



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** VELO ANTON, GUILLERMO  
**Referencia:** RYC2019-026959-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
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#### Título:

Integrative analytical framework to study complex evolutionary traits

#### Resumen de la Memoria:

I am an evolutionary biologist interested in conducting integrative research to better understand how complex traits evolve in nature, and the eco-evolutionary implications of novel traits. My research interests have been focused on the study of mechanistic forces involved in diversification and differentiation processes at both genetic and phenotypic levels. During my research trajectory I gained solid background and multidisciplinary skills in the fields of integrative phylogeography and landscape genetics (combining spatial genetics, genomics and ecological analysis), which allow me to decipher the underlying processes (i.e. neutral or adaptive) involved in current patterns of genetic and phenotypic differentiation in several organisms.

I created an independent research line that rely on multidisciplinary skills obtained during my research career (10 years of international postdoc experience at Cornell and CIBIO). In particular, I examine the ecological and genomic mechanisms underlying viviparity in salamanders using a comparative framework. My research agenda aims to: i) characterize the phenotypic, ecological and genetic differentiation of a reproductive shift in amphibian urodeles, ii) unveil the genetic architecture underlying the shift to viviparity using transcriptomics and genomics, iii) identify the environmental drivers that promoted this shift using ecological modelling techniques, and iv) evaluate the critical eco-evolutionary implications (e.g. dispersal, microbiome) of this transition, as it entails independency from water. This research agenda lays on previous work done during my early scientific career, the work I developed under the scope of two funded projects as P.I. (>300.000 €), and a solid network of PhD students and collaborators that help me to complement and integrate this research. I apply this agenda to provide an analytical integrative framework with which to distil an evolutionary scenario for the evolution of viviparity in the species, which could be applied for the study of the mechanistic forces behind the evolution of other novel traits.

I also apply integrative studies at different spatial and temporal scales to study micro- and macro-evolutionary processes aimed to explain patterns of genome and phenotypic evolution responsible for species diversification. This includes answering scientific questions in the fields of Biogeography, Systematics, Evolutionary Biology, which are later applied in Conservation planning, across different taxonomic groups occurring in several continents, but mostly focused to island-mainland systems, circum-Mediterranean taxa and biodiversity in desert and arid regions.

#### Resumen del Currículum Vitae:

I graduated (2002) and completed a PhD degree (January 2004 - February 2008), both in Biology, at Vigo University. During the PhD studies I completed several stays in international research institutions (Newcastle University with a Marie Curie training site grant; UNAM, México; Berkeley, California University). I have 10 years of international postdoctoral research experience. I did my first post-doc (October 2008 - December 2010) in Cornell University (USA), followed by a second post-doc (April 2011 - April 2015) in CIBIO (Porto University, Portugal). Since April 2015, I hold an Auxiliary Researcher position at CIBIO developing an independent research line.

I have attained the following achievements during the last years, among others:

i) Publication record: I published 80 peer-reviewed scientific articles, 58 of them in SCI journals (44 in the first quartile of their area), including top-ranked journals as *Nature Ecology & Evolution*; *Biological Reviews*; *Global Change Biology*; *Molecular Ecology* (3); *Molecular Ecology Resources* (2); *Scientific Reports*; *Journal of Biogeography* (6); *Molecular Phylogenetics & Evolution* (3); *Heredity*; *Diversity & Distributions* (2); *PLoS One* (2), *Biological Conservation*. I also published 3 book chapters. My work has been presented in 74 communications in international and national congresses. I am the first or senior author in ca. 70% of the publications, accumulating over 1.200 citations, h-index = 20, I-index = 35. My publication record increases steadily in both the quality (higher average IF) and quantity. Follow the link to my ever-updated list of publications: <https://scholar.google.com/citations?user=qkDDzm4lBwsC&hl=en>, and to my personal website: <https://sites.google.com/view/velo-anton/home>

ii) Attraction of competitive national and international funding: I have been the Principal Investigator of 4 research projects, with two main projects supporting my current research line (SALOMICS [233.000 €]; and EVOVIV [80.000 €]), and participated in 8 projects, for a total amount of >700.000 €.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

iii) Advanced training of human resources: supervision of 5 PhD thesis (2 completed and 3 in progress), 16 MSc students (12 completed and 4 in progress), and 2 internships completed, from four European countries.

iv) Internationalisation of research. I have an extensive multidisciplinary, international and long-lasting collaboration networks, with researchers from 14 institutions and 8 countries: Portugal (CIBIO); Spain (CSIC; UAM; U. Vigo; U. Oviedo); USA (Berkeley-UCAL; Smithsonian Museum); Australia (Australian National University; The University of Queensland); France (CNRS); Germany (Braunschweig and Dresden University); Morocco (Abdelmalek Essaadi and Cadi Ayyad University), Poland (Jagiellonian University).

v) Outreach activities: I contributed with newspaper interviews, popular science magazines (Quercus), courses, and a documentary (The last urban dragons) to attract media coverage to my work and to reach a wider and general audience.

vi) Position as Associate Editor in the SCI-journal Amphibia-Reptilia; and served as reviewer for over 20 scientific journals (e.g. Molecular Ecology, Scientific Reports, Journal of Biogeography, Heredity, Biological Conservation, among others). I have been member of 5 tribunal PhD and 2 MSc thesis defense.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** GARCIA BRAVO, ANDREA  
**Referencia:** RYC2019-028400-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
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#### Título:

Fundamental knowledge on mercury cycling and the risks to the populations

#### Resumen de la Memoria:

My CV reveals a trajectory towards the definition of an independent scientist carrying high-level research in the understanding of mercury biogeochemistry and the formation of toxic methylmercury in the environment. Interdisciplinarity is the backbone of all phases of my career. Degree in Environmental Sciences from Universidad Autónoma de Madrid (2004). PhD in Environmental Sciences in 2010 in Geneva University, Switzerland. During my pre-doc, I revealed the geochemical conditions prone to methylmercury formation in impacted by sewage treatment plants (Bravo et al., 2011, JEM; Bravo et al., 2015, Water Res). In parallel, in the European project ORSED-ESTROM, I determined past and recent mercury releases of a chlor-alkali plant (Bravo et al., 2009, ESPR), its fate into aquatic ecosystems (Bravo et al., 2014, Water Res; Bravo et al., 2016, ESPR) and human exposure to mercury through fish consumption (Bravo et al., 2010, ESPR). Later, in my first post-doc (Geneva University, 2011), I developed a methodology to study mercury accumulation in planktonic organisms (Bravo et al., 2014, Env. Poll.). Afterwards, I made a post-doc at Uppsala University (Sweden) where I studied the interplays between mercury, organic matter and microbial communities. After 5 years in Sweden (where I did a total of 2 post-docs in Uppsala and 1 in Umea), I moved to the IDAEA-CSIC in 2017 with a Beatriz de Pinos grant. Since September 2018, I am working on my Marie Curie grant at the ICM-CSIC to study mercury cycling in the global ocean. After 9 years of postdoctoral research at 5 different institutes (3 countries) performing innovative geochemical studies in boreal lakes (Bravo et al., 2017, Nat. Com.), temperate lakes (Gasco et al., 2016, ES&T), ponds (Herrero Ortega et al., 2017, L&O) and streams (Bravo et al., 2018, Water Res) and fundamental microbial ecology (Bravo et al., 2018; ISME; Bravo et al., 2018, AEM), I have acquired the required skills to lead an interdisciplinary, competitive and innovative research group. The high quality of my students' work (Gasco et al., 2016, ES&T; Herrero Ortega et al., 2017, L&O; Xu et al., Sci Rep.) highlights these acquired skills.

#### Resumen del Currículum Vitae:

- High publication record: 49 publications (43 scientific JCR articles, 1 book chapter, 1 Proceedings, 1 viewpoint and 3 outreach science debate articles)
- Relevant role in >50% of my contributions: 17 as first and 5 as second author and 5 more publications as last- leading corresponding author, which result of my implication in students supervision.
- High rank journals: first author in Nature Communications (IF: 12.5), the ISME Journal (IF: 9.5), Water Research (IF: 7.1). Last and corresponding author in Environmental Science & Technology (IF: 6.6) and Limnology & Oceanography (IF: 4.5, this journal is ranked on 1st position in the field of Limnology) and in Scientific Reports (IF: 4.1).
- Influential research: more than 1000 citations. H-index: 17.
- Successful fund raiser: More than 600 000 euros including projects by the Swedish Research Council (2011, 2018), the Olsson- Borgh Foundation (2013, 2017, by the Generalitat de Catalunya (Beatriz de Pinos grant, 2017), by the European Commission (Marie Curie-IF, 2017). I am the PI of theme 2.2 of the Venezia 2021, a project that involves more than 200 researchers funded by Corilla (Italy).
- Contribution to international conferences and workshops: 51 contributions (more than 30 oral presentations).
- International leadership: Leader of the EuroRun\_mercury (a subproject of the 1st Collaborative European Freshwater Science Project for Young Researchers, funded by the European Federation of Freshwater Sciences-EFFS). WP-leader in the SMaRef (international project funded by the Swedish Research Council for scientific cooperation between China and Sweden).
- International recognition: Recipient of the prestigious 2019 Raymond L. Lindeman Award by the Association for the Sciences of Limnology and Oceanography ASLO, to recognize an outstanding paper written by a young aquatic scientist for my paper Bravo et al 2017 Nat. Commun. (this article is in the 98th percentile of citations). Awardee of the 2013 Early Career Research Award by King Carl XVI Gustaf of Sweden. More than 10 invited talks to international conferences and workshops.
- Independent and integrative: I set up and developed my own research lines at University of Geneva, University of Uppsala and the institute of marine sciences (ICM-CSIC). Those research lines are still on-going.
- I have supervised 9 master students and 1 PhD. I am currently supervising a PhD student.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** SERRANO GRAS, OSCAR  
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#### Título:

Biogeoquímica costera, ciclo del carbono, carbono azul, y reconstrucción paleoecológica del Holoceno empleando el registro sedimentario de praderas marinas

#### Resumen de la Memoria:

I have over 12 years research experience in marine ecology and palaeoecology, chemistry and in marine biogeochemical cycles. After completing my PhD in 2011 in Spain, I quickly secured a 4-year postdoctoral research contract in a multi-institutional research project based in Australia. I have used this to rapidly build my research activity at the international level, and in 2016 I was awarded an ARC DECRA Fellowship, the most prestigious fellowship for Early Career Researchers in Australia. I have taken many opportunities to develop my research performance through participation in grant proposals, communicating my research in scientific papers and media outlets, and giving more than 25 invited presentations.

My work has contributed to generate a new research program on seagrass ecology based on the analysis of the palaeo-archives existing in the massive deposits these ecosystems develop over millennia. Utilizing this increasingly valuable method I have been able to reconstruct the past history of coastal and terrestrial ecosystems in response to environmental forces, thereby answering key questions of human concern. This research program is now a central motor of development in the field worldwide. Over my career I have become recognized as one of the leaders in Blue Carbon research (i.e. Carbon Dioxide storage by coastal vegetated ecosystems) worldwide. The large Blue Carbon datasets gathered have been contributing to the publication of high impact manuscripts in collaboration with the top international researchers in the field. This research informs the development of methodologies for the inclusion of blue carbon abatement strategies in carbon accounting by governments, as an strategy to contribute to mitigate climate change.

#### Resumen del Currículum Vitae:

I ve co-authored 6 refereed book chapters and 56 papers published in peer-review journals (H Index = 21 and ~1,750 citations in Scopus, December 2019). The journals rank between 1st and 10th in their respective disciplines (>95% of the publications are in first quartile journals), with an average impact factor of 4.5, including 8 manuscripts published in journals with Impact Factor ranging from 9 to 19, ranking among the first in their respective disciplines. Since the completion of my PhD in 2011, my publications were cited 224 times per year on average. I have co-supervised 10 undergraduate research projects, 1 PhD student and 1 Master of Science student until completion and guided them through the process of delivering publications. I am currently co-supervising 3 Master of Science students and 3 PhD students. I have been awarded 14 competitive grants and been involved in the award of another 3 grants funded by Australian and European Institutions (> 800,000), involving 32 researchers from 7 different countries and engagement with Industry.

I have taken many opportunities to develop my research performance through participation in grant proposals, communicating my research in popular and scientific papers, inviting researchers to Australia, visiting key researchers at other institutions, presenting at international conferences and giving 15 invited presentations. I have also been invited to chair symposiums at the American Society Limnology and Oceanography; and Australian Marine Science Association conferences, the former being the premier oceanographic scientific meeting in the world, and regularly review papers for SCI journals. Some of the research outputs generated large media campaigns, with appearances on TV, radio, newspapers and other media outlets. More than 90% of these achievements have been accomplished during just seven years after completing my PhD, and following the disruption involved in moving from one country to another.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** CARBAJALES-DALE , MICHAEL  
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**Título:**

GALLILEO

**Resumen de la Memoria:**

For the Ramón y Cajal award, my plan is to lay the foundation for a European-wide, multi-regional, environmentally-extended, input-output model. Initial development will focus on building the tool (GALILEO, described below) for the Galician region and then be deployed for other regions across the EU. The motivation for this work is that food, energy, and water have been identified as critical infrastructure and natural resource systems. Analytical and technological innovations enabling their efficient use are important research priorities across all RIS3, especially in the RIS3 Galicia, since agrofood is one of the leading sectors in which Galicia has a competitive advantage.

The main goal of GALILEO is to develop a decision-support system (GALILEO tool) consisting of a GALician regionally-located Environmentally-extended input-Output model, with a focus on the food-energy-water-climate nexus with the following objectives: (1) establish an assessment model for food-energy-water (FEW) supply and consumption as well as greenhouse gas (GHG) emissions based on input-output analysis; (2) quantify characteristics of FEW+GHG flows, and the relationship among them at the regional and industry level; (3) undertake network analysis to characterize economic structure and identify key industrial sectors within the nexus; (4) undertake critical paths analysis to identify key coupling points which significantly affect FEW+GHG flows; and (5) determine a control model of regional FEW+GHG flows, simulating and evaluating synergistic conservation policies. The expected results of the project are: (i) development of a DSS (GALILEO tool) for the simulation and evaluation of synergistic policies to improve utilization of food-energy-water resources; (ii) increase industrial competitiveness and promote overall sustainability of the Galician regional economy by incorporating environmental, economic and social performance indicators; (iii) enable the harmonization and simplification of FEW+GHG analyses for communication purposes across the EU; (iv) boost the replication, transfer and commercialization of the proposed methodology to other regions within the European and other markets; and (v) serve as the foundation for a multi-national, regional-level, environmentally-extended, input-output (EEIO) model for the entire EU.

The GALILEO project serves as the foundation for an EU-wide regional-level EEIO model, which will be proposed as via an ERC Consolidator Grant. The GALILEO model will be implemented in such a way as to leverage existing EU data sources (e.g. EUROSTAT), such that the methodology can be easily replicated for other locations, building up to an EEIO model that covers the whole EU region, with regional-scale (e.g. NUTS level 2). Additionally, the GALILEO project provides complementary information to an ERC Consolidator Grant that the candidate is submitting with UDC, by analyzing the structural characteristics of physical resource flows through regional economies and potential adaptation strategies to manage resources more efficiently.

**Resumen del Currículum Vitae:**

Dr. Carbajales-Dale heads the Energy-Economy-Environment Systems Analysis (E3SA) Group (<http://e3sa.sites.clemson.edu>) at Clemson University. He has a wide range of International experience, having undertaken his Bachelors and Masters degrees in the United Kingdom, his PhD in New Zealand, and his postdoctoral work at Stanford in California before starting as an Assistant Professor in South Carolina. He has also gained broad experience in different disciplines, with a BS/MS in Physics & Philosophy, PhD in Mechanical Engineering, and currently working in an Environmental Engineering & Earth Sciences department.

He has an established reputation of attracting and managing large grants. To date he has been Principal Investigator (PI) on \$1.7M USD and co-PI on over \$5.8M USD of funding. Dr. Carbajales-Dale is an internationally recognized and highly-motivated researcher with extensive knowledge of modeling the coupled energy-economy- environment systems. He is also Director of the Clemson Industrial Assessment Center, which conducts no-cost energy assessments for small- to medium-sized manufacturing enterprises within South Carolina.

His group builds tools to analyze environmental impacts of technology systems and the structural transformation necessary for a peaceful transition to a sustainable future. Specifically, modeling energy and material resource requirements at three distinct levels: (1) micro: the device/facility level, using engineering-based, bottom-up life cycle assessment and techno-economic modeling tools; (2) meso: the industry/local level, using multi-layer, network-analytic techniques; and (3) macro: the regional/national/global scale, using geographic information systems (GIS) and environmentally-extended input-output models.

Research projects include: (1) agent-based modeling of resource investment strategies and technology development under supply constraints; (2) development of a web-based, serious game (built on a suite of open software tools, e.g. python) in which the user takes on



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## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

the role of CEO of an electric utility who must make capacity investment decisions under a variety of scenarios to weigh supply-demand, economic, social, and environmental considerations; (3) analysis of the food-energy-water nexus of municipal service areas using an environmentally-extended, input-output model; (4) assessment of the geographical potential for utility-scale PV in South Carolina likely PV expansion in Duke Carolinas service region; (5) assessment of the trade-off between efficiency and embodied energy for the major solar PV technologies; (6.) a carbon footprint assessment of Clemson campus operations to explore synergistic opportunities to reduce emissions; and (7.) development of a suite of tools to extend the domain of LCA to encompass low TRL, emerging technologies, which includes (8.) a formal integration of LCA and TEA tools such that technology developers can simultaneously evaluate and optimize the economic and environmental performance of their technology systems.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** TURCO , MARCO  
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**Área Temática:** Ciencias y tecnologías medioambientales  
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#### Título:

Making climate information action oriented

#### Resumen de la Memoria:

Dr. Turco is currently a postdoctoral researcher at the University of Murcia (UM; Spain) leading the national project PREDFIRE (PI; 145K): "climate monitoring and PREDictions to forecast global FIRE activity". This project applies his current cutting-edge research, focused on making climate information action-oriented, which he approached using multidisciplinary and multi-sectorial experiences on operational and research activities. Within a context of global changes, seasonal climate forecasts enable a more effective and dynamic adaptation to climate variability and change. Dr. Turco's scientific aim is to explore how best to exploit seasonal forecasts for end-user decision making on a global scale employing the latest advances in climate science.

He has extensive experience of analysis of the scales of weather forecasts and climate change projections to the dimensions of seasonal climate predictions. At this stage of his career (7 years as a meteorologist and 10 as a climate researcher in different research centres and foreign institutions), he has gained skills in leadership, management, funding, supervision, teaching and communication. He has published in complementary areas of research, namely evaluation of different types of climate-driven natural hazards.

Dr. Turco's scientific career comprises the following steps. He studied Physics at the University of Turin (final mark 110/110, 2002). He moved to the Regional Civil Protection Weather Service (Italy) to work as a meteorologist under the umbrella of national and European projects (2002-2009). He then joined the group of Prof. Llasat (University of Barcelona, UB) in the Spanish project eSTcena (2009-2012). He obtained a PhD in Physics in 2012 at the UB (summa cum laude and Doctor Europeus mention), studying climate change in a Mediterranean environment (north-east Spain) and its impacts on forest fires. These investigations were recognized with a MedCLIVAR Young Scientist award. He returned to Italy as a postdoctoral researcher, first at the Euro-Mediterranean Center on Climate Change (2012-2013) and then at the Italian National Research Council (2014-2015). Back in Spain, he joined the group of Prof. Doblas-Reyes (Barcelona Supercomputing Center, BSC; 2016). He was on parental leave during part of 2016, and was awarded the Juan De La Cierva-Incorporación Grant at the UB (2017-2018), in which he pursued the establishment of his independent research career on forest fire, drought and seasonal forecasts. From November 2018 to October 2019 Dr. Turco was on a Marie Curie Individual Fellowship at the BSC, leading as Principal Investigator the European Commission project CLIM4CROP: Climate monitoring and seasonal forecast for global crop production.

To sum up, the work of the candidate has led to 42 peer-reviewed publications in top journals (e.g., 4 Nature Communications) attracting over 1100 citations, and international collaboration with different institutions and projects, and winning competitive fellowships (the Juan De La Cierva Grant and the Marie Curie IF) and he has been beneficiary as PI of the PREDFIRE project.

#### Resumen del Currículum Vitae:

Dr. Turco has extensive experience of analysis of the scales of the weather forecasts and climate change projections to the dimensions of seasonal climate predictions. He is currently a postdoctoral researcher at the University of Murcia (Spain) leading as Principal Investigator the national project PREDFIRE (PI; 145K): "climate monitoring and PREDictions to forecast global FIRE activity". This project applies his current cutting-edge research, focused on making climate information action-oriented, applying his multidisciplinary and multi-sectorial experiences in meteorology-climatology sciences to develop operational facilities and research advances.

The applicant has a very strong publication record for his career stage, with 42 scientific papers in top journals (plus 5 under review, 35 in the first Quartile Q1, 20 as first author), including some in high-impact interdisciplinary journals (e.g. 4 Nature Communications, of which 2 as first author). He has a progressively growing number of citations (1106, of which 373 in 2019, source: Google Scholar) and has reached an h-index of 22 in only nine years since his first publication as a PhD student. In addition, he has published 13 chapters in books and proceedings, 1 scientific monograph, 1 scientific book and 11 scientific reports. He has also performed reviewer tasks for several journals (approximately 5-10 per year) for 26 top-ranked journals, 2 IPCC reports, 1 project and 1 PhD thesis.

He has demonstrated an international outlook. After graduating at the University of Turin (2002, Italy), he worked as a meteorologist at the Regional Civil Protection Weather Service (2002-2009, Italy) and went on several training courses (including those at the ECMWF). He received his doctorate in Physics in 2012 at the University of Barcelona (Spain), and carried out his postdoctoral research at the CMCC (Italy, 2012-2013), at the CNR (Italy, 2014- 2015) and at the BSC (Spain, 2016). Afterwards he was a postdoctoral researcher at the



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

University of Barcelona (2017-2018), supported by the Spanish Juan de la Cierva Programme, and at the BSC (2018-2019) on a Marie Curie Individual Fellowship. These competitive grants ( 234K in total) reflect his ability to secure funding, with also 2 travel grants ( 4K), along with the competitive Spanish project PREDFIRE ( 145K). Furthermore, since obtaining his PhD, he has carried out several postdoctoral stays (at the Ebro Observatory and the University of Cantabria, Spain; at the University of Tel Aviv, Israel; at the JRC, Italy; and at the IDL, Portugal).

He has worked as a researcher in the framework of 12 projects (2 as PI), 6 contracts (4 as co-PI to deliver seasonal fire-risk forecasts to fire managers in Catalonia, Spain) with most of his research carried out through collaborations with several research institutions (over 100 co-authors). He has also been involved in 12 research networks and 2 societies. In addition, he has presented over 100 contributions to scientific conferences (including 2 keynote talks) and been invited to deliver 12 scientific seminars. He is currently supervising 1 PhD student and 1 MS student, and has supervised 1 PhD student (who will defend on January 21, 2019), 2 MS students, and 2 end-of-degree projects. These activities show his strong commitment to serving the science community.





## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** KALIONTZOPOULOU KALIONTZOPOULOU, ANTIGONI

**Referencia:** RYC2019-026688-I

**Área Temática:** Ciencias y tecnologías medioambientales

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#### Título:

THE SCALING OF BIODIVERSITY: EVOLUTIONARY DYNAMICS FROM INDIVIDUALS, TO POPULATIONS, SPECIES AND ECOSYSTEMS

#### Resumen de la Memoria:

I am an evolutionary ecologist interested in the evolution of phenotypic diversity. My principal scientific endeavor is to provide a better understanding of the ecological and evolutionary causes of phenotypic diversification. Explaining what drives the astonishing diversity we observe in nature is a puzzle of describing phenotypes across different spatial and temporal scales, teasing apart the processes that shape them, and deciphering how variation scales up from individuals, through populations, to across species, communities, and ecosystems. In my research, I combine field observations, experimental approaches and quantitative analytical tools to investigate the ecological and evolutionary mechanisms that drive phenotypic diversification at different spatial and temporal scales. I address questions such as how developmental processes shape morphological variation; how sexual and natural selection drive sexual phenotypes; what determines the geographic structure of morphological, functional, ecological and genetic diversity; which is the influence of environmental and genetic variation on the phenotype; how variation in morphology translates into differences in functional performance and ecology; and how the combination of these processes determines phenotypic diversity within and across individuals, populations, species, and ecosystems. For this, I combine a multidisciplinary toolbox that includes linear and geometric morphometrics to quantify morphological variation; force, image, and motion analyses to measure whole-organism functional performance; population genetics, phylogeography and phylogenetics to characterize recent and deep-time evolutionary dynamics at distinct geographic scales; and multivariate statistics, phylogenetic comparative methods, and spatial analyses to test hypotheses about how environmental and genetic factors shape phenotypic diversity.

In addition to empirical research, I develop quantitative methods and tools for measuring phenotypic diversity and testing hypotheses on its causation. I have contributed to this field through the development of software and refined protocols for quantifying morphological variation using geometric morphometrics; and by conducting theoretical research that explored the statistical properties of methods commonly used for studying phenotypes.

My main scientific contributions and research activities focus on:

- 1) Microevolutionary causes of diversity, where I study morphological variation across individuals and traits, and I seek to link it to its functional significance.
- 2) Macroevolutionary diversification, where I test hypotheses on how environmental variation (e.g. habitat use, climatic niche) and evolutionary history (i.e. population dynamics, phylogenetic relatedness), influence morphological, functional and ecological traits.
- 3) Tools for studying phenotypic evolution, which provide the essential means for testing evolutionary hypotheses and statistically linking phenotypes to their underlying genetic, ecological and evolutionary drivers.

These activities have led me to develop a solid, coherent research program, which culminated in 2017 in the creation of the Phenotypic Evolution research group in CIBIO/InBIO, Portugal (<https://cibio.up.pt/research-groups-1/details/phenevol>), to which I act as the group leader.

#### Resumen del Currículum Vitae:

Since the completion of my PhD in 2010, which included 10 published articles, I have had a fast-developing career and high international mobility. After four years of post-doc, I obtained a position as an Auxiliary Researcher in April 2015, and became the leader of the Phenotypic Evolution research group in CIBIO/InBIO in 2017 (<https://cibio.up.pt/research-groups-1/details/phenevol>).

My scientific CV can be summarized in these key points:

1. Over 50 indexed scientific papers published, 23 of them as the first and 12 as the senior author. At present (29 December 2019), my Google Scholar profile sums 1484 citations, with a continuously ascending rate, which corresponds to an h-index of 20.
2. A highlight of my scientific contributions is my participation to the development team of the geomorph R-package for Geometric Morphometrics (<https://cran.r-project.org/package=geomorph>.)
3. Successful research fund-raising, with over 450K raised as the PI, including recently a research grant of approx. 240K to develop the project MEDBIODIV: linking phenotypes to diversification dynamics to decipher the temporal and spatial scaling of biodiversity evolution in the Mediterranean Basin. I also participate as a collaborator in several international projects, with a cumulative budget of over 2M.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

4. High international mobility: after concluding my undergraduate studies in the University of Crete (Greece), I did my PhD in the University of Barcelona (Spain), and a post-doc shared between the Department of Ecology, Evolution and Organismal Biology of Iowa State University (USA) and CIBIO/InBIO (Portugal), where I then got established as an Auxiliary Researcher. I have developed research in major European Natural History Museums, partially funded by SYNTHESYS EU grants.
5. My international reputation is also enhanced by the instruction of numerous international courses and workshops. These include courses in geometric morphometrics, multivariate statistics for ecology and evolution, and phylogenetic comparative methods. I have been invited to teach in e.g. Spain, Portugal, Sweden, the UK, Norway, Canada and Chile, and have interacted with participants from over 20 countries. In CIBIO/InBIO, I am a member of the coordination committee of the courses of the BIODIV doctoral program. I am also a dedicated mentor and I have supervised more than 20 students and post-docs.
6. I regularly participate in international conferences, with over 80 contributions in total. My most relevant recent contributions are the organization, in August 2018, of the Symposium S30: Novel approaches in phylogenetic comparative methods for modelling trait evolution, in the II Joint Congress of Evolutionary Biology (Montpellier, France); and the organization in December 2019 of TiBE2019: Biodiversity, Ecology and Evolution in Mediterranean ecosystems.
7. Through my international activities, I have established a dense collaborative network with researchers from Europe, the US, and South America.
8. Other professional service includes my role as an Associate Editor for Evolution, and as a vice-president for the Societas Herpetologica Europaea, as well as a reviewer for several major journals in my fields of expertise, for international grant assessment panels, and for academic exams (MSc and PhD committees).



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** ALMEIDA FRANÇA E MILLER, ANA ZELIA  
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**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** anamiller@uevora.pt

#### Título:

Geomicrobiology of natural and cultural heritage

#### Resumen de la Memoria:

My research career is focused on geomicrobiology of natural and cultural heritage, an interdisciplinary field of science that investigates the interactions of microorganisms with geological substrates. During my PhD thesis, granted with a PhD fellowship from the Portuguese Government (FCT), I pioneered the implementation of stone colonization experiments using multi-species phototrophic cultures for simulating competition and/or synergy among microorganisms under laboratory conditions. This novel methodology is now widely used in the curricula of European PhD programs in this field.

During my first postdoctoral fellowship awarded by FCT (2010-2014) at the CERENA Research Centre (University of Lisbon, Portugal), I grew my competency in microbe-mineral interactions, microbial dispersion and stone biodeterioration processes in subterranean environments, and was principal investigator (PI) of a research project funded by FCT.

In 2014, I was granted a prestigious 2-year Marie Curie Intra-European Fellowship from the European Commission (EC) to address my research at the IRNAS-CSIC (Seville, Spain). I implemented novel approaches to blending classical microbiology, molecular biology, metagenomics, mineralogy and geochemistry in a holistic effort to understand microbial life and minerogenesis in volcanic caves from Canary (Spain), Easter (Chile) and Galapagos (Ecuador) Islands, leading to major breakthroughs on geomicrobiological interactions, paleoclimates and biosignatures preserved in the rock record.

In 2016, I was successful in receiving a Juan de la Cierva-Incorporación fellowship from the Spanish Ministry of Economy and Competitiveness (MINECO) to continue my innovative research line into the geomicrobiology of subterranean environments at the IRNAS-CSIC. Owing to my internationally recognized expertise in the geomicrobiology of lava tubes, I was selected by the European Space Agency (ESA) to train ESA astronauts within the PANGAEAX programme, held in Lanzarote in November 2017. I designed and implemented a geomicrobiological sampling procedure valid for future missions to the Moon and Mars subsurface, and was responsible for the scientific training of ESA astronauts on how to collect microbiological samples and perform real-time DNA sequencing inside of lava tubes. Following delivery of a successful workshop, I was invited to organize the next ESA PANGAEA and CAVES training campaigns in 2018 and 2019.

Currently, I have taken up a role as a postdoctoral researcher at the HERCULES Laboratory (University of Évora, Portugal), part of a highly competitive individual postdoctoral contract awarded by FCT, where I established and lead my own and new research line in subsurface geomicrobiology.

In the course of my research career, I proved the ability to attract competitive research funds through (i) 5 research projects acting as PI (FCT-Portugal, Marie Curie-EC, MICSS project-ESA, EUROPLANET H2020-EC, Bordeaux University-France) and (ii) 6 highly competitive individual fellowships (3xFCT-Portugal, Marie Curie-IEF, DAAD-Germany, MINECO-Spain). In addition, I have consolidated experience in supervising students, with 3 PhD and 5 MSc completed theses. In recognition of my research achievements in the academic year 2017/2018, I was distinguished with a CSIC honorary mention in June 2018.

#### Resumen del Currículum Vitae:

##### EDUCATION AND POSITIONS

05/2019- : CEEC postdoctoral researcher, HERCULES Lab, Portugal.  
03/2018-02/2019: Postdoctoral research contract, IRNAS-CSIC, Spain.  
03/2016-02/2018: Juan de la Cierva- Incorporación fellow, IRNAS-CSIC, Spain.  
09/2014-10/2014: Visiting Scientist (DAAD scholarship), Federal Institute for Materials Research and Testing, Berlin, Germany.  
03/2014-02/2016: Marie Curie IEF fellow, IRNAS-CSIC, Spain.  
03/2010-02/2014: Postdoctoral fellow, CERENA, University of Lisbon, Portugal.  
03/2006-02/2010: Predoctoral fellow, New University of Lisbon (UNL), Portugal.  
05/2015-01/2006: Postgraduate fellow, UNL, Portugal.  
09/1999-06/2004: Undergraduate student, UNL.

##### INDIVIDUAL FELLOWSHIPS AND R+D PROJECTS

- Principal investigator of 5 R+D projects (EUROPLANET H2020-EC, ESA-Germany, Marie Curie-EC, FCT-Portugal, University of Bordeaux-France).  
- 6 highly competitive individual fellowships (3 FCT-Portugal, Marie Curie-EC, DAAD-Germany, MINEICO-Spain).  
- Participant as team member in 13 projects (1 European-FP6, 6 MINEICO, 4 FCT-Portugal, Mexican Government, 1 National Geographic-USA).



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

- 8 non-competitive research contracts.

#### SCIENTIFIC PRODUCTION

- 75 peer-reviewed publications (55 in SCI journals, 16 book-chapters, 4 non-SCI journals).
- 55 articles in SCI journals (66% in Q1, 44% as main author).
- Citations: 922 (WoS), 1039 (Scopus), 1485 (Google Scholar).
- h-index: 17 (WoS), 19 (Scopus), 22 (Google Scholar).
- 6 scientific-technical reports.
- 95 contributions to international and national conferences and seminars (9 as invited speaker).
- Member of 11 organizing committees.

#### PRIZES AND AWARDS

- 2019: Premio Bruker Universidad de Sevilla
- 2019: Team achievement award, CAVES 2019, European Space Agency (ESA)
- 2018: CSIC honorary mention in recognition of my research achievements in the academic year 2017/2018
- 2017: Team achievement award, PANGAEA-X2017, ESA
- 2016: Travel award, 16th EANA
- 2016: Travel award, 40th ISCC
- 2016: Best presentation award, XVI COLACRO
- 2013: Travel award, 26th IMOG

#### TEACHING/MENTORING

- 3 PhD theses
- 5 MSc theses
- > 120 lecturing hours (New University of Lisbon, University of Seville)
- Co-organizer and instructor in CSIC formation courses (2016, 2017)
- Jury member of 4 PhD theses
- Co-organizer of ESA PANGAEA 2018 and CAVES 2019 astronaut training programs.

#### MEMBERSHIP OF SCIENTIFIC SOCIETIES, NETWORKS

- Since 2016: International Society for Subsurface Microbiology
- Since 2015: European Astrobiology Network Association
- Since 2015: European Geosciences Union
- Since 2014: CSIC Thematic Network for Science and Technology for the Conservation of Cultural Heritage

#### OTHER MERITS

- Visiting Scientist at several research institutions in Spain, Germany and USA.
- Reviewer of R+D projects (Pegasus Marie Curie Fellowships and Regional Government of Madrid) and > 75 articles in SCI journals.
- Associate Editor of International Journal of Speleology and Conservar Património .
- Organizer and leader of several sampling campaigns in subterranean environments.
- Training course of Speleology organized by the Andalusian Federation of Speleology.
- Active participation in outreach activities, including media appearances (newspapers, radio, popular science journals).



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** SEBASTIAN GONZALEZ, ESTHER  
**Referencia:** RYC2019-027216-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** esebgo@gmail.com

#### Título:

Understanding the processes shaping the structure of vertebrate communities

#### Resumen de la Memoria:

My multidisciplinary research has broadly covered the areas of ecology, conservation biology and ornithology from different perspectives. I have focused in understanding the factors driving the structure of terrestrial animal communities (mostly, but not exclusively, birds) and how the habitat and the interactions among the species influence them at local and macroecological scales. I have used diverse analytical techniques ranging from stable isotopes, network analyses, statistical modelling and bioacoustics. My research has covered several study systems worldwide. I am interested in understanding community ecology from both a theoretical (e.g. hypothesis testing) and an applied (i.e. conservation and management) point of view. Specific research lines include:

- Patterns, processes and conservation of waterbird communities in natural and artificial wetlands
- Structure and efficiency of vertebrate scavenger assemblages
- Global patterns in seed-dispersal interaction networks
- Using bioacoustics to study the assembly and conservation of bird communities

#### Resumen del Currículum Vitae:

I have authored 44 SCI scientific articles in journals such as *Global Change Biol* (IF: 8.88, ranked 1/59 in *Biodiversity and Conservation*), *Global Ecol. Biogeogr.* (IF: 5.84; ranked 1/49 in *Geography*) or *Ecology* (IF: 4.81), and I have 2 more under review. I am the first author in 25 (57%) of them and the single author of one article published in *J. Animal Ecol.* (IF: 4.47). 25 of my SCI articles are in Q1. The average impact factor of my SCI papers is 2.9, and they accumulate +650 citations. I am also the author of 7 book chapters and 4 popular publications.

I have presented 34 works in scientific conferences (21 of them international). My outreach activities include many interviews for newspapers (*New York Times*, *EFE*), radio (*BBC*, *SER*) and specialized TV programs. I was awarded with the Extraordinary Doctorate Award, a Top Reviewer award (2018, *Publons*), Best Poster award (*SEO Conference*, 2019) and a scientific video award (*Science in Action*, 2019). I have been working for 8 years as a postdoctoral research associate: 2yr in the *São Paulo University* (ranked #2 in Latin America), 1yr at *Stanford University* (ranked #2 QS world ranking), 2yr at *University of Hawaii* and 3yr at *Universidad Miguel Hernandez* (2 as *Juan de la Cierva*, 1 with my own funding). I have supervised 3 master theses, 4 final degree projects and one introduction to research project. I am currently supervising two PhD theses and I am a member of a master thesis committee (*Univ. Hawaii*). I have also been a research mentor for two undergrads in a Field Course in *Costa Rica* (*NAPIRE-OTS*).

I have been invited as a speaker or collaborated in several classes in either undergrad or master level and I have also been responsible for several classes in Spain and USA. I am a regular reviewer (+100 ms) for +50 peer-review journals in *Ecology*, *Conservation Biology*, and *Ornithology* (e.g. *PNAS*, *Nature Comm*, *J Animal Ecol*, *Ecography*). I am an associate editor (*Ibis*, Q1) and a recommender (*PCI Ecology*). I have participated in 6 PhD thesis and 2 qualification tribunals.

I have participated in 12 research projects (Total funding: >5M\$) from competitive calls (4 of them international), being the principal researcher 3 times (Total funding projects as PI: 346,105). I have also been part of 9 non-competitive contracts (3 times as PI). I am the single PI of a 3-years project that has allowed me to create and manage the largest network of researchers working on vertebrate scavengers worldwide, with +50 researchers from 17 countries involved; to hire a PhD student and a technician, and to fund two fieldwork campaigns in *Brazil* (2018) and *Mongolia* (2019).



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** GARCIA ROBLEDO, EMILIO GUILLERMO  
**Referencia:** RYC2019-027675-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** emilio.garcia@uca.es

#### Título:

Biogeochemistry of aquatic ecosystems

#### Resumen de la Memoria:

The impacts of environmental changes on the contribution of microorganisms to the biogeochemical cycling of oxygen, carbon and nitrogen of aquatic ecosystems have constituted my main research topic.

My scientific career started during the BSc degree and continued with my PhD thesis. During that period, I introduced to my lab several electrochemical and optical microsensors and isotopic tracing techniques that, combined with analytical chemistry and simple modelling, revealed the impacts of massive macroalgal proliferations on benthic primary production, organic matter and nutrient remineralization, as well as, on the micro- and meiofauna communities inhabiting shallow sediments. During two stays at Danish universities, I learned to construct biosensors and apply the isotope pairing technique to study nitrogen cycle processes. These stays improved my manuscripts and PhD thesis level, and initiated long-lasting collaborations.

Since my postdoctoral period at Aarhus University in Denmark, I started studying the Oxygen Minimum Zones and microbial metabolism at low oxygen concentrations. I characterized the regulation and community rates of aerobic processes in trace oxidic conditions and apparent anoxia in OMZ during several international cruises as well as in laboratory experiments with selected bacterial strains.

I have also participated and led studies of biogeochemistry in other systems such as macrophytes and vegetated sediments, soils, acidic lakes affected by mining activity, wastewater treatment plant and biogas reactor biofilms, continuing my scientific collaboration with the microbial ecology group at UCA and other groups.

These scientific achievements were possible thanks to the technical development of sensors and procedures I have accomplished. During the last years, I have led the development of methods and procedures, participated in the development and application of sensors for the measurement of O<sub>2</sub> at trace concentrations, microsensors for H<sub>2</sub>, H<sub>2</sub>S and pCO<sub>2</sub> in water as well as patented a method for the analysis of NO<sub>2</sub><sup>-</sup> and NO<sub>3</sub><sup>-</sup> in aquatic samples.

To date, I lead a project on the impact of extreme climatic events on the production and release of greenhouse gases, such as CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O, in coastal environments. I also participate in international projects to study OMZs and I have applied for a National project to continue the study of ocean deoxygenation, including the distribution of oxygen in the oceans and the adaptations of marine microbial communities to low oxygen conditions.

#### Resumen del Currículum Vitae:

My scientific career started during the BSc degree in Marine Sciences and continued with my PhD thesis, both at the University of Cadiz. My PhD thesis was supported by a FPU grant of the Spanish Ministry of Science. During that period, I introduced to my lab several electrochemical and optical microsensors and isotopic tracing techniques that, combined with analytical chemistry and simple modelling, revealed the impacts of massive macroalgal proliferations on benthic primary production, organic matter and nutrient remineralization, as well as, on the micro- and meiofauna communities inhabiting shallow sediments. During two stays at Danish universities, I learned to construct biosensors and apply the isotope pairing technique to study nitrogen cycle processes. These stays improved my scientific expertise and initiated long-lasting collaborations.

In 2012, I was awarded with a Ramon Areces postdoctoral grant at Aarhus University, Denmark. There, I started studying Oxygen Minimum Zones and microbial metabolism at low oxygen concentrations. I characterized the regulation and community rates of some aerobic processes in trace oxidic conditions and apparent anoxia in OMZ during several international cruises as well as in laboratory experiments with selected bacterial strains.

I have also participated and led studies of biogeochemistry in other systems such as macrophytes and vegetated sediments, soils, acidic lakes affected by mining activity, wastewater treatment plant and biogas reactor biofilms.

The results obtained have been possible thanks to the technical development of sensors and procedures I have achieved. During the last years, I participated in the development and application of sensors for the measurement of O<sub>2</sub> at trace concentrations, microsensors for H<sub>2</sub>, H<sub>2</sub>S and pCO<sub>2</sub> in water as well as patented a method for the analysis of NO<sub>2</sub><sup>-</sup> and NO<sub>3</sub><sup>-</sup> in aquatic samples. My development of techniques and methods to measure Oxygen concentrations and metabolism is leading me to be regularly invited to participate in international projects and oceanographic cruises, further increasing my collaborations. I participated in the Global Ocean Oxygen Network (GO2NE) Summer school from UNESCO and currently, I am involved in the incipient creation of the Global Oxygen Data Platform.

Currently, I lead a project as PI on the impact of the extreme climatic events in the production and release of greenhouse gases, such as CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O, in coastal environments. In addition, I have applied for one project (national call) to continue the study of ocean deoxygenation, including the distribution of oxygen in the oceans and the adaptations of marine microbial communities to low oxygen conditions. Meanwhile, I participate in 1 national project about the impact of physical forcing in intertidal sediments and 2 projects of the



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## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

Nations Science Foundation of USA about the nitrogen and carbon cycling in OMZs. I have also participated in 21 National and International research projects funded with competitive calls. I have participated in several National and International conferences, more than 25 times as speaker, one as an invited speaker, and more than 50 posters. I have revised numerous manuscripts for relevant scientific journals and I am currently Guest Associated Editor for Frontiers in Marine Sciences. I have revised project proposals for the European Research Commission and different calls of the Spanish Ministry for Science.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** LOPEZ MERINO, LOURDES  
**Referencia:** RYC2019-026790-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** lolome@hotmail.es

#### Título:

Paleoambiente y paleoecología a través de archivos ambientales terrestres y marinos

#### Resumen de la Memoria:

Captivated by climate-human-environment links, as well as by the consequences of those links, I have devoted my career to apply the palaeoecological approach to detect patterns and processes of environmental change. In particular, my research deals with the multi-proxy-based reconstruction of past climate, environmental and land-use change, the detection of disturbance, and its impact on the functioning of a variety of terrestrial and marine systems. This knowledge is key for mitigating present-day and projected global change scenarios. My research scheme is focused on four lines:

1. Detecting long-term terrestrial responses to environmental stressors
2. Palaeohydrology of large lakes located at climate-sensitive areas
3. Conservation palaeoecology of seagrass meadows
4. Interdisciplinary study on humans and the environment

I am currently a Marie Skłodowska-Curie Fellow at the EcoPast Research Group of the Universidade de Santiago de Compostela. Before that, I was a Lecturer in Physical Geography in the Department of Geography, Geology and the Environment at Kingston University London (January-August 2019), and a Research Fellow at the Institute for the Environment (2010-2013) and the Institute of Environment, Health and Societies (2014-2018) at Brunel University London. The nine years I spent in the UK allowed me to be trained in many aspects of the academic career, from research fellow to lecturer, however Brexit played a role in deciding to change my position as a lecturer.

I have published 40 papers in international peer-reviewed journals (75% in Q1), contributed to national journals, book chapters and a book, and my research has been presented >50 times in international and national conferences. My readiness to engage in collaborative research is evidenced by multi-authored publications. However, my role as first (12) and corresponding (11) author illustrates my scientific independence. Another indicator of independence is that >50% of my scientific production is autonomous from my PhD advisor. According to Google Scholar, my work has been cited ~1800 times (h-index = 26), and according to Scopus, >1200 times (h-index = 20).

The increasing recognition has led to a number of other achievements, such as my leadership securing research funding worth >1 million to develop my independent research agenda, invitation as keynote speaker (Max Planck Institute; XIV MEDECOS & AEET meeting), to deliver seminars (Universidade de Santiago de Compostela and Edith Cowan University), to participate in workshops (Palaeo50 at Oxford and The Lived Environment at The Royal Society), requests to act as reviewer for top-tier journals and funding bodies.

My CV contains examples of my commitment with the transfer of knowledge, including the supervision of 3 PhD (2 completed), 5 Master (4 completed), and 1 BSc students, as well as lecturing at three different institutions in two different languages. In addition, I have taken part of 16 projects: international (ERC), supra-national (Britain-Israel Research and Academic Partnership), national (British Academy, 5 × Plan Nacional I+D+i, 3 × Spanish Autonomous Organism of National Parks, programa CONSOLIDER-CSIC and Proyecto Intramural de Frontera-CSIC) and regional (2 × Fundación Seneca, Xunta de Galicia).

#### Resumen del Currículum Vitae:

##### EDUCATION

2019: Associate Fellow of the Higher Education Academy (AFHEA)  
2018: Science to Data Science (S2DS) organised by Pivigo. London, UK  
2009: PhD Ecology and Environment, Universidad Autónoma de Madrid  
2006: DEA Ecology and Environment, Universidad Autónoma de Madrid  
2004: BSc Biology, Universidad Autónoma de Madrid

##### POSITIONS HELD

September 2019 present: Marie Skłodowska-Curie Independent Fellow, Departamento de Edafología e Química Agrícola, Universidade de Santiago de Compostela  
January 2019 August 2019: Lecturer in Physical Geography, Department of Geography, Geology and the Environment, Kingston





## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

#### University London

September 2010 August 2018: Research Fellow, Institute for the Environment / Institute of Environment, Health and Societies, Brunel University London

April 2009 September 2010: Research Assistant, Archaeobiology Group, CCHS-CSIC, Madrid

May 2005 December 2008: PhD I3P Scholarship, Archaeobiology Group, CCHS-CSIC, Madrid

2003-2004 academic year: Collaboration scholarship, Department of Ecology, Universidad Autónoma de Madrid

#### SECURED FUNDS AS PRINCIPAL INVESTIGATOR

I just was awarded with a group leader Talent Attraction Fellowship (mod. 1) by the Comunidad de Madrid. Long-term ecology of natural carbon sinks: from proxy data to conservation under global change (ECOSINK). Ref. 2019-T1/AMB-12782. Amount awarded: 4-year salary + 200,000 for starting my group. PI: Dr Lopez-Merino (Universidad Complutense de Madrid)

September 2019 August 2022: Marie Skłodowska-Curie Fellowship. Conservation palaeobiology of terrestrial and marine carbon sinks (PALAEOCON). Ref. 833422. Amount awarded: 241,398.72. PI: Dr Lopez-Merino (Universidade de Santiago de Compostela)

I also obtained a 3-year JIN project (Proyectos I+D+i «Retos Investigación» jóvenes investigadores, 212,960). I renounced, as I accepted the Marie Skłodowska-Curie fellowship

October 2016 March 2017: Researcher Visibility Award, Brunel University London internal scheme. Miners, metallurgists and their cultural and physical environment: an intimate long-term relationship. Amount awarded: £3692. PIs: Dr Anguilano and Dr Lopez-Merino

March 2016 August 2017: AHRC Science in Culture Early Career Awards. Orkney: Beside the Ocean of Time. Ref. AH/N007182/1. Amount awarded: £79,676. PI: Dr Downing (Falmouth). Co-Is: Dr Lopez-Merino (Brunel), Dr Fearnley (UCL), Dr Krus (Glasgow), Dr Irvine (Cambridge)

January 2014 December 2016: Early Career Fellowship, The Leverhulme Trust. Posidonia as environmental archive: long-term ecology and conservation views. Ref. ECF-2013-530. Amount awarded: £87,000. PI: Dr Lopez-Merino (Brunel University London)

I also obtained the Juan de la Cierva fellowship. I renounced for the Leverhulme one

October 2010 September 2012: Spanish postdoctoral support scheme, Spanish Ministry of Economy and Competitiveness. Patterns and processes of vegetation change for the Iberian Holocene. Ref. EX2009-0213. Amount awarded: 50,400. PI: Dr Lopez-Merino (Brunel University London)



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** MORALES CASTILLA, IGNACIO  
**Referencia:** RYC2019-027648-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** ignacio.moralesc@uah.es

#### Título:

Improving predictions of the spatial and temporal distribution of biodiversity

#### Resumen de la Memoria:

Understanding what causes variation in the spatial and temporal distribution of biodiversity has long been a challenge in ecology and biogeography. This knowledge would enable better predictions about how biological diversity will respond to the massive ongoing environmental change. Accurate predictions are urged to anticipate, mitigate and adapt to the negative outcomes that global change poses on wildlife, agriculture and human health. While researchers are increasingly successful in identifying the drivers of biodiversity distribution, predictions of how species will distribute and interact are far from satisfactory. My research aims at improving the accuracy of these forecasts. It does so by studying the roles of biogeographic history and evolution in shaping species distributions, accounting for how species interact with other species and, including eco-physiological and phenological processes in predictive models.

Concisely, my work integrates the temporal dimension at varying scales into the study of the spatial distribution of biodiversity. My research has confirmed that explaining current distributional patterns requires recurring to biogeographic history and evolutionary processes. I have developed conceptual and methodological frameworks that improve the prediction of species distributions and interactions for both current and future times by combining phylogenetic and coexistence data. More recently, I have started to explore how integrating process-based phenological models with niche models can produce highly accurate forecasts of biodiversity distributions under climate change. This line of research has the advantage of tackling questions of applied interest at biogeographical scales.

My research is published in top journals such as PNAS, Nature Climate Change or Trends in Ecology and Evolution, being cited over 700 times. I have proven a strong ability to obtain external funding, raised over 280,000 euros through direct competition and, been PI of a research project financed by sDiv (Germany). I have been invited to participate in seven established international research networks. Finally, I have supervised 1 PhD (ongoing), 2 MSc (ongoing) and 10 BSc theses, mentored a postdoctoral student and held positions of academic responsibility at top ranked institutions such as Harvard University.

#### Resumen del Currículum Vitae:

My research aims at improving the accuracy of forecasts of biodiversity distributions across space and time. It does so by, studying the roles of biogeographic history and evolution in shaping species distributions, accounting for interactions among species and, including eco-physiological and phenological processes in predictive models.

My research is question-driven and interdisciplinary. Not focusing on particular taxa has permitted my research to broaden the scope of the questions posed. My research has confirmed that explaining distributional patterns of biodiversity requires accounting for the temporal dimension (i.e. from evolutionary to yearly seasonal timescales). Further, I have developed frameworks that improve the prediction of species distributions and interactions for both current and future times by combining phylogenetic and coexistence data. By developing enhanced forecasting techniques, I have shown that increasing intra-specific crop diversity can reduce by a half agricultural losses due to climate change. These findings can move biogeography and macroecology towards a more applied paradigm, which requires the integration of theory and methods from multiple disciplines such as ecology, evolution, macrophysiology, agronomy, or paleontology.

My research is highly internationalized and collaborative. I have consolidated a wide network of international collaborations with over 130 experienced researchers from 30 countries through my participation by invitation to seven international research networks and through the invited seminars that I have delivered at top research schools (e.g. Imperial College London, Australian National University, INRA, CSIC). I have played a major role in the publications led by other colleagues (8 second authorships), and I have conceived and led many of those collaborations as the senior author (6 senior authorships).

My research has an impact in the scientific community and beyond. This impact is endorsed by: the quality of my publications in some of the highest-impact top journals in my fields of interest (e.g. PNAS, Nat Clim Change, Trends Ecol Evol, Glob Ecol Biogeogr); the relatively high number of citations; and the recognition of my ideas to be conveyed either as keynote talks (IBS Climate Change) or plenary symposia (IBS 9th biennial meeting). Beyond academia, my recent research on agronomical applications of macroecology has attracted media attention (e.g. El Economista, La Vanguardia). This research has potential for transferring knowledge to the industry, with whom I am currently establishing collaborative links and who are giving me the opportunity to disseminate my research through talks to non-



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## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

scientific stake-holders (e.g. invitation to III Jornadas Vitícolas Villena).

In sum, my non-linear research trajectory is overarched by, first, large doses of leadership and independence. This is endorsed by a solid record of fund-raising (ca. 650,000 obtained through grants, R&D projects and awards), and by my experience being PI of international research projects and as research supervisor (I am senior author in 6 publications). Second, I have a clear strategic vision of how my research can aid the international visibility of Spanish research, inspired by the World's highest ranked institutions where I have had the privilege to work (i.e. Harvard University, McGill University).



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** MONCLUS SALES, HECTOR  
**Referencia:** RYC2019-026434-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** hecmonc@gmail.com

#### Título:

Aplicación de la Inteligencia Artificial en el tratamiento del agua (depuración y potabilización)

#### Resumen de la Memoria:

From the very early stages of my research career, I have been interested in improving water treatment to ensure the health of the end-user is safeguarded while addressing technological, environmental and socio-economic issues and the way I approach this is to continually broaden and extend my expert (old and new) knowledge acquisition and codification (e.g., control rule-based systems) and pursue opportunities to include any new developments and/or treatments into the water domain as a whole. My endeavours have been focused on the application and use of artificial intelligence techniques, such as environmental decision support systems (EDSS) and control algorithms, to control and optimize wastewater and drinking water treatment plants to properly address technological, health, environmental and economic issues.

In my PhD, I investigated the use of advanced treatments for biological nutrient removal, such as the membrane bioreactor (MBR), together with the use of artificial intelligence (AI) techniques to monitor, control and supervise the process with the aim of improving wastewater treatment. My doctoral thesis, entitled *Development of a Decision Support System for the integrated control of membrane bioreactors*, a compendium of seven journal articles, was awarded the University of Girona Extraordinary Doctorate Award in Industrial Engineering thanks to the outstanding CV I was able to build during my PhD.

My scientific trajectory is strongly balanced between academia and business institutions with my participation in different national and international projects and with my contracts signed as Principal Investigator (PI) with different private companies (TELWESA, Anxoves de l'Escala, Polymem, ATLL, CWP) especially focused in membrane technology and in the optimization of Drinking water treatment.

In 2011, upon completing my PhD, I joined GS Inima Environment S.A. as a postdoctoral researcher, where I led an industrial research project funded by CDTI to validate the MBR automatic control system developed in my doctoral thesis on a full-scale. At the end of this CDTI project (2013), and to consolidate my scientific career, I joined the UdG as an assistant professor.

In 2015 I was granted a Marie Curie COFUND TECNIOspring fellowship (SSAMBRA project, TECSPR14-2-0021) and spent the first year at the facilities of the membrane manufacturer Polymem in Castanet-Tolosan (France). In this period (2015-2017) I signed three technology research contracts as PI with private companies (two of them are still in progress).

In July 2017, within my Juan de la Cierva incorporation fellowship, I signed as PI a 3-year research contract with ATLL (DrinkIA Project), and I am a research team member in three competitive projects (the WATSON project funded by MINECO's Retos program and the EdiCitiNet and ELECTRA projects funded by the EU's Horizon 2020 programme) where I have noticeable roles (leading work-packages and tasks).

The funding related to drinking water research line obtained during 2014-2018 was >1,202,000 €. This budget came from two doctoral fellowships, the Juan de la Cierva Incorporación fellowship, the four on-going projects (DrinkIA Project, EdiCitiNet, ELECTRA and WATSON Project) and the three research contracts signed with ATL.

In October 2019 I reach a temporary position for two years as researcher and assistant professor in the Ch

#### Resumen del Currículum Vitae:

I am a postdoctoral researcher at LEQUIA research group and assistant professor at the University of Girona (UdG, Spain) since 2013. Currently, I am a researcher and assistant professor.

I defended my PhD thesis *Development of a Decision Support System for the integrated control of membrane bioreactors* in 2011, as a compendium of seven journal articles, and I was awarded the University of Girona Extraordinary Doctorate Award in Industrial Engineering.

I have a strong publication record of 32 peer-reviewed articles, 65% of which published in Q1 research journals, including 8 as first author and 5 as corresponding author. These publications have more than 690 cites, leading to an H-index of 14. In the past five years, my average citation count is 102 citations per year. Moreover, my scientific production includes one book, one chapter book, more than 50 presentations in international conferences, one patent and one trade mark.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

Since 2006 when I started my PhD, I got seven research grants: the first one during the last year of my chemistry degree (BTI-2006), then a FPI pre-doctoral grant to carry out the doctoral thesis (BES-2007-16286), one FPI mobility (EEBB2010-SEST1000I000412XV0), two Marie Curie fellowships (TECSPR13-1-0050 and TECSPR14-2-0021) and finally in 2017 I got a Juan de la Cierva Incorporación (IJCI-2015-23159).

I worked as postdoctoral researcher for 22 months at the company GS Inima Environment, where I led an industrial research project funded by CDTI. Over this period, I successfully validated on a full-scale plant the MBR automatic control system developed in my doctoral thesis.

To consolidate my academic career, I joined the UdG as assistant professor in September 2013. Since then, I gained experience as university lecturer having taught 50 ECTS, supervised two PhD thesis and >15 final projects (degree and master). I have two different and official certifications "LECTOR and RESEARCHER certification" from AQU.

In 2015 I started my Marie Curie COFUND TECNIOspring fellowship. During the first year of the project, I worked at the facilities of the membrane manufacturer company Polymem in Castanet-Tolosan (France) and the last one at UdG.

Hence, I have successively worked in international environments both during my PhD training (7 months research stay at UK, Cranfield University), 3 months in GS Inima Brasil and as postdoctoral researcher (12 months fellowship in France, Polymem company).

In July 2017 I started my 2-years Juan de la Cierva incorporation fellow at the University of Girona. During this period I have already signed as PI the 3-years research contract DrinkIA Project with ATL, besides having noticeable roles leading work-packages in three competitive projects: WATSON, funded by MINECO's Retos program, and the international EdiCitiNet and ELECTRA, funded by the EU's Horizon 2020 Programme.

Thus, my research background, which is strongly balanced between academia and business institutions, allowed me to participate in a number of national and international projects as PI in Technology transfer agreements between University and relevant stakeholders such as TELWESA, Anxoves de l' Escala, Polymem, ATLL, CWP, FISERSA and Createch360.

In September 2018, in recognition of my leading role in the DrinkIA project, I was awarded the prestigious Award to Young Talent Applied to Sustainable Water Management from Botín Foundation.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** PASTOR GALAN, DANIEL  
**Referencia:** RYC2019-028244-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** dpastorgalan@gmail.com

#### Título:

Plate reconstructions, Paleogeography and Earth History

#### Resumen de la Memoria:

I am a multifaceted geologist who works in global tectonics and Earth history. My ultimate goal as a geologist is to understand the interactions between tectonics and long-term secular variations in the geo-, hydro- and bio-sphere. I integrate field geology observations in all kind of terranes (sedimentary, igneous and metamorphic), structural analysis, paleomagnetism, geochronology, isotope geochemistry and modeling techniques (analog and numerical). Using these techniques I perform global reconstructions of the past Earth bridging the fundamental processes driving (and driven by) global geodynamics with evolution of life, oceans and climate through Earth history.

As a PhD student I investigated the Variscan orogen in Iberia. Combining structural geology, geochronology and modeling I constrained the kinematics and the deformation history associated with the secondary buckling of the orogen forming the Cantabrian Orocline. Similarly, during a postdoc at Utrecht university (The Netherlands), I have studied the formation and evolution of the orocline formed by the Lesser Caucasus and Talysh-Alborz mountain belts in the Middle East. My research on the Variscan orogen awoke my interest on the Late Paleozoic paleogeography of the world. As a JSPS postdoctoral fellow (successful rate <10%) at Tohoku University (Japan) I combined my knowledge on the core of Pangea with the processes happening along its boundary with the Panthalassa and Tethys oceans. Most reconstructions assume a stable supercontinent, Pangea, from ~320 to ~180 Ma. I documented >2000 km of shortening and extension in the core of Pangea between 320-270 Ma which is coeval with extensive magmatism and subduction initiation along the Paleotethys and Panthalassa, indicating Pangea was not a tectonically stable environment until at least the Middle Permian. Such tectonic movement has potential implications in the development of Large Igneous Provinces (LIPs, e.g. CAMP, Siberian traps, Deccan traps) and perhaps in the Permo-Triassic extinction. I am currently finishing a quantitative plate reconstruction and paleogeographic model testing the various hypotheses regarding the late Palaeozoic evolution of Pangea and the surrounding Panthalassa Ocean.

From 2019 I am Assistant Professor at Tohoku University, the results from my previous postdoc in Japan led me to develop new ideas about plate reconstructions zones. The tendency of continental plates to grow and later break up and become destroyed is a significant impediment to developing quantitative plate reconstructions. I received funding for a study of tectonic erosion in Japan and its link to mega-thrusts Earthquakes combining geochronology, paleomagnetism and numerical modeling in collaboration with Yo Fukushima (Tohoku University) and Chris Spencer (Queen's University). I will develop a research line towards understanding subduction erosion in Pacific-type orogenies to better reconstruct plate motions at pre-Pangean times.

#### Resumen del Currículum Vitae:

completed my Ph.D. at Universidad de Salamanca (Spain) in 2012. Since then and until 2016 I was a postdoctoral fellow at Utrecht University (The Netherlands). Later, I obtained the prestigious JSPS postdoctoral fellow (Japan Society for Promotion of Science grant, successful rate <10%) to study the tectonic evolution of the Paleotethys and Panthalassa oceans interface during the Pangea amalgamation. From June, 2019 I became Assistant professor at Tohoku University.

My research has produced 30 accepted papers to date (15 of them as lead author). 3 are submitted and several in preparation. Two editors invited me to write reviews about the Supercontinent Cycle (Geological Society of London, published) and Pangea amalgamation (Tectonophysics, in preparation). I have been member of the editorial board of Lithosphere (2017-2020). From this year I am associate editor of Island Arc and board member of the preprint server EarthArXiv. In April 2019 I was awarded the Tectonics and Structural Geology (TS) Division Outstanding Early Career Scientist Award from EGU. In addition, I have experience in teaching courses in structural geology, tectonics, paleomagnetism, and field geology. I have supervised 4 B.Sc. and 4 M.Sc. Students and currently I am co-supervising a PhD.

My past, present and future research converges on the goal of understanding the episodic nature of the geological record in deep time. The Earth has written its own history in thousands of rock pages, the geological record, which contains evidence of the evolution and interactions of continents, oceans, atmosphere, and biosphere. Despite the rock archive is really dismembered, scattered and hidden in remote places or deeply buried, gathering the pieces together is our only opportunity to reveal the history of our planet, our history. Sometimes struck by punctual catastrophes, secular changes have shaped most Earth history: crustal growth and loss, biogeochemical cycles, global mantle circulation, long-term secular changes in sea-level, major variations in the geomagnetic field, global climate changes, mass extinctions. There are emerging signs that the supercontinent cycle (Fig. 1) controls, at least partially, these episodic changes.

Together with the supercontinent cycle, various hypotheses have been proposed to account for this periodicity, including slab avalanches or a global tectonic system controlled by two large anomalies in the Core-Mantle boundary (LLSVPs). The time interval between the amalgamation of Rodinia (~1 Ga) and the break-up of Pangea (200 Ma) provides a tangible opportunity to investigate the amalgamation and break-up of older super-plates and their intrinsic relationship with the long-term secular trends and the distribution of



MINISTERIO  
DE CIENCIA  
E INNOVACIÓN



**AYUDAS RAMÓN Y CAJAL  
CONVOCATORIA 2019**

**Turno de acceso general**

natural resources.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** SANCHEZ FERNANDEZ, DAVID  
**Referencia:** RYC2019-027446-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** davidsan@um.es

#### Título:

Ecology and biodiversity conservation

#### Resumen de la Memoria:

Along my scientific career, I have combined observational and experimental studies with synthesis of big datasets to answer key questions in ecology, biogeography and conservation biology. My primary research goals are directed towards understanding how environmental changes affect biodiversity and how can biodiversity be conserved given current and future challenges. I am particularly interested in studying how species physiology, dispersal abilities and historical factors have an impact on current species distributions. Within this context, one of the most exciting research lines developed so far is trying to predict the fate of biodiversity under global change. We have demonstrated in previous studies i) that current protected areas cannot be considered to guarantee the long-term survival of freshwater biodiversity, and ii) that species may be affected by climatic warming in very different ways, despite having broadly similar ecological and biogeographical traits. Lastly, I took the opportunity to work with the fascinating deep subterranean environment (natural laboratories with constant climatic conditions) to explore the relation between global change and loss of biodiversity. Currently, I am the PI of an ongoing R&D project (Excellence Program) to work on this exciting issue. My research scope has been recently extended to explore the taxonomic, functional and phylogenetic structure of biological communities and their changes as a consequence of different types of impacts. Our results on this field demonstrate that communities may show predictable functional changes in response to novel chronic stressors that ecosystems will face in the future, which could increase our ability to predict biological responses to environmental change. This is reflected in my publication record of 81 highly-cited peer-reviewed papers (68 SCI, 45 Q1) by ongoing collaborations with more than 30 institutions from several countries, by the participation in >30 international conferences, and by the ability to get funding for my projects (>200,000 raised as a PI). I did research stages in 5 countries (UK, USA, Morocco, Portugal and Brazil), so I have experience in working with different research administrations. Recently, I have been appointed member of the Terrestrial and Freshwater Invertebrate Red List Authority (IUCN) and member of the editorial board of Biology Letters. I have supervised three PhD thesis. Currently, I work as independent researcher at the University of Murcia supervising two PhD students, one TFM and two TFG.

#### Resumen del Currículum Vitae:

I obtained my PhD in July 2008 with a mark of outstanding Cum Laude. My thesis received the maximum academic distinction, the European PhD mention, and the Doctoral Extraordinary Prize (2008-2009). During my PhD, I focussed on freshwater biodiversity conservation diversifying my expertise in three international research centres (UNESP (Brazil), University of Plymouth (UK), and Abdelmalek Essaâdi University (Morocco)). Since then, I have been awarded six highly competitive postdoctoral fellowships (e.g., Juan de la Cierva, Saavedra Fajardo or Severo Ochoa Excellence Programs) to work at prestigious institutions such as the National Museum of Natural Sciences (CSIC, Madrid), Institute of Evolutionary Biology (CSIC-UPF, Barcelona) or Doñana Biological Station (CSIC, Seville). In addition, I have completed my postdoctoral stage working in research institutions from Portugal (CiBio/InBio) and the United States (City University of New York, CUNY). Currently, I work as independent researcher (5-yr contract) at the University of Murcia as part of the own program of research. My research has been published in multidisciplinary and top journals such as Global Change Biology, Philosophical Transactions of the Royal Society B, Global Ecology and Biogeography, Conservation Biology, Ecology, Journal of Applied Ecology or Nature Scientific Reports. I have published 81 peer-reviewed papers, 68 of them in SCI journals (45 in first quartile (Q1) SCI journals); >80% of them I acted as first, second, or senior author. These papers accumulate 2416 citations, H index=27 (Google Scholar Database); 1356 citations, H-index=21 (ISI WoS database). I have an extensive multidisciplinary, international and long-lasting collaboration network, as I have co-authored with 78 scientists from 15 countries and >30 institutions. So far, I have been member of 6 research teams and international scientific advisory committees. Recently, I have designed member of the Terrestrial and Freshwater Invertebrate Red List Authority (International Union for Conservation of Nature, IUCN) and we are also working on the creation of the IUCN Water beetles Specialist group. I am Principal Investigator (PI) of two ongoing R&D project (>160K), one of them funded by the Spanish Ministry of Economy and Competitiveness (Excellence Program). I have participated on other 11 R&D projects funded through competitive national and international calls (e.g., European Science Foundation, COST actions, one submitted project to the current Biodiversa H2020 Biodiversity and Climate change call). I have participated in 9 R&D non-competitive contracts, agreements or projects with public agencies (2 of them as Co-PI). I am regular reviewer for 30 scientific journals (incl. most of the top journals in ecology and biodiversity conservation), research projects for national and international funding agencies (incl. EU Biodiversa H2020 program, Argentina FONCYT, Spain MINECO or Italy MIUR). Since 2018 I am member of the Editorial Board of Biology Letters (Royal Society). So far, I have completed the supervision of 3 PhD students (1 international, 2 more in course) and 4 Master Students. Finally, I have been invited to give talks at different research institutes and international congresses, and actively participated in outreach activities (regular collaborator of Ecomandanga).





## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** FRANCO RODIL, IVAN  
**Referencia:** RYC2019-026821-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** ifrodil@gmail.com

#### Título:

Ecología bentónica costera

#### Resumen de la Memoria:

I want to understand how coastal ecosystems work, and how they respond to natural and human-induced changes, so we can value and protect the services they provide. My research interest focuses on understanding the relationships between biodiversity and ecosystem functioning (e.g. productivity, nutrient cycling and carbon burial) in coastal ecosystems, and how they respond to change. An understanding of the variations in production and respiration of different communities underlies many aspects of ecosystem functioning (e.g. carbon and nutrient cycling and burial). These processes are key to several major environmental problems facing society such as carbon emissions, eutrophication, and hypoxia. Only understanding the functioning of these processes, we will develop the ecological knowledge necessary for a sustainable management of the marine resources, eventually moving from real problems to possible solutions. My main research line of work relates to five interconnected topics in marine ecology and ecosystem functioning: (1) coastal biodiversity and spatial subsidies (food-webs and source-sink dynamics), (2) primary productivity and respiration, (3) disturbances and biodiversity loss (ecosystem change and resilience), (4) restoration of degraded coastal ecosystems, and (5) statistical modelling of marine ecological and environmental properties.

I have participated in studies involving different marine environments, from soft-sediments to rocky communities, from the intertidal to the subtidal. My research experience focuses on the measurement of dynamic rates and ecosystem processes (e.g. primary production, respiration and nutrient fluxes) of coastal habitats, and how they are related to functional biodiversity. Only understanding the functioning of these processes, we will develop the ecological knowledge necessary for a sustainable management of the marine resources, eventually moving from real problems to possible solutions. I have studied the effects of climate change (e.g. UVR, temperature, CO<sub>2</sub>) on biotic interactions, and the implications of global changes and invasive species on the connectivity between areas of different productivity. I have explored the long-term effects of human interventions (contamination, nourishment, construction) and large disturbances (sediment loads, storms, and earthquakes) on coastal communities worldwide. I keep a large international network with research groups from Denmark (Prof. R. Gludd and Dr. K. Attard) working on seafloor oxygen flux dynamics across coastal habitats; Sweden (Dr. Agnes Karlsson, Prof. C. Humborg) working on stable isotopes and food-webs; Spain and Portugal (Prof. M. Lastra, Dr. C. Olabarria, and Dr. F. Arenas) working on sandy beaches, spatial subsidies, macroalgae, climate change and Antarctica; Chile and USA (Prof. E. Jaramillo, Dr. J. Dugan, Prof. C.H. Peterson, Dr. S. Fegley) working on shoreline protection, human intervention, catastrophic events; New Zealand (Prof. S. Thrush, Dr. A.M. Lohrer, and Dr. J. Hewitt) working on disturbances, biodiversity-ecosystem functioning, and ecosystem services, and Finland (Prof. A. Norkko) working on biodiversity-ecosystem functioning, biological traits, and metacommunities.

#### Resumen del Currículum Vitae:

I am a marine ecologist with long experience on estuarine and coastal environments. I have worked on soft-sediments and rocky communities, from the intertidal to the subtidal. Although, my expertise revolves around invertebrates, my experience also lays on other key marine components, such as macroalgal and seagrass communities and microbial activity.

After completing my PhD on sandy beach ecology (The Ecology of Macrofauna in Sandy Intertidal Habitats. University of Vigo, Spain, 2008), I moved to New Zealand (Hamilton) with a postdoctoral fellowship (Ángeles Alvaríño fellowship-Xunta de Galicia) to work at the National Institute of Water and Atmospheric Research (co-appointed with the University of Vigo, 2009-2012). I studied the dynamic rates and processes in soft-sediment habitats (e.g. benthic chamber incubations to measure net and gross primary production and nutrient uptake and release), and how they are related to key elements of biodiversity while influenced by disturbances. Later, I worked as a postdoctoral fellow (FCT, Portugal) at CIIMAR-University of Porto (2013-2015) on the effects of global changes (UVR, temperature & CO<sub>2</sub>) on macroalgae-consumers interactions. I studied the implications of global changes and invasive species on connectivity between juxtaposed ecosystems (from highly productive rocky bed communities to low productive sandy beaches). Here, I orientated two graduate students conducting two different projects: (1) climate change and macroalgae-herbivore interactions in rocky habitats, and (2) the role of detrital non-native and native macroalgae on sandy beach microbial communities.

Since September 2015 I work as a University Researcher at the Tvärminne Zoological Station (TZS, University of Helsinki). My research focuses on exploring the role of key shallow habitats (e.g. macroalgal bed communities and blue mussel rocky beds, shallow seagrass sediments and bare soft-sediments) in the benthic biodiversity and ecosystem functioning (e.g. primary production, respiration and nutrient fluxes) of coastal systems. We are using aquatic eddy covariance as a cutting-edge way to quantify habitat-function relationships



MINISTERIO  
DE CIENCIA  
E INNOVACIÓN



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

across key shallow habitat types in the northern Baltic Sea. I have experience analysing large data sets using different statistical techniques.

I have participated in 26 international conferences (10 as speaker) and I have been invited to present 9 seminars. I have been member of 10 international Academic Juris. I currently supervise one PhD student and two MSc students.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** RICO ARTERO, ANDREU  
**Referencia:** RYC2019-028132-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** andreu.rico@imdea.org

#### Título:

Ecotoxicología acuática

#### Resumen de la Memoria:

Dr Andreu Rico obtained an MSc and a PhD on Environmental Sciences, with specialization on aquatic ecology and ecotoxicology, from Wageningen University (the Netherlands). During his MSc and PhD he performed research on the impacts of pesticide pollution in tropical ecosystems and on the risk assessment of veterinary medicines used in aquaculture, and performed several research stays in America and Asia. Furthermore, during that period he collaborated in an international project evaluating the influence of biological interactions on the response of aquatic invertebrates to chemical stress. After his PhD, Dr Andreu Rico worked as junior researcher in the Wageningen Environmental Research institute (the Netherlands), where he developed trait-based approaches for the identification of vulnerable taxa for pesticide risk assessment. In that period, he also developed multivariate statistical techniques for the analysis of complex monitoring datasets and for the identification of multiple stressors influencing biodiversity. In 2015, he moved to the IMDEA Water Institute (Spain) with a Marie-Curie contract. Afterwards, he received the Juan de la Cierva post-doctoral grants (formation and incorporation). His work at the IMDEA Water Institute focuses on the ecotoxicological risk assessment of contaminants of emerging concern (including microplastics and pharmaceuticals), and on the impact assessment of multiple chemical and non-chemical stressors related to global climate change on aquatic populations and communities. His research is crucial to better understand how ecosystems will respond to continued pressures in the future, and to predict the vulnerability of endangered species and extinction rates. He has developed tools that help improving the prospective and retrospective risk assessment of chemicals, and his research contributes to the development of sustainable environmental policies.

#### Resumen del Currículum Vitae:

Dr Andreu Rico graduated on Agricultural Engineering (with honours) and Environmental Sciences from the Polytechnic University of Valencia (Spain). Afterwards, he obtained an MSc and a PhD on Environmental Sciences, with specialization on Aquatic Ecotoxicology, from Wageningen University (the Netherlands). His PhD was embedded on an EU-FP7 project, and included several research stays in Asia to assess the fate and ecological risks of veterinary medicines used in aquaculture production. After his PhD, Dr Andreu Rico worked as junior researcher in the Wageningen Environmental Research, formerly Alterra (the Netherlands), where he specialized on the ecological risk assessment of pesticides, and developed trait-based approaches and complex statistical techniques for the prediction of population and community-level responses to chemical stress. In 2015, he moved to the IMDEA Water Institute (Spain) through a Marie-Curie contract. Then he received the Juan de la Cierva post-doctoral grant (formation and incorporation). His current work focuses on the assessment of the effect of emerging contaminants (including microplastics) and global climate change on aquatic ecosystems. He is principal investigator of four research projects (one funded by National Geographic, two by the H2020 programme of the European Commission, and one national one), and participates in the research team of other four research consortia. Since 2015, Dr Andreu Rico has raised 700,000 for his research group. He is co-author of 46 peer-reviewed papers (H-index: 20) and more than 50 conference presentations. He currently supervises three PhD students, and participates as lecturer in two masters at the University of Alcalá de Henares and the University Rey Juan Carlos. He acts as reviewer in renowned international journals and forms part of the editorial board of the journal Environmental Toxicology and Chemistry. In 2015, he won the Best Paper Award provided by this journal for his study on the relationship between biological traits and the vulnerability of aquatic invertebrates to pesticide exposure.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** CARABALLO MONGE, MANUEL  
**Referencia:** RYC2019-026496-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** macaraballomonge@gmail.com

#### Título:

Environmental Nanogeosciences & Mining Sustainability

#### Resumen de la Memoria:

During my Ph.D. in Environmental Science and Technology at the University of Huelva and thanks to 11 months of international research stays in UK and USA, I became one of the few Spanish experts on the design and implementation of passive treatment systems to treat highly polluted acid mine drainages. Afterwards, during my two years postdoctoral research stay at the NanoBioEarth group led by Distinguished Professor Dr. Michael Hochella at Virginia Tech (USA), I led the research line deciphering the role of Al- and Fe-nanominerals on the transport of metallic pollutants in rivers impacted by mining activity. The work that we developed during that time was essential to place the NanoBioEarth group as a leading institution in USA in the field of Nanogeosciences and it built the foundations of the current NanoEarth Laboratory (<https://nanoeearth.ictas.vt.edu/>), that is part of the USA National Nanotechnology Coordinated Infrastructure.

In 2014, I accepted an Assistant Professor position at the Mining Engineering Department of the University of Chile (1st Mining Eng. Dep. in South America, and 8th in the World, according to the QS Ranking) and started my own research group in Environmental Nanogeosciences and Mining Sustainability. Seeking to obtain the most from this fascinating research line, I have decided to diversify my studies in the following four research topics that are in the fore front knowledge in Environmental Mineralogy and Hydrogeochemistry, Nanogeosciences, Circular Economy and Mining Sustainability:

- 1) Non Classical Nucleation and Crystal Growth.
- 2) Metallic water pollutants monitoring and remediation.
- 3) Mine residues management, reuse and revalorization under a circular economy perspective.
- 4) Nanomineral-based technologies to treat polluted waters.

My research line is part of several international initiatives aiming to improve the socioenvironmental realities at mining districts by connecting the newest and most relevant discoveries in Nanogeosciences, Hydrogeochemistry, Mineralogy and Environmental Sciences.

#### Resumen del Currículum Vitae:

I have coauthored 29 publications (plus other 5 submitted or under review) in international scientific journals, mostly in the first quartile of their research areas. I am first author and corresponding author in 13 and 16 of these publications. These works were made in collaboration with 54 researchers from 12 different nationalities around the world. I have also coauthored 73 Conference presentations. Currently my h-index is 18 (according to Scopus) and my research works have been cited 718 times. Also I am one of the few researcher from Latin America actively working on the generation of the Global Research Consortium on Tailings promote by the University of Queensland (Australia).

As proposal member I have participated in 15 research project in the last 14 years, rising a total funding of 6,731,500US\$; among which 5,755,500US\$ were obtained during my last 6 years in Chile. Specifically, as Principal Investigator, I have been directly responsible of managing 1,200,500 US\$ (1,120,500 US\$ in the last 6 years). I have tried to balance obtaining pure scientific and more technological projects applying to governmental and industrial funding. As a result, I had 3 and 1 I+D+i research projects partially or completely funded by industry, respectively. Some of those projects have led to the obtention of two industrial patents. These multiples projects and funding have given me great experience as group leader and project coordinator.

During my research and teaching career I have accumulated an important international mobility with a total of 11 months of research stays during my Ph.D. in (i.e., 3 + 3 months research stays at the USGS, Denver, USA; and 2 + 3 months at the University of Newcastle, UK), 24 months of postdoctoral research stay at Virginia Tech USA, 71 months as Assistant Professor in Chile, and 1 month as Visiting Professor at the University of Salento, Lecce, Italy).

Currently, my International Network of Collaborations in Environmental Nanogeosciences and Mining Sustainability is comprised by multiple institutions and researcher from Europe, IberoAmerica, and several other countries around the world (South Africa, Australia and USA).

Over the last 5 years in Chile, I have mentored/supervised or co-mentored/co-supervised a total of 26 students from the Geology (8) and Mining Engineering (4) degrees, from the Geology (6) and Mining (4) Masters and from the Geology (3) and Mining Engineering (1) Doctorate Program. I have also supervised 2 postdoctoral researchers.

Regarding my role as higher education communicator and educator, I have created two new courses (i.e., Chemical Mineralogy and Characterization and management of surface waters in Mining) and revisited a third one (i.e., Mining Sustainability) of the Mining



MINISTERIO  
DE CIENCIA  
E INNOVACIÓN



AGENCIA  
ESTATAL DE  
INVESTIGACIÓN

## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

Engineering degree at the University of Chile, where I have consistently obtained high ratings (typically close to 6 on a scale from 1 to 7), being among the best teachers of the Mining Engineering Department. I have also some valuable administrative experience during my role as Sub-head of Teaching Affairs (2016-2018) and of the M.Sc. Program in Mining (2017 to date) both at the Mining Engineering Department (University of Chile). Since 2017 to date, I am also Associate Editor at Journal of Geochemical Exploration, (WOS-JCI Impact Factor = 3.472).



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** GARCIA-NAVAS CORRALES, VICENTE  
**Referencia:** RYC2019-026703-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** vicente.garcianavas@gmail.com

#### Título:

Tempo and mode of diversification in evolutionary radiations

#### Resumen de la Memoria:

I am an evolutionary ecologist with broad interests in the evolutionary and ecological processes that shape patterns of life-history and phenotypic variation in natural populations. In the early stage of my career, I mostly worked at individual level trying to better understand factors involving in two key decisions faced by all organisms at least once in the course of their lifetime: when and with whom to breed. During this period, I combined field-experiments and the employment of molecular tools. After my PhD, as postdoc in Switzerland, I continued combining field- and laboratory-based work to study from a population level perspective changes in genetic composition and social and genetic structure in a free-living population of snow voles located in the Swiss Alps. Subsequently, I moved to Doñana wherein I started to establish the roots of my ongoing research line. The need to answer broader questions pushed me to move from working at the individual or population level to adopt a more comprehensive approach and work on a macroevolutionary scale using -mostly- modern phylogenetic comparative methods, a nascent field of research. Thus, I have progressively expanded my interests from (short-term) individual decisions and taxon-specific questions to broad-scale processes that act as biodiversity engines and how these factors shape the evolution of life-history, ecological and phenotypic traits. Hence, my current research builds on my expertise in evolutionary ecology and genetics acquired during my PhD and my first postdoc, and develops it towards a broader, more sophisticated and up-to-date analysis of the agents promoting the variability we can observe in the wild. Back in Zurich, I continue deepening into these research avenues by employing state-of-the-art techniques and using vertebrate radiations as model systems with special emphasis on taxonomic groups that diversified in Australia and nearby islands. In the coming years, I plan to focus my work around two main objectives: a) unravelling the drivers and processes underlying the proliferation of biodiversity (lineage diversification, phenotypic disparity) into a biogeographic context, and b) untangling the interactions between contemporary, local processes like competition and historic, long-term processes like species movement, patterns of trait evolution, and rates of speciation/extinction in shaping the composition of present-day communities. The proposed working plan relies on an innovative and integrative approach that reflects my scientific maturity. I anticipate that it will yield results at the forefront of research in this emerging field, thereby having a significant international impact. Although I maintain productive collaborations with researchers from Australia, Sweden, and France, I am solely responsible for the intellectual development of my projects since I began my postdoctoral stage. Experience gained during the last years as postdoc from some of the best labs worldwide (Department of Evolutionary Biology and Environmental Studies, University of Zurich, Switzerland; Department of Integrative Ecology, Estación Biológica de Doñana CSIC, Spain; Laboratoire d'Ecologie Alpine, CNRS-Université Grenoble Alpes, France), coupled with my scientific independence and leadership capacity place me in an ideal position to set up my own research group. I am an evolutionary ecologist w

#### Resumen del Currículum Vitae:

After graduating in Environmental Sciences at Univ. Castilla-La Mancha (2005), I conducted my PhD with a FPI grant. After completion my PhD, I was hired as postdoc researcher at Univ. Castilla-La Mancha (2012) and received a grant for young researchers from the British Ornithologists Union (UK). Afterwards, I moved to University of Zurich (Switzerland), one of the most outstanding academic institutions of Europe, where I did a postdoc (2014-2015) with Dr. E. Postma that resulted in 7 scientific publications. Subsequently, I continued my postdoctoral experience at the Doñana Biological Station (CSIC) funded by the Juan de la Cierva program (JdC-formación and JdC-incorporación fellowships), where I started to work at a macroevolutionary scale developing a promising and state-of-the-art research line. In 2018, I was chosen as one of the 68 laureates of the 'Make Our Planet Great Again' initiative launched by the President of the French Republic, a call to researchers to join France to lead the fight against global warming. Funded by this program, I visited the Laboratoire d'Ecologie Alpine (Université Grenoble Alpes, France), a worldwide leading department in global change biology and community ecology, where I carried out a project on diversity dynamics in land bird communities in collaboration with Prof. W. Thuiller, one of the three most cited ecologists. At present, I work again at the University of Zurich where I lead my own project funded by a prestigious Forschungskredit. My ongoing research at Zurich aims to explore variation in niche and trait evolution from a multi-scale and multi-dimensional approach. Specifically, I use phylogenies as a tool to examine the evolution of climatic and phenotypic traits in a temporal framework, with the aim of understanding the role of extrinsic factors and lineage-specific traits in driving vertebrate radiations, a research topic that is currently not covered by any research group in Spain.

I have a solid publication track that reflects my scientific independence and leading potential. I have published 47 articles in SCI journals (including Proceedings of the Royal Society of London B, Molecular Ecology, Journal of Animal Ecology, Oikos, Oecologia, Journal of Evolutionary Biology) out of which I am lead (first or corresponding) author of 38 (80%). Most of them (83%) are included in top-tier (Q1) journals and have already attracted a good number of citations (about 800). My h-index is 17 (i10 = 26), this number is a positive outlier for



MINISTERIO  
DE CIENCIA  
E INNOVACIÓN



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

someone at the age of 35 who completed his PhD thesis less 7 than years ago.

I have repeatedly proven my capacity to get funding in national/international competitive calls. I have participated in 5 international projects acting as PI in 4 of them (total budget: 164.613 Euros) and I have taken part in 6 Spanish R&D projects. I have reviewed research projects for the Agence National de la Recherche (France) and Czech Science Foundation (Czech Republic). I am Reviewing Editor of Journal of Biogeography since January 2019. I have also reviewed manuscripts for over 30 journals including Ecology, J Anim Ecol, Funct Ecol, Mol Ecol, and Proc R Soc London B. My outreach activities include several publications in popular science magazines and press releases to the mass media. I have supervised 4 BSc projects and 1 MSc thesis and I have been member of 2 PhD committees.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** RUIZ GONZALEZ, CLARA  
**Referencia:** RYC2019-026758-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** clararg@icm.csic.es

#### Título:

Diversity and function of microorganisms in aquatic ecosystems

#### Resumen de la Memoria:

My research focuses on understanding the drivers and role of microbial communities in aquatic ecosystems, with the ultimate aim to predict how changes in microbial diversity may impact biogeochemical processes. During my career, I have moved from a detailed experimental assessment of local microbial responses to environmental factors in marine ecosystems using microscope techniques, towards a more comprehensive and theoretical exploration of the regional and historical processes shaping microbial communities, by means of large-scale samplings of terrestrial, freshwater and marine ecosystems and massive DNA sequencing. My main current research objective is to understand how microbial dispersal and connectivity shape the diversity and activity of aquatic microbial communities.

During my PhD at the Institut de Ciències del Mar (ICM-CSIC) in Barcelona (2006-2011), I studied how sunlight influences the processing of carbon by different marine bacterial groups using single-cell microscope techniques, publishing 6 first-author papers and a literature review (Ruiz-González et al. 2012a-f, 2013a). I moved then my focus to the study of freshwater bacterial communities through the use of high throughput sequencing technologies, first at the University of Girona (Spain, 2011-2012), where I investigated the effects of damming on riverine bacterial communities (publishing 3 papers, Ruiz-González et al. 2013b;2015a, Artigas et al. 2012), and then at the Université du Québec à Montréal (Canada, 2013-2015), exploring the large-scale biogeography of terrestrial and aquatic bacterial communities and their connectivity across the landscape. This period was highly productive, resulting in 13 published articles (5 first-author) of high quality (e.g. 2 Ecol.Lett, 4 ISME).

I moved back to the ICM in 2015 with two self-granted postdocs (Beatriu de Pinós, JdIC-Incorporación), where, building on my prior research on microbial ecology across the terrestrial-aquatic interface, I have established a research line on groundwater-seawater microbial connectivity in the coastal Mediterranean. Since Sept. 2019, I lead my own 3-year project on this topic (Retos-Investig 2018, JIN). Also, applying concepts developed for freshwater communities (e.g. Ruiz-González 2015 Ecol. Lett.), I have published one Molec. Ecol. (Ruiz-González et al. 2019) and one PNAS paper (Mestre et al. 2018, Landmark Paper Award for 2018 by the Deep-Sea Biology Society), and several others have just been submitted. Since my first paper in 2012, I have already published 31 (15 (ca. 50%) as first author), a book chapter, and I am largely involved in mentoring PhD, master or undergraduate students. I have contributed multiple presentations (>40) in international meetings or as an invited speaker (plenary talk at AIOL 2017 in Cagliari-Italy, closing plenary at 1st SIBECOL 2019 meeting, Barcelona, scientific expert for a Science Forum for the Ramon Margalef Prize in Ecology, Barcelona), and have organized special sessions on microbial dispersal (ASLO 2018, Canada) and microbial ecology (1stSIBECOL meeting 2019, Barcelona).

Overall, my scientific experience has consolidated between research fields that not always communicate, such as limnology, oceanography and theoretical ecology. This trajectory has provided me with an unusual balance between these disciplines that I try to maintain in my research.

#### Resumen del Currículum Vitae:

I graduated in Biology in 2005 at the Universidad Autónoma de Madrid. In 2006 I moved to Barcelona to start a PhD at the Institut de Ciències del Mar (ICM-CSIC, Barcelona) on marine microbial ecology. 4.5 years later (May 2011) I defended my thesis, which was translated into 6 first-author papers in and a literature review that were published in high impact journals during 2012 and 2013. During my postdoctoral stage, I moved my focus to the study of freshwater bacterial communities, first at the University of Girona (Spain, 2011-2012), where I investigated the effects of damming on riverine bacterial communities publishing 3 papers, and then at the Université du Québec à Montréal (Canada) during almost 3 years (2013-2015). This period was highly productive, resulting in 13 published articles (5 first-author) of high quality (e.g. 2 Ecol.Lett, 4 ISME). I also had the opportunity to co-direct an undergrad project and two PhD theses, which were defended in 2016 (see CV).

Since 2015 I am back at the ICM-CSIC, initially funded with a Beatriu de Pinós postdoctoral fellowship (AGAUR and EU-funded project ITHACA-Marie Curie program) followed by a Juan de la Cierva-Incorporación contract, and currently with my own project as a PI (Retos 2018, modalidad JIN). One of my most recent papers has been awarded the Landmark Paper Award for 2018 by the Deep-Sea Biology Society (Mestre et al. 2018). I have recently supervised two practicum summer projects and a Msc. thesis. I have contributed multiple presentations (>40) in international meetings or as an invited speaker (see CV), and have organized special sessions on microbial dispersal (ASLO summer meeting 2018, Canada) and microbial ecology (1stSIBECOL meeting 2019, Barcelona).

Since my first paper in 2012, I have already published 31 scientific articles (15 (ca.50%) as first author,6 as second author), and a book chapter. All papers have been published in high-impact Q1 journals (e.g. 1 PNAS, 2 Ecology Letters, 4 ISME J.), with the exception of one invited paper in the AIOL Journal resulting from one plenary talk at the AIOL meeting in Cagliari, Italy, Sept 2017). It is also remarkable that I am first or second author of four of my five most cited articles. My h-index (as in Scopus) is 14 (16 in Scholar), and the total number of





MINISTERIO  
DE CIENCIA  
E INNOVACIÓN



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

citations is 555 (710 in Scholar), although the articles from the past three years are increasing their citation metrics fast (e.g., 52 cites in 2015 to 153 in 2019 -56 to 208 in Scholar-).



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** CARRO GARCIA, LORENA  
**Referencia:** RYC2019-028311-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** lcg@usal.es

#### Título:

Genomics applied to the study of microbial ecology

#### Resumen de la Memoria:

Dr. Carro's interest in searching for environmental solutions to improve the world led her to study a four-year BSc degree in Environmental Science. After discovering how microorganisms interact with their environment and their capacity to solve problems, she decided to enrol herself in Molecular Microbiology and Genetics Advances Studies (Honours). She then successfully applied for a position in one of the most important groups conducting bacteria-legume symbiosis research in Spain to start her PhD studies under the supervision of Prof. Trujillo and Prof. Martínez-Molina (Univ. of Salamanca). She was granted a four-year fellowship to develop her research on the study of endophytic and rhizospheric actinobacteria of *Pisum sativum* plants, their relationships and taxonomic study, demonstrating the presence of *Micromonospora* in nodules and identifying 15 novel species. Her interest in the relationship of plants with microorganisms drove her to conduct a second degree, this time in Agriculture Engineering. During 2010 and 2011 she worked with Prof. Encarna Velázquez in two projects to study endophytes of legumes and their effects as bioinoculants from which she obtained a patent and several publications. Later, Dr. Carro contacted Dr. Normand (CNRS, France) to apply for a postdoctoral fellowship proposal, which was granted by the Spanish Government to be developed in his lab. Based on transcriptomic analysis, she found the implication of antimicrobial peptides produced by *Alnus* plants during the symbiotic process in nutrient exchange, and she demonstrated the presence of *Micromonospora* in actinorhizal nodules. In 2015, she joined Prof. Hans-Peter Klenk's team at Newcastle Univ. (UK), where she carried out mining of actinobacteria genomes and determining the biotechnological and ecological potential of *Micromonospora* genus, as well as developing a new whole classification of Actinobacteria phyla based on genomic information. In 2018 she obtained a competitive research fellowship from the Univ. of Salamanca where she analyzed the *Micromonospora* response to root exudates, and the application of this system was granted with a MSCA-IF to be developed at NEIKER (Basque Country). She is interested in deciphering first molecules implicated in symbiotic relationships and the elicitors that define the responses between the host and the hosted. During her scientific career, she has participated in 15 research projects and 45 scientific conferences, as well as being invited as referee by a number of international journals and to give seminars in several Universities. She has been invited as an external examiner/jury in several PhD thesis, project evaluator, and as editor of JCR journals and books. At Newcastle Univ., she taught first and last year undergraduate students, she has fully supervised three undergraduate and one MSc project. At Salamanca, she was involved in the practical teaching of several modules and at present, she supervises undergraduate and PhD students, as well as lecturer in environmental science degree and Master studies. Dr. Carro has developed a multifaceted experience portfolio, from physiology to genomics, and her career has been multi-institutional, which has helped her to consolidate a robust international reputation and an extensive network on microbial ecology.

#### Resumen del Currículum Vitae:

Scientific and technical merits: Dr. Carro has an h-index of 21, with more than 70 publications and over 1400 citations according to Google Scholar. She is co-author of a whole teaching book and has participated in 12 book chapters. She is first and corresponding author in publications in high-impact journals. She has participated in 45 conferences at national and international level, being selected as speaker in several international meetings. Dr. Carro is involved in the transfer of technology, being co-author in a patent and participating in projects with several companies. Dr. Carro has been a very active reviewer since 2009, collaborating with fifteen JCR journals, reviewing also book chapters (Wiley) and book proposals (Springer). Currently, she is editor of several JCR journals and the Bergey's Manual of Systematics of Archaea and Bacteria book. She is project evaluator for the National Research, Development and Innovation Office of Hungary. She transfers her research to society by several methods: communication with local and national newspapers, informal science talks like Pechakucha and Women and Girls in Science Day, participating in science for children at Scientific Spring activities, etc. Dr. Carro has given lectures at undergraduate and master level at Newcastle University (UK) and University of Salamanca (Spain) in several subjects (Microbiology, Environmental Microbiology, Genetics, ), as well as being supervisor of several students at laboratory (undergraduate, master and doctorate).

Mobility and International activity: The candidate has been working abroad for five and a half years from her 15-years research period. She spent three months at the DSMZ (Germany) as predoctoral student, as well as 35 months at University of Lyon 1-CNRS (Lyon, France), including one stage at the Institute for Integrative Biology of the Cell-CNRS (Gif-sur-Yvette, France), and 28 months at Newcastle University as research fellow. This multi-institutional experience has been the base to consolidate Dr. Carro's international reputation. She has an extensive network, with more than 160 co-authors according to Scopus.

The professional independence and leadership capacity of Dr. Carro is reflected in different activities: (i) writing projects as PI that were funded: Villalar Foundation project 2010, postdoctoral fellowship granted by the Spanish Government 2011, postdoctoral fellowship from University of Salamanca 2018, Marie Skłodowska-Curie Independent Fellowships 2019, (ii) participating as researcher in 15 projects at



MINISTERIO  
DE CIENCIA  
E INNOVACIÓN



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

several levels: local, regional, national, european and international projects, (iii) full supervising projects of BTS, undergraduate, and MSc students, as well as co-supervising PhD students, (iv) being external examiner for PhD thesis, (v) being thesis jury, (vi) being associate editor for JCR journals and International books, (vii) being reviewer of papers for a number of indexed journals and books, (viii) being invited as guest speaker to give conferences in well-known universities, (ix) being selected as oral speaker in international conferences, (x) being project evaluator for other countries, (xi) having an extensive international network of collaborators in France, Spain, Germany, UK, Japan, and USA, among others, and (xii) being leader of several high-impact publications.



## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

**Nombre:** RUIZ CANOVAS, CARLOS  
**Referencia:** RYC2019-027949-I  
**Área Temática:** Ciencias y tecnologías medioambientales  
**Correo Electrónico:** carlos.ruiz@dgeo.uhu.es

#### Título:

Metal release to the hydrosphere by mining and industrial wastes and recovery of elements of economic interest

#### Resumen de la Memoria:

During my research career, I have used a multidisciplinary approach (e.g. geochemistry, biology, chemistry, hydrology and modeling) to study the metal pathways in water bodies affected by mining and industrial pollution. I have mainly developed my academic career in two experienced research centers on Geosciences in Spain; the University of Huelva (UHU, Department of Earth Sciences) and the Severo Ochoa Excellence center of IDAEA-CSIC. My studies have mainly focused on acid mine drainage (AMD) a major worldwide environmental problem associated with the mining of sulfide and coal deposits. Sulfides are stable and very insoluble in reducing conditions. Naturally, the pyrite and associated sulfides remain buried in anoxic conditions and only very minor parts of the ore bodies outcrop. Sulfide oxidation takes place once the minerals are exposed to atmospheric conditions generating extremely acid lixiviates with high concentration of sulfate, iron and other metal/loids (i.e. Al, Cu, Pb, Zn, As, Tl) and radionuclides (i.e. U, Th). My research has dealt with geochemical processes controlling metal and radionuclide content in water bodies (i.e. rivers, lakes and estuaries), considering especially those scavenging elements (i.e. mineral precipitation, sulfate reduction, sorption processes onto Fe and Al colloid surfaces) and those releasing (i.e. sulfide oxidation, washout processes during flash floods, transport vectors from mine wastes). Of particular interest, has been the study of metal pathways and fluxes in rivers affected by AMD during floods, which constitutes large examples of metal pollution worldwide. I have also investigated the release and fate of metal/loids and radionuclides from industrial wastes, such as phosphogypsum, a highly-pollutant waste generated at a rate of 280 Mt/yr by the fertilizer industry worldwide. In this issue, I have investigated the mobility and transport to the receiving water bodies of metal/loids and radionuclides, as well as potential treatment to avoid pollution in water bodies. In order to close the cycle of research on this subject, I opened a new research line to evaluate the suitability of these wastes (i.e. mine and fertilizer wastes) as a source of metals of economic interest, during my UE 7th FP Marie Curie fellowship at the Institute of Separative Chemistry of Marcoule (ICSM-CRNS-CEA). During this 2-year project I worked on the optimization of techniques to selectively recover metals of economic interest from different waste streams and thus, provide a sustainable solution for mining and industrial wastes. As a result, I am principal investigator of a EU 7th MSCA project (Techmine), an ESRF project coordinator ( EV-358, Unravelling REE mobility in phosphogypsum: environmental implications ), team coordinator and WP leader of a H2020 EIT raw materials project (Morecovery), scientist in charge of UHU in H2020-MSCA-ITN-2018 PANORAMA project, and principal investigator of VALOREY project (RETOS JIN 2018; RTI2018-101276-J-I00). In addition, I have taken part in 27 competitive international and national research projects (e.g. H2020-EIT, Marie Skłodowska-Curie actions, EU 7th Framework Program, ESRF, AECID, INTERREG, Plan Nacional, Proyectos Excelencia Junta de Andalucía, etc.) I have 57 SCI publications (42Q1, 10 Q2; average IF of 3.92), of which I am principal investigator of 20.

#### Resumen del Currículum Vitae:

PhD in Earth Sciences from the University of Huelva (UHU) (2008), postdoctoral researcher at the Severo Ochoa excellence research center IDAEA-CSIC (2010-12) upon the competitive call Juan de la Cierva program. Then, I moved as postdoctoral researcher to the Biology Department of University of Cádiz (2014/15) and Institut de Chemie Separative de Marcoule, France (2015-17) under the EU 7th Framework Program, Marie Skłodowska-Curie actions. Currently I am postdoc researcher at Dept of Earth Sciences of the University of Huelva, where I lead the RETOS JIN 2018 project VALOREY.

My studies have mainly focused on acid mine drainage (AMD) a major worldwide environmental problem associated with the mining of sulfide and coal deposits and the recovery of elements of economic interest from mine and industrial wastes. I have investigated the geochemical processes controlling metal content in AMD-affected water bodies (i.e. rivers, lakes and estuaries). I contribute actively to the advance of the knowledge in the field of AMD as Associate Editor of *Mine Water and the Environment* (Springer), the main journal on AMD. I have taken part in 27 competitive international and national research projects or contracts (e.g. H2020-EIT, H2020-MSCA, EU 7th FP, ESRF, AECID, INTERREG, Plan Nacional; 68/83) as principal investigator (6) and team member (21). Team member of AMDREY (ERANET) and LIFE-ETAD projects (LIFE12 ENV/ES/000250, principal investigator of TECHMINE (EU 7th Framework Program-Marie Curie Actions) and EV-358 (ESRF), team coordinator (UHU) and work package leader of MORECOVERY project (H2020 EIT Raw Materials), scientist in charge of UHU in H2020-MSCA-ITN-2018 PANORAMA project and ESRF project coordinator (EV-358)

Professor in International Master Programs (Erasmus Mundus Master WACOMA and MSc in Geology and Environmental Management of Mineral Resources), I have supervised 10 MSc Thesis, 5 BSc Thesis and currently supervising 2 PhD Thesis. I have 57 SCI publications (42 Q1, 10 Q2) and 4 submitted under review. My h index is 17 (SCOPUS) and my works have a total of 1368 citations. First author of 20 SCI pubs,



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## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2019

### Turno de acceso general

the average impact factor (IF) of my publications is 3.92, with an average number of coauthors of 4. In addition to my SCI publications, I have published 16 non-SCI papers, 1 book and 21 book chapters. I have widespread the results of my research in 76 national and international congresses. Member of the Evaluation Committee of the Deutscher Akademischer Austauschdienst (DAAD) fellowship program (2017-2022), EVALUA panel (AEI) and frequent reviewer of main journals of my research field (e.g. J Haz Mat, Water Res, Sci Total Environ, Env Poll, Environ Int, J Clean Prod, etc.). I3 certification (I3/2019/098) in the PEJ CVS area by the Spanish AEI. I was selected in the reserve list of Ramón y Cajal call 2018. During my research, I have obtained a total funding of 590.101 ; of them 428.621 were achieved from competitive project funding calls (i.e. H2020, EIT, EU 7th FM MSCA, ESRF, CEIMAR foundation, 68/83, etc.), 161.480 in competitive open call for human resources (Juan de la Cierva and FPI programs) and funding calls for research stays (COST, DAAD, ERASMUS+, etc.).