AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2022

Turno RYC-INIA-CCAA

Área Temática: **Ciencias agrarias y agroalimentarias**

Nombre: BARBETA MARGARIT, ADRIÀ

Referencia: RYC2022-037566-I

Correo Electrónico: adria.barbeta.margarit@gmail.com

Título: Plant ecophysiology in a drier and warmer future

Resumen de la Memoria:

My research trajectory mainly addressed the ecophysiological responses of woody species to increasing drought, warming, and extreme climatic events. I studied plant water sources, water and energy fluxes, forest productivity, and long-term responses to climate change. In the projects I am currently leading at the University of Barcelona, I am conducting research on the responses of forests to climate change at a range of spatiotemporal scales and using approaches such as stable isotopes, remote sensing, dendrochronology, and microclimatic measurements. As a postdoctoral researcher at INRAE Bordeaux (France), I investigated and developed new stable isotope applications to determine the spatiotemporal patterns in tree water sources. I demonstrated that a long-standing assumption in stable isotope applications was not as universal as previously thought using field and greenhouse experiments. Also, I developed a new water extraction technique that provides an estimation of tree water sources at unprecedented precision. My PhD (CREAF, 2015) provided novel insights into how Mediterranean forests adapt their functioning to increasing water stress at a range of temporal and spatial scales. I adopted a novel statistical approach to assess tree water sources, which has become of widespread use thereafter. At the global scale, I synthesized isotope-based studies on plant groundwater use and highlighted that deep water sources in saturated soil layers and bedrock are important to sustain transpiration, which has led to their inclusion in new approaches and models of land-atmosphere interactions. Also, I unraveled new demographic compensation mechanisms operating in forests that reduce the impacts of climate-change-induced droughts.

My future research lines will address the challenges posed by climate change on forest and woody crop productivity and particularly those related to water and heat stress. I aim to improve our capacity to measure and model critical physiological processes directly linked to societal essential needs such as access to water resources and agricultural products, or the mitigation of CO2 emissions provided by the forest carbon sink. I will address important knowledge gaps in (i) the effects of different forest covers on the availability of water for streams and aquifers adopting an approach heavily focused on the temporal origin of tree water use applying stable isotopic techniques and complementary ecohydrological measurements, in (ii) the physiological mechanisms of woody crops to avoid heat damage during heatwaves with a special focus on transpiration cooling, already observed in wild plants and in (iii) the interaction between ecophysiological functioning and forest structure for the determination of future carbon sink capacity of forests. The goal of the proposed research lines is not only to advance our basic understanding of pressing conundrums related to plants responses to climate change but importantly, to inform forest and crop management practices to be adopted to cope with the challenges faced by societies in the Mediterranean region. I aim to incorporate novel methodologies at the forefront of plant ecophysiology in general, particularly of stable isotopic applications and remote sensing.

Resumen del Currículum Vitae:

I am a plant ecophysiologist focused on the soil-plant-atmosphere hydraulic continuum and its responses to increasing drought, warming, and extreme climatic events. I authored 35 in ISI-indexed journals and 1 book chapter. I have an h-index of 20, 1619 citations, and a median 88th citation percentile (WoS). In GS, I have an h-index of 23 and 2302 citations. Since the completion of my PhD in December 2015, I raised 349k as a PI, including projects funded by national and international agencies and prestigious fellowships (Generación de Conocimiento, IdEx Bordeaux, Beatriu de Pinós, and others). I supervise one MSc student and 4 students completed their MSc theses under my supervision, all with outstanding marks; one of them received the award Cátedra del agua in 2020. I also supervised 1 PhD student and 2 BSc students. These students came from diverse socio-economic and ethnic backgrounds both in France and Spain and had successful career starts after the MSc, either as PhD students (2) or highly qualified professionals (2). Between 2019 and 2022, I taught 292 hours in MSc and BSc courses (Universitat de Barcelona (UB) and Universitat de Vic (UVIC)) and participated in teaching innovation activities. I evaluated MSc theses (10) and was part of 3 PhD committees in Spain (2) and Luxembourg (1). Currently, I am Working Group leader in a COST action. I convene sessions at society conferences such as those of the European Geoscience Union and the Spanish Ecological Association of Terrestrial Ecology. I was keynote speaker in a Galileo conference, invited speaker at another Galileo conference, and both to online seminars and in-person seminars at foreign institutions. I am reviewer for 25 ISI journals including Nature and Editor for Frontiers in Plant Science and Frontiers in Forests and Global Change. I evaluated R&D projects for international agencies (Czech Science Foundation, Connecticut Institute of Water Resources, Research Grant Council of Hong Kong). Now, I am a Beatriu de Pinós fellow (MSCA COFUND) at UB, where I am the principal investigator of 2 R&D projects and lead the transfer of knowledge activities with a public Natural Park. I joined UB in 2019 with a Juan de la Cierva-Incorporación fellowship. Previously, I was an IdEx postdoctoral fellow at INRAE Bordeaux (France) and had my first projects as PI, resulting in 3 ground-breaking 1st-authored publications in isotope-based studies of tree water use (1 Highly Cited Paper in WoS). There, I developed a new water extraction technique for isotopic analysis that is now being set up in research labs in Canada, China, and Australia, with whom I am collaborating. This long-term stay in France allowed me to continue building my own international scientific network, but early during my PhD I conducted 3-month stays at the University of California at Berkeley (USA, 2012) and the German Centre for Geosciences in Potsdam (Germany, 2014). Since my 1st article (2011), my research contributed to expanding our knowledge on the responses of forests to a changing climate. My PhD (defended in 2015) provided novel insights into how forests adapt their functioning to increasing water stress at a range of temporal and spatial scales. It resulted in 5 extensively cited 1st-authored papers. My PhD research received a total of 464 citations, with a single study cited 193 times (WoS). My PhD was awarded the Best thesis synthesis (2016) by the journal Ecosistemas.

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Área Temática: **Ciencias agrarias y agroalimentarias**

Nombre: MARTINEZ SERRANO, CRISTINA

Referencia: RYC2022-036771-I

Correo Electrónico: cristina.martinez@inia.csic.es

Título: Biotechnology of Reproduction in Mammals

Resumen de la Memoria:

My research was firstly focused on studies on embryo production and development, embryo preservation and embryo transfer (ET) in pigs, which was the basis of my PhD thesis entitled Improving porcine embryo biotechnologies. During my postdoctoral career, I have continued working for the implementation of porcine ET conducting research on the transcriptome of vitrified embryos, the simultaneous vitrification of large number of embryos, the embryo production efficiency and transcriptome changes in the genital tract of synchronized-superovulated donors, and the gene expression and cytokine response of endometrium and embryos in donors and/or recipients in response to seminal plasma. However, one of my main challenges has focused on the embryo-maternal interactions and to unveil the causes and mechanisms of the high embryo mortality rates occurring during pregnancy, mainly in the case of allogeneic (ET) pregnancies. My research helped to reveal that porcine ET pregnancies involve a complex modulation of the maternal immune system, which is inefficient in preventing rejection of allogeneic embryos and leads to large percentages of embryo mortality.

The main line of investigation that I plan to develop if awarded combines my previous knowledge in the area of porcine in vitro embryo production and the phenomenae of embryo-maternal communication with a field not yet explored in my scientific careear; the presence, roles and mechanisms of action of embryonic and maternal extracellular vesicles (EVs). EVs are membrane-enclosed microparticles that mediate cell to cell communication in proximity to, or distant from, the cell of origin. Cells release a heterogeneous spectrum of EVs depending on their physiologic and metabolic state. I aim to isolate EVs from in vitro and in vivo derived embryos, oviductal and endometrial fluids, determining biological characteristics of EVs, including variations in their morphology, size, concentration, composition, cellular source and biogenesis. I would explore the molecular characterization of EVs (proteins, lipids, mRNA and non-coding RNAs) isolated in physiological and pathological conditions and search for potential non-invasive biomarkers. I aim to unveil the roles of EVs in porcine embryo-maternal communication and will try to translate that knowledge into mechanistics to improve the efficiency of embryo in vitro production systems. This will allow the use of this technology with potential benefits for the industry, suh as transport of genetics without affecting animal welfare and reducing costs. Moreover, a more precise vision of the cocktail of biomolecules inside the EVs mediating communication between the embryo and mother could provide new insights to optimize the therapeutic action of EVs use.

Resumen del Currículum Vitae:

After completing my PhD (Excellent Cum Laude, International mention and Extraordinary Award) at the research group "Animal Reproduction", at University of Murcia in 2018, I was awarded with a competitive Postdoctoral Fellowship (Spanish Government; Seneca-formación Scheme, 20780/PD/18) at Linköping University (LIU, Sweden) and, in 2020 I obtained a Marie Sklodowska-Curie Individual Fellowship (grant agreement No 891663) to continue my research at LIU. In 2021 I was awarded with a Maria Zambrano fellowship (R-1500/2021, University of Murcia; DECLINED) and a Juan de la Cierva-Incorporación fellowship (IJC2020-043598-I) at the Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA) where I am currently working.

The main contributions of all these investigations are reflected in a total of 117 publications with a h-index 14: 62 research articles (Q1: 72,5%) in SCI/JCR-journals (mostly in collaboration with foreign authors), in relevant signature positions (53,2% as first/last author, and 20,9% as corresponding author), 52 abstracts published in SCI/JCR-journals and 4 book chapters (1 in edition). Scientific responsibilities, international collaborations, and leadership: I served as board member of the Junior Faculty Organization (Linköping University, Sweden; 2020-2022). I have participated in 10 competitive national and international projects (Principal Investigator in 3) and in 10 research contracts with national and international companies (Principal investigator in 2). I have collaborated with distinguished International Scientists and I have participated in 3 competitive contracts with private companies through CDTI and in 7 direct contracts with national and international companies (Principal Investigator in 2). Training of young researchers: I have been teaching for 6 academic years at different universities (UMU and LIU-Animal reproduction and Introduction to cell culture) with more than 330h of theory and practices. I have supervised 7 Final Degree Projects (1 ongoing) and 2 PhD Thesis (ongoing). An important number of these students are now PhD. Editorial activities, evaluation of researchers, projects, and other research activities: I am Guest Editor and Topic Editor of peer-reviewed international SCI/JCR-journal (Frontiers in Veterinary Sciences and Animals, respectively). I serve as reviewer for more than 15 SCI/JCR-journals (mostly in Q1). I am responsible for the evaluation of national (AEI) and international (NCN) researchers and research projects. I have performed a total of 5 research stays abroad: 3 months at University of California, Davis (USA), 3 months at Lisbon University (Portugal), 3+39 months at Linköping University (Sweden) and 2 months at Okayama University (Japan). I am member of scientific international societies (AERA, ICPR, etc). I have been awarded with important prizes, including PhD Extraordinary Award 2018 (UMU), the Marie Sklodowska-Curie Actions Seal of Excellence 2019 for MSCA proposal 840604 Alloem. European Commission, the II Prize for the Best Thesis in Health Sciences 2019 (Robles Chillida Foundation), and the Biology of Reproductions 2022 Graphical Abstract contest on behalf of the SSR Publications Committee.

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Área Temática: **Ciencias agrarias y agroalimentarias**

Nombre: CASTANERA ANDRÉS, RAÚL

Referencia: RYC2022-037459-I

Correo Electrónico: raulcastanera@gmail.com

Título: Impact of structural variation on the genome evolution of plant crops

Resumen de la Memoria:

Since the beginning of my PhD, the core of my research has been the analysis of transposable element activity in eukaryotic organisms to understand their potential to generate genetic variability with phenotypic consequences. As a graduate student, I deployed computational and experimental approaches to describe the distribution and impact of TEs on gene expression in fungal species of high industrial and/or agronomic interest. This uncovered that TEs had a strong potential to regulate the expression of surrounding genes trough epigenetic mechanisms. As part of multiple international collaborations, I participated in the genome sequencing, annotation, and comparative analyses of more than 70 fungal species (Castanera et al, 2016, 2017; Ruiz-Dueñas et al, 2020; Haridas S et al, 2020). These analyses revealed that TEs had shaped the genome architecture of fungi during millions of years through amplification bursts that lead to massive differences in genome size among close species. During my postdoc at CRAG (Centre for Research in Agricultural Genomics) I studied the impact of TEs on the generation of plant genetic variability linked to agronomic trait variation, using rice, almond and peach as models. I also continued to develop computational approaches for detecting TE activity and participated in several crop genome sequencing projects. The very recent availability of plant genomes and pangenomes opened the door to uncover enormous amounts of structural variability (SV), including but not limited to TEs. In the last years, many individual examples have shown that SVs (ie, insertions, deletions, etc) have played an important role in the domestication and subsequent diversification of cultivated plants, given their potential to generate genetic variability. The main hypothesis of my research line is that previously overlooked structural variants selected during crop domestication and breeding are at the origin of agronomic trait variation. The study of genomic structural variation powered by the use of pangenomes can greatly contribute to develop tools for genetic improvement, but also to establish conceptual advances that can be generalized to other types of plant species. For this, I plan to integrate genomic, transcriptomic, epigenetic, and phenotypic data for some of the most important crops cultivated in Spain, to study the link between genotype and phenotype. The ultimate goal is to find causal SVs responsible for trait variation, understand their causal mechanisms, and produce suitable markers for their incorporation into breeding programs. The research that I intend to develop follows two main lines. One targets rice as a working model, and the objective is to understand the impact of SVs on the diversification of transcriptional networks that allowed rice to adapt to different environments. The second targets rice as well as horticultural crops such as peach, almond or strawberry, and the aim is to use computational analyses of pangenomes and structural variation to improve genomics-assisted breeding.

Resumen del Currículum Vitae:

I started my PhD at the Genetics and Microbiology Research group (Universidad Pública de Navarra) after obtaining a FPI fellowship in 2012. I worked on fungal comparative genomics to understand the impact of Transposable Elements (TEs) on genome architecture and transcriptional profiles. As part of my PhD work, we described for the first time the regulatory potential of TE insertions in fungi in a genome-wide perspective and were able to link this phenomenon with the presence of a transposon-associated epigenetic gene silencing machinery (Castanera et al., 2016). During this stage I performed four international research stays and was funded by the DOE-Joint Genome Institute with my first project as principal investigator. As part of this project, we sequenced the genome of the fungus Coniophora olivacea to uncover the genomics basis of its enzymatic repertoire (Castanera et al., 2017). After my PhD and a short stay at the IKBM (Kiel, Germany), I moved to CRAG (Center for Research in Agricultural Genomics) to perform a postdoctoral stage funded by two competitive fellowships, Severo Ochoa Internationalization and Juan de la Cierva-Formación (2018-2021). During this stage, I contributed to the development and evaluation of bioinformatics tools to detect TE insertion polymorphisms (TIPs) from re-sequencing data (Bogaerts et al., 2020; Vendrell-Mir et al.,2020), and obtained a funded project as co-principal investigator. Within the scope of this project, we described the contribution of transposon insertion polymorphisms (TIPs) to rice crop genomic variability and phenotypic variation (Castanera et al., 2021). In addition, I participated in the assembly and annotation of several plant crop reference genomes such as almond (Alioto et al., 2020), melon (Castanera et al., 2020) or pineapple (Yow et al., 2021). In 2021 I obtained a Juan de la Cierva-Incorporación fellowship and started a new stage on my career marked by a higher level of independence. My main contribution on this stage was the genome-wide identification of rice TIPs affecting the expression of trait genes, and how this TIPs have been differentially selected in indica and japonica populations, suggesting that TEs have played a role on the adaptation of rice to specific agro-environments (Castanera et al, 2022). This research has been funded as part of two projects for which I am principal investigator, SVADAPT (funded by CRAG) and DIBGP (AEI, Retos Investigación). During my career, I have performed 6 international stays, 4 of them funded through competitive calls. I have participated in 13 funded projects, 3 as principal investigator and one as co-principal investigator. I have published 26 articles (H-index of 15, 701 citations), 4 of them as corresponding or co-corresponding author and 10 as first author, as well as a book chapter and an opinion piece. I have been co-advisor of two PhD thesis (one ongoing), two graduate and one master final projects. I have been associate editor in the journal BMC Genomics from 2018 to 2021, reviewer for the French National Research Agency (2019 call) and scientific journals, and member of a PhD thesis committee.

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Área Temática: **Ciencias agrarias y agroalimentarias**
Nombre: PREECE , CATHERINE
Referencia: RYC2022-037008-I
Correo Electrónico: catherine.preece09@gmail.com
Título: Improving drought tolerance and soil carbon sequestration in agriculture

Resumen de la Memoria:

I am an ecologist whose research interests lie in improving global food security through understanding the links between plants and soils. My past experience is in both plant and soil science, with a strong influence of agricultural systems and climate change. In my PhD, awarded by the University of Sheffield (UK), I studied the effect of climate change on the eco-physiology of Arctic vegetation, including research stays and field work in Sweden. In my first postdoc I moved into investigating the origins of agriculture on a multi-disciplinary project. I studied how traits of crops differ from those of their wild relatives, to better understand crop evolution and gain clues for future crop improvement. This project laid the groundwork for my current research, firing my enthusiasm for working to improve our understanding of agricultural systems.

My next position was as an EU Marie Curie Research Fellow at the Ecological and Forestry Applications Research Centre (CREAF) in Spain. This prestigious project, which I designed and managed, focused on plant-soil interactions in the Mediterranean. I explored the effect of drought and soil nutrients on the function and resilience of common Mediterranean tree species and their soil communities. I increased my skills in soil microbiology and the analysis of root exudate metabolomics, as well as maturing as a PI, in charge of successful experiment. Next, I stayed in CREAF as a postdoc on an EU Synergy project which sought to understand the effects of phosphorus limitations on life, the earth system and society. I continued my work on plant-soil interactions in Mediterranean ecosystems, but with a broader outlook and with more collaborations. Results from my work at CREAF have been novel and exciting in the field of plant-soil interactions, and have been well-cited by the scientific community.

In 2020 I was awarded a competitive fellowship at the University of Antwerp (Belgium) for a two-year project entitled ?Exploring belowground traits in crops and their wild relatives to improve food security in times of drought.? This project, which I designed and wrote, was an important step in bringing together my previous research subjects on belowground plant and soil traits with crops and their wild relatives. In 2022 I was awarded a ?Kleine Projecten? research grant from the University of Antwerp to fund an additional experiment. In January 2023 I joined the Instituto de Investigación y Tecnología Agroalimentaria (IRTA), in Spain, as a researcher in soil quality and carbon sequestration. During my career I have published 31 SCI articles, most as first or last author, and I have participated in nine projects, three as PI. I am involved in teaching and supervision of students from Bachelors to PhD level, and have built a strong, international network due to my extensive mobility, including 7.5 years in the UK, more than 5.5 years in Spain and 2.5 years in Belgium.

The next step in my career is investigate how we can exploit interactions between root traits of crops and agricultural soils and their microbial communities to improve food security. My future work will focus on two specific challenges to agricultural systems ? improving drought tolerance and increasing soil carbon sequestration. I will bring together my broad research expertise and guarantee that these are research priorities in Spain and beyond.

Resumen del Currículum Vitae:

Summary of scientific output:
Total articles in SCI journals = 31.
First author articles in SCI journals = 15, including first author papers in Trends in Plant Sciences, New Phytologist, and Journal of Ecology.
1 highly cited paper as first author.
H index = 16 (Google Scholar)
i10-index = 25
Total citations = 1301
Non-SCI articles and book chapters = 6

Summary of Research Experience:
2008-2011: PhD (University of Sheffield, UK). ?The impacts of icing events on sub-arctic heathland vegetation?. I studied climate impacts on Arctic plants, with field experiments in Sweden and developing my skills in plant eco-physiology.

2011-2014: Postdoc (University of Sheffield, UK). ?Origins of agriculture: an ecological perspective on crop domestication?. I studied crop domestication from an ecological, trait-based perspective. I designed and managed a series of large-scale greenhouse experiments with more than 30 species of crops and wild relatives.

2014-2016: Marie Curie Individual Fellow (CREAF, Spain). ?Drought impacts on plant-soil interactions and ecosystem stability?. I gained experience in plant-soil interactions, particularly root exudation and metabolomics skills, and also leadership skills, as lead researcher of this project.

2016-2020: Postdoc (CREAF, Spain). ?Impacts of nutrients and drought on root exudation and soil microbial communities?. I continued my previous work on root exudation, but incorporated soil microbial ecology and nutrients, and I began work on belowground traits in crop wild relatives.

2020 2022: FWO MSCA-Seal of Excellence Postdoctoral Fellowship (University of Antwerp, Belgium). ?Exploring belowground traits in crops and their wild relatives to improve food security in times of drought?. The results from this project are laying the groundwork for my upcoming research programme with the RyC grant, providing useful preliminary data which will help develop my research objectives.

Since Jan 2023: Researcher (IRTA, Spain) in soil quality and carbon sequestration.

Funding and projects:

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I won a Marie Curie fellowship (166,336) in 2013, a Belgian FWO fellowship (183,694) in 2020 and a University of Antwerp Kleine Projecten grant (10,000) in 2022. I have also participated in six other competitive projects.

International Experience:
My pre-doctoral and post-doctoral research experience has included 7 years in the UK (University of Sheffield), 5.5 years in Spain (at CREAF) and 2.5 years in Belgium (University of Antwerp). Throughout my PhD I also had long research stays in Sweden (Abisko Scientific Research Station) where I did my field work, and short research stays in Belgium (University of Antwerp) and Germany (Helmholtz Centre, Munich).

Communication:
I have presented my research at conferences, including 24 first author oral presentations and invited seminars. I have also engaged in science communication to the general public via interviews, seminars, blog posts, and radio interviews in Spain and the UK. I have published six non-SCI articles and book chapters, and work on two projects with my local natural history group.

Supervision:
I am currently co-supervising one PhD student at CREAF and two Masters students who successfully graduated (University of Antwerp) in 2022. I have teaching experience at the Autonomous University of Barcelona (2019-2020) and the University of Sheffield (2012-2014).

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Área Temática: **Ciencias agrarias y agroalimentarias**

Nombre: FERNÁNDEZ AGUILAR, JAVIER

Referencia: RYC2022-036927-I

Correo Electrónico: xfdezaguilar@gmail.com

Título: One Health, Infectious diseases at the wildlife, livestock and human interface

Resumen de la Memoria:

My research interests are the eco-epidemiology of infectious diseases at the wildlife-livestock and human interface, zoonoses, emerging infectious diseases and wildlife conservation.

I obtained the degree in Veterinary Medicine in 2009 (Universitat Autònoma de Barcelona - UAB) and a master's degree in wildlife management and health in 2010 (Universidad de Murcia). Between 2011 and 2012, I worked with a research fellowship from the Universidade de Lisboa, Portugal, in a research project developed in the Estación Biologica de Doñana (EBD-CSIC), Seville. This project aimed to understand the effects of anthropogenic infrastructures on behavior and health (genetic resilience) of diverse mammal species.

In 2013, I obtained a scholarship (FI-DGR 2013) to perform my PhD studies at UAB. My thesis was supervised by Dr. Oscar Cabezón and Dr. Jorge R. López-Olvera. In my thesis, I studied modes of transmission and disentangled the roles of wildlife and livestock in the epidemiology of infectious keratoconjunctitis in mountain ecosystems from northern Spain. I also studied the transition from an outbreak to an endemic and mostly asymptomatic infections, providing evidence of the potential role of wild hosts for the maintenance of M. conjunctivae. During my PhD, I performed most of my research at CRESA animal health research center and I performed a research stay at the University of Bern, Switzerland. I defended my PhD dissertation in 2017 with Cum Laude and with a quality distinction from the UAB.

During 2018, I worked as research assistant at Royal Veterinary College with Prof. Richard Kock. My roles were to organize and coordinate, analyze data and scientific writing for national and international projects on emerging infectious disease and One Health approaches, including research on Lassa Fever and other Viral Haemorrhagic Fevers and Peste des Petits Ruminants (PPR). My work on PPR led to different scientific productions and I am currently a member of the wildlife working group on PPR from the PPR-GREN group (Global Research and Expertise Network) for the global eradication program organized by FAO and OIE.

By the end of 2018, I gained a postdoctoral position with Prof. Susan Kutz at the University of Calgary (UofC), Canada. There, my research was to 1) investigate the health and causes of population declines of key Arctic species by using interdisciplinary approaches, 2) assess the effect of climate change on Arctic Health, 3) Identify drivers of emergence of zoonotic diseases in the Arctic, 4) validate health indicators, methods and diagnostic techniques within the frame of wildlife, local knowledge and participatory epidemiology, and 5) promote capacity building for health surveillance in the Arctic, including community-based approaches. While being at the UofC, I earned an international project as principal investigator, "Estimating the impact and role of diseases in tundra caribou declines". This project covered my salary for the last two years at the University of Calgary. I also generated with Dr. Mathieu Pruvot a novel framework for wildlife health assessment using multiple health indicators.

In December 2022, I returned to Spain with a María Zambrano scholarship to UAB, to continue studying infectious diseases at the wildlife-livestock and human interface from a One Health approach.

Resumen del Currículum Vitae:

Most of my works are interdisciplinary using a One Health approach and include international collaborations with renown researchers and institutions, such as the Universitat Autònoma de Barcelona, Royal Veterinary College, University of Calgary, IRTA-CReSA, Pirbright Institute, the CIRAD, the USDA, the EBD-CSIC (Estación Biologica de Doñana) or the Wildlife Conservations Society, among others. I have performed five research stays (from one to 20 months of duration) before my PhD dissertation and I have more than four years and a half of international postdoctoral experience. This is represented in my scientific productions in which 60% of my SCI articles include authorships affiliated to institutions from different countries.

I published in the first quartile of a broad range of scientific categories within the SCI, such as Environmental Sciences, Microbiology, Virology, Multidisciplinary Science, Infectious Diseases, Parasitology or Veterinary Sciences. Among my publications, I am first author in prestigious SCI journals including Science, Emerging and Infectious Diseases, Applied and Environmental Microbiology, Veterinary Microbiology or Veterinary Parasitology.

I have 78 publications, among which 51 are SCI articles (33 in first quartile) with relevant author positions (first/last) in 17 of them. I published 3 peer-reviewed non-SCI articles, 3 book chapters and I lead one of them, 9 publications in congress proceedings and 12 technical reports for local or national agencies. I participated in 12 competitive research projects, among which I am principal investigator in one of them (100,000 USD), and 16 contracts with public agencies. I have participated in 91communication, in 46 congresses (8 national and 38 International) and specialized meetings.

I supervised one master thesis, and I am currently supervising two master students and two TFGs (UAB and UM). I have also participated in the ARGO program for high school students (UAB), and mentored MSc students (RVC) and undergraduate summer students (UofC). Since 2018, I am teaching at the Internship program on Wildlife Population Health at UAB in which I co-supervised 21 DVM students, and I am teaching in one subject of an official MSc from the UM.

I have been member of two Doctoral Thesis Committees. I have editorial roles in two journals from the Q1 of Veterinary Sciences. I worked as a reviewer in a book chapter, project grants and manuscripts from diverse SCI journals. Other merits include the organization of meetings and workshops for end-users of knowledge, including livestock owners, wildlife rangers and hunters. I have also been actively involved on outreach activities including the publication of articles and blogs for the diffusion of science to general public.

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Área Temática: **Ciencias agrarias y agroalimentarias**

Nombre: FONSECA RODRÍGUEZ, OSVALDO

Referencia: RYC2022-037029-I

Correo Electrónico: osvaldo.fonseca@umu.se

Título: Epidemiology

Resumen de la Memoria:

In 2006, I got a Bachelor in Veterinary Medicine and Husbandry at the Agricultural University of Havana (Cuba), where I also got a Master's degree in Preventive Veterinary Medicine (in 2012), and later a Doctorate in Science (in 2016). Between 2006 and 2017, I worked as a researcher at the Epidemiology Department from the National Center for Animal and Plant Health (Cuba). There I studied the epidemiology of Classical Swine Fever (CSF). I detected high-risk areas for CSF in Cuba and identified risk factors for the disease. In addition, I estimated the effect of animal movements on CSF disease transmission in Cuba. Besides, I also participated in studies to enhance avian influenza surveillance. We identified areas with a higher risk for the introduction of AI, increasing the probability of the detection of cases. I obtained two fellowships (total time 18 months) to stay at the Postgraduate Program in Biometrics and Applied Statistics (PPGBEA) of the Federal Rural University of Pernambuco (UFRPE), Brazil. That experience allowed me to improve my knowledge of statistics while working on my PhD.

In 2017, I moved to Brazil for a postdoc, and worked at the Laboratory of Infectious Diseases, Department of Veterinary Medicine, UFRPE. There, I studied the spatiotemporal distribution of Glanders in equids in Brazil. I identified the areas of high risk of the disease in Brazil, the long-term trend from 2005 to 2016 and its seasonality.

In 2018, I got a postdoc at the Department of Epidemiology and Global Health at Umeå University (UMU), Sweden. I investigated the associations between daily weather based on "Spatial Synoptic Classification" and health outcomes. Also, I projected the future health burden of oppressive weather types considering different climate and demographic change scenarios.

In 2020, I got a permanent position as a senior research assistant in the same department and affiliated with the Clinical Microbiology Department (UMU). Here, I participate in 10 projects studying complications following COVID-19 infection. We have demonstrated that COVID-19 is an independent risk factor for severe cardiovascular problems, which has resulted in a change in diagnosis and prophylactic practices. Our results had extensive media attention, with news coverage from The BBC, The Guardian, The Sun, and Dagens Medicin, among others.

Thanks to my experience in environmental epidemiology (weather and health studies), in 2020, I got a position at the Faculty of Environmental Sciences at the Czech University of Life Sciences, Czech Republic. There I have evaluated the temporal changes in the mortality attributable to heat in the Czech Republic and the adaptations to increasing temperature.

Thanks to my scientific results, I have been awarded nine times by different institutions in Cuba, including the Academy of Science.

Even though during the last years of my career, my focus has been mainly on human and environmental epidemiology, my main interest is still animal health. In fact, throughout my career, I maintained a connection with the veterinary field, as shown by my publication record. Now, I look forward to starting a new career as Ramón y Cajal Research Fellow in Spain. Furthermore, through my experience in human and environmental epidemiology, I have learned highly advanced methodologies that I would like to apply to veterinary problems.

Resumen del Currículum Vitae:

Throughout my career, I have published 76 scientific papers, 16 as the first author and five as the last, some of them in the most prestigious Medical and Veterinary journals. Within the field of human epidemiology, I have studied the consequences of COVID-19 on cardiovascular problems, also its spatial distribution in Sweden, and the identification of high-risk areas, and risk factors of severe health outcomes. Further studies are still ongoing. The studies I led, have been published in the most prominent medical journals, including The Lancet, with an impact factor of 202.7, or The British Medical Journal (BMJ), with an impact factor of 96.2.

Within the field of environmental epidemiology, I evaluated the effect of weather types on hospitalizations and mortality in the Swedish population. Those studies have been published in journals such as Environmental Research (IF 8.4), International Journal of Biometeorology (IF 3.7), and International Journal of Environmental Research and Public Health (IF 4.6), well-known within this field. In addition, another study evaluating the temporal changes in mortality attributable to heat in the Czech Republic, and the adaptation to increasing temperature, has been published in Urban Climate with an impact factor of 6.6

For a large part of my career, I worked as a veterinary epidemiology researcher in Cuba and Brazil. I worked on improving the control and eradication of Classical Swine Fever (CSF), developing the surveillance system for Avian Influenza, or increasing the detection of vector-borne pathogens, including some with zoonotic potential. Publications within the veterinary field include journals such as Frontiers in Veterinary Science (IF 3.4) or Transboundary and Emerging diseases (IF 4.5), Acta Tropica (IF 3.2), and Preventive Veterinary Medicine (IF 3.4).

I have participated as a researcher in several Swedish (total funding: 11,761,000 SEK) and European projects (total funding: 8,384,036 EUR) studing complications following COVID-19. Regarding environmental epidemiology, I was a researcher in a Swedish project studying the effect of weather types on health outcomes (funding: 2,996,265 SEK). Furthermore, I participate in an international project (funding: 135,000 EUR) studying the impacts of climate variability and change on human health in the Czech Republic.

In the veterinary field, I have worked on multiple projects in Cuba, including a national project studying the epidemiology of CSF where I was the PI (funding: 455,220 CUP). Also, I was a PI of a project in Brazil (funding: 52,800 BRL) about the spatial and temporal epidemiological characterization of Glanders.

I have supervised five master theses in public health, two PhD theses in medical sciences in Sweden and one PhD in veterinary sciences in Mexico. Also, I supervised a thesis from the multi-professional internship program in Collective Health in Brazil. Furthermore, I am a lecturer in the postgraduate Master's Programme in Public Health at Umeå University, where I teach several courses, including Health, Environment, and Sustainability or Advanced biostatistics and epidemiology. Additionally, I took part in three technical missions in the Dominican Republic under the Technical South-South Cooperation program financed by the FAO, in which I provided training to the Epidemiology division of the Veterinary Services.

AYUDAS RAMÓN Y CAJAL – CONVOCATORIA 2022

Turno RYC-INIA-CCAA

Área Temática: **Ciencias agrarias y agroalimentarias**

Nombre: RODRÍGUEZ SOLANA, RAQUEL

Referencia: RYC2022-036888-I

Correo Electrónico: rrsolana@ualg.pt

Título: Elaboration of innovative agri-food products by means of the valorization of by-products and new/emerging underutilized crops

Resumen de la Memoria:

Raquel Rodríguez Solana obtained a degree in Chemistry (2006) and completed the official postgraduate program in Agro-food Science and Technology (2009) at Vigo University (Spain). In December 2014, she obtained her PhD with International Mention from Vigo University, receiving in 2015 the Extraordinary PhD Award.

She was awarded different fellowships in competitive processes, which allowed her to acquire in-depth knowledge and wide experience in chemical analysis, and to exchange experiences with professionals from other countries. She was awarded (July-December 2007) the fellowship "Training of technologists and support staff for agricultural research" from Xunta de Galicia at the Viticulture and Oenology Research Station in Galicia (EVEGA), where she was trained in different routine wine analyses, and gas chromatography applications for the analysis of volatile compounds in alcoholic drinks. She obtained a competitive pre-doctoral fellowship (2011-2013) at the Scientific and Technological Support Centre for Research (CACTI, Vigo Univ.) where she continued her training in different sample preparation techniques and in the determination of minerals in different food matrices by Atomic Emission/Absorption Spectroscopy (AES/AAS) and Inductively Coupled Plasma Mass Spectrometry (ICP-MS). During her PhD, she was trained in gas (GC-FID, GC-MS) and liquid (HPLC-DAD, HPLC-MS) chromatography techniques for the study of the volatile and phenolic composition of aged distillates, herb liqueurs and spirits from Galicia. Dr. Rodríguez also studied the impact of different extraction techniques (accelerated solvent extraction (ASE), supercritical fluid extraction (SFE) and Soxhlet) on the chemical profile of medicinal and aromatic plants (MAPs).

During her PhD, she was awarded a pre-doctoral fellowship (Vigo Univ.) for a stay at the Agriculture University of Athens (Greece, 10/2013-01/2014). During the stay, she was trained in the processes for obtaining plant extracts and essential oils, and the use of "green" techniques for the identification of the main chemotypes of MAPs, the spectroscopic techniques Fourier transform infrared (FT-IR) and Dispersive-Raman.

From 2015 to 2020, Dr. Rodríguez worked at the Plant Biotechnology laboratory at the University of Algarve (Portugal) with a postdoctoral grant from Fundação para a Ciência e a Tecnologia (FCT) of the Portuguese government. She studied the influence of different factors of the manufacturing processes of traditional Mediterranean fruit and herbal liqueurs and spirits on their chemical (volatile, phenolic and mineral) composition. Taking advantage of the group's experience, during this stage she was trained in different in vitro antioxidant capacity, enzymatic inhibitory methods and in simulated gastrointestinal digestion protocols.

At present, she works with a postdoctoral Juan de la Cierva Incorporation contract at the Andalusian Institute of Agricultural and Fisheries Research and Training (IFAPA) in studies focused on different research lines related to the evaluation of the influence of factors (processing, genotype, biotic and abiotic factors, etc.) that influence the chemical profile of foods. The current research interest is to extend her work on the development of innovative products in the agri-food industry by adding value to by-products and new/emerging crops.

Resumen del Currículum Vitae:

The PhD thesis of Raquel Rodríguez was awarded with the highest qualification, the International Mention (2014), and the PhD Extraordinary Award from Vigo Univ. During her pre- and post-doctoral training, she gained vast experience of the analysis of analytical techniques for the determination of the volatile (GC-FID and GC-MS), phenolic (HPLC-DAD and HPLC-MS) and mineral (AAS and ICP-MS) composition in different food matrices, from raw materials (medicinal and aromatic plants) to final products (fruit and herbal liqueurs and aged spirits). This knowledge was acquired during different competitive fellowships and grants: the predoctoral fellowships (2011-2013) at the Scientific and Technological Support Centre for Research (Vigo Univ.); the pre-doctoral international stay (2013/2014) at the Agriculture Univ. of Athens (Greece); and the postdoctoral grant (2015-2020) from Fundação para a Ciência e a Tecnologia at the Algarve Univ. (Portugal). Since March 2020, she has been working with a postdoctoral Juan de la Cierva Incorporation contract in the Agroindustry and Food Quality department at IFAPA, leading the research line focused on the valorisation of by-products from the food industry and underutilized native resources, researching the relationship between research-production-development and society, as well as innovations in process technologies, seeking natural and pure products obtained through sustainable and eco-friendly processes.

To date, she has co-authored 37 research papers in JCR journals (h-index: 19, 788 citations, 43% as first author) and two book chapters. She presented the results of her research in four oral communications and 9 posters at national and international congresses and one technical conference. She has participated actively in six national and four international projects and eight research contracts (principal investigator of three) with national companies, all directly related to the field of food science. She has been a PhD Thesis jury member at Vigo Univ., Guest Editor of four special issues in two JCR journals (Foods and Processes). Moreover, she is a member of the Topic Advisory Panel for the Processes journal, and of the Section Board for the Foods journal. She evaluated two international projects from the Croatian Science Foundation and from the State Technical University of Quevedo (Ecuador), and is regular peer-reviewer for different JCR journals (LWT, Horticulturae, Plants, Molecules, Foods, etc). She co-directed two degree theses at Vigo Univ. and Algarve Univ. (Portugal), and one international Master¿s degree thesis at Piemonte Orientale Univ. (Italy). At present, she is co-supervisor of two PhD students (Cordoba Univ.). She participated in the development of courses related to the production of liqueurs (uAlg) and processed vegetables (IFAPA). She has participated in different dissemination activities: European research night (Portugal), publications in sector journals (Semana Vitivinícola, Campo Galego), in regional newspapers (Faro de Vigo, Voz de Galicia, La Región, etc), on Galician radio, in regional TV programmes about the agro-industrial sector, namely ⍰O Agro⍰ (Galician TV) and ⍰Salud al día⍰ (Canal Sur). Recently, in recognition of the quality requirements of production and scientific-technological activity that imply an outstanding research career, she has been awarded the i3 mention.