (Organización Internacional de la Viña y el Vino): Grupo de expertos OIV "Vine Protection"
- Participación en la exposición del CSIC sobre vid y vino
- Aparición en medios de comunicación: informativos TVE1, Agroesfera TVE2, Mira con quién andas Telerioja y Lab24 de Canal 24h
- Docencia: UPV (120 h + cursos), Universidad de Córdoba (6 h), curso en IAS-CSIC (1 h), Universidad Menéndez Pelayo (1,5 h) y Master en la Universidad de La Rioja (6 h)
- Contratos en convocatorias competitivas (JAE-DOC y DOC-INIA)

2- CAPACIDAD

- Coordinador proyecto RTA2015-00015-C02 - IP Subproyecto 1 (2017-2020) (Cuantía: 300.000 €)
- IP 4 proyectos autonómicos (2015-2018) (Cuantía: 120.266 euros)
- Co-IP 2 proyectos CIEN-CDTI empresas (2016-2020) (Cuantías: 683.259 € y 41.111 €)
- Co-IP 5 contratos con empresas (Cuantía: 107.348 €)
- Co-IP proyecto PDR Gob. La Rioja (Cuantía: 82.967 €)
- Líder del grupo de investigación BIOVITIS (ICVV)
- Participación en 7 proyectos nacionales y en la red REDVITIS (MINECO)
- Participación en 4 contratos con empresas y/o administraciones
- Comité científico congresos IWGTD y organizador COST Action meeting.
- Invitado a impartir 22 conferencias internacionales (6 como conferenciante plenario)
- Revisor y tribunal de 2 Tesis Doctorales
- Revisor de proyectos de investigación de Israel, Sudáfrica y Uruguay.
- Revisor de contratos postdoctorales Agreenskills Francia y DOC-INIA.
- Codirector de 4 TFC y 1 Tesis Doctoral
- Associate Editor de Fungal Systematics and Evolution (FUSE)
- Review Editor de Frontiers in Plant Science - Section Plant-Biotic Interaction
- Premio Extraordinario de Tesis Doctoral (2012)
- Premio Consejo Social de la U. La Rioja - investigador emergente 2016



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Nombre: LORA CABRERA, JORGE
Referencia: RYC-2017-21909
Área Científica: Agricultura
Correo Electrónico: jlora@eelm.csic.es

Título:

Study of the key interactions in the progamic phase. Implication for plant breeding of subtropical fruit crops.

Resumen de la Memoria:

I started my scientific career in cancer research studying the role of glutaminase in apoptosis during my BS dissertation thesis (two SCI publications). The background acquired allowed me to continue my scientific career with a PhD dissertation in a different subject, plant reproductive biology. I studied reproductive biology in an early divergent angiosperm, *Annona cherimola* (cherimoya) following a multidisciplinary approach that combined intensive field studies with microscopy and molecular approaches in the laboratory. The results from my Ph.D work were reflected in six SCI publications that contributed to a better understanding of the evolution of reproductive biology of angiosperms and provided clues for an adequate management of this underutilized fruit crop. During my thesis the discovery of a natural seedless mutant of a sister species, *Annona squamosa*, led me to continue my research on ovule development and perform additional molecular work during a postdoctoral stay financed by a competitive grant of the MORPH network of the NSF of the USA in Prof. Gasser's lab in the University of California Davis, US, with excellent results published in PNAS (2011). I continued my research on ovule development through a postdoctoral stay at the laboratory of Prof. Thomas Laux in the University of Freiburg, Germany, where I performed a molecular and genetic study of genes involved in megasporogenesis in the model plant *Arabidopsis*. Part of the results was published in *Current Biology* (2011). The acquired skills during the postdoctoral stays abroad allowed me to perform a multidisciplinary research combining morphological, evolutionary, genetic and molecular approaches during a "Juan de la Cierva" research project in the laboratory of Prof. Maria Herrero at the EEAD-CSIC in Zaragoza. This project focused on ovule development comparing ovule development in Rosaceae species with the known genetics of *Arabidopsis* and part of the work was also performed at Harvard University thanks to a competitive grant from the Arnold Arboretum of that University. Several publications were produced during that period, although with the objective of prioritizing publication quality versus quantity, the main results have been recently published in two articles in *New Phytologist* (2015 and 2017). Currently, I am carrying out a research project as PI (AGL2015-74071-JIN) at the IHSM "La Mayora" on the characterization of genes associated with ovule development and their implications for breeding subtropical fruit crops. My previous RYC candidature (RYC-2016-20529) had the position of reserve.

Resumen del Currículum Vitae:

- 15 papers in SCI journals (see "Publications, scientific and technological activities"), 12 as first author, 1 as last author, 1 as second author and 1 as a third author.
- Eleven of my publications are in the top quartile journal ranking (Q1) and six of them are in the upper 10% journal ranking D1 [BMC Plant Biology (2009), PNAS (2011), *Current Biology* (2011), *New Phytologist* (2015, 2017), *Frontiers in Plant Science* (2016)].
- 16 Communications in scientific meetings (6 publications in proceeding, see "Work submitted to national or international conferences").
- 3 book chapters (2018), two of them as first author.
- h-index: 8 (ISI), 10 (Google Scholar).
- Sum of the Times Cited: 277 (ISI), 404 (Google Scholar).
- Sum of Times Cited without self-citations: 231 (ISI).
- Average Citations per Item: 19,79.
- Average authors/publications: 3,92.
- Total Impact Point: 53,824.
- 2 Scientific photographs were selected for journal cover of *American Journal of Botany* (2011, 2014).



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Nombre: MARTIN BENITO, DARIO
Referencia: RYC-2017-23389
Área Científica: Agricultura
Correo Electrónico: dmartinbenito@gmail.com

Título:

Variabilidad climática, dinámicas forestales y ciclo de carbono

Resumen de la Memoria:

My research focuses on the ecological dynamics of forests and the processes behind them at a broad range of spatial and temporal scales. I am particularly interested in understanding how the combination of climate, species diversity, environmental legacies, and tree competitive interactions drive forest structure and composition. By exploring how forest dynamics have responded to past climatic variations and disturbances to create the forests we can currently observe, we can put current changes in a deeper temporal context and gain insight into how forests will respond to rapid environmental changes in the future. I have worked in different types of forests, from temperate mesic forests to Mediterranean to tropical, both evergreen and deciduous dominated forests.

For my PhD, I developed individual and stand forest growth models for *Pinus nigra* across Spain based on tree-ring proxies and forest inventory data. These empirical models included radial growth and site index. My studies combined the high temporal precision and long-term availability of growth measurements with the completeness of stand inventories and allowed us to analyse forest processes at different spatial and temporal scales. During my PhD and my 7 postdoctoral years in France, the US, and Switzerland, I investigated the responses of forests to climate extremes and variability in temperate, Mediterranean and tropical forests. Using large dendrochronological networks containing several broadleaf species, I have investigated the most limiting abiotic factors in the temperate forests of eastern North America and the Caucasus, and showed that drought limits growth across a broad environmental and climatic gradient. I have also developed the first dendrochronological reconstruction of precipitation variability for the Caucasus.

Integrating diverse approaches of empirical and dynamic modeling approaches, I examine the effects of environmental variations on forest ecosystems at scales that are most relevant to the forest processes, from annual to centennial and from local to continental. These scales are the most appropriate for the sustainable management of forests and to project their future development. By combining the use of forest succession models and stand disturbance history derived from tree-rings, I aim at a better understanding of the causes that drive forest development. Using long-term data and empirical models I also contribute to validate and inform the process based models and also assist in their further improvement. Applying these approaches in forests with different climates and tree species diversity allows quantitatively addressing fundamental ecological questions and exploring general forest ecological patterns.

Continuing these lines of research, I started working at the forest research Center of INIA (INIA-CIFOR, Madrid) in 2017 as Principal Investigator of project AGL2015-73190-JIN funded by Spanish National Plan for Scientific and Technical Research and Innovation (Plan Nacional) within the Program of Research Aimed at Society's Challenges (Challenge 2: Agriculture and Natural resources) known in Spanish as Programa Estatal de I+D+i Orientada a los Retos de la Sociedad.

Resumen del Currículum Vitae:

My research focuses on how environmental variability affects forest ecosystems at multiple scales in time (annual-centennial) and space (local-continental) relevant to their processes and sustainable management. My aim is to improve our understanding of the driving causes of forest development. I use a combination of dynamic vegetation models (DVM) and stand development histories derived from inventories and tree-ring proxies (width, stable isotopes, anatomy). Benchmarking DVMs with these long-term data contributes to improving the models. Applying these approaches to forests in different regions (Europe, North America, Caucasus) with diverse climates and tree diversity allows quantitatively addressing fundamental ecological questions and exploring general forest patterns. At the moment, I am a research scientist at the INIA as Principal Investigator of the project AGL2015-73190-JIN funded by Spanish National Plan for Scientific and Technical Research and Innovation (Plan Nacional) within the Program of Research Aimed at Society's Challenges (Challenge 2: Agriculture and Natural resources).

I have a MSc in Forest Engineering (2003) with a thesis on the chemical ecology of bark beetles. I obtained my PhD in 2009 on forest ecology and modelling at the Forest Research Center of INIA (INIA-CIFOR) and the Polytechnic University of Madrid (UPM), from which I published five ISI papers. I received the Outstanding Doctorate Award from the UPM. During this time, I visited three research institutions in Europe (12 months in total) which resulted in papers with international collaborations.

After my PhD, I was a postdoc at the Laboratoire Ecologie Systématique et Evolution of University of Paris-Sud. In 2010, I obtained a Fulbright Scholarship to work at the Lamont-Doherty Earth Observatory LDEO of Columbia University (US) for 3 years. Since 2013, I am an Adjunct Associate Research Scientist at LDEO. In 2013, I was awarded the competitive Marie Curie IEF fellowship to work on long-term forest and climate dynamics in the Caucasus at to ETH Zurich. I developed the first multispecies dendrochronological network in the Caucasus, the first dendrochronological reconstruction of precipitation for this region, and the first study of past forest dynamics in its temperate rainforest. In total, I have over 7 years of international experience.



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I have participated in 17 competitive projects (4 as PI, 4 as co-PI) most during my postdocs in the US and Switzerland. In 2017, I was awarded a project as PI from the Plan Nacional. I have co-directed 3 master thesis in UPM and ETH Zurich, and I am currently co-supervising a PhD student at INIA-CIFOR. My 25 papers (12 as first author and most in first quartiles) are cited a total of 841 times (GoogleScholar), 14 over 20 times, and one of them is one of the most cited papers from INIA-CIFOR (151 citations). My H-index is 15. I have also co-authored a book chapter published in 2017. One of my papers was featured in the media (e.g., CNN, National Geographic, The Washington Post)

I have lead annual ecology research campaigns in the Caucasus since 2012 and a module of the North American Dendroecological Fieldweek (NADEF) in June 2013. I have co-organized sessions at conferences on "quantitative wood anatomy of conifers" and "tree rings and dynamic vegetation models" and several workshops on the US on forest dynamics.



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Nombre: NIEVES CORDONES, MANUEL
Referencia: RYC-2017-21924
Área Científica: Agricultura
Correo Electrónico: mncordones@gmail.com

Título:

Optimization of K⁺ nutrition in crops

Resumen de la Memoria:

Agriculture is now challenged to meet the sustainable production of nutritious food. Within this context, three goals can be considered: 1) production of more efficient crops (use of water and nutrients), 2) crops better adapted to global change (abiotic stress tolerant crops, for instance) and 3) production of safe food (crops without pollutants). My scientific career is driven by the aforementioned goals. My field of research is focused on the study of potassium transport systems in plants. I have developed skills in a wide range of approaches and species to study plant K⁺ homeostasis, covering from protein engineering to whole-plant enhanced performance. I am particularly interested in the CRISPR-Cas9 technology to study/improve gene function in crops.

I did my PhD under the supervision of Francisco Rubio and Vicente Martínez in the Plant Nutrition team of the CEBAS-CSIC (2005-2009, Predoctoral fellowship FPU) on the transport systems contributing to K⁺ uptake in tomato and Arabidopsis roots. Here, I gained large expertise in the field of potassium nutrition by combining physiological and molecular biology approaches. Moreover, I learnt electrophysiological techniques which are very challenging. During this period, I did a stay at Rothamsted Research (UK) and collaborated with the University Miguel Hernandez (3 joint publications).

As a post-doc I wanted to enlarge my competences around potassium transport in plants, so I pursued my formation at the INRA (BPMP, Montpellier, France) in the team headed by Hervé Sentenac. During my stay there (2010-2016) I have worked in three main topics: (i) regulation of Shaker K⁺ channels' traffic and activity at the plasma membrane (Fundación Alfonso Martín Escudero fellowship), (ii) control of transpiration by modulating turgor of epidermal cells (Marie Curie IEF fellowship, PI) and (iii) reduction of radiocaesium accumulation in rice by using CRISPR-Cas technology (INRA postdoctoral contract).

On January 2017, I joined the Plant Nutrition team at CEBAS-CSIC with a young researcher project (JIN call, funded by the Spanish Ministry of Economy) of which I am PI. This project aims at identifying long-distance potassium transport systems in tomato plants (particularly those related to fruit development), constituting a new field of research in the team. It benefits from two key approaches I learnt during my post-doctoral stay in France: two-electrode voltage-clamp on *Xenopus* oocytes as a system to study plant protein function and the CRISPR-Cas technology to produce knock-out mutants à la carte. Both approaches are bringing national and international collaborators to the team.

Resumen del Currículum Vitae:

I finished my studies in Biology in 2004 at the University of Murcia. Then, I obtained an introductory fellowship from the CSIC (2004) to start my work in the CEBAS-CSIC in Murcia until I was awarded first with the predoctoral fellowship I3P from the CSIC and then the FPU predoctoral fellowship (funded by Ministry of Culture) to do my PhD work (2005-2009). I obtained my PhD degree in 2009 (with European mention; PhD Title: Systems involved in K⁺ uptake in plants: tomato and Arabidopsis thaliana). As part of my PhD, I did a 3-months stage at Rothamsted Research (UK) in 2007.

I pursued my postdoctoral formation at Biochimie et Physiologie Moléculaire des Plantes (BPMP, Montpellier, France) in the *Shaker* Channels' team headed by Hervé Sentenac from 2010 to 2016 (73 months) on three different topics which were funded by Fundación Alfonso Martín Escudero (Postdoctoral fellowship, 2010-2011), Marie Curie Programme (IEF fellowship, PI, project name: KinPlants, project budget: 185.748 €, 2012-2013) and ANR Investissements d'avenir (INRA postdoctoral contract, project name: DEMETERRES, project budget: 19 Mill. €, 2014-2016). During my stay in France, I was elected as member of the *Conseil de Service* (from 2014 to 2016) which is the governing body of BPMP.

In January 2017, I joined the Plant Nutrition team at CEBAS-CSIC with a young researcher project (budget: 169500 €, PI, project name: VASKTOM, JIN call funded by the MINECO).

I have 24 SCI articles (10 as first author, 1 as co-first author, 1 as last author and 5 as corresponding author) of which 20 are ranked in the Q1 (83%) and 10 in the first decile (42%). Additionally, I have 1 article in preparation (as first author). I have written 2 book chapters as first author. According to WoS, my contributions have received 688 cites (27.5 cites/item) and they have an h-index of 13.

I have contributed to 15 scientific conferences from which two oral presentations are worth to highlight: one in the Salt & Water Stress in Plants Gordon Research Conference (held in Hong Kong in 2012) and one in the 14th International Symposium in Rice Functional Genomics (held in Montpellier 2016).

I have taken/take part in 7 scientific projects, being PI in two of them: a young researcher project (2017-2019) and an IEF Marie Curie Fellowship (2012-2013) which represents more than 350000€.

I am Lecturer of Master courses in the University Miguel Hernandez (UMH) since 2012 (6 academic years). I have co-supervised 2 Master students (UMH) and 3 undergraduate students (at BPMP). I am currently co-supervising 1 Master student at CEBAS-CSIC.



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Due to the increasing interest on gene-editing technologies such as CRISPR-Cas, I have received several invitations to give seminars (for high-school and university students) and to write divulgation articles on this topic.
I have been invited to review papers for: Plant Journal, Plant Physiology, Scientific Reports (Nature Publishing Group), BMC Plant Biology and Functional Plant Biology. I am review editor of Frontiers in Plant Sciences (abiotic stress panel).
I have been included in the list of experts of the ANEP to evaluate applications in competitive calls.



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Nombre: MATUS PICERO, JOSE TOMAS
Referencia: RYC-2017-23645
Área Científica: Agricultura
Correo Electrónico: tomas.matus@gmail.com

Título:

Multiomics and systems biology approaches in grapevine (*Vitis vinifera* L.) for characterizing secondary metabolic regulators and studying their modulation by the environment.

Resumen de la Memoria:

I am a plant biologist and PhD in Agricultural Sciences with experience, independence and leadership in the use of genomic and systems biology tools for studying regulatory networks of secondary metabolism, bringing the fields of molecular biology and agronomy closer thanks to my multidisciplinary background. I obtained both my academic degree and PhD in Pontificia Universidad Católica de Chile (PUC), one of Chile's best Universities (QS Stars University Rating System). I finished my degree studies in 2003 and obtained the award for best undergraduate thesis. In 2004, followed by my interest in fruit crops and their management I joined the PhD Program in Agricultural Sciences and was awarded with the MECESUP fellowship, given each year to the top3 students. I conducted minor studies in Enology and Viticulture and became highly motivated for conducting agronomic studies (e.g. concerning productivity and quality) to incorporate a view from the molecular biology perspective. The importance of focusing the problem through this approach has been confirmed by the number of times these three PhD-derived manuscripts had been cited in journals: in total, 382 citations (ISI-WoS). After 1 year of Postdoc in Chile, I joined Dr. José Luis Riechmann's group at the Centre for Research in Agricultural Genomics (CRAG, CSIC-IRTA-UAB) in Barcelona. In 2010 I was awarded by the Marie Curie FP7 Program and the European Molecular Biology Organization (EMBOCOFUNDFP7, ALTF 406-2010), one of the top leading fellowships for scientific research in Europe. This fellowship supported my cross-border research and reinforced my settlement in Spain. During the last 9 years working at CRAG I've gained experience in "Omics" technologies such as ChIP-seq, RNA-Seq, PolyRibo-Seq and proteomics. One of my major aims is to propose and test models for the regulation of phenylpropanoid metabolism in the context of climate change. As an example, by studying flavonoid metabolism in grapevine and understanding its modulation by the environment, I have brought knowledge to understand how to improve grape's quality, contributing to the viticulture and wine industry. The main findings of my research are: (1) determining key regulatory mechanisms of the phenylpropanoid pathway by identifying and characterizing novel transcription factors (TF), (2) demonstrating how the environment and agricultural practices affect phenylpropanoids through the modulation of TFs and (3) incorporating a systems biology approach to identify new secondary metabolism regulators and characterize genome-wide responses to environmental factors. I have published in highly qualified D1/Q1 Journals such as Plant Journal, Plant Physiology, Genome Biology, PNAS, Current Opinion in Biotechnology and Journal of Experimental Botany. The impact of these results is in part due to the integration of different approaches (e.g. representing large biological data as networks and performing large-field experiments) in the study of the genetic regulation of metabolite accumulation.

Resumen del Currículum Vitae:

My CV can be summarized in the following categories:

1. Relevance and degree of contribution in list of articles.
 - Research/Review Articles: 31 (ISI-WoS), 27 with citation data (ISI-WoS).
 - Book chapters: 1 (2nd in preparation)
 - Articles belonging to first quartile (Q1): 23 (74%).
 - Articles belonging to first decile (D1): 16 (52%).
 - Articles as First/Corresponding author Since 2015: 8/11 (73%); Since 2004: 18/31 (58%).
 - Sum of the Times Cited: 861 (Scopus), 775 (ISI-WoS), 1184 (Google Scholar).
 - h-index: 15 (Scopus) /14 (ISI-WoS)
 - i10-index: 21
2. Participation in national and international research projects.
 - Researcher in National Projects: 4 (Competitive calls).
 - Researcher in International Projects: 3 (Competitive calls) and 2 (Non-competitive calls).
 - International collaborations (with or without joint projects): 10 (leader/main coordinator in 2, with 5 associated publications in 2010-2018).
 - Scientific collaboration with Industry: 1 (design and writing of scientific project to apply a competitive research funding for the private winery-Research Center CII Concha y Toro).
3. R&D Dissemination, Activity Organization and Evaluation.
 - National and International Conferences: 22 (64% as first/corresponding author).
 - Conferences given upon invitation: 9 (5 International).
 - R&D Organization in COST Action: Currently as as Second Proposer in COST Action Proposal OC-2017-1-22194 "Phenotyping grapevine through omics integration" (Main Proposer, Dr. Mario Pezzotti).



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-Editor tasks: 1 (Frontiers in Plant Science Topic: Omics and systems approaches in grapevine fruit composition to understand responses to environmental factors and agronomical practices. Webpage: <http://journal.frontiersin.org/researchtopic/4675/>).

-Reviewer tasks : 20 (covering different sub-disciplines in D1 journals such as New Phytologist, The Plant Journal, Journal of Experimental Botany, BMC Plant Biology and BMC Genomics. Publons profile: <https://publons.com/author/691417/jose-tomas-matus#profile>).

-Scientific Committees: 1 (International Scientific Committee. XII International Grapevine Genetics and Breeding Symposium).

-Degree, Masters and PhD thesis tutorship: 3

-R&D project evaluation: 1 (FONDECYT, Chile)

4. Fellowships

-PhD fellowships: 4

-Postdoc fellowships: 1 (Marie Curie/European Molecular Biology Organization-EMBO)



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Nombre: BALLESTER FRUTOS, ANA ROSA
Referencia: RYC-2017-22009
Área Científica: Agricultura
Correo Electrónico: ballesterar@gmail.com

Título:

Unraveling fruit-Penicillium spp. interactions and postharvest fruit quality

Resumen de la Memoria:

My research activity at the IATA-CSIC has been mainly focused on the study of fruit-pathogen interactions, mostly on orange-Penicillium digitatum and apple-Penicillium expansum interactions. I have used genomics, transcriptomics and metabolomics to increase our knowledge on the fruit responses after the infection by the pathogen or after elicitation of induced resistance, and on the mechanisms of virulence and pathogenicity of the pathogen. From the point of view of the fruit, my results have shown that secondary metabolites, mainly phenylpropanoids, and ethylene play important roles in the induction of resistance in citrus fruit. During the last years, I have been more focused on the genomics of the pathogens, and I have been involved in the elaboration of the first draft of Penicillium spp genomes. Our knowledge on the development of a protocol for gene disruption and on genomics and transcriptomics analyses have helped us to establish an important number of international collaborations.

During my postdoctoral stay at the PRI-WUR, I have been involved in the study of the quality of tomato and pepper. We have identified the MYB12 transcription factor, which plays an important role regulating the flavonoid pathway, being responsible of the pink color in tomato. Regarding pepper fruits, we have elucidated the molecular mechanisms underlying the production of flavor and health related compounds. I have also participated in the study of differential tomato transcriptomic responses induced by Pepino mosaic virus isolates, and in the characterization of the tomato FRUITFULL transcription factor, which regulates ethylene-independent aspects of fruit ripening.

During my scientific career, I skilled myself as an independent and resourceful thinker. My scientific record indicates that I am expert in postharvest, and due to the multidisciplinary activities in which I have taken part, I have increased my knowledge in postharvest, and mastered both pathology and physiology postharvest fields. At present, I am focused on two main research lines that are settled over my previous experience, but that also aim to improve methodologies, designs, and analyses:

1. Take advantage of omics analysis and the availability of fungal genomes to provide a comprehensive understanding of the pathogenicity/virulence specificity. After high-throughput analysis, and based on the comparison of the different Penicillium spp. and another necrotroph pathogens, we can discover putative effectors involved in the pathogenicity/virulence of P. digitatum and P. expansum.
2. Using the genome-wide analysis of different Penicillium spp. in order to reveal and characterize putative gene clusters and master regulators for different secondary metabolites, such as mycotoxins. I am part of a national network on mycotoxins.

Resumen del Currículum Vitae:

I got my BSc degree in Agricultural Engineer by the Polytechnic University of Valencia in 2001. I started my research carrier in 2000 as internal student in the Biotechnology and Physiology Postharvest group at the Institute of Agrochemistry and Food Technology (IATA-CSIC, Valencia, Spain) investigating the interaction between orange and its major fungal pathogen. My PhD thesis was awarded with the maximum mark of "Sobresaliente cum laude". During my PhD, carried out at the IATA-CSIC, I undertook both a transcriptomic and a metabolomic approach to study changes associated with relevant processes in postharvest pathology. After my PhD, I did a three-year post-doctoral stay at the Plant Research International @ Wageningen University (PRI-WUR, The Netherlands) focused primarily on aspects related with the quality of tomatoes and peppers. During this stay, I was involved in four international projects, including European and non-European countries. After that, I returned in Jan 2010 to the IATA-CSIC with one-year contract followed by a three-year competitive contract (JAE-Doc) to the Biotechnology and Physiology Postharvest group. Nowadays I continue working in the same lab in order to elucidate the mechanisms of virulence and pathogenicity of Penicillium spp. during their interaction with oranges and apples. Since 2016, I am also teaching at the University of Valencia in the Degree in Human Nutrition and Dietetics.

My research work has resulted in 27 publications in SCI journals, being first author in 14 of them and one as corresponding author, and six non-SCI journals. All of my SCI publications are on the top 25% Journal@s ranking, being 14 of them on the top 10%. I have co-authored 9 book chapters, being editor of 1 of them. My h factor is 16 (Scopus) and 17 (Google Scholar). According to WOS (access on 09/01/2018), my articles have been cited 770 times (723 without self-citations), with 159 citation only in 2017. As of July/August 2017, two of my articles are highly cited papers according to the Essential Science Indicators.

I have 17 and 56 national and international conferences, respectively, 10 of them as invited oral communications. I have participated in 16 projects funded by different agencies: 9 CICYT, 1 MEC (excellent program), 1 regional project (PROMETEO), 1 European project (EU), and 4 International projects. I am actively collaborating with a number of national and international research groups. During the last years I built international collaborations for the creation of networks that resulted in the participation in the European COST Action, the Red Micelio, and MicoFood network.

I have supervised two PhD theses (The Netherlands and one in progress in Spain), four master thesis (Spain, The Netherlands), and six



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undergraduate students. I acted as a member of the committee of national PhD thesis and Master Thesis, and I act as a frequent reviewer of SCI journals. I have also participated in several divulgation events.

During my scientific career, I have been involved in multidisciplinary activities supported by prestigious and competitive programs that provided me the opportunity to gain an important professional maturity as well as to improve my researcher's skills and competence such as project management and presentation skills. For that, in 2017 I successfully passed the 2 exams for getting a permanent Faculty position as Researcher for Public Research Organizations.



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Nombre: GUZMAN GARCIA, CARLOS

Referencia: RYC-2017-21891

Área Científica: Agricultura

Correo Electrónico: ge2gugac@uco.es

Título:

Improving Wheat Grain Quality for Processing, Nutrition and Health

Resumen de la Memoria:

I have devoted my career to the genetic improvement of wheat grain quality, conducting research about this topic and leading grain quality work in an international wheat breeding program.

In 2007, I was awarded with a F.P.U. grant to carry out at the University of Cordoba my Ph.D. focused on the use of genetic resources to improve wheat quality. In 2011 I successfully defended my Ph.D. thesis that was awarded the "Extraordinary Ph.D. Award". After I was awarded a highly competitive postdoctoral grant from the "Fundación Alfonso Martín Escudero" that allowed me to continue my research career at CIMMYT (International Maize and Wheat Improvement Center), Mexico, a world-leading international research institution.

At CIMMYT, I joined the Wheat Chemistry and Quality Laboratory (WCQL) of the Global Wheat Program, a large breeding program where I expanded my knowledge in field and lab work and breeding. In 2013 I successfully competed in an international open process for a Scientist position to lead the WCQL of CIMMYT, charge that I kept nowadays as Senior Scientist. My main tasks are to participate actively in the breeding process to enhance the grain quality of the germplasm developed by the Program; develop research proposals and conduct fund raising activities; build and lead international breeding and research networks; and to conduct research studies about wheat quality. So far, I have participated in 50 SCI publications (18 as first author and 10 as last author), three book chapters and in lot of communications presented at different international conferences.

At present, I am at a very productive stage of my career as I am collaborating with internationally recognized researchers in several studies on wheat quality and breeding. I am also leading international networks and consortiums related with my topic of research such as: the Expert Working Group on Improving Wheat Quality for Processing and Health of the Wheat Initiative (Vice-chair of the group); the Cluster of Activities "Nutrition, processing quality and health" of the CGIAR Research Program on Wheat; or the International Gluten Workshop, an international conference focused on wheat quality in which I am the chair and main organizer.

Although I have been out of Spain in the last six years, I have maintained closed links and collaborative research with many Spanish researchers, including with the University of Cordoba. I have contributed in the training of two Ph.D. students from this institution as Ph.D. advisor and participated in different projects hosted there. I also have active collaborations with scientists from other Spanish institutions and companies (UPM, INIA, IRTA, Agrovetal), which will help in the future to build larger and more ambitious research projects in collaboration with them.

Resumen del Currículum Vitae:

My Ph.D. (University of Cordoba, 2007-2011) focused on genetic resources for wheat quality improvement was supported by a competitive F.P.U. programme grant, which also allowed me to do a stay abroad (NICS, Japan) and acquire experience in international collaboration. Thanks to the high quality and high number of studies (8 SCI papers and 1 book chapter) conducted during my Ph.D. I was awarded with the Extraordinary Ph.D. Award by the University of Cordoba. Few months after I was awarded a highly competitive two-year postdoctoral grant from the «Fundación Alfonso Martín Escudero» to continue my research career at CIMMYT (International Maize and Wheat Improvement Center), where I joined the Wheat Chemistry and Quality Laboratory. Afterwards, I have been able to continue working at CIMMYT first as Scientist and currently as Senior Scientist after succeeding in an international recruitment open process for the position of Head of the Wheat Chemistry and Quality.

Regarding training activities I have supervised 1 degree projects, 4 Master students, and 2 Ph.D. students. Currently I am directing 2 degree projects and supervising a post-doc at CIMMYT. I also participate every year in the basic and advanced breeding courses given at CIMMYT for wheat breeders.

Since 2005, I have participated in 12 research projects (5 international and 7 national). The international projects in which I have been involved are large breeding projects, in which I have been responsible of managing the budget allocated for grain quality improvement and lead those activities. I have also raised funds participating as principal investigator of eight different agreements with seed and food private companies for a total close to 270 thousand Euros.

My ability to conduct high quality and innovative research is demonstrated by my publications. I have already published 50 publications in SCI Journals: 27 in Q1 (12 as first author and 5 as last author) 19 in Q2 (6 as first author and 4 as last author) and 4 in Q3 and Q4. These publications have been cited 219 times based in WOS (265 times based on Scopus) and I have an h-index of 9 in WOS (11 in Scopus). Of the total 50 publications 25 have been published during 2016-2018. More than 95 researchers from 12 different countries participated as co-authors of the above mentioned publications, which indicate the high level of networking and international collaboration reached during my career. I have also participated in 3 book chapters and in 60 communications in national and international conferences (9 as invited speaker).



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My international leadership and expertise is well recognized. I was elected as Vice-Chair of the Expert Working Group (EWG) on Improving Wheat Quality for Processing and Health of the Wheat Initiative in April, 2016. This EWG is formed by 68 wheat quality specialists from 24 different countries within the Wheat Initiative. I am also the leader of the Cluster of Activities «Nutrition, processing quality and health» of the CGIAR Research Program on Wheat. I have chaired sessions about wheat grain quality in the most important international conferences (International Wheat Conference, Sidney 2015; International Wheat Genetics Symposium, Vienna 2017) and I am the Chair of the 13th International Gluten Workshop (most important international wheat quality conference) to be held in Mexico in March 2018.



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Turno de acceso general

Nombre: SANTAMARIA FERNANDEZ, MARIA ESTRELLA

Referencia: RYC-2017-21814

Área Científica: Agricultura

Correo Electrónico: esantamaria_fernandez@yahoo.es

Título:

PLANT-PEST INTERACTION

Resumen de la Memoria:

My research career can be divided in two lines:

1) Plant Micropropagation and Epi-genetic dynamics during development processes

My predoctoral phase introduced me in the study of the epigenetic regulation of chestnut bud dormancy. I optimized several protocols previously recalcitrant for Chestnut buds (Hasbún et al. 2005, Hasbún et al. 2008, Santamaría et al. 2010a). I established a negative correlation among the methylation and the H4 acetylation levels in chestnut buds during bud set and bud burst (Santamaria et al. 2009). The construction of two suppression subtractive hybridization libraries enabled us to deposit 512 chestnut expressed sequence tags (ESTs) into public databases (Santamaría et al. 2011). The information compiled encourage us to compare the behaviour of buds and seeds to cope with the stresses (Santamaría et al 2010b). In parallel, I collaborated in other projects studding epigenetic dynamics during different plant developmental processes as bud formation, flowering and aging (Meijón et al. 2009, Revilla et al. 2010, Valledor et al. 2007) or micropropagation systems (Hasbún et al. 2007). I also participated in the writing of three book chapters (Meijón et al. 2008, Rodriguez et al. 2012, Viejo et al. 2012) where we summarized the state of the art of the plant epigenetics, the basic procedures to analyse epigenetic modifications and the role of DNA methylation on tree development.

2) Plant-Pest Interaction

After finishing my thesis I started to study the molecular mechanisms of plant-pest interaction. I focused mainly in 4 aspects of plant-pest interaction.

i) The Functional Analysis of Arabidopsis Response to Tetranychus urticae

To understand the interactions between spider mite and a plant at the molecular level, we examined reciprocal genome-wide responses of mites and Arabidopsis. Mutant analysis of induced plant defense pathways showed functionally several programs, in particular jasmonic acid signalling and biosynthesis of indole glucosinolates (Zhurov et al. 2015). In addition, we showed the role of cysteine and serine protease inhibitors, as well as C1A pro-regions in plant defence against mites (Santamaría et al. 2012a, Santamaria et al. 2015a). We also discovered new proteins involved in plant defence against herbivore attack (Santamaría et al. 2017b).

ii) Comparison of Arabidopsis and Tomato defences against T.urticae.

In parallel to the work with the model species, we worked with tomato compared plant defence responses against spider mites (Martel et al. 2015).

iii) Characterization of Spider Mite Feeding

Using several histology and microscopy methods we discovered some features of mites interface with the plant during feeding and the plant damage directly inflicted by mites (Bensoussan et al. 2016).

iv) The Role of Cysteine Proteases/Inhibitors in Plant-Pest Interaction and another processes

By combining comparative genomic approaches and experimental procedures the importance of the plant protease inhibitors in plant defence against mites and the role of the T.urticae proteases in plant digestion were shown (Diaz et al. 2012, Martinez et al. 2012, Santamaria et al. 2012a,b, Diaz et al. 2014, Santamaría et al. 2014, Santamaria et al. 2015a,b, Martinez et al. 2016, Diaz-Mendoza, 2017). I also participated in other works studying the role of proteases in germination, senescence or microspor

Resumen del Currículum Vitae:

I did my PhD in the Epiphysage Research Group at the Oviedo University (Spain) under the supervision of Professor Roberto Rodriguez and Professor M^º Jesús Cañal. During this period I characterized the "Bud Dormancy Stages of Chestnut Tree at the Transcriptomic and Epigenomic level". To carry out my thesis I was granted with a three competitive grants (Oviedo University, FPU and Finalization) and to complement my skills I profited from 10 months secondment in the Millennium Seed Bank (UK) under the supervision of Peter Toorop. I was awarded with Extraordinary Degree and PhD Prizes from the Oviedo University.

I further started my postdoctoral period supported by a Postdoc Fellow (37 months) in The University of Western Ontario (London, Canadá) under the supervision of Professor Vojislava Grbic. Then, I was awarded with a competitive Juan de la Cierva Postdoc (36 months) in the CBGP (Madrid, Spain) under the supervision of Professor Isabel Diaz and I am currently enjoying a postdoct contract granted by a National Project.



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I have published 29 articles in SCI journals and 6 book chapters (ISBN). I have participated in 52 national/international conferences. I have been involved in 13 research projects funded by top national/international institutions. H Index=12, Scopus. In addition, I have collaborated in 4 private projects and in the International Plant-Spider Mite Consortium (GAP-M). I have demonstrated scientific initiative and intellectual independence designing projects. I am accredited as "Assistant", "Associate" and "Private University" professor by ANECA (2012). I have been involved in teaching duties and I have supervised 1 Master Thesis, 3 Grade Final Projects, 1 ERASMUS project and 1 Doctoral Thesis student. I collaborate as referee in several the Scientific Journals and I am Guest Editor of Frontiers Plant Science Research Topic.



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Turno de acceso general

Nombre: CASTILLEJO SANCHEZ, M^a ANGELES

Referencia: RYC-2017-23706

Área Científica: Agricultura

Correo Electrónico: macastillejo@ias.csic.es

Título:

Characterization of resistance mechanisms at a molecular and physiological level to multiple stresses (biotics and abiotics) in plant systems. Systems biology and targeted omics for multiplexed verification of biotic stress resistance markers

Resumen de la Memoria:

My main research line has been focused on the characterization of resistance mechanisms at a molecular and physiological level to multiple stresses in plant systems. During my PhD I discovered some of the pathways activated during defense mechanisms in plant by using biochemistry, physiology and proteomics, allowing me to continue and focus my investigations generating high valuable information. The impact of the results as has been recognized by high-impact publications, as well as being awarded with two of the most competitive grants from Spanish MICINN: Juan de la Cierva to join IAS-CSIC (Spain), and the Postdoctoral Mobility Program fellow to join MoSys lab (University of Vienna, Austria). During my postdocs (in Spain and Austria) I focused on the study of defense mechanisms in legumes (*Medicago truncatula* and pea) to biotic and abiotic stresses. These findings did not only provide new insights in defense mechanisms in plants, but also provided a new series of potential targets that can be used in breeding programs. In addition, I implemented methods and developed workflows based on mass spectrometry: *Selpex strategy* allows the quantitative comparison of target peptides minimizing analysis time and enabling high-throughput measurements of huge sample sets. Besides, I actively collaborated on the implementation of software (for automated protein turnover calculations based on partial metabolic labeling), as well as on the *plant peptide spectra database Promex*.

Currently, I lead my research line focused to identify biomarkers of resistance in legumes and forest species by using cross-disciplinary approaches (from physiology to omics). So far I also have actively contributed as researcher in 12 national and 6 international projects, being responsible of the work package 4.2 of the European FP6 project (EU-FP6-2002-FOOD-1-506223).

Resumen del Currículum Vitae:

I obtained my title degree in Biology in 1997. Later I joined to Biochemistry and Phytopathology Dept. University of Córdoba (UCO) to work on the biocontrol of important phytopathogens fungi. From this work came my thesis degree obtained in 1999 with outstanding mark. Then, I got a contract by the University of Salamanca from 2000-2001 to work on the biological control of fungal pathogens on strawberries and citrus. In May 2002 I started my doctoral studies, obtaining the PhD title on November, 2005 with Cum Laude qualification. My thesis focused on the study of the molecular basis of plant responses to biotic and abiotic stresses by applying proteomic techniques and classical biochemistry, and being one of the pioneers work in Plant Proteomics in Spain. During my PhD I performed two stays abroad at the laboratory PME-INRA Dijon (France), and two more at national centers (CNIC-Madrid, CSIC-Valencia). Then, I joined to SCAI-UCO facility during 2006-07, acquiring skills in proteomic methods and collaborating with numerous research groups. In January 2008 I got a competitive grant of the MICINN (Juan de la Cierva subprogram) to join the IAS-CSIC of Córdoba. Here I defined my professional career on studying the molecular basis of legume responses to important crop pest and drought, by means of selection of proteins as marker-resistance. I have identified a considerable list of proteins related with resistance to several stresses by applying the latest proteomics methods (gel based and label-free), whose results are well reflected by the numerous articles published. In January 2012 I was granted with a competitive grant of the Spanish Ministry of Education (Mobility Program) for two years of postdoc at the University of Vienna (Austria), where I learned the latest techniques in proteomics (shotgun nLC-MS/MS), computation and new metabolic strategies based on the isotope labeling. In January 2014 I came back to IAS-CSIC (Cordoba) leading my research line focused to identify biomarkers of resistance in legumes. Currently, I am incorporated to Plant and Agroforestry Biochemistry, Proteomics and Systems Biology group (UCO) focusing my investigations in identifying biomarkers of resistance in legumes and forest species by using cross-disciplinary approaches (from physiology to omics).

In short, I have 1070 paper citations and my h-index is 16. I have a total of 36 publications, 26 in SCI (9 of them published in D1 journals and 13 in Q1; 14 as first or last author), 6 book chapters and 6 scientific outreach articles. I have published in some of the most prestigious journals in their field: *Molecular & Cellular Proteomics*, *Journal of Experimental Botany*, *BMC Genomics* and *Proteomics*. I am regular reviewer in top journals of my research field. I have 55 participations in national and international conferences, and invited as speaker to several meetings and seminars. I supervised several students (undergraduate, master, PhD) and postdoc, and also have more than 200 h of lectures teaching (mainly in Master's Degree of UCO). I obtained the qualification of Assistant Prof. (Prof. Contratado Doctor) by the National Agency for Quality Assessment and Accreditation (ANECA).