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AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023

Turno RYC-INIA-CCAA

Área Temática: **Ciencias agrarias y agroalimentarias**

Nombre: ESPINOSA RUIZ, CRISTOBAL

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Título: Immunobiology and antioxidants for aquaculture

Resumen de la Memoria:

My research activity begins on 2006 on 'Nutrition Lab team (UMU), where I collaborated in the development of two projects first as student, but after I did my Master thesis and PhD thesis. In that period (2006-2015), I was able to set up and develop different techniques for the evaluation of antioxidant, polyphenols and oxidative stress. We studied the effects of polyphenols administered for long-time (1 year) against the oxidative stress produced by chemotherapy by collaborating in two projects (1 National and 1 European) and I defended my doctoral thesis in antioxidant and oxidative stress at the UMU in 2015. After that, I had the opportunity of change my research line being hired as researcher on Fish Innate Immune System group (UMU), focused in the immunology of marine farmed fish. This period (2015-2017) gave me, not only the opportunity of learn a wide range of techniques (molecular biology, cell biology, histology, immunology, microbiology, pathology), but gave me the chance to connect the knowledge in antioxidants and oxidative stress and stablish new relationships with teams focused on fish immune system. We worked with pro- and prebiotics, immunostimulants, new cell lines development, pollutants and micro- and nanoparticles. In this regard, I have collaborated on 4 projects, maybe the most important was the European project EPHEMARE (JPI Oceans), on microplastics. In this period, I published about 22 articles and a book chapter, as well as 22 communications. In 2017, I obtained a position as researcher in the Department of Earth and Marine Science of University of Palermo (Italy), where I worked in the national (Italian) project CISAS International centre of advanced study in environment, ecosystem and human health until November of 2019. This period (2017-2019) allows me to apply all my previous experience in the evaluation of ecotoxicological effects of new emerging contaminants for marine environment, in vivo and in vitro study of different mixtures of emerging pollutants. I produced 8 articles and 5 communications to congresses. Then, I obtained a position as PhD researcher again on Fish Innate Immune System group (UMU). Since 2019, I worked on AMPs, probiotics, post-biotics, cell migration, skin regeneration, collaborating in 2 projects. I have developed a patent together with my Indian collaborator in 2023. Recently, I obtained funding for my project on the study of fatty liver disease in fish, which has started in January 2023 and will last about two years ('ThinkINAzul', supported by MCIN with funding from European Union NextGeneration EU). The global aim of the proposed research line is to improve the knowledge regarding the development of the fatty liver disease (FLD) on fish establishing an in vivo FLD model using a Mediterranean specie as well in vitro tools. That advances may allow to study the FLD development from a metabolism, structural and molecular point of view, including possible preventive applications to FLD and/or treatments. In addition, the establishment of correlations between the data from fish with FLD and healthy ones, using invasive and non-invasive techniques may allow the evaluation of the FLD on farmed fish.

Resumen del Currículum Vitae:

Since 2011, I have has published 75 journal articles (50 on Q1 and the rest on Q2), 26 of them signed as first author while in 60 of them have international co-authors. In addition, I have published a book chapter with a foreign publisher and a special issue in Fish Physiology (Frontiers, 2023). The total number of citations of his works almost 1400 citations (01/02/2024; Scopus), having in the last five years an increased number of citations: 86, 183, 265, 345 and 352 (Feb-2024) since 2018 till 2023, respectively (Scopus 01/02/2024). The H index is 20 (Scopus 01/02/2024) and the Research-Gate Interest Score of 1,140. I have participated in 11 research projects (7 as a hired, 2 European, 2 Spanish nationals, 4 regionals (2 of them in association with enterprises); 1 Italian national project and the last was a regional proposal with European foundationand the last was as IP with European foundation (Next-generation). I have obtained the certification of Contracted Lecturer by ANECA. I have sent 45 communications to National and Internationals Congress, invited speaker on international congress, done seminars, two years of post-doctoral grant in Italy, 57 courses related to research and teaching and divulgation activities. I have done different teaching activities (such as lectures at UMU, science festivals, Biology Olympiads, teaching on BIR courses of COBRM 1st ed. 2022) and dissemination (such as different information events about microplastics (EPHEMARE project), Science Festivals in Murcia and Cieza (Spain) (editions 2017, 2019, 2021 and 2022), talks on the role of women in science in schools (2023), and different workshops and talks on aquaculture. I have been involved in the training of 6 different PhD students at UMU (all of them PhDs to date), as well as 3 in Italy, who have continued with their research career until today. Currently involved in the training of 5 doctors, the development of 2 master thesis and 2 professional education students. I am accredited since 2022 as an evaluator in the Agència Valenciana d'Avaluació i Prospectiva (AVAP) and I regularly participate in researcher evaluation activities, projects and other grants. Besides, I am a regular reviewer of scientific papers in MDPI and Frontiers journals, and member of the Editorial boarding of the internationally peer reviewed journals: IJERPH (IF: 2.468) since 2017, the European Journal of Pharmacology since 2018, Guest Associate Editor in Aquatic Physiology (4.755 Impact factor), and Review Editor in Comparative Immunology J. (8.786 Impact factor) since 2022. Overall, my work compiled in 65 journal articles, 1 book chapter and 1 special volume (as editor) has provided to me a high experience with the data curation and results discussion and presentation. I am the most experienced hired PhD in the research team being responsible for a team lab of 7 people.

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Área Temática: **Ciencias agrarias y agroalimentarias**

Nombre: MACAYA SANZ, DAVID

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Título: Genomic selection of adaptive and yield traits for accelerated breeding in forestry

Resumen de la Memoria:

I started my academic career in the lab of Dr. Gonzalez-Martinez in the Center of Forest Research (INIA), studying the genetic aspects of the ecology of Populus alba and tackling the genomics of reproductive isolation. That research led me to graduate as a Doctor under the co-supervision of Prof. Lexer at University of Fribourg (Switzerland), and funded by the FPI program. Right after, I collaborated in the lab of Dr. Juan A. Martin at Universidad Politécnica de Madrid, investigating the ecological functions and biotechnological applications of tree endophytes. That collaboration was followed by a 4.5-year postdoctoral fellowship at the West Virginia University, in the DiFazio□s lab working in genomic selection, genome evolution and breeding. Currently, I am a junior researcher in the ICIFOR (INIA-CSIC) with a grant from the Talent Attraction Program from the Community of Madrid. I am leading a project from the State Research Agency (AEI)□s Knowledge Generation Plan and just got granted with another project from the Community of Madrid, both as sole Principal Investigator (PI).

Most of the research I have conducted during my scientific career could be enclosed in the field of forest genetics, more specifically in the interface between genetics and tree biotic interactions, with an emphasis in genomics and bioinformatics. My main researching goal is to understand the genomic architecture of traits involved in tree production and adaptation, especially to biotic interactions both antagonistic (such as pathogens) and mutualistic (such as endophytes), and using that information as priors to improve genomic selection models to accelerate breeding.

To attain this goal, I am pursuing the following research lines: (1) describing and understanding the basics of tree genomic structure and functioning, with the use of novel and classical approaches of statistical genetics (linkage mapping) and genomics (de novo assembly and comparative genomics); (2) dissecting the genetic architecture of relevant tree traits (so far, the ones involved in growth and biotic interactions, but in future expanding to abiotic adaptation) using tools like QTL, GWAS and landscape genetics; (3) understanding the qualities of the interaction of trees with biotic agents (pathogens and endophytes) and how the genome affects that interaction; (4) applying all that information to create genomic selection models and other tools to accelerate breeding; (5) and, finally, since genomic selection models are greatly empowered by the addition of phenotypes, researching and adapting methods of high-throughput phenotyping of endophytic compositions and other traits to forest breeding.

Resumen del Currículum Vitae:

I have published 27 articles in high-impact journals (12 D1, 4 Q1, 11 Q2); seven as first author (4 D1, 3 Q1) and 9 as second author (mostly as PhD students□ tutor). I also have contributed to two book chapters (one in press). I have created several genotype and sequencing datasets, collaborated in the assembly of three reference genomes, proposed new approaches to forestry breeding by genomic selection and researched the ecological roles of tree endophytes. Based on Web of Science, my H-index is 14 and have 581 citations, and on Google Scholar, my H-index is 17 and have 890 citations. I have contributed with more than 41 items to congresses and conferences.

I am the sole PI of the project DEDGENE, funded by the AEI (ref: PID2021-127347OA-I00) and just received as well as a sole PI another project grant from the Community of Madrid (2023-T1/ECO-29053). I lead the investigation of adaptation and domestication signatures and genomic selection in stone pine, within the Project B4EST and the assembly of the elm genome within the "Convenio del Olmo (UPM-MITECO)". I got an Endeavour Research Fellowship from the Australian Research Council for a six-month stay, declined because it overlapped with another fellowship. I also got a grant for a three-months stay in the University of Copenhagen (ConGenOmics).

I have reviewed SCI-indexed articles in 43 instances, evaluated externally two PhD dissertations and a research project and been member of two PhD committees. I have been member of the organization board of a scientific congress and guest editor of a special issue. I have received the Seal of Excellence of Marie Sklodowska-Curie Actions 2019, the Certificado R3, a scholarship □Formación del Personal Investigador□ and a fellowship □Ayuda del Programa de Atracción de Talento de la Comunidad de Madrid□.

I have participated in two US federal projects, in a US federal project in collaboration with China, and in a European project. I have also been a member of the COST FRAXBACK Action. I have enjoyed a 4.5-year postdoctoral fellowship in the USA (West Virginia University). In addition, I have completed a total of 1 years of pre-doctoral stays (4 independent stays) in the US (University of California at Davis) and the UK (Kew Gardens, London). I have also done a three-month postdoctoral stay in Denmark (University of Copenhagen). Of my articles, 21 are the product of international collaborations and participation in international projects.

I have a patent granted on an industrial application of a tree endophyte. I collaborate with end users like policymakers (MITECO, Comunidad de Madrid, Junta de Castilla y León, Parliament of Sweden) and industry (Greenwood resources), having produced several technical reports and I have published a dissemination article.

I have co-directed four Master theses and am currently co-directing two PhD students.

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Área Temática: **Ciencias agrarias y agroalimentarias**

Nombre: BURÓN , GEMMA

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Título: Management of plastic waste pollution in agricultural soils

Resumen de la Memoria:

As a biologist specialized in agri-food biology and biotechnology, my research has always involved agricultural and food sciences, inseparably combining academic and industrial activities. My most notable contributions include: (i) a platform for the in vitro analysis of microbial degradation of polymers during my MSc; (ii) identifying proteins underlying the fruit defence response against abiotic (wounding) and biotic stress (fungi) during my PhD, which settled the bases for enhanced disease control strategies across important postharvest diseases; (iii) optimizing RNA extraction protocols to develop a ready-to-use kit, for rapid assessment of crop load programs and bitter pit disorder in apple fruit; (iv) discovering how a single gene loss determines the fermentation pathway used by lactic acid bacteria, paving the way to directly produce non-alcoholic beverages without dealcoholisation; (v) developing the first Carlsberg Sour beer; (vi) founding the SIEF delegation in Toulouse, an excellent platform to mentor young researchers and disseminate science (10,000 attracted for 2019-2022), and (vii) partaking in Inspiring Girls, an organization committed to elevate the aspirations of young girls by linking them to female role models. This has resulted in 11 peer-reviewed and influential publications, 1 invited book chapter, and 14 presentations at national and international conferences (1 invited), in addition to multiple instances of knowledge transferred back to the industry.

Most of my postdoctoral career took place in Denmark and France (7+ years), albeit I also realized short stays in reputed research institutions of Belgium and the USA during my PhD. Thanks to these, I have weaved an extensive network of renown scholars, national and international, that persist until today. I have also successfully supervised 5 students, all of whom pursued a scientific career afterwards. In France, my postdoctoral research was conducted in the prestigious Toulouse Biotechnology Institute, through a Marie Curie in which I was principal investigator (~190,000). Ever since, I focused my research on the biodegradation of polyethylene, the most frequent plastic polluting agricultural soils, an environmental concern of increasing importance. Immediate repercussions encompass soil degradation and reduced permeability, as well as disrupted nutrient cycles, ultimately reducing crop yield. Additionally, plastics can unleash toxic chemicals during decomposition, risking wildlife, food safety and consumer health.

Following my promising biodegradation results, I have been recently awarded with a follow-up Beatriu de Pinós fellowship (132,300), to further optimize microorganisms to biodegrade plastic waste in agricultural soils. This BdP is strategically conceived to bring back a new line of research into IRTA, which I am fully leading and deploying. I have already recruited 2 students and a postdoctoral researcher and secured funding for 2024 (~50,000), in addition to access to technicians provided by the host institution. I am IRTA's representative in the Waste Cluster, a Catalan government initiative fostering collaboration between scholars and companies for synergies. Altogether, my career delineates successful lines of research, funded by prestigious fellowships and institutions, collectively proving my proficiency to become a fully independent researcher

Resumen del Currículum Vitae:

Trained as a biologist by the University of Barcelona, my journey towards scientific independence includes: (i) the prestigious La Caixa foundation fellowship for my MSc studies (Research in Agro-Food Production Systems), (ii) an international PhD with stays in Belgium and USA (Agricultural and Food Science and Technology, University of Lleida), and (iii) 2 postdoctoral stays (Denmark and France), the latter as PI funded by the competitive MSCA-IF. After 7+ years of international mobility, I currently enjoy a BdP fellowship, strategically designed by the Catalan system to attract talented and well-connected researchers.

Along this journey, I have trained 5 young investigators, substantially boosting their professional development. My leadership and scientific responsibilities are also reflected by an invited talk and an invited book chapter, editorial tasks for the journal Frontiers in Industrial Microbiology (Agriculture section), reviewing tasks (~5 articles/year), the organization of one national and one international conferences, and actively volunteering in the platform Inspiring Girls (6 high school talks since 2020), among others. In 2019, I also founded in Toulouse the Society of Spanish Researchers in France (SIEF). Its management provided me further experience in leadership, including private funding acquisition for organizing dissemination events (10,000+ for 2019-2022, attracting ~50 attendees).

Despite the inherent conflicts between my fundamental and applied research, due to the exploitability of industrial results, I have notably published 11 articles10 of which are peer-reviewed (7 as first author, 2 as second to last, and 3 as corresponding author)in addition to the book chapter. My work has been also presented in 14 national and international conferences (1 invited), once recognized as best oral presentation. My trajectory also includes groundbreaking cases of knowledge transfer to the industry. Among my most standing contributions, the identification of proteins underlying the fruit defense response against abiotic (wounding) and biotic stress (fungi), settling the bases for enhanced control strategies in postharvest handling. I also discovered how a single gene loss determines the fermentation pathway used by Lactic Acid Bacteria (corresponding author), leading to the development of a new line of beverages at the Carlsberg Research Laboratory. This work finally upended with the market launch of the first Carlsberg Sour beer.

Since 2019, I am tackling plastic waste pollution in agricultural soils, initially with the MSCA-IF (184,707+10,000; France) and now as a BdP fellow (132,300). This fellowship has allowed me to initiate and lead a new research line at IRTA, targeting this invisible threat that negatively affects food production. My innovative research plans include recruitment of 2 students and a postdoc for 2024, and secured funding as co-PI through the IRTA Proof of Concept (6,000) and a contract with the company Derypol (43,076), to evaluate the impact of polymers as soil amendments. Additionally, I am the sole IRTA representative in the Waste Cluster, a governmental initiative fostering synergies between researchers and companies, to boost waste valorization efforts. Together, my trajectory shows scientific maturity, commitment, and leadership, as expected for fully consolidated researchers

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Área Temática: **Ciencias agrarias y agroalimentarias**

Nombre: GARCIA MORANTE, BEATRIZ

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Título: Health and welfare management of infectious diseases of swine

Resumen de la Memoria:

Current researcher at IRTA-CReSA, I have spent a great deal of my academic career working on research focused on providing insights into the pathogenesis and epidemiology of respiratory infectious diseases of swine. The knowledge background I have gained all along my research career has allowed me to lead and support research on swine health issues that are critical to the swine industry. One of my actual motivations is to bring to the sector easy-to-use decision support tools based on data, to mitigate both animal health and welfare burden, and promote sustainable meat production.

I completed my PhD degree in IRTA-CReSA, where I had my first contact with swine infectious diseases by assessing key factors to establish a successful Mycoplasma hyopneumoniae infection model in pigs. Thereafter, I worked as R+D project manager, both as part of an international pharmaceutical company and owning my own consultancy firm. Such job positions broadened my knowledge to other swine infectious diseases, increased outreach activities and relations with allied companies, and provided me with a more business-minded approach of research. For my postdoctoral training, I continued to build on my previous expertise in swine mycoplasmology by joining the Mycoplasma Research Laboratory of the University of Minnesota. My goal was to improve on diagnostics and epidemiology of swine mycoplasma species and to generate information that practitioners could use for control and elimination of these bacteria in the field.

My current position as a researcher at IRTA-CReSA is linked to a five-year Horizon 2020 project namely DECIDE, which states for Data-driven control and prioritisation of non-EU-regulated contagious animal diseases. This project brings together 19 partners from 11 European countries and involve about 80 people, gathering expertise from different scientific fields. Our main objective is to develop and evaluate data-driven decision support tools that will allow stakeholders in animal health and welfare management to take improved decisions on controlling animal diseases.

Taken all together, I have published 16 scientific articles in my research career, 13 as first or last author. I am or have been PI of two research grants funded through competitive calls in the USA and Europe and a contract with an industry partner. Almost all the research I have performed has been disseminated through national and international scientific congresses with either oral or poster presentations, or technical articles and books for knowledge transfer to the sector. I have also gained experiences in grant writing, undergraduate and graduate supervision, and teaching.

I envision myself consolidating the area of research I have started within the DECIDE project in IRTA-CReSA regarding technologies for sustainable livestock development, especially in terms of guaranteeing animal health and welfare. Thus, I am at integrating heterogeneous data streams into edible information that could assist stakeholders to make decisions. All in all, I think it will be very useful for the swine industry to integrate existing data to prevent the spread of pathogens, to react quickly in front any possible threat, or to promote tailored interventions for improved health and welfare outcomes.

Resumen del Currículum Vitae:

I received the Doctor of Veterinary Medicine degree by the Universitat Autònoma de Barcelona in 2012. One year after, I obtained my first master of sciences (MSc) degree in Advanced Immunology by the Universitat de Barcelona. From 2014 to 2017, I performed my PhD at Centre de Recerca en Sanitat Animal of Institut de Recerca i Tecnologia Agrolimentàries (IRTA-CReSA). Thereafter, I achieved a second MSc in Porcine Health and Management by the Universitat de Lleida.

My PhD was developed within the framework of the Industrial Doctorates Plan driven by the Catalan government of Spain, in close collaboration with the pharmaceutical company Boehringer Ingelheim. As a result, 3 articles published in Spanish scientific journals, 5 articles published in peer-reviewed, international journals, and a practical guidebook that has been published in three different languages (English, Spanish and Italian) were achieved. After the PhD, I was fortunate to experience research from the industry perspective. I worked as R+D project manager at the Boehringer Ingelheim Veterinary Research Center GmbH & Co.KG in Hannover (Germany) and started my own consultancy company afterwards. In both cases, I led and monitored a variety of multidisciplinary research studies and field trials in pigs, analysed data, and provided publications based on industry collected data, leading to numerous cross-team publications.

Thereafter, I obtained a postdoctoral position at the Department of Veterinary Population Medicine of the University of Minnesota (USA), where I continued to build on my previous training in swine mycoplasmology within the Mycoplasma Research Laboratory (MycoLab). As a postdoc, I participated as co-investigator in several projects and as principal investigator (PI) in a project rewarded in the 2020 Award for Advancing Research in Respiratory Disease. Moreover, I had the opportunity of supervising undergraduate and graduate students and providing support to academic teaching. The work done during this period has been translated in 2 scientific publications (including one review as first author) and three more manuscripts under preparation.

My current position at IRTA-CReSA is linked to a five-year Horizon 2020 project (DECIDE), aiming to develop data-driven decision support tools, which present (i) robust and early signals of disease emergence and options for diagnostic confirmation, and (ii) options for controlling the disease, along with their implications in terms of disease spread, economic burden and animal welfare. Through DECIDE, I am exposed to an invaluable professional network across Europe, which has already led to 2 accepted publications. In this framework, I am also leading (PI) a project rewarded by the Royal GD Innovative Challenge Award 2023.

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Altogether, I have published 16 scientific articles, 13 as first or last author. I am or have been PI of two research grants (~85,000) funded through competitive calls in the USA and Europe and a contract with an industry partner. Almost all the research I have performed in collaboration or by my own has been disseminated through national and international scientific congresses with either oral or poster presentations, or technical articles and books for knowledge transfer to the sector. Besides, I have supervised undergraduate and graduate students, and gained experience in academic teaching.

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Área Temática: **Ciencias agrarias y agroalimentarias**
Nombre: CUESTA GEIJO, MIGUEL ÁNGEL
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Correo Electrónico: mangelcuestageijo@gmail.com
Título: Trayectoria CuestaMA

Resumen de la Memoria:

During my scientific career, I have demonstrated research capabilities by being part of 20 national and international and contracts, by being the author/co-author/corresponding author of 8 publications in journals, and by supervising undergraduate and postgraduate students. I have been doing research African swine fever virus infection and its interaction with the host cells from multiple approaches since 2008 as PhD student, learning about the viral infection to unveil novel cellular therapeutic targets and test new chemicals based on this with potential antiviral activity. Since I started my scientific career I have learnt several different techniques (including immunofluorescence, optical, confocal, spinning disc confocal and electron microscopy, cryo-sample preparation and vitrification, DNA manipulation and cloning, CRISPR Cas technology, Western blot, baculovirus expression system, protein purification, immunoprecipitation, proteomics, transcriptomics, viral infection related techniques, in vitro cell culture, and more recently in vitro advanced cell culture, co-culture, culture of organoids, culture in transwells) These techniques have been applied in the pursuit of my research objectives. I am the main responsible for a variety of investigations in my group, leading the research from the beginning, demonstrating independent and critical thinking. Some of them have crystallised in relevant collaborations with top researchers in the field. Nowadays, I am involved in two projects pending resolution, based on advanced cultures and organoids, and top companies as Pharmamar or Algenex. I participated as a researcher leading the aspects associated with highly pathogenic viruses that threaten human and animal health. I have also collaborated in the development of several research projects funded by the Spanish Government and international entities as EU, collaborating with top researchers in the field. I have participated in national and international conferences, seminars, and coordinating and teaching in institutional and international training courses. I have shown that I can work independently, having collaborated with co-authors, many of them top researchers in their field (for instance my collaboration with Prof. Juan Martín Serrano of King¿s College London, UK, published in the journals Developmental Cell in 2018 and Frontiers as corresponding author in 2023). During my research career, I also work as coordinator and lecturer in two prestigious Universities. I am supervising 1 PhD Thesis (ongoing) and 1 BSc Degree Final Project at King¿s College London and 3 Master Final Project in Spain University, demonstrating mentoring and leadership skills, crucial for independence in research.

From this frame, the main line of investigation that I plan to develop if awarded combines my previous knowledge in virology (African swine fever virus or other viral model of interest in industry) and virus-host interaction with an innovative and promising approach based on advanced cultures, organoids and organ-on-a chip technology for modelling and perform antiviral screening in an organoids-based platform to combat African Swine Fever using a near phisiological structures to identify more reliable therapeutics against ASFV. This will allow the use of this technology with potential benefits for the industry, animal welfare and reducing costs.

Resumen del Currículum Vitae:

I hold a Ph.D. (Cum Laude) from the "Virus-Host Interaction" group at INIA-CSIC, complemented by an international fellowship at the Netherlands Cancer Institute. My postdoctoral journey began with research on the endocytic pathway in African Swine Fever Virus (ASFV) infection, followed by a prestigious contract at King's College London. Returning to Spain in 2018, I contributed to the PTI Salud Global against SARS-CoV-2, where I am currently engaged.

Scientific Contributions: My Ph.D. research focused on ASFV infection, uncovering critical host targets and decoding early infection steps. These findings laid the groundwork for subsequent group projects. During my postdoctoral tenure, I made novel contributions, identifying shared targets with Ebola and SARS-CoV-2, emphasizing the crucial role of the cholesterol transporter NPC1. My work at King's College London explored the involvement of the endocytic ESCRT complex in nuclear envelope dynamics and viral processes, resulting in publications. My main challenge involves rational therapeutics based on common host targets for highly pathogenic viruses, advancing our understanding of virus-host interactions, and identifying therapeutic targets through Proteomics or CRISPR. Notably, I identified common cellular factors for ASFV, Ebola virus, and SARS-CoV-2, leading to patent applications for antiviral molecules. I also conducted morphological studies funded by Alba Synchrotron.
I am currently leading the implementation of a system to validate antiviral compounds using organoids and organ-on-a-chip technology. All these investigations are reflected in a total of 25 scientific publications (Q1: 88%) with a h-index of 17 and relevant signature position in 32% (co-author, first or corresponding author) and 3 in preparation.

Scientific Responsibilities, Collaborations, and Leadership: As a Reviewer for the Viruses Journal, I actively participate in 20 competitive national and international projects. I serve as the principal investigator (PI) for a pending ART Call project to develop porcine organoids, organ-on-a-chip, and OMICS analysis for ASFV disease modeling at INIA-CSIC. Additionally, I lead a project with Pharmamar to decipher the antiviral activity of Plitidepsin in ASFV infection. I collaborate with Prof. Vicente Larraga (CIB-CSIC) on designing a rational ASFV vaccine, with the Company Algenex and Prof. Nuria Verdaguer (IBMB-CSIC) to decipher a novel ASFV fusion complex, and with Prof. Juan Martín Serrano at King's College London. I coordinate institutional training related to the confocal microscopy unit and collaborate with AECID on the course "Una amenaza real: Fiebre Porcina Africana" for researchers and decision-makers in the agrarian public sector in South America. I also organized Seminar series related to ASFV at INIA-CSIC.

Mentoring, Education, and Other Research Activities: I have directed final year projects at King's College, supervised Master's theses at INIA (with an ongoing Ph.D. thesis), and mentored students progressing to contribute to science dissemination. I engage in school activities to promote science,

collaborate with "Eres ciencia," and work as Coordinator and Associate Professor at Francisco de Vitoria University and in the Master in Virology at UCM. I am member of the Spanish Society of Virology and BICS Unity (CIB-INIA) to generate synergies.

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Área Temática: **Ciencias agrarias y agroalimentarias**
Nombre: LÓPEZ BALLESTEROS, ANA
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Título: Carbon, water and energy balances from the leaf and soil to the ecosystems

Resumen de la Memoria:

I graduated in Environmental Sciences at Univ. Granada (UGR, 2012). Afterwards, I got a Master's degree in Geophysics and Meteorology (UGR, 2013) and a PhD in Earth Sciences (UGR, 2017). During my predoctoral stage at EEZA-CSIC, I investigated the land-atmosphere exchange of mass (CO_2, H_2O, CH_4) and energy with special focus on semiarid ecosystems (López-Ballesteros et al. 2016,2017,2018). One of the most important findings derived from this work was the great relevance of the unknown subterranean ventilation process in the carbon balance of water-limited ecosystems, not only in southern Spain (López-Ballesteros et al. 2017) but globally (Moya, López-Ballesteros et al. 2022). I also investigated other ecosystem types, such as wetlands and irrigated olive orchards. During my PhD, I became an expert on the Eddy Covariance (EC) technique, which I combined with other methodologies (Pérez-Priego, López-Ballesteros et al. 2015). The datasets I generated contributed to the global database FLUXNET2015, which has been massively utilized to calibrate models and validate remote sensing products for the monitoring of the terrestrial biosphere.

During my postdoctoral stage, I firstly worked at UCLM performing quality control analysis of EC large datasets. Afterwards, I moved to the Ecophysiology group of Trinity College Dublin (TCD, Ireland), where I worked on the H2020 SEACRIFOG project together with other 16 African and European institutions. Co-leading the WP4, my main task in this project was to support research infrastructure development by specifying where (Nickless et al. 2020), and how (López-Ballesteros et al. 2018,2020, Beck et al. 2019) GHG fluxes and other climate forcing components should be measured across Africa to improve our current understanding of global GHG budgets. Given the experience gained in data harmonization, I later worked at University College Dublin (Ireland) on the PROTECTS project in partnership with other 4 Irish institutions. This work was framed at the science-policy interface and resulted in a set of recommendations for reporting pesticide usage across the EU (Mesnage et al. 2021, López-Ballesteros et al. 2022).

I came back to Spain in 2020 as a Juan de la Cierva-Formación (JCF) awardee to work at the Basque Centre of Climate Change, where I investigated multidecadal holm oak decline across Spain and its relationship with land use, climate, and topography (López-Ballesteros et al. 2023). This work allowed me to acquire new skills (e.g. geospatial computing), and to identify key knowledge gaps to tackle in the future (e.g. role of management in holm oak decline).

Since 2022, I have worked at the Agri-Food Research and Technology Centre of Aragon (CITA) as a Juan de la Cierva-Incorporación (JCI) fellow. Thanks to the funding awarded as the Principal Investigator of the MANAGE4FUTURE national project, I have initiated my own research line at CITA. I have established the first two permanent EC stations of Aragon at holm oak forests to evaluate the effect of thinning as a beneficial management practice to promote both natural carbon sinks and forest health in the current climate change scenario.

Resumen del Currículum Vitae:

Since the beginning of my career, I have secured >350000 as a Principal Investigator (PI), being selected for three highly competitive postdoctoral grants (success rate<15%; JCF, JCI, Postdoc Junta de Andalucía - declined). I have participated in 26 projects (9 international) and authored 26 papers (>1400 citations, 73% Q1, 35% D1, 50% without PhD supervisors) in high impact journals such as Global Change Biology, Nature Ecology and Evolution, or Environmental Research Letters.

I participate in international networks such as FLUXNET, as the PI of two EC sites, and ICOS (European Integrated Carbon Observing System) by contributing to the development of EC-related methodological protocols (Franz et al. 2018, Saunders et al. 2018). I also participate in national networks such as Red Remedia (Red Científica de Mitigación de Gases de Efecto Invernadero en el Sector Agroforestal) as the Coordinator of the Agroforestry Group, and SilvAdapt (Red de Serlvicultura Adaptativa al Cambio Climático).

Currently, I am the PI of one national project (MANAGE4FUTURE) and I participate in other ongoing 4 national and 2 international projects. Current collaborators include the Max Planck Institute for Biogeochemistry (Germany) and the Image Processing Laboratory (Univ. Valencia), who chose the MANAGE4FUTURE EC stations as calibration/validation sites for the European Space Agency FLuorescence EXplorer-Sentinel 3 (FLEX) mission (SpaFLEXCal Project).

My most relevant contributions in the creation of technological tools are the development of: (i) a portable chamber system to monitor plant-atmosphere carbon and water fluxes, (ii) a system to pump CO_2-rich air from the subterranean soil layers to greenhouses to increase crop yield, (iii) an automated system to quantify and trace the metabolic origin of CO_2 fluxes in soils, living organisms and ecosystems by means of real time monitoring of CO_2 emission/uptake, ^{13}C and ^{18}O stable isotopes and other related variables (e.g., transpiration, air/soil/stem temperature, radiation), and (iv) a water band sensor that utilizes a detector in the 1450 nm wavelength band to track vegetation water status.

I have contributed to teaching with 110h of lecturing (Spain, Ireland, South Africa) and as organizer of an international summer school at Univ. Venda (South Africa). I have been an evaluator in three PhD committees, and I am currently supervising two MSc theses. My commitment with science communication and dissemination can be proven with the following roles: session convener and member of the scientific committee of the 2023 AEET conference, member of the organizing committee of the 4th Biohydrology conference, speaker in 5 invited talks (4 international), participant in 55 conferences (38 international), anonymous reviewer of ISI publications (e.g. Agricultural and Forest Meteorology, Journal of Environmental Quality,

New Phytologist), organizer of 4 science communication events, and participant in 20 press releases, TV programs and talks (e.g. 11F). I am certified as a R3 researcher (AEI) and Profesora Contratada Doctora (ANECA).

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AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2023

Turno RYC-INIA-CCAA

Área Temática: **Ciencias agrarias y agroalimentarias**

Nombre: HERES -, ANA-MARIA

Referencia: RYC2023-044212-I

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Título: Drought resilience and ecological value of native and non-native tree species in the face of climate change

Resumen de la Memoria:

My scientific contributions have been published in high impact journals & disseminated in national & international conferences. They have high impact in forest ecology & gather 26 citations in 18 policy documents. They focus on the impact of climate change on forests, are well connected with my line of research to be developed, highlight the int. scientific community that I work with, show my multidisciplinary research approaches & underlie this last Ramón y Cajal that I can ask for.

My scientific career has been enriched by the int. scientific community that I work with & by my mobility between different research institutions (short stays, visits). I am currently organizing an int. conference at the Faculty of Silviculture & Forest Engineering (UniTBv; RO), where I am collaborating since 2015 & working since 2018.

My scientific independence & leadership are highlighted by the research projects in which I've been involved either as principal investigator (PI), either as part of the research teams, by knowledge transfer & by other relevant scientific (first & corresponding author) & professional (young researchers' training) contributions. All of them are in synchrony with my line of research to be developed, being a base for it.

My line of research to be developed is focused on deepening into the Climate-Smart Forests concept (hereinafter CSF). This research line represents an advance in forest ecology & beyond it, as CSF represent healthy forest ecosystems that provide key ecosystem services, including climate change mitigation, & concurrently satisfy the needs of the human society in a sustainable way. My objective is to try to understand the underlying mechanisms & processes that may explain why, on the long-run, native* tree sp. might be more successful & sustainable than non-native** tree sp. {Definitions: *Native tree sp. occur naturally & are able to self-sustain their populations within their past and present natural distribution ranges, including the areas that they may occupy using their natural dispersal systems}; **Non-native tree sp. have been/are introduced (accidentally or intentionally) by humans in new geographic areas outside their natural vegetation zone, area or region}.
The strength of my research line is given by the multidisciplinary approach that I propose (dendrochronology, ecophysiology, successional processes, management practices & their legacies, co-evolution with soil microbiota, micro-environment), which will allow me gain novel knowledge. It will also allow me to interconnect all these approaches & have a more holistic image on the forests' stability in the face of climate change, i.e., CSF.
My line of research to be developed stands as original & innovative although, naturally, it has a scientific background represented by my trajectory. Still, this trajectory has only shaped my path towards novel scientific challenges that have been poorly explored so far: evolution & stability of tree-growth-climate relationships (stationary & non-stationary character); early stress markers to define trees physiological status; feedback loops between the roots & crowns; belowground successional processes; umbrella reviews on forests management; plant-soil-microbiota interactions; fine scale micro-environmental processes. I consider thus that deepening into the CSF concept is a natural path for me to move forward.

Resumen del Currículum Vitae:

My scientific contributions focus on the impact of climate change on forest ecosystems using multidisciplinary approaches: dendrochronology; isotopes; wood anatomy; soil biogeochemical cycling, microbial communities and heterotrophic CO2 emissions; ecophysiology; management practices and their legacies; micro-environment. They are the result of the different research projects in which I have been involved either as principal investigator (PI; two finished projects [NATIvE, REASONING; 152.873,00] and 1 pending on resolution [QUERCUS; 239.967,28]), either as part of international research teams.

My scientific contributions have been published in over 25 peer-reviewed papers (first, corresponding and contributing author) in high impact journals (Nature Communications, Global Change Biology, Science of the Total Environment, Soil Biology & Biochemistry, New Phytologist, etc.) and they have a high impact in forest ecology (1876/2595 citations WOS/Scholar, 3 listed as highly cited by WOS and 1 listed as the Editor's Choice 2022).

My scientific contributions have been disseminated in over 40 national and international conferences (AT, CO, DE, EE, ES, FR, IT, MD, PT, RO, RU, UK) where researchers from different scientific disciplines working in forest ecology gather and share their scientific knowledge.

In 2024 I am organizing myself the international conference TRACE 2024 - Tree Rings in Archaeology, Climatology & Ecology that gathers experts in tree-rings research (ecology, chemistry, archaeology, climatology, etc.) from all over the world, being an important global research dissemination event where young researches are especially encouraged to participate.

My scientific contributions highlight the international scientific community that I work and collaborate with and the multidisciplinary approaches that I apply in my research.

The impact on the society of my scientific contributions has been reflected through knowledge transfer actions:
- my papers gather so far 26 citations in 18 policy documents (Sage PolicyProfiles, Overton): European Union, ES, UK, USA;
- I led as an author the writing of the IHOBE reference document Estrategia de Protección del Suelo para el País Vasco: vinculo suelo cambio climático, a document that was the writing base of the Estrategia de Protección del Suelo de Euskadi 2030 - first soil law in Spain;

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- I train young researchers, future forestry scientists and engineers, an action that will have a direct impact on the forests research and management, and, thus, on the society;
- I contributed to raise awareness on the importance of protecting the forest ecosystems, with a special focus on their decline and mortality caused by severe droughts, by sharing my scientific data with an artist that has used it in a MSc thesis;
- other actions in which I have been involved: EU reports, Natura2000 information campaign, SciComm activities, popular science articles, school contests on environmental topics, blogs, etc.

I am reviewer for Forest Ecology and Management, Science of the Total Environment, Frontiers in Plant Science.

I am evaluator in national Romanian panels.

I am member of the Association for Tree-Rings Research (ATR) and the ECOSOIL network (edaphic biodiversity).