AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

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Título:

Soil Agroecology: characterizing multi-trophic interactions to improve biocontrol of insect pests

Resumen de la Memoria:

I have devoted my career to the study of entomopathogenic nematodes (EPN), employing these organisms as a model in the area of Soil Agroecology.

My thesis "The entomopathogenic nematodes from La Rioja and their symbiotic bacteria" (CCMA-CSIC/UCM, Madrid, Spain) advanced the knowledge in our country on EPN, being here the pioneer on the study of the two partners, nematode and bacteria. I demonstrated, for the first time, the negative impact of heavy metal and agrochemical residues on the EPN distribution in agro-ecosystems. Moreover, my work during the PhD was the first that isolated a symbiotic bacterium in the stable variant phase from an infective juvenile, posing an evolutionary link between the two phases (UMII-INRA, France).

During 8 years of postdoctoral experience, I expanded my professional goals to both basic and applied research in multitrophic interactions, exploring the impact of various organisms (plants, insects, nematodes, bacteria and fungi) on the crop health and production.

My first postdoctoral experience (CREC-UF, USA, 2008-2012) focused on the mechanism by which EPNs help to increase citrus production through herbivore suppression. My research pioneered the development of new molecular tools (species-specific primers/probes) for the evaluation of EPN soil food webs. By combining geospatial and multivariate analyses with such molecular tools, we elucidated key abiotic factors affecting natural enemies, which drive in turn insect population dynamics. Our studies also probed how a new citrus management system alters the soil food web and increased the severity of a pest-disease complex, a critical issue now with corrective measurements implemented.

My second postdoctoral experience in Switzerland (UniNe, 2013-2015) was focused on the study of ecological consequences of multitrophic interactions in annual crops (maize and wheat). As a junior group leader, I coordinated multiple field and laboratory studies in combination with the Soil Biology Consortium. Our results revealed that EPN can be applied in combination with other beneficial organisms, such as bacteria that promote plant growth and vigor, and mycorrhize that provide plants with nutrients. However, we showed that EPN presence in Swiss agricultural soils is insufficient to combat current and emerging soil pest problems; therefore, studies are ongoing for fine-tuning EPN application.

My current postition in Portugal (UAlg, 2015-present) focus on understanding how various entomopathogens (fungi, nematodes) interact with the pest and other organisms in the rhizosphere community. We are expanding knowledge about belowground multitrophic interactions in Mediterranean ecosystems, particularly the antagonistic interactions that modulate EPN efficacy in crops.

Based on my previous experience and scientific maturity, my long-term goals as independent researcher are to (1) seek new methods/systems to enhance the effectiveness of beneficial organisms against agricultural pests, and (2) address key basic ecological questions on multitrophic interactions linked to crop production. My main goal is to establish a new research line seeking for new methods and approaches for pest management in sustainable agriculture. I pursue an open vision to both basic and applied questions to fulfill fundamental key gaps of knowledge in the area of Soil Agroecology.

Resumen del Currículum Vitae:

My PhD (CCMA-CSIC) was supported by two competitive grants: FPU (Ministry of Education, Culture and Sports, Spain, 2002-05), and I3P postgraduate (CSIC, Spain, 2006), which allowed me to acquire international experience abroad during 10 months (Cuba and France). My PhD (December 2006) was awarded with the European Mention and Annual Extraordinary Award (UCM, Spain). My postdoctoral periods were also funded by competitive fellowships/contracts: Ramón Areces Foundation (Spain, 2008-2010), IOF Marie Curie Program (EU, 2010-13), Swiss National Science Foundation (Switzerland, 2013-15), and IF Investigator FCT (Portugal, 2015-18), comprising >87 months of postdoctoral research abroad (USA, Switzerland and Portugal). Overall, I have gained competitive fellowships/contracts equivalent to 634,000 euros. My research activities have produced 77 presentations in international conferences (13 invited speaker) and 53 publications, including one book as Editor (Springer, 2015), five book chapters and 37 (+2 in press, +1 in revisions) peer-review articles SCI in top journals in Agriculture, Entomology, Soil Science, and Zoology (WOS, H index=13; Q1=60%; first author/corresponding=65%; independent from PhD advisor=62.5%). I paid special attention to networking, with >60 researchers from Spain, Cuba, France, USA, Czech

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

Republic, Iran, Argentina, Lithuania, and Switzerland among my co-authors in peer-review articles.

Leadership has been a key feature during my career. Besides self-funding my whole career, I acquired >120.000 euros as Principal Investigator (PI): two grants as PhD student (La Rioja Government, Spain), managed the lab-associated grant in my IOF Marie Curie grant (EU), and was leader the Exploratory Grant from IF program (FCT, Portugal). In addition, I have collaborated in 12 national/international projects (EU, USA, >1.8 millions euros). I co supervised various undergraduate students/short stages and co-advise 3 PhD students (1 defended on June 30th 2016, and 2 ongoing). I team taught formal courses in Biology (UCM, Spain and University of Neuchâtel, Switzerland), Master and PhD program in Entomology and Nematology (University of Florida, USA), participated in summer schools and short postgraduate courses (Universidad de La Rioja and Universidad de La Laguna, Spain). As outreach, I developed activities for High School students (CSIC, Spain, and UAlg, Portugal), and promoted activities for transferring knowledge to the public/farmers (UAGR COAG, Spain and AGRIDEA, Switzerland).

My international expertise is also widely recognized. I serve as international expert for project evaluation panels: US Egypt (2012) and US-Israel (2014) Joint Science and Technology Program (USA), NWO Open program (The Netherlands, 2014), Science Centre (Poland, 2015), CONICYT (Chile, 2015), and ANECA (Spain, 2016). Also, I receive frequent invitations as symposium and workshop organizer, was chair and vice chair of Entomophilic Nematode Divisions, keynote speaker for the Sociedade do Nematologia do Brazil meeting (2012), and delivered 20 invited lectures (Brazil, USA, France, Spain and Portugal). Finally, I am Editorial Board member of three international journals (Frontiers in Plant Science, Journal of Nematology and Journal Nematoda) and served as reviewer for >25 international journals (e.g., Applied Soil Ecology, Biological Control).

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

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Título:

Understanding spatio-temporal dynamics of forest communities to promote resistance and resilience to cope with global change disturbance

Resumen de la Memoria:

My research career started focusing on understanding the impact of forest management on regeneration and understorey species responses. However, I realized that the tree component is a portion of plant community, thus I decided to start focusing on vegetation community responses. As forest land degradation was increasing worldwide by human disturbances, the idea of restoring forest ecosystems in degraded areas being challenging seduced me. My PhD thesis (2006-2010) dealt with the effective restoration of forest in open-cast mining areas, identifying constraints to accelerate forest recovery. This research completed the first comprehensive model of mining sites restoration in N-Spain. Also, this period allowed me to acquire large research experience in community ecology and statistics. During my postdoc in Liverpool (2011-2012), I continued my research on disturbances, but now over agroforestry landscapes. During that time, I started to interest in understanding how management and environmental disturbances impact vegetation community dynamics. Finding different post-disturbance response trajectories in similar communities made me deepen into the alternative states theory and the concepts of community resistance and resilience as an important ideas for management. Due to my statistical background, I developed a new multivariate methodology to test the evidence of alternative stable or transient states in disturbed ecosystems. Then, I started working in forestry at UPV (2013-2014), which made me interested in exploring how to recover oak woodlands in unprofitable pine plantations. Here, I explored links between succession and restoration using the potential of natural processes to achieve native forest restoration. My colleagues during that time got me interested in how to incorporate Ecosystem Services into forest restoration outcomes. Based on my statistical and dynamic process perspective, I developed a new integrated indexes to measure the spatio-temporal change of ES provided at landscape level. However, due to my interest in continuing working with different perturbation types I moved back to Liverpool (2014-2015) to work in fire ecology by exploring how understanding biomass accumulation help predicting fire occurrences and successional trajectories. Then, I moved to Lleida (2015), where I started working with colleagues from Medforlab (UdL) providing further insight into applied dynamics to fungal and fire ecology or dendrochronology. Along with my career, I have combined applied and basic science to study community dynamics as a key management component of agroforestry systems. Also, I am contributing with statistical analyses and theories to different research topics such as marine and human ecology. Currently, my main research line, settled over my previous experience, explores the spatio-temporal dynamics of Mediterranean forest communities to promote resistance and resilience to cope with global change disturbance. It aims 1) to explore the mechanism behind diverse vegetation dynamics and trajectories of same communities in response to similar human-disturbances 2) to identify components of community resistance/resilience using long-term datasets and 3) to design new statistical methodologies to evaluate resilience dynamics. All these aims are highly relevant for conservation and sustainable management of forest communities.

Resumen del Currículum Vitae:

I am a graduate and postgraduate in Forest Engineering (BS and MSc) from the Universidad de Valladolid, where I received a PhD with European Mention in 2010 (predoctoral grant from Basque Government). Afterwards, I have worked as a postdoctoral researcher at the University of Liverpool (United Kingdom; 2011-2012, 2014-2015), Universidad de País Vasco (Spain, 2013-2014) and Universidad de LLeida (2015-present), where I benefit from a Juan de la Cierva-Incorporación 2014 contract. Also, I made postdoctoral collaborative research stages at the Seoul National University (R. Korea, 2012), University of Western Sydney (Australia, 2013), ECOTRON-CNRS (France, 2013) and Inha University (R. Korea, 2016). These stages allow me to establish a broad network of international collaborators. I have 49 peer-reviewed publications, plus 7 JCR-papers under review, and 7 book chapters. Within these 49 publications 40 are in JCR journals, some of them in top journals of their specific area (GigaScience, Glob Change Biol, Scientific Rep, Agric Ecos Env, J App Ecol, Biol Conserv, J Veg Sci, F Ecol Manag), being 33 in journals of the first quartile and 12 in the first decile, while the others are non-JCR papers and conference proceedings. I am the first author in ~60% of the JCR papers, and first, second or senior in 83%. These publications have accumulated 501 citations (~53 citations/year; >110 citations/year last two years) and my h-index is 15 and i10-index is 20. Also, I am first author of two R libraries: Dendrosync and EcoResil. Through my career I have been founded by competitive fellows and contracts showing my capability to obtain funding for salary (pre and postdoctoral grants), research projects (CyL Government, MINECO, EU 7th framework) and travel expenses (International mobility grants: VG, UVa, UdL). I have contributed as a researcher to 6 international and 9 national research projects, being PI in two of them. I have also participated in 8 non-competitive projects with public and private companies. I have 57 contributions in national and international conferences since 2006, most of them as a lead author (34 oral; 3 invited talks; 4 scientific-organizing committee or session convenor). I have been invited to give 12 invited talks in different universities worldwide. I have co-supervised 2 PhD theses (1 in progress UdL), and 2 master theses (Spain, Korea), and all of them obtaining the highest marks. My teaching duties started at Liverpool as a demonstrator of biology and ecology undergraduate courses (2011-2012). Currently, I am teaching at UdL Statistical Methods in Forest Engineering bachelor degree (2016-2017) and Biodiversity in a global change context in international

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

MEDFOR master (2015-2017). Moreover, I have wide experience conducting multivariate statistical courses in R environment since 2011 in official masters at Universidad de Valladolid, and in national and international research centres (IUGFS, NIE, NIER). Recently, I have been contributor and expert reviewer of IPBES thematic assessment on land degradation and restoration, as well as external examiner of 3 PhD theses (2 Spain, 1 Australia) and being also a PhD panel jury (2016). I am very active reviewer, 83 reviews since 2009, and well valued by up to 29 SCI journals from forestry and ecology including: Ecology, J App Ecol, J Biogeo, Biol Conserv, J Veg Sci, F Ecol Manag.

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

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Título:

AGRICULTURE AND THE NITROGEN CYCLE: FROM THE PLOT TO THE GLOBAL SCALE, FROM THE PAST TO THE FUTURE

Resumen de la Memoria:

My research interests are framed within the interactions between agricultural activities and agronomic and environmental performance with special emphasis on the alteration of the N (and P) cycle and greenhouse gas (GHG) emissions. I am also focused on the particularities of Mediterranean areas and in the study of best management options to reconcile productivity and environmental quality.

Throughout my career (including, after my PhD 3 years in Spain, 3.5 years in France and 2.3 in The Netherlands) I have studied the dynamics of the nutrients in agricultural systems from the plot to the global scale, including the river basin and the country scale, the past trend perspective and the future scenarios construction. I am also directing a thesis devoted to the study of the potentiality of different agricultural management practices to mitigate GHG emissions in the Mediterranean region.

I am deeply involved in the study of the nutrient ,use efficiency of the cropping and livestock systems as indicators for a better nutrient management. I have worked in the Netherlands Environmental Assessment Agency (PBL) contributing to the improvement of the agricultural modules of the most internationally reputed integrated model to assess the global environment (IMAGE). I have worked in departments very linked to the environmental management and policy, particularly in Paris (CNRS/UPMC) and at PBL and the results of my research at different scales have been used or oriented to advice policy makers.

Currently, I am at a very productive stage of my career as I am collaborating with internationally recognized researchers in several studies on sustainable cropping and livestock systems. I am also involved in international networks and consortiums related with my topic of research such as the International Europe Nitrogen Initiative, and the UNEP-FAO Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) among others.

Although I have been out of Spain in the last six years, I have maintained closed links and collaborative research with many Spanish researchers working in this field. In fact, I am currently co-leading the creation of a Spanish initiative to perform the proposed research, in close collaboration with professors Miguel Quemada and Antonio Vallejo¿s teams at UPM. This consortium would be built with the cooperation with scientists currently participating in the Spanish network REMEDIA, the Red de Excelencia SIRENA (Spanish Initiative Research in Efficiency of N in Agroecosystems) the H2020 project Solutions for improving Agroecosystem and Crop Efficiency for water and nutrient use (SoilACE).

Resumen del Currículum Vitae:

I spent my pre-doctoral stay at the Universidad Complutense de Madrid (UCM), period 2002-2007. After finishing my PhD grade in June 2007 I worked for 1 year as Head of the Bureau of Environmental Management of Alcalá de Henares University (UAH), Spain, coordinating the Programme of Environmental Quality of the UAH. Then I joined the UCM in close collaboration with CIEMAT as a postdoctoral fellow (2 years contract) to work in a project on agricultural nutrient pollution in large river basins in a project funded by the Spanish Ministry of Environment led by Dr. B.S. Gimeno. In 2010 I moved to Paris working for almost 4 years in the Research Group of Profs. G. Billen and J. Garnier (CNRS/UPMC) to follow up on the study of N flows (6 months funded by the European Science Foundation and 1 year by the Research in Paris Programme conducting a project as IP). In the last period in Paris I worked funded by FP7-ERANET (2 years contract). In October 2014 I was contracted as a Senior Scientist by the Netherlands Environmental Assessment Agency (PBL) to improve the feed, livestock and nutrients in crops module of the Integrated Model to Assess the Global Environment IMAGE. During these years I have established high quality research collaborations with researchers from 7 European and 2 American countries and I have also participated in 16 research projects funded at the regional, national end European level. I also participated in the Modelling Advisory Group for the preparation of a GEF-INMS-UNEP proposal. I was recently invited to join to join the European Nitrogen Experts Panel.

During my career I have published 38 SCI contributions (23 of them in the last 3 years): 10 as 1st and corresponding author (6 in first quartile (1Q), 3 in 2Q), 4 as a senior author (all in 1Q) and 12 as a second author. 26 papers in 1Q journals and 8 in second quartile journals. My H factor is 14 (Web of Science, WOS) and 17 (Google Scholar). According WOS (access 20-1-2017), my articles have been cited 482

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

times (390 without self-citations), with 185 citations only in 2016. Many of my paper have a high number of citations. 15 papers with 10 or more citations of which 10 papers have 20 or more citations.

I am currently living a highly productive period, 2 papers are currently under review and other 6 will be submitted during the next months. I have also published 3 book chapters, 4 scientific reports, 20 conference proceedings and 5 popularization documents. I have contributed to 27 international conferences (10 invited talks, 17 oral communications and 12 posters; 14 of these contributions as a first author). I have lectured 300 hours at university grades and masters supervising one PhD thesis and 3 Master thesis. I have edited a Special Issue for the journal Agriculture, Ecosystems & Environment being co-corresponding author about mitigation of GHG in Mediterranean cropping systems. I am a regular reviewer of high impact journals including Nature, PNAS, Nature Geosciences and Nature Scientific Reports.

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

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Título:

From Wastes To Resources: Microbial Community Changes In Aerobic And Anaerobic Waste Treatments And Posterior Application To Soil

Resumen de la Memoria:

Throughout my research career as a microbial ecologist, I have developed my current expertise and research lines in the field of Soil Microbiology and Organic Waste Management. In 2003 I finished my Degree in Biology at the University of Santiago de Compostela. In the same year I was awarded a two-year predoctoral grant from La Xunta de Galicia to study for my diploma of advanced studies at the University of Vigo. In 2006, I gained a FPU grant to carry out my PhD thesis focused on the relationships that detririvore earthworms establish with microorganisms during the process of vermicomposting and to evaluate the potential of using vermicompost as a soil amendment. In 2010 I successfully defended my PhD thesis that was awarded the Premio Extraordinario de Doctorado by the University of Vigo. In 2011, I was awarded a highly competitive two-year postdoctoral grant from the Fundación Alfonso Martín Escudero that allowed me to continue my research in the Institute of Microbiology at the University of Innsbruck. My research activities fall within the area Microbial Resource Management, and are linked to the study of waste products derived from bioenergy processes such as anaerobic slurries and wood ash. In particular, I am broadly interested in understanding how the addition of these products into soil may affect the structure and function of microbial communities and, ultimately, the maintenance of soil fertility. In my current institution, the University of Innsbruck, I have also successfully broadened my research topic towards the study of both direct and indirect impact of climate change on microorganisms and the capacity for such effects to amplify or dampen carbon cycle feedbacks in sub- and alpine soils. I am particularly proud of leading my own research group and to date, I have supervised a PhD thesis obtaining the maximum qualification and several bachelor and master theses. Moreover, I am able to secure funding to continue my research thanks to the recent and ongoing projects led by myself. Apart from this I also had a main role in the acquisition and implementation of a 4-year project within the Horizon 2020-research and innovation program. Furthermore, I have been invited to review several international project proposals, and to take part in PhD committee theses over the last years. Additionally, I act as a frequent reviewer of SCI journals and in particular, I am an editorial advisory board member of the scientific journals Applied Soil Ecology and EC Microbiology. All in all, this helped me to get a positive evaluation for the figure of Contratado Doctor by the ANECA.

Resumen del Currículum Vitae:

Since I began my scientific career in 2003 until the present date I have been working in the field of Soil Microbiology and Organic Waste Management. My interest in this research field started at the University of Vigo where I was awarded a four-year FPU grant to carry out my PhD thesis dealing with the use of aerobic processes for the treatment of a wide variety of solid organic wastes. Thanks to a two-year postdoctoral grant from the Fundación Alfonso Martín Escudero I started my PostDoc studies in the Institute of Microbiology at the University of Innsbruck. Afterwards, and thanks to the Austrian Science Fund that is the most important funding agency in Austria, I have been able to continue working as a Senior PostDoc and lead my research group at the University of Innsbruck. My research activities fall within the area Microbial Resource Management, and are linked to the study of waste products derived from bioenergy processes such as anaerobic slurries and wood ash and their impact in soil microbial communities. I was responsible for the supervision of a PhD thesis that obtained the maximum degree at the Institute of Microbiology. Moreover, I am currently supervising another PhD thesis, along with several Master and Bachelor theses. Furthermore, I have been able to secure funding to continue with my research acting as PI and co-PI of recent projects funded through competitive calls. I also played a relevant role in the acquisition and implementation of a 4-year project within the Horizon 2020 programme in co-operation with the Austrian company BioTreaT. I acted as a reviewer for international project proposals, and as a member of the committee of national and international PhD theses. I carried out a short research stay at the University of Lund and at the University of Florence. I have published 30 peer-reviewed papers in SCI journals and five book chapters. Eighty percent of my publications are within the first quartile, and although most of them are very recent, some have already been highly cited. One of my publications was awarded the first prize by the Plataforma Tecnológica de Agricultura Sostenible for being the best scientific article in the field of sustainable agriculture. Moreover, I act as a frequent reviewer of SCI journals and I belong to the editorial committee member of the scientific journal Applied Soil Ecology. Moreover, my research have been presented and defended in a good number of national and international conferences as posters and oral presentations. All in all this has helped me to get a positive evaluation for the figure of Contratado Doctor by ANECA in March of 2015.

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

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Título:

FUNGICIDE MANAGEMENT TO AVOID RESISTANCE IN BIOTROPHIC AND NECROTROPHIC FUNGI ON KEY HORTICULTURAL CROPS

Resumen de la Memoria:

Diseases are a major source of crop and plant damage that can be caused by a number of plant pathogenic organisms, being fungi the number one cause of crop loss worldwide. Fungicide treatments are, and will remain, essential for maintaining healthy crops and high-quality yields. They are a key component of integrated crop management; however, their continuous use has caused in many fungal pathogens the appearance of resistant isolates soon after their introduction in the market. Monitoring for fungicide resistance is vital to determine whether resistance management strategies are working. I have a very strong background in this subject dealing during the last 14 years with detection, molecular characterization, and management of fungicide resistance in several biotrophic and necrotrophic plant pathogenic fungi. I was also interested in relating resistance to the genetic structure and diversity of populations. After obtaining a MSc (2005) and PhD degree in Biology at the University of Malaga (2007), I acquired a solid experience in fungicide resistance studying with several multidisciplinary approaches, the geographical distribution and molecular bases of resistance to QoI fungicides in the cucurbit powdery mildew Podosphaera fusca (9 JCR publications). My scientific career has been completed in two world-leading international research institutions in UK and the US, performing cutting-edge research in laboratories lead by the most outstanding researchers in their fields. At Rothamsted Research (UK, 2008-2011), I continued perfecting my background on fungicide resistance, dealing with Mycosphaerella graminicola isolates, the causal agent of Septoria leaf blotch disease in wheat, with reduced sensitivity to azole fungicides. After be awarded with a Spanish postdoctoral fellowship, my studies were focused in the use of Fusarium spp., causal agents of Fusarium head blight in wheat, as indicators for climate change and studying the evolutionary resolving power of the CYP51C gene to distinguish several Fusarium spp. (3 JCR publications). At Clemson University (USA, 2011-2014), a complete detection, molecular characterization, and management of fungicide resistance in Botrytis cinerea, causal agent of gray mold disease on strawberry, were carried out (18 JCR publications). During this stay was very relevant the development of a novel fungicide resistance monitoring program that helped hundreds of growers to make more informed decisions on fungicide use. I have been able to obtain funds from competitive calls to finance my research abroad (Spanish Postdoctoral grant 2009, and Marie Curie COFUND fellowship in 2012), and establish my own research line in Spain as PI (ComFuturo Program, 2015). My research line is going to provide not only relevant information on occurrence, distribution and molecular mechanisms of resistance but also a significant practical application for a better management of two important fungal diseases on strawberry (2 JCR publications).

Resumen del Currículum Vitae:

I have participated in 17 research projects (3 as PI, and 4 as Co-IP) in three countries (Spain, UK, and USA) which resulted in 32 peer-reviewed SCI publications (22 research articles; 10 Plant Disease notes; h-index 14), 22 as first author (69% of the total), 23 Q1 (included in the top 25% of their category; 72% of the total); 3 book chapters; 51 conference presentations (6 as invited speaker). The results of my research have also generated 37 dissemination activities (11 popular agricultural articles, 7 invited informative talks, 13 media interviews, and 6 media news related with my research studies).

I applied for and obtained two competitive postdoctoral grants, one from the Subprograma de Estancias de Movilidad Postdoctoral en el Extranjero (Ministerio de Ciencia e Innovación/Fullbright) in 2009; and from the Marie Curie COFUND programme (UMA, the European Commission FP7, and the Ministerio de Economía y Competitividad) in 2012, which resulted in two postdoctoral stays in UK and USA performing cutting-edge research in laboratories lead by the most outstanding researchers in their fields. At Rothamsted Research (UK, 34 months) my research generated 3 first author D1 (included in the top 10% of their category)-SCI publications and at Clemson University (USA, 40 months), 18 SCI publications (12 first author; 12 Q1).

My research has always led to significant practical applications, including the development of a novel fungicide resistance monitoring program that has helped hundreds of growers in the US and Spain to make more informed decisions on fungicide use. The dissemination of my results has been featured in news, radio and newspapers interviews, popular agricultural magazines, received several awards, including three personal ones, and distinctions including, among others, from the American Phytopathological Society. Some of our publications have been the most read article, the most downloaded publication or the best research article of the month of the journal Plant Disease.

In September 2015, I obtained funds (159.000) from the competitive call ComFuturo (CSIC General Foundation), establishing my own

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

research line as PI at the IHSM-UMA-CSIC La Mayora. My research project was the only one funded in Agricultural Science. I have supervised 5 degree projects, 1 Master student, 4 internship students, and 2 PhD students in short stays. Currently directing a PhD student and 2 degree projects. I have been invited to act as a reviewer for diverse PhD thesis, international projects, and leading JCR journals in the fields of Agriculture and Plant Sciences being Associate Editor in the Editorial Board of the journal Plant Disease (Q1 in Plant Sciences). Active member of several scientific societies and specialized groups.

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

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Título:

Evaluación de la contaminación de suelos agrícolas: comportamiento químico y efectos sobre los microorganismos

Resumen de la Memoria:

Mi carrera investigadora se ha centrado principalmente en el en el campo de la contaminación de suelos dedicados a la agricultura intensiva por metales pesados y compuestos orgánicos. Entre los años 2004 y 2008 mi trabajo se centró fundamentalmente en la dinámica y distribución de cobre en suelos de viñedo. Tras la defensa de mi Tesis doctoral en Mayo de 2008 (Presencia distribución y dinámica de cobre en suelos de viñedo) inicié una nueva línea de investigación enfocada al estudio de los efectos de la contaminación del suelo sobre los microorganismos que habitan en él. Esto supuso un reto importante ya que requirió una perspectiva multidisciplinar de la investigación a realizar y el aprendizaje de nuevas técnicas metodológicas y analíticas (PLFAs, incorporación de sustratos marcados con 3H y 14C para determinar el crecimiento de comunidades bacterianas y fúngicas, PICT). Para ello inicié una importante labor de contacto con otros grupos de investigación que me llevaron a realizar distintas estancias de investigación tanto dentro de España como en el extranjero (Instituto de Investigaciones Agrobiológicas de Galicia, Instituto de Ciencias Agrarias, ambos del CSIC; así como en la Universidad de Lund en Suecia y la de Copenhague en Dinamarca). En total realicé 59 meses de estancias postdoctorales, durante las cueles he participado en diversos proyectos de investigación internacionales (3). He abordado además otras temáticas como la Adsorción/desorción y transporte de contaminantes (orgánicos e inorgánicos) en suelos ácidos cultivados y la Valorización agro-ambiental de residuos. Recientemente he orientado mi investigación hacia el uso de la tolerancia de las comunidades bacterianas a los contaminantes como indicador directo de la toxicidad de metales pesados sobre los microorganismos. Actualmente, y dentro de esta línea de investigación, soy IP del proyecto Evaluación de la contaminación del suelo por metales pesados. Utilización de las comunidades microbianas del suelo como indicadores del uso sostenible del territorio financiado por el Ministerio de Economía y Competitividad del Gobierno de España.

Resumen del Currículum Vitae:

He publicado 58 artículos en revistas SCI, 41 de ellos (71%) en revistas del primer cuartil del SCI 2015. En 29 de los 58 artículos he sido primer autor, en 4 último autor y en 5 de ellos autor de correspondencia (en los que no figuro ni de primer ni de último autor). Además he publicado 2 capítulos de libro internacionales y 62 comunicaciones a congresos. Mi actividad internacional es elevada. He realizado 4 años y 2 meses de estancias postdoctorales en centros de investigación extranjeros. En la Universidad de Lund (24 meses) he trabajado con el profesor Erland Bååth, pionero en el estudio del crecimiento de las comunidades bacterianas y fúngicas del suelo utilizando sustratos marcados con 3H y 14C. En colaboración con el profesor Bååth he trabajado en los proyectos internacionales The activity of fungi and bacteria in soil y Pollution effects on soil microorganisms. Posteriormente fui seleccionado en concurso competitivo para trabajar en el proyecto PICT-RISK: Evaluation of pollution-induced community tolerance (PICT) as an ecologically relevant effect and exposure indicator for RISK assessment of biocides en la Universidad de Copenhague (26 meses). En este proyecto, junto al profesor Kristian Koefoed Brandt, contribuimos a mejorar la técnica PICT para la detección de efectos adversos de la contaminación del suelo sobre los microorganismos. Además he colaborado con científicos de otras universidades como la de Aarhus en Dinamarca o la de Bangor en el Reino Unido. Durante mis estancias en las Universidades de Lund y Copenhague también he desarrollado actividades docentes en cursos de posgrado. Otros méritos de relevancia son estancias en centros españoles de relevancia internacional (Instituto de Investigaciones Agrobiológicas de Galicia del CSIC en Santiago de Compostela, 5 meses; Instituto de Ciencias Agrarias del CSIC en Madrid, 6 meses); ser censor de 77 artículos de revistas del SCI; ser premio extraordinario de doctorado de la Universidad de Vigo; ser miembro de comités de evaluación de tesis doctorales y proyectos de fin de carrera; o ser docente en titulaciones de grado y posgrado, tanto en universidades españolas como extranjeras (Universidad de Vigo, Universidad de Lund y Universidad de Copenhague). Mi actividad investigadora ha sido evaluada positivamente ANECA para ejercer como Profesor de Universidad Privada, Profesor Ayudante Doctor, Profesor Contratado Doctor y Profesor Titular de Universidad. Actualmente mi índice H es de 17. Mi experiencia me capacita para liderar mi propia línea de investigación, ya que he participado en numerosos proyectos de investigación, tanto en España (12) como en el extranjero (3), siendo en dos de ellos el investigador principal. Además ha sido responsable del laboratorio de Biología de Suelos del grupo AA1 de la Universidad de Vigo y responsable de equipamientos singulares como el Contador de Centelleo Líquido. Tengo amplia experiencia en la dirección de proyectos fin de carrera (8), tesis de licenciatura (1) y actualmente dirijo 1 tesis doctorales. En la actualidad soy Investigador Principal del proyecto Evaluación de la contaminación del suelo por metales pesados. Utilización de las comunidades microbianas del suelo como indicadores del uso sostenible del territorio financiado por el Ministerio de Economía y Competitividad del Gobierno de España.

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

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Título:

Integration of Next-Generation Genotypic and Phenotypic Data for Future Crop Improvement

Resumen de la Memoria:

La carrera investigadora del solicitante, Pedro José Martínez García, ha estado ligada a la mejora y a la genómica de especies leñosas abarcando desde frutales de hueso (Prunus) a especies forestales. Su carrera ha estado marcada por el estudio de caracteres agronómicos de interés en diferentes especies así como por el uso de herramientas genómicas y recursos bioinformáticos para la obtención de mapas genéticos de alta densidad en diferentes especies, la secuenciación, ensamblaje y anotación de genomas complejos de varias especies y la implementación de nuevas estrategias de mejora a través del uso de herramientas genómicas en los programas de especies leñosas. Así, durante su etapa Pre-Doctoral el solicitante se centró en el estudio de los factores que afectaban a la fructificación y producción del almendro, adquiriendo formación en mejora clásica de frutales. Sus resultados han contribuido a un cambio en el sistema de cultivo del almendro a nivel nacional, promoviendo el cultivo de plantaciones monovarietales, utilizando variedades auto-compatibles y de floración tardía. Durante su etapa Post-doctoral, el solicitante codirigió un proyecto (354,096.51) para el desarrollo de herramientas genómicas para melocotón y almendro en el programa de mejora de la Universidad de California, Davis. Durante esta etapa el candidato desarrolló un mapa genético de alta densidad usando un elevado número de marcadores SNPs, obtenidos tras la secuenciación de los genomas de dos variedades de melocotón y un híbrido inter-específico de almendro y melocotón. El solicitante identificó diferentes regiones del genoma asociadas a caracteres importantes de calidad del fruto y asociadas a diferentes síntomas relacionados con daños por frio en postcosecha. Tras su primera etapa de Post-doctoral, el solicitante fue contratado por el Profesor David Neale, para su participación en un proyecto de secuenciación de varias especies de coníferas. Durante esta etapa el solicitante trabajó principalmente con datos obtenidos con tecnologías de secuenciación masiva, con lo que el solicitante adquirió un fuerte conocimiento bioinformatico. El solicitante contribuyó al desarrollo de mapas genéticos ultra densos para mejorar el ensamblaje del enorme genoma de Pinus taeda (22Gb). El solicitante además ha realizado la secuenciación masiva de ARN, tecnología conocida como RNA-seq, para obtener el ensamblaje y anotación del transcriptoma de sugar pine (Pinus lambertiana). Tras este periodo postdoctoral, el solicitante fue contratado como asistente de investigación por el Profesor Neale, para co-dirigir un proyecto de cinco años financiado por la California Walnut Board y dotado de 2 millones de dólares (1.920.800/4años), el objetivo del proyecto y del solicitante es la implementación de herramientas genómicas y el desarrollo de modelos de selección genómica en el programa de mejora clásica de nogal (Juglans regia) de la Universidad de California, Davis. El primer gran resultado de este proyecto, y del solicitante, es la obtención de la primera secuencia completa del genoma de nogal. Además de sus resultados científicos, a nivel profesional el solicitante ha desarrollado y consolidado una fuerte red de contactos, como mejoradores, genetistas, biólogos moleculares y bioinformaticos, pertenecientes a algunas de las universidades más importantes de EEUU y Europa.

Resumen del Currículum Vitae:

El solicitante, Pedro José Martínez García, es Ingeniero Agrónomo (2004) por la Univ. Miguel Hernández de Elche (Alicante) y Doctor (2009) por la Univ. de Murcia. En el periodo 2005-2009 disfrutó de una beca FPI, desarrollando su Tesis Doctoral dentro del Programa de Mejora del Almendro del CEBAS-CSIC. En el periodo 2009-2010 fue contratado en el Depart. de Mejora del CEBAS-CSIC. Posteriormente, fue contratado como postdoctorado en la Univ. de California, Davis (USA), fue Co-IP con el Dr. Carlos Crisosto del proyecto USDA NIFA #2008-35300-04432 (354,096.51).Durante esta etapa postdoctoral desarrolló herramientas genómicas para la mejora de Prunus. Después, fue contratado por el laboratorio del Prof. David Neale (2012-2014), y participó en un gran proyecto (PineRefSeq) de la Fundación Nacional para la Ciencia de los EEUU. Este proyecto (PineRefSeq) fue financiado con 14 millones de dólares con el objetivo de obtener el genoma completo de varias especies de coníferas. Entre sus logros científicos destaca la participación en la secuenciación del genoma de Pinus taeda y Pinus lambertiana, con 31 Gb P. lambertiana es el genoma mas grande (siete veces mayor que el genoma humano) publicado en la actualidad. Una vez concluida su etapa postdoctoral, fue contratado como asistente de investigación en el mismo laboratorio. Posteriormente, lideró como Co-IP junto con el Prof. David Neale el proyecto Application of Molecular Breeding in the Walnut Improvement Program (MB/WIP) (1.920.800/4años), para la secuenciación del genoma de nogal y desarrollar recursos genómicos para su implementación en el programa de mejora genética de nogal de UC Davis. En Diciembre 2016, el candidato ha sido seleccionado y contratado por un año como Discovery Scientist por Monsanto, para liderar una línea de investigación en genómica y bioinformática con el objetivo de descubrir genes de interés comercial en vegetales. A continuación se presentan los méritos del candidato agrupados según los criterios de evaluación de la convocatoria.

A. Méritos curriculares:

- Aportaciones: 33 artículos publicados en revistas científicas y 36 trabajos presentados en congresos.
- Actividad Internacional: el candidato ha colaborado con la Universidad de California, Davis (USA), Universidad de Connecticut (USA), Universidad John Hopkins (USA), Universidad de Texas A&M (USA), Universidad de Florida (USA), Universidad Nacional Autónoma de

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

México (UNAM), Universidad de Gante (Bélgica)
- Otros Méritos Curriculares: el candidato obtuvo la beca Juan de la Cierva en 2014, ha publicado 8 artículos de divulgación y ha sido evaluador de FONDECYT(Chile). Ha realizado varios seminarios científicos y clases en varias universidades americanas. Ha recibido una oferta de trabajo como profesor en la Univ. de O'Higgins de Chile.

B. Capacidad de liderazgo:

Ha participado en la formación de varios estudiantes de doctorado en la Univ. de California, siendo co-autor de 2 publicaciones como resultado de esta interacción. Respecto a la movilidad internacional, ha estado mas de 70 meses en la Universidad de California, Davis. Entre las publicaciones incluidas en la WOS con índice de impacto, figura como primer autor en 13 artículos. Sus artículos han sido citados 345 veces con un índice H=10 (WOS 11/01/2017). Debemos destacar que ha participado en 11 proyectos de investigación (2 como Co-IP).

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

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Título:

Biotechnology of Oilseed Crops

Resumen de la Memoria:

Dr. Noemí Ruiz López main research focuses on enhancing the nutritional and industrial value of oilseed crops. Dr. Ruiz-Lopez started her research career as an internal student in the Faculty of Biology (University of Seville, 1998). In 2000, she got her degree in Biological Sciences (University of Seville). Dr. Ruiz-Lopez did her PhD at the Instituto de la Grasa (CSIC). Her thesis was entitled Characterization of the acyltransferases system in developing sunflower (Helianthus annuus L.) seeds. Cloning of a heterotrophic ferredoxin. In 2003, Dr. Ruiz-Lopez had also the opportunity to work at the School of Biosciences (Cardiff, UK) in the lab of Prof. J.L. Harwood. After finishing her PhD, Dr. Ruiz-Lopez was employed as a Marie Curie Postdoctoral Researcher in Unilever R&D (The Netherlands) in the project: Characterization and modeling of enzymatically rearranged fats. In May 2007, Dr. Ruiz-Lopez was offered a permanent position as a Postdoctoral research scientist and she joint one of the most successful groups in Biotechnology of Plant Lipids in the world. Dr. Ruiz-Lopez worked in the group of Prof. Johnathan Napier (Rothamsted Research, UK) in The production of docosahexaenoic acid (DHA) in transgenic plants: a sustainable source of omega-3 fish oil and in Engineering oilseed to synthesize designer wax esters. During these years, Dr. Ruiz-Lopez has had a leading responsibility in the two projects above indicated; accordingly, she is the first author in most of the articles published out of her studies. Moreover, Dr. Ruiz-Lopez has productively mentored 3 graduate students conducting research in Prof. J. Napier s lab. In September 2013, Dr. Ruiz-Lopez was employed by ETSI Agrónomos (Universidad Politécnica de Madrid, Spain), where she worked in maximizing marine omega-3 retention in farmed fish: looking for a sustainable production of healthy food. In June 2014, Dr. Ruiz-Lopez moved to the Instituto de la Grasa (CSIC), Seville. Dr. Ruiz-Lopez was involved as a Postdoctoral Research Scientist in the development of ultra-high oleic sunflower lines for food applications. Additionally, she was leading the project which aims to establish Ricinus communis (castor) as a sustainable plant chemical factory to synthesize unusual fatty acids with significant added value for industry (other than ricinoleic acid) in seeds and to study the assembly of these fatty acids into triacylglycerols. Finally, the candidate has been recently awarded (throughout an extremely competitive process) a Marie Curie Individual Fellowship, entitled PLICO - Plant lipidome remodeling during cold acclimation , which budget is 170,121.60 EUR. This award will enable Dr. Ruiz-Lopez to spend two years (January 2016 2018) working with the research team of Prof. Miguel Angel Botella at the University of Malaga.

Resumen del Currículum Vitae:

The ability of the candidate to conduct high quality and innovative research is demonstrated by her strong publication record along with her scientific research lines. During her career, Dr. Ruiz-Lopez has developed research of excellence using multidisciplinary approaches and she has had a close interaction with the most qualified international groups in Biotechnology of Oilseed Crops, keeping long-standing collaborations with many of them: UK, Germany, Sweden, France, USA, Australia and others. The candidate has more than seven years of international postdoctoral experience As a result, she has already published 29 scientific documents (23 peer reviewed SCI articles, 11 as first author) in many in high impact factor journals (Metab. Eng.(1), Plant Biotech. J.(6), Plant J.(1), Prog. Lipid Res.(1), J. Exp. Bot (1) and Metab. Eng. Com.(1). These papers have received >480 citations and the candidate H-index is 12 (Source: SCOPUS). Dr. Ruiz-Lopez is also an inventor in two international patents (WO/2011/161093 and WO/2013/153404). Dr. Ruiz-Lopez has extensively contributed in national/international meetings (32 meeting presentations, 18 selected as oral presentations including 3 invited/keynote talks). Dr. Ruiz-Lopez has been directly involved in 14 R&D projects funded in competitive tenders and 4 R&D projects funded by companies. Moreover, Dr. Ruiz-Lopez is co-directing a PhD Thesis and she has productively mentored 3 Master Theses. She usually participates as external referee in SCI journals. Her exceptional results have been recognised by Rothamsted Research with 2 Exceptional Performance Awards (years: 2009, 2011) and she has been awarded with the Paul Stumpf Award (2012): designated to the most promising early-career researcher in Plant Lipids. Finally, she has been recently awarded (throughout an extremely competitive process) a European Marie Curie Individual Fellowship to continue her research at the University of Malaga.

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

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Título:

Biotic interactions in Mediterranean environments: Applications for regeneration and conservation of forest and agroforestry systems

Resumen de la Memoria:

During the last year of my first degree (2005-2006), I was funded by the Ministry of Education with a Research Initiation Grant in Rangeland Ecology and Management where I studied the effects of large herbivores on forest composition and the implications for vegetation conservation. Following this, I was granted with a PhD fellowship to do my doctoral thesis in Forest Ecology (seed dispersal and regeneration of temperate forests). During my PhD, I carried out several research stays abroad. First, in United States (University of Nevada) where I received an outstanding training on plant-animal interactions in the context of Forest Regeneration and, then, at the Centre for Ecology and Hydrology (Oxford, UK) where I was trained in seed dispersal by abiotic factors (modelling the spread rate of wind-dispersed plants under different scenarios of climate change). All this allowed me to develop new tools and novel insights into the dispersal process of trees, particularly on the complex plant-animal interactions. Then, in 2011, I moved for a post-doctoral stay at the Doñana Biological Station (CSIC, Spain) where I focused my research on mutualisms and their spatio-temporal variation, describing the complexity and conditionality of mutualism-antagonism continuums. In 2012, I was appointed Postdoctoral Researcher at the Technical University of Madrid where I worked on several research projects funded by the Spanish National Parks Agency and the Ministry of Science. I mostly focused my research on biotic interactions, particularly herbivory and plant-plant interactions (plant facilitation), in search for ecological and management solutions for an increasing shortage of natural regeneration in Mediterranean ecosystems.

Then, in 2013, I was awarded a Marie Curie International Outgoing Fellowship (IOF) to develop the project BIOSTRESS -Linking biotic and abiotic stress into the net outcome of plant interactions- at Stanford University (USA), where I focused my research on the response of woody plants and Mediterranean forest systems to current global change, using simultaneous and increasing levels of biotic and abiotic stress. My 2-years fellowship in Stanford University represented a milestone to develop more complex and innovative questions, including new aspects of global change biology, biodiversity conservation and applied ecology in order to successfully implement restoration and forest management techniques. I also developed a complex model on the demography of oaks (Quercus spp.), incorporating detailed knowledge on the transition probabilities of their regeneration cycle and their vulnerability to anthropogenic changes. In 2015, I was appointed Lecturer at the School of Sciences and Humanities (Stanford University) where I have been teaching Plant Biology, Ecology and Evolution (as main instructor and coordinator) as well as advising graduate and undergraduate students. During my last 2 years, I combined teaching and advising students with research on Ecology, Conservation and Management of Mediterranean forest and agroforestry systems, particularly to ensure their sustainability as a result of anthropogenic changes. I believe that a Ramón y Cajal fellowship would strongly boost my research capacities, including research management, fund raising and leading and would provide a promising added value to the Spanish scientific community.

Resumen del Currículum Vitae:

I earned my first University degree in 2006 (Forest Engineering, 6 year-courses, Polythecnical University of Madrid) with maximum grade (Sobresaliente), and 1-year course at the Swedish University of Agricultural Sciences (SLU, Uppsala). I also earned an Inter-University Master¿s degree in Restoration Ecology (Master thesis with maximum grade; UAH, UCM, URJC and UPM) and a second University degree in Environmental Sciences (UNED, 2009). In 2011, I successfully defended my doctoral thesis with Summa cum laude and European Mention, receiving 2 Awards (Extraordinary Doctoral Award and Best Doctoral Thesis by the Spanish Society of Terrestrial Ecology, AEET). During this period, I did several research stays, including University of Nevada (USA) and Centre for Ecology and Hydrology (Oxford, UK).

From 2011 to 2014, I worked as a postdoctoral researcher, first at Doñana Biological Station (EBD, CSIC, Spain) and, then, at the Technical University of Madrid (UPM). Then, I was awarded a Marie Curie International Outgoing Fellowship (IOF) to join Stanford University (USA). There, I developed the research project BIOSTRESS Linking biotic and abiotic stress in the net outcome of plant interactions-. In 2015, I was appointed Lecturer (Profesor Contratado) at Stanford University where I have been teaching Plant Biology, Ecology and Evolution as the main instructor and coordinator as well as advising graduate and undergraduate students.

During my research career, I have been the author and co-author of 63 publications (5 books, 15 book chapters and 43 scientific articles). Twenty seven (27) of the articles are included in the SCI (in 18 of them I was the first author and in 2 the senior author), with an h-index of 13. Most of the SCI articles (70%) have been published in top-ranking journals (Q1) of my research areas: Forestry, Ecology, Biodiversity Conservation, Zoology and Plant Sciences.

AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2016

Turno de acceso general

Since 2005, I have participated in 20 Research projects (3 International, 7 from National Plans and Spanish National Parks, 9 from Autonomous Communities, and 1 from Biodiversity Foundation) and I am currently the Principal Investigator of a competitive research project funded by the Spanish Society of Terrestrial Ecology (AEET) to conduct in collaboration with the Federal University of Minas Gerais (Brazil). I have presented 24 communications in national (11) and international (13) conferences and I organized different symposia in international meetings. Since 2014, I am a member of the review panel for the US National Science Foundation (NSF). I have worked as a reviewer for 34 JCR journals in the areas of Forestry, Ecology, Biodiversity Conservation, Zoology and Plant Sciences. I have been the major advisor of 7 Final Projects (PFC), 1 International Bachelor thesis, and 2 Master Theses. Currently, I am co-advising 3 PhD students. I was also the major supervisor of 7 international students (undergraduate level. Biology and Earth Sciences degrees. Stanford University). I have also published in popular journals and in the popular media (22 articles), and I received the Second Award for Popularization of Science (Premio Divulgación Científica, FECYT) and 2 Awards for the best poster presentation. Since 2012, I have the ANECA accreditation for Lecturer (Profesor Contratado Doctor) and, recently, in 2016, I received the UPM Excellence Award for my research trajectory (Research Projection Award for researchers under 35).