Oferta 2019 de Prácticas en el Marco de los Convenios UAM-CERU, UAM-CERFA y UAM-CEBE y Erasmus+ Prácticas

### Prácticas en el Reino Unido bajo el amparo del Convenio UAM-CERU

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<td>UK 1</td>
<td>Arnau Bolet</td>
<td>Biology/Paleontology</td>
<td>University of Bristol</td>
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<tr>
<td>UK 2</td>
<td>María Jimenez-Sánchez</td>
<td>Biology/Biomedicine/Neurophysiology/Biochemistry</td>
<td>King’s College-London</td>
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<tr>
<td>UK 3</td>
<td>Nerea Irigoyen</td>
<td>Biology/Biomedicine/Microbiology</td>
<td>University of Cambridge</td>
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<td>UK 4</td>
<td>Carolina Mayoral</td>
<td>Biology/Plant Physiology/Environmental Sciences</td>
<td>University of Bradford</td>
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<td>UK 5</td>
<td>Estrella Luna</td>
<td>Biology/Biotechnology/Plant Physiology/Microbiology/Environmental Sciences</td>
<td>University of Birmingham</td>
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<tr>
<td>UK 6</td>
<td>Irene Olivé</td>
<td>Environmental Sciences/Biology</td>
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<td>Dolores González</td>
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<td>UK 8 y 9</td>
<td>Carlos Fresneda Portillo</td>
<td>Mathematics</td>
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### Prácticas en Alemania bajo el amparo del Convenio UAM-CERFA

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<tr>
<td>AL 1</td>
<td>Eva Blasco</td>
<td>Chemistry/Chemical Engineering</td>
<td>Institute for Technical Chemistry and Polymer Chemistry, KIT</td>
</tr>
<tr>
<td>AL 2</td>
<td>Pablo Lodeiro Fernández</td>
<td>Chemistry/Environmental Sciences</td>
<td>GeoMar, KIEL</td>
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<tr>
<td>AL 3</td>
<td>Lucía Pita Galán</td>
<td>Biology/Biodiversity/Marine Ecology-Marine Microbiology</td>
<td>GeoMar, KIEL</td>
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### Prácticas en Bélgica bajo el amparo del Convenio UAM-CEBE

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<td>BE 1</td>
<td>Sergi Farré &amp; Miguel Ángel Berrocal</td>
<td>Diplomacia y Comunicación Científica</td>
<td>Embajada Española en Bruselas</td>
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<tr>
<td>BE 2</td>
<td>Sergi Llambrich</td>
<td>Biology/Biomedicine/Biochemistry</td>
<td>Biomedical MRI Unit, KUL LEUVEN</td>
</tr>
<tr>
<td>BE 3</td>
<td>Adrián Ranga</td>
<td>Biology/Biochemistry/Biochemistry/Biochemistry</td>
<td>Biomechanics Section, KUL LEUVEN</td>
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<tr>
<td>BE 4</td>
<td>Rodrigo Bacigalupe</td>
<td>Biology/Human Nutrition/Biochemistry/Genetics/Microbiology</td>
<td>Rega Institute, KUL LEUVEN</td>
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<td>BE 5</td>
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A continuación aparece toda la información de cada una de las ofertas.
PRÁCTICAS EN EL REINO UNIDO BAJO EL AMPARO DEL CONVENIO UAM-CERU

Los estudiantes seleccionados para disfrutar de una beca Erasmus+ Prácticas en Reino Unido dentro del Convenio UAM/CERU.

En función de cómo se desarrolle la salida de Reino Unido de la Unión Europea, los estudiantes seleccionados para estas becas UAM-CERU podrán renunciar a su movilidad sin ninguna consecuencia académico-administrativa. Todos los estudiantes que opten por solicitar una de las becas UAM-CERU quedan informados de la posible eventualidad de que dicha concesión de beca sufra modificaciones económicas y/o administrativas, o que incluso finalmente no pueda realizarse la estancia.

OFERTA UK 1 – SUPERVISOR DR. ARNAU BOLET

Título del Proyecto: Fossil lizards (Reptilia, Squamata): phylogeny, systematics and processing of CT-Scan data

Afiliación del supervisor: Life Sciences Building, 24 Tyndall Avenue, BS8 1TQ, Bristol
http://www.bristol.ac.uk/earthsciences/#_ga=2.210867345.54795109.1520060335-823320932.1520060335

Perfil preferencial del estudiante: Biologist with special interest in Paleontology

Fechas orientativas: 20/06/2019 al 19/08/2019

Programa/ Detailed program of the traineeship period
Transcriptional changes elicited by signalling are highly dynamic. Though static patterns of gene expression have been The student will join a vibrant research group directed by Professor Mike Benton. Supervised by Dr. Arnau Bolet he will participate in two different ongoing research lines:
1) The study of the first articulated fossil specimen of scincid lizard from the Canary Islands (Spain). The specimen is exceptionally well preserved, but a laborious and time-consuming processing of the CT-Scan data obtained at Duke University (USA) is necessary for its study. The student will learn everything about the process of digital segmentation, where every bone of the specimen will be digitally isolated from surrounding matrix and other materials (e.g. crusts). The objective is to obtain a 3D model of the skull (and other body parts) where both the external and internal morphology of the specimen can be directly studied.
2) The study of a partially described specimen of fossil lizard from the Cretaceous of Armuña (Spain). The specimen is interesting being supposedly related to xenosaur lizards, a poorly known group that had not been reported from the Iberian Peninsula before. The idea is to involve the student in running phylogenetic analyses (using Paup and TNT softwares) that should help in supporting or rejecting the xenosaur affinities of the taxon. Regardless of its exact phylogenetic position, we are certain about the fact that this fossil represents a new genus and species, and the student will be involved in the description and erection of the new taxon.

Competencias a adquirir por parte del estudiante/ Knowledge, skills and competences to be acquired by the trainee at the end of the traineeship (expected Learning Outcomes)
Full training will be provided by Dr. Arnau Bolet in all the required methods. Projects will involve the acquisition of the following competences/skills:
- Deep knowledge of lizard skull morphology, general osteology and fossil record.
- CT-Scan methods for segmentation, from an already available CT-Scan dataset, in order to obtain a 3D model of the fossil specimen. Full access to software will be provided.
- Study of isolated, highly fragmentary fossil specimens, and associated problems
- Phylogenetic comparative methods
- Process of erection of a new taxon (description, comparisons, or diagnosis)

**Seguimiento/ Monitoring Plan**
Continued supervision of the development of the stay is planned, with scheduled formal meetings with the student and full availability of the host at any moment. This is possible due to the lack of other duties (e.g. teaching) along the proposed period.

**Evaluación/ Evaluation plan**
The success of the stay will be evaluated regarding different aspects, from more to less important: 1) success in learning the different techniques, 2) success in finishing any or both projects and 3) potential additions of the student to these studies.

**Additional important information:**
The visiting student application will have to be submitted before the visit. For administrative support please contact: Karen Soencer, Student administration manager, University of Bristol, K.M.Spencer@bristol.ac.uk, +44 (0) 117 331530
Título del Proyecto: Investigating the role of astrocytes in neurodegeneration.

Palabras clave: Neurodegeneration, alzheimer

Afiliación del supervisor: Maurice Wohl Clinical Neuroscience Institute, Department of Basic and Clinical Neuroscience, Institute of Psychiatry Psychology and Neuroscience, King's College London [https://www.kcl.ac.uk/ioppn/depts/nci/our-research/neurodegeneration/jimenez-glial-cells-and-neurodegeneration/about-the-group]

Perfil preferencial del estudiante: estudiantes de Másteres de Biociencias o estudiantes de último curso de Biología o Bioquímica. Conocimientos de Biología, Bioquímica, Neurofisiología.

Se ofrece periodo de tres meses con financiación Erasmus Prácticas, pero si el estudiante desea permanecer 4 meses también se ofrece dicha disponibilidad.

Fechas orientativas: del 01/09/2018 al 30/12/2019

Programa/ Detailed program of the traineeship period

Currently, more than 46 million people worldwide are living with dementia and Alzheimer's disease, a number that is expected to double every 20 years. Traditionally, drug discovery strategies have focused on neurons as the main targets in Alzheimer's and other brain disorders. In the brain, neurons are responsible for processing information, learning and memory, while other specialized brain cells called glial cells are necessary to maintain neuron health and to aid neuron function. To be able to design effective therapeutic strategies for Alzheimer's disease, we need to investigate not only how neurons become dysfunctional but also to better understand what is the contribution of glial cells to the degeneration of neurons and the disease progression.

Protein aggregation is a common aspect in all neurodegenerative diseases, and leads to the accumulation of tau and amyloid beta in Alzheimer's disease. Cells have several mechanisms to protect from protein aggregation, including preventing protein misfolding through molecular chaperones and inducing protein degradation by autophagy or the proteasome. The aim of this project is to investigate how these mechanisms that prevent protein aggregation are regulated in astrocytes, one of the most abundant type of glial cell, and how these could mediate a non-cell autonomous protection of neurons in Alzheimer's disease.

This research will be carried out at the Maurice Wohl Clinical Neuroscience Institute, a newly built highly interdisciplinary neuroscience center at King's College London.

Competencias a adquirir por parte del estudiante/ Knowledge, skills and competences to be acquired by the trainee at the end of the traineeship (expected Learning Outcomes)

The student will be trained in cell culture techniques (which may include among others the culture of primary mouse astrocytes and human cell lines, DNA and siRNA transfection, cell treatments and harvest) and the analysis of proteins using western blotting and immunohistochemistry. All these are very relevant techniques for any student willing to pursue a research career in biology, biochemistry or neuroscience.

The student will also be trained in the analysis of the data and in the communication of his/her research as the student will present his/her data regularly in group meetings.

The student will be able to attend regular seminars hosted at the Maurice Wohl Clinical Neuroscience Institute, which will expose him/her to a variety of speakers with experience in neuroscience research. This will include: weekly group meetings, weekly internal and external seminars, monthly Alzheimer’s disease club and monthly glia club meetings.
Seguimiento/ Monitoring Plan

In the first weeks, the student will become familiar with the basic procedures, working next to the supervisor. We expect that from the 4th week, he/she will be able to carry out the experiments independently, always under close supervision. All the techniques are routinely used in the laboratory and appropriate controls are in place to monitor the performance.

Data will be regularly presented in the weekly group meetings and feedback will be provided by other members of the group.

Evaluación/ Evaluation plan

- The supervisor and student will meet on a regular basis, at least once per week, with meetings being more frequent in the first weeks.
- Every 3 weeks, the student will present his/her research progress in the laboratory group meetings.

We expect that results from this project are included in a poster at ARUK202 conference, and appropriate credit will be given.

Additional important information:
Paperwork is required upon acceptance of the student, not before.
The student will be informed of the details once he/she is selected.
Título del Proyecto: The role of novel open reading frames in Zika virus infected cells

Palabras clave: Virus, molecular biology, microscopy

Afiliación del supervisor: Department of Pathology, Tennis Court Road, CB2 1QP, Cambridge (United Kingdom)
https://www.path.cam.ac.uk/directory/nerea-irigoyen

Perfil preferencial del estudiante: estudiantes de Máster de Biociencias o estudiantes de últimos cursos de Biología o Bioquímica

Fechas orientativas. Del 01/07/2019 al 30/09/2019

Programa/ Detailed program of the traineeship period

Zika virus (ZIKV) was first isolated in Uganda in 1947 (African strain) but long considered of low importance as most infections were asymptomatic. However, it gained prominence when the virus spread to Brazil (American strain) in 2015. This newly emerged American strain is more virulent than the original African one and causes severe neurological manifestations. The infection of pregnant women can lead to gestational abnormalities including ‘congenital Zika virus syndrome’ (e.g. microcephaly).

The first analysis of the viral translatome by ribosome profiling (a sensitive technique that can obtain a global ‘snap-shot’ of host and viral translation) of an American strain revealed two new upstream Open Reading Frames (uORFs) encoded upstream of the main ORF (main polyprotein) (Irigoyen et al., 2017. bioRxiv doi:10.1101/112904). Moreover, these uORFs are not conserved in African isolates in which they are fused together as a single ORF. Thus, it is hypothesized that ZIKV uORFs have a strain-dependent impact on viral virulence and pathogenesis.

Bioinformatic analyses do not reveal any homology between ZIKV uORFs and known proteins. Therefore, to determine the role(s) of American and African ZIKV uORF proteins during infection, the student will clone and transiently express FLAGtagged versions of these proteins in mammalian and mosquito cells and he/she will use confocal microscopy and cellular fractionation to determine their cellular localization. In pull-down experiments with lysates of infected and mock-infected cells and subsequent immunoprecipitations and mass-spectrometry, the student will identify potential cellular and viral partner proteins of the uORFs

Competencias a adquirir por parte del estudiante/ Knowledge, skills and competences to be acquired by the trainee at the end of the traineeship (expected Learning Outcomes)

This studentship will provide basic training in techniques broadly used in molecular biology/molecular virology laboratories:
1. General knowledge of flaviviruses and especially Zika virus.
2. Basic molecular biology techniques: PCR, cloning, plasmid isolation from bacterial cultures.
3. Tissue culture techniques including cell passaging and plasmid transfections.
4. Basic virology techniques including virus infection of mammalian and insect cells, virus isolation and virus titration.
5 Immunoblotting techniques (Western blotting)
6. Cellular fractionation and immunoprecipitations.
7. Immunofluorescence and confocal microscopy.
Seguimiento/ Monitoring Plan
The supervisor will supervise the summer student directly on a day-to-day basis helping him/her with the experimental planning, set up and data interpretation.

Evaluación/ Evaluation plan
The student will be allowed to plan, trouble-shoot and perform his/her own experiments. I will have weekly meetings with the student to monitor and evaluate his/her correct performance and help in data gathering and interpretation. In addition, the student will also join our weekly lab meetings and will be allowed to present his/her research project; this will directly contribute to the development of his/her communication and presentation skills.
Título del Proyecto: Effect of elevated CO2 on a mature temperate deciduous forest

Palabras clave: Biosensors, Ecology, microbial cell fuels

Afiliación del supervisor: University of Birmingham, Institute of Forest Research (BIFoR)
https://www.birmingham.ac.uk/research/activity/bifor/index.aspx

Perfil preferencial del estudiante: Biologist with special interest in Plant Physiology

Fechas orientativas: periodo de hasta tres meses entre el 01/07/2019 y el 30/10/2019

Programa/ Detailed program of the traineeship period
The traineeship will be carried out in a long-term FACE experiment set up in a mature, unmanaged, deciduous, temperate oak forest. This is the only FACE experiment of these characteristics carried out in the north hemisphere. This project arises as an association between the University of Birmingham and the Birmingham Institute of Forest Research. https://www.birmingham.ac.uk/research/activity/bifor/index.aspx.

The experiment consists of 9 arrays in which CO2 has been fumigated in open-air conditions since 2016. It is called a ‘sci-fi experiment’ since we are simulating the effect of the CO2 concentration forecasted for 2050 by means of 30 m diameter and 20 m height arrays set up in a mature forest. Global system models estimate a huge CO2 sink in temperate forest, however, it is not clear up to which degree this is true since global system models do not consider the effect of nutrient limitations (we don’t know the rate of nutrient regeneration under a CO2 enriched atmosphere). Where these trees allocate carbon is unclear: leaves, root, growth, secondary metabolites?. All these questions and more are trying to be answered by means of many different experiments carried out inside of these arrays.

Program:
During the first stage of the stay, before the growing season has started, the trainee will get practical skills on dendrometers installation in mature oak trees.

b) At the onset of the germination period, the trainee will work on finding naturally regenerated seedlings of the main tree species. This activity will also encompass identifying species, measuring basic parameters related to tree size and labelling seedlings.

c) Once leaves are fully developed, physiological measurement campaigns will be carried out on both naturally regenerated seedlings and potted plants. The later, were introduced in the experimental site last summer as a semicontrolled experiment in which seedlings of similar age are kept at field water capacity in order to have a baseline on the physiological performance of the main tree species coexisting in the forest. During the physiological campaigns, the trainee will gain knowledge on gas exchange, photochemical efficiency of photosystem II, chlorophyll contents, soil moisture, stem diameter and height measurements in both natural and potted seedlings. Physiological campaigns will take place every 2 to 3 weeks and will consist on three consecutive days of measurements.

d) Physiological campaigns will require long days of more than 10 hours in some cases that will be compensated by days off after campaigns.

Apart from the above activities, the trainee will likely develop skills on:
f) photographing, drying and weighing frozen leaves that will be used to estimate biomass productivity under both elevated and ambient CO2 conditions.
g) chemical analysis of the live leaves

h) Analyses of hemispherical photographs to estimate leaf area index and global site factor.
i) Analyses of phenocam data to assess phenology.
j) The trainee will attend to weekly meetings of our research group.
Competencias a adquirir por parte del estudiante/ Knowledge, skills and competences to be acquired by the trainee at the end of the traineeship (expected Learning Outcomes)

At the end of the traineeship the trainee would have broaden knowledge on the ecology of temperate deciduous forests under the forecasted scenario of climate change.
- The trainee will gain competences on ecophysiology, including tree stress and ecosystem dynamics.
- The trainee will gain practical skills on dendrometric and dasometric analyses.
- The traineeship has a strong empirical component with a lot of field work, the trainee will learn to install dendrometers in adult tree, developing competences such as decision making and work in teams with other students, thus the trainee will develope strategic-organisational skills. The trainee will assess results from his or her own measurements such as rates of growth in seedlings .
- He or she will become familiar with physiological measurements, learning the basis on how to use instruments such as LICOR 6400.
- He or she will learn how to carry out basic statistical analyses using own measurements.
- The trainee will not only gain academic skills, but he or she will improve the knowledge of a foreign language, and will gain communication skills.

Seguimiento/ Monitoring Plan
The trainee will be supervised until she get autonomy enough to develop specific activities by herself

Evaluación/ Evaluation plan
The evaluation will take place throughout the whole period of this traineeship by assessing the former knowledge on specific areas and the evolution of the trainee.
At the end of the traineeship, the trainee will be ask to write up an scientific document (including introduction, material and method, preliminary results, discussion and conclusion) about the activities carried out.

Additional important information:
El estudiante tendrá que rellenar al incorporarse a la Universidad de Birmingham los siguientes documentos:
Application form
Confirmation of Studies Letter
Copia de ID card/passport, which can be sent directly to Admissions.
Titul del Proyecto: Understanding neighbouring effects in the tolerance to ash dieback disease

Palabras clave: Tree diseases

Afiliación del supervisor: School of Biosciences, University of Birmingham

https://www.birmingham.ac.uk/staff/profiles/biosciences/luna-diez-estrella.aspx

Perfil preferencial del estudiante:

Students of Forestry, Environmental Sciences or biology will bring the right expertise to the project. However, students from other disciplines such as Agronomy or Biotechnology are also encouraged to apply if they are willing to learn about forest pathology. Students need to have willingness to undertake fieldwork and to work outdoors during the summer months.

Additional important information:

To process Home/EU Erasmus Plus applicants’, the University of Birmingham requires the following documents:

Completed application form (to be completed by the applicant)
Completed Checklist (to be completed by supervisor and the host school, in this case Biosciences)
Confirmation of Relevant Studies – students need to send the original copy

Programa/ Detailed program of the traineeship period: en la siguiente página

Competencias a adquirir por parte del estudiante/ Knowledge, skills and competences to be acquired by the trainee at the end of the traineeship (expected Learning Outcomes): en la siguiente página
**Planned period:** from 17/06/2019 to 13/10/2019 (4 months, estimated dates with full flexibility)

**Research Areas** (select only one from annex II) **Biology**

1. **Traineeship title:** Understanding neighbouring effects in the tolerance to ash dieback disease

2. **Detailed programme of the traineeship period** (Max 250 words):

   In the last few decades, we have seen outbreaks of tree diseases for which we were not prepared. In 2012, after a long-time coming threat from mainland Europe, ash dieback disease was first confirmed in the UK. In Britain, there are approximately 120 million ash trees and no full genetic resistance to the disease has been identified. Intriguingly, tolerance to the disease has been documented, yet the mechanisms underpinning tolerance have not been unravelled. Current studies are focusing on understanding the effect of ash genetic variability and environmental conditions (e.g. soil characteristics, temperature, water availability) in the expression of tolerance. **In this project, we will investigate whether neighbouring trees can drive tolerance to ash dieback disease.**

   The project will characterise the extent of ash dieback disease in a mixed forest plot at the private Estate of Norbury, in Staffordshire. There, since 2012, over 3,000 ash trees are growing in random mixture with other 25,000 trees from 16 other native and exotic broadleaved and coniferous species. Ash dieback disease is found in the plot and variability in the level of symptoms can be visually observed.

**Objectives:**

1. Survey disease tolerance by visual *in situ* analysis. Disease will be scored by visually assessing the symptoms as previously described [1].

2. Identification of tree species driving tolerance. Linear models in factorial ANOVA tests will be used to determine tolerance-driving species.

With this work, we will obtain information as to whether mixed plantations offer a source for future solutions against this disease.


3. **Knowledge, skills and competences to be acquired by the trainee at the end of the traineeship (expected Learning Outcomes)** (Max 100 words):

   The student will gain knowledge in pathology techniques, including identification and scoring of ash dieback disease. He/she will also gain experience in botany and identification of tree species. The student will obtain practical experience in fieldwork by working in a unique forest setting. Gathering of large data and statistical analysis will also provide transferable skills, including use of R, SPSS and others with the potential to learn to use modelling software. Photoshop will be used for analysis of images. The student will work in a team and individually, therefore providing experience in both types of working scenarios.

4. **Monitoring plan** (Max 50 words):

   During the first month, the student will work together with me and the technical team where monitoring will occur daily. After, he/she will report progress at the BiCoR weekly meetings (Monday mornings). The student will be expected to explain progress achieved and set objectives for the week ahead.

5. **Evaluation plan** (Max 50 words):

   Quality of the work will be evaluated by assessment of data gathering (e.g. lab notebooks, organization of digital data), a report that will be produced at the end of the studentship in the form of a research publication, and a poster that will gather the results of the studentship.
Título del Proyecto: Metabolic status of seagrasses around Scotland: effects of Climate Change and implications on Blue Carbon

Palabras clave: Marine microorganisms, climate change

Afiliación del supervisor: School of Geographical and Earth Sciences, University of Glasgow
https://www.gla.ac.uk/schools/ges/staff/ireneolivesamarr/

Fechas orientativas: del 24/06/2019 and 24/09/2019, fechas flexibles a acordar entre supervisor y estudiante.

Perfil preferencial del estudiante: Estudiantes de Master o último curso de Biología, Ciencias ambientales o doble grado en Ciencias Ambientales y Geografía y Ordenación del Territorio.

Especificaciones del supervisor: “Interest in Ecology and Plan physiology. Capacity to work outdoors in remote natural locations over long days during field work. For safety reasons, swimming skills are required”

2. Detailed programme of the traineeship period (Max 250 words):
This traineeship is integrated within a larger project (Marie-Skłodowska-Curie postdoctoral project, SEAMET, nº 752250) that aims to evaluate the potential of marine benthic photosynthetic organism to face Global climate change threats (i.e. global warming, ocean acidification and hypoxia) by exploring the physiological tolerance, metabolic adjustments and plasticity limits of seagrasses. Seagrasses are marine plants that play a major role in coastal ecosystem as engineering species supporting biodiversity and providing key ecosystem services, such as blue carbon storage and ocean acidification buffering. The model species will be the seagrass Zostera marina.

The traineeship will be performed under the supervision of Dr. Irene Olivé; Dr. Nicholas Kamenos.

The traineeship project is structured in 3 tasks:
Task 2. In situ quantification of Net Plant Productivity. Carbon metabolism incubations (photosynthesis and respiration) in the field in different locations along the Scottish coastline. Estimated duration: 1 month.
Task 3. Physiological plasticity. Analysis and comparison of the photosynthetic and respiratory performance (PE curves) of Z. marina exposed to different carbon availability (ocean acidification scenarios). Estimated duration: 1.5 month.

3. Knowledge, skills and competences to be acquired by the trainee at the end of the traineeship (expected Learning Outcomes) (Max 100 words):
At the end of this traineeship the student will have understanding on marine ecology, the scientific process and the skills necessary for a scientific career.

The student will be actively involved in all the tasks described in the project, including experimental design, setting up, performance of the experiments, data treatment, analysis of results and interpretation.

Specific skills developed:
- Marine plants cultivation techniques, mesocosm maintenance, analysis of seawater physico-chemical parameters (T, S, pH, O₂)
- Determination of net metabolism (photosynthesis and respiration) from in situ incubations in the field and from photosynthesis vs Irradiance (PE) curves in the laboratory.
### 4. Monitoring plan (Max 50 words):
The global performance of the student will be supervised by Dr. Olivé. A “kick-off” meeting will be set to discuss the project and the timetable. Weekly meetings will run to evaluate the project progress. Supervisors will teach the techniques, closely follow-up the student’s performance, and discuss in common the results.

### 5. Evaluation plan (Max 50 words):
The student will be evaluated by following-up his/her daily activities and by periodical reports:
- First report presenting the project, including the scientific interest, objectives and experimental design.
- Weekly reports (oral or written) on the work performed.
- Final report presenting the work performed, results, conclusions and supervisors’ evaluation.

### 6. Benefits of the traineeship to the applicant (host) (Max 200 words):
Several benefits are expected for the applicant’s group from hosting a student during a summer traineeship. Due to the geographic location of Scotland (high latitude) and the intrinsic growth pattern of the organisms studied (seagrasses), summer is the most intensive period for field and laboratory work within the host group. Accordingly, summer is the best period for hosting a student in terms of work demand and offer of topics and tasks for student’s learning and development.

This traineeship will be a valuable contribution to the successful accomplishment of the European project SEAMET lead by the host group. This traineeship will contribute to 3 “work-packages” outlined in the SEAMET project.

Together with the scientific advancing, hosting a student is a great opportunity to improve and further develop the training and mentoring skills of the supervisor. This is particularly relevant for Dr. Olivé in order to secure her leadership as independent researcher.

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**Additional important information:**

El estudiante que resulte seleccionado para esta beca deberá contactar con Rocio Gómez en [rocio.gomez@uam.es](mailto:rocio.gomez@uam.es) para solicitar el “Glasgow guidelines for students”
Título del Proyecto: Development of a self-powered MFC for pesticide detection in water

Palabras clave: Mathematica modelling, Fluid dynamics, electrodynamics

Afiliación del supervisor: University of Bath, Department of Chemical Engineering, Claverton Down Campus. Proyecto a desarrollar dentro del grupo liderado por el Dr. Bernardo Castro Domínguez https://www.bath.ac.uk/departments/department-of-chemical-engineering/

Perfil preferencial del estudiante:
Enthusiastic and motivated students, willing to learn new skills and be involved in a highly multidisciplinary project are encouraged. Preferentially a Master student from any of the following disciplines: Chemistry, Electrochemistry, Biology, Environmental and Chemical engineering. Application from undergraduate student of the last year of Chemistry, Electrochemistry, Biology, Environmental and Chemical engineering will also be considered.

Fechas orientativas: a concretar entre supervisor y estudiante

Programa/ Detailed programme of the traineeship period
The use of pesticides has increased 63% over the last 30 years worldwide and their toxicity have been greatly improved (i.e. nicotinoids are 10000 more toxic than DDT). Although necessary to increase crop efficiency, discharge and accumulation of these substances in the environment is a major issue. Yet, the fate and impact of these compounds on the ecological status and human health still uncertain, partially due to lack of an effective, in-situ monitoring. Traditional analytical sensing technologies are expensive and time consuming. Biosensors in particular are cost-effective as they provide information on the bioavailability and bioaccumulation of pesticides. A biosensor is a self-contained device that integrates an immobilized biological element (biofilm) that recognizes the analyte and a transduction element that converts the effect of the analyte on the bioreceptor into an electronic signal.

Current biosensors are not suitable for field applications due to power requirements and lack of recovery of the bioreceptor after a toxic event. In this context, Microbial Fuel Cell (MFC) based biosensors hold great potential to overcome these issues. In a MFC, the electrodes are colonised by a biofilm (sensing element) that generates an electrical current output. The value and shape of signal output depends on the metabolic activity of the microorganisms within the biofilm. As such, changes in the signal output of the MFC can be correlated with changes in the metabolic activity of the biofilm, without transduction of the signal. In this context, we propose a 3-month project to elucidate the impact of different pesticides in the signal output of a MFC based biosensor.

The specific objectives are:
- To construct and ensemble an array of MFC sensors.
- To grow the biofilms on the electrodes.
- To characterise the MFC sensors by electrochemical methods.
- To test different pesticides and analyse the signal output.

The traineeship will involve experimental work, data analysis and literature review. The student will be trained on the different disciplines involved in the project, including electrochemistry, microbiology and fuel cell technology. The multidisciplinary nature of the proposed work will provide a unique set of skills to the Trainee, and will widen their future career perspectives. The student will take advantage of the extensive expertise that we have in the Biosensors and Biological Fuel Cell Cells (B&BFC) on biology, chemical engineering, electrochemistry and microbial fuel cell technology. Transferable skills such as academic writing, presentation skills and English lessons are also available on Campus.
**Programa:**
Health and safety induction (2 days)
Introduction to all the research activities within the B&BFCs group (week 1)
Literature review: Throughout the Prácticas, the student will learn the state-of-the-art on microbial fuel cells biosensors.
Training on all the electrochemical and biological techniques involved in the project and methods to grow the biofilms (month 1)
Preparation and enrichment of the MFC sensors (month 1)
Electrochemical characterisation of the MFC sensors and optimisation of the environmental conditions (month 2)
Toxic tests and data analysis (month 3)
The student will also be involved in any B&BFCs activity, including weekly seminars, group meetings, gathering events.

**Competencias a adquirir por parte del estudiante/ Knowledge, skills and competences to be acquired by the trainee at the end of the traineeship (expected Learning Outcomes)**
Due to the highly multidisciplinary nature of the project, the Trainee will acquire technical skills on:
- (Bio)electrochemistry;
- Microbiological techniques;
- Energy harvesting;
- Fuel cell technology;
- Water quality assessment;
- Data analysis;
The student will also improve their communication skills by presenting and discussing their results during the weekly group meetings

**Seguimiento/ Monitoring Plan**
The student will work under the supervision of the PhD student Miss Dolores Gonzalez. There will be weekly group meetings with the group Leader Dr Di Lorenzo and, during the traineeship, he/she will have to give two seminars to the B&BFCs group to present their results.

**Evaluación/ Evaluation plan**
The student’s performance will be evaluated on a weekly basis during group meetings with Dr Di Lorenzo. A workplan of activities will be agreed during each meeting with tangible and focused goals to be met each week. At the end of the traineeship, the student will have to submit a final report with all the results that might be part of a scientific publication.

**Additional important information:**
The student will have to register as a visiting researcher at the University of Bath in order to get access to the library card and diverse facilities.
Este supervisor ofrece plaza para dos estudiantes dentro del mismo proyecto

_Título del Proyecto_: Existence and uniqueness of solutions of partial differential equations in fluid dynamics, electrodynamics and magneto hydrodynamics and its applications to the mathematical modeling of plasma physics, nuclear fusion and solar shocks.

_Affiliación del supervisor_: Oxford Brookes University, Wheatley Campus, OX33 1 HX, Wheatley, Oxfordshire, UK
https://www.brookes.ac.uk/

_Perfil preferencial del estudiante:_
- Master students in Mathematics should have priority. Then, undergraduate students with good grades can also be considered in third place if they are familiar with some of the knowledge detailed below.
- The student should have studied a module on Functional Analysis and Partial Differential Equations.
- Knowledge of Sobolev spaces and distribution theory would be highly desirable.

_Fechas orientativas_: periodos de hasta tres meses financiados entre 01/06/2019 al 01/10/2019

_Programa/ Detailed programme of the traineeship period_

This fellowship will aim to study some of the fundamental equations of Mathematical Physics such as the Stokes, Navier Stokes, Darcy Forcheiman and Maxwell Equations. These equations are of utmost importance in nowadays Mathematical modelling of aerodynamics, magnetic and electric radiation fields or plasma dynamics as it is the case of solar shocks or nuclear fusion models.

The first objective is to understand the main mathematical techniques of functional analysis and partial differential equations to prove existence and uniqueness of the problems. As well as understanding the role of the different boundary conditions employed to model different physical scenarios which are current trends of research as this is the case for example of magnetohydrodynamics (MHD) models for nuclear fusion.

Certain boundary value problems with constant coefficients and homogeneous partial differential equations defined on threedimensional domains can be reduced to an equivalent system of integral equations defined solely on the boundary. This offers a considerable reduction on the computational cost of the discretisation since we only need to discretise the boundary. Furthermore, the study of the integral operators involved on appropriate Sobolev spaces provides a natural context to investigate compactness properties of these integral operators to apply Fredholm Alternative theorem for proving uniqueness and existence of solution.

Students will also have the possibility focus rather on numerical computation and implementation of numerical methods, such as finite elements or boundary elements to obtain an approximate solution to the problems investigated.

_Competencias a adquirir por parte del estudiante/ Knowledge, skills and competences to be acquired by the trainee at the end of the traineeship (expected Learning Outcomes)_

The student will understand the main techniques used in potential theory to prove existence and uniqueness Theorems of problems related to the partial differential equations stated above.

The student will be able to analyse the advantages and limitations of different mathematical models related with fluid dynamics and electromagnetism.

Become familiar with Sobolev spaces and Operator Theory techniques at an appropriate level.

The student will become familiar with contemporary research, research methodology and literature review.

The student will be able to derive systems of boundary integral equations from given boundary value problems with constant or variable coefficients.
**Seguimiento/ Monitoring Plan**

The student will work closely with me and hold informal meetings regularly. There will be at least three formal assessment meetings where the student will have to present a short report with evidence of findings and learning outcomes up to the date.

**Evaluación/ Evaluation plan**

Research report of appropriate length depending on the length of the stay and level of the student. Draft of a research paper for submission to mathematical journal, i.e., Communications in Pure and Applied Analysis. Oral presentation. Student diary with tracked daily progress.

**More important specifications:**
The student needs to formally enroll and pay and administration fee of £100.
PRÁCTICAS EN ALEMANIA BAJO EL AMPARO DEL CONVENIO UAM-CERFA

Los estudiantes seleccionados para disfrutar de una beca Erasmus+ Prácticas en Alemania dentro del Convenio UAM/CERFA. Optarán también a una Ayuda CERFA-Fundación Ramón Areces

La convocatoria para prácticas internacionales CERFA/UAM 2018/2019 en centros de investigación en Alemania se encuadra en el programa Erasmus+ Prácticas. Además de los beneficios que este programa tiene, CERFA ofrece a los estudiantes que sean seleccionados para una de las plazas ofertadas por investigadores CERFA un paquete de ampliación de beca que cubre lo siguiente:

- Ayuda de manutención: 200 €/mes
- Curso presencial de desarrollo de carrera (orientación laboral)
- Ayuda de viaje para asistir al curso de hasta 250 €

El comité CERFA coordinador del convenio UAM/CERFA ayudará a los estudiantes a gestionar el viaje y alojamiento para asistir al curso. Mira todas las condiciones aquí.

CERFA quiere apostar así para que todos los estudiantes de la UAM puedan optar por una experiencia en Alemania enriquecedora para su futuro profesional.

OFERTA AL 1. SUPERVISORA DRA. EVA BLASCO

Título del Proyecto: Novel Materials for 3D and 4D Printing at the Micro and Nano-scale

Afiliación del supervisor: Institute for Technical Chemistry and Polymer Chemistry, Karlsruhe Institute of Technology.

www.kit.edu

Fechas orientativas: 01/07/2019 to 30/09/2019

Perfil preferencial del estudiante: Estudiantes de últimos cursos del Grado en Química o ingeniería química. Estudiantes de Másters relacionados.

English/B2. Some background in synthetic organic and/or polymer necessary chemistry are necessary. Good knowledge in data analysis and processing is an asset.


Programa/ Detailed program of the traineeship period: Three-dimensional (3D) printing, also known as additive-manufacturing, has attracted much attention not only in academia yet in industry in recent years. Although a considerable amount of progress has been made in the field, most of techniques employed are limited to the fabrication of static objects. Incorporation of ‘life’ into the created 3D objects, also known as 4D printing, is one of the current challenges. Self-evolving structures or active origami based on smart polymers are recent examples of 4D printed materials on the macroscale, yet scarcely explored on the microscale. The current proposal focuses on the design and preparation of novel smart 3D structures based on smart polymers. The technology selected for the printing of the smart microstructures is 3D laser lithography, an excellent tool for the preparation of highly defined 3D structures with sub-micron resolution.[1-3] The proposed strategy will be potentially useful in emerging fields such as micro-robotics and lab-on-a-chip systems.
As a first step, the design and synthesis of stimuli responsive polymers, namely photoresists, suitable for 3D printing in the micro and nano-scale will be carried out. Thus, novel new photoresists based on smart materials which contain i) photocrosslinkable groups (for laser printing) and ii) stimuli-responsive groups (switchable between at least two states in response to external stimuli) exhibiting elastic behaviour will be pursued. Second, the synthesized materials will be employed for the preparation of 3D microstructures via laser lithography and their response to the different stimuli will be studied.

References:

Knowledge skills and competences to be acquired by the end of the traineeship. The project is ideal for engaging undergraduate students. The trainee will gain insights into research and scientific processes. In particular, he/she will improve the synthetic skills acquired during his/her studies and will learn how to use a wide variety of characterization techniques, such as nuclear magnetic resonance (NMR), infrared (IR) and UV visible spectroscopy as well as the interpretation of scientific data. Furthermore, he/she will become familiar with cutting edge 3D printing technologies, such as 3D laser lithography.

The trainee will also have the opportunity to be part of an international, interdisciplinary group and participate in the group meetings and seminars. The interaction with other group members will promote knowledge transfer and allow him/her to gain experience and broaden their expertise, not only in chemistry but in different fields such as material science and physics.
OFERTA AL 2. SUPERVISOR DR. PABLO M. LODEIRO FERNÁNDEZ

Título del Proyecto: Organic Matter-Metal Interactions In The Ocean


Fechas orientativas: 17/06/2019 to 17/10/2019

Perfil preferencial del estudiante: Estudiantes de últimos cursos del Grado en Química o ingeniería química. Estudiantes de Másters relacionados.

English/B1. Chemistry background; physical chemistry and analytical techniques basic knowledge is desirable. Matlab programing skills not required but appreciated.

Paquete de financiación extra por parte de CERFA: paquete ampliación de beca + curso de desarrollo de carrera/orientación: 200 euros/mes + 250 euros como ayuda de viaje para asistir al curso.

Programa/ Detailed program of the traineeship period: The work that the trainee will do will form a small component of a funded DFG project. The aim of this project is to derive Non Ideal Competitive Adsorption (NICA) parameters for preconcentrated marine dissolved organic matter (DOM) and to link the derived parameters to DOM molecular composition. The student will undertake large volume DOM extractions from the surface waters of the Baltic Sea. Surface samples will be collected using a trace metal clean pumping system on board a research vessel. The trainee will extract the DOM after acidification by polymeric resins (PPL). The elution will be done with acetonitrile. Dissolve Organic Carbon (DOC) concentrations and trace metal concentrations in original samples and preconcentrated DOM will be determined by the trainee using a Total Organic Carbon (TOC) analyser and by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS), respectively, according to standard methods routinely applied for marine samples in our laboratories. The trainee will also undertake the characterisation of acid base chemistry of extracted DOM by potentiometric titrations at different temperatures (5, 15 and 25 °C) with computer controlled closed half-cell glass pH, double junction reference and ion selective electrodes. The trainee will also investigate how chromatographic properties of the organic matter change with pH conditions. Specifically, she/he will:

1) Sampling of seawater from the Baltic Sea on board the German research vessel Littorina (one day trip)
2) Sequentially preconcentrate DOM from ca. 25 L seawater using Bond Elut PPL columns at the ambient pH of seawater and then at pH 2
3) Elute the preconcentrated organic matter
4) Measure the number of binding sites and protonation constants (pK) by potentiometric titrations
5) Analyse the samples by High Performance Liquid Chromatography-Mass Spectrometry (HPLC-MS) and ICP-MS under different pH conditions

Knowledge skills and competences to be acquired by the end of the traineeship. The student will be able to work with state of the art techniques and gain first hand experience in working in a world-leading marine institution. The trainee will acquire knowledge in physicochemical and analytical aspect related to metal-dissolve organic matter interaction in the ocean and related lab/sampling procedures-Specifically, she/he will be trained on: Seawater sample collection/ Sampling-working procedures on research vessel / work and sampling under clean conditions / DOM extractions / Potentiometric titrations / Use of automatized equipment working under MatLab scripts / Dissolve Organic Carbon (DOC) analysis / Metal samples preconcentration-analysis (Seafast/ICP-Ms)/ Organic matter analysis by HPLC-MS.
Titular del Proyecto: Exploring the specificity of sponge immune responses

Afiliación del supervisor: RD3 Marine Ecology-Marine Microbiology Unit. EPLUS-RES. KIEL (Schleswig-Holstein). Germany.

https://www.geomar.de/en/

Fechas orientativas: 29/07/2019 to 28/10/2019

Perfil preferencial del estudiante: Estudiantes de último curso (o verano de 3º a 4º) de Biología o de Másteres relacionados.

English/B2. Knowledge on molecular techniques and evolutionary terms is desirable

Paquete de financiación extra por parte de CERFA: paquete ampliación de beca + curso de desarrollo de carrera/orientación): 200 euros/mes + 250 euros como ayuda de viaje para asistir al curso.

Programa/ Detailed program of the traineeship period: All animals engage in stable and highly-specific associations with microbial communities. Those microbes influence host's ecology, development, and function. A common challenge for the animal host is discriminating between microbes in order to maintain specific microbiotas, while also avoiding overgrowth, harmful infections, or energetically-expensive immune reactions to innocuous microbes. As early-diverging animals, sponges (phylum Porifera) provide the opportunity to explore conserved mechanisms for animal-microbe crosstalk. However, the field of sponge symbiosis largely focused on the microbial side, whereas the host mechanisms for microbial recognition remain poorly explored.

We hypothesize that sponge's immune system is responsible for orchestrating host-microbe interactions and provides specific recognition. This project will focus on the capacity of sponge to distinguish different types of microbes.

The trainee will optimize and apply quantitative PCR to characterize the gene expression of immune genes on sponge samples from an experimental setup. In addition, available sequencing data in the lab will serve to explore evolutionary aspects of genes involved in immune-related signaling pathways.

Knowledge skills and competences to be acquired by the end of the traineeship. The proposed project will improve trainee's knowledge on symbiosis and microbiome research, an emerging field in biological science. Core skills for the project will be related to molecular analysis, in particular quantitative PCR. The trainee will also learn bioinformatic analysis (transcriptomics and phylogenetic analysis) and will collaborate in running aquarium experiments. Additional skills include: growing and maintenance of microbial cultures.

We will put further emphasis on organizational skills, time management, and ethical values
PRÁCTICAS EN BÉLGICA BAJO EL AMPARO DEL CONVENIO UAM-CEBE

Los estudiantes seleccionados para disfrutar de una beca Erasmus+ Prácticas en Reino Unido dentro del Convenio UAM/CEBE.

OFERTA BE 1: SUPERVISORES SERGI FARRÉ & MIGUEL ÁNGEL BERROCAL

Título del Proyecto: Introducción a la Diplomacia y la Comunicación científica

Entidad de acogida: Embajada Española en Bruselas

Fechas orientativas: entre junio y octubre de 2019, a concretar entre el estudiante y el supervisor.

Detailed program and Knowledge skills and competences to be acquired by the end of the traineeship:
El alumno trabajará en la Embajada supervisado por un miembro de CEBE. Su trabajo consistirá en:

- Apoyar a la Consejería Cultural y Científica en la ejecución del Plan de Acción de Diplomacia Científica para Bélgica, aprobado por la Dirección de Relaciones Culturales y Científicas de la AECID-Ministerio de Asuntos Exteriores, UE y Cooperación de España
- Gestión de las actividades y eventos de carácter científico que organiza o en los que participa esta Consejería Cultural y Científica.
- Identificar instituciones, personas y proyectos de interés para estrechar los lazos de cooperación en materia de ciencia e innovación entre Bélgica y España.
- Apoyar la elaboración de una base de datos de contactos de interés en este ámbito.
- Desarrollo de un programa de apoyo a jóvenes científicos, en colaboración con la Asociación de Científicos Españoles en Bélgica y la Consejería de Empleo de esta Embajada.

OFERTA BE 2: SUPERVISOR SERGI LLAMBRICH


Afiliación del supervisor: Biomedical MRI UNIt, KUL LEUVEN

Fechas orientativas: entre junio y octubre de 2019, a concretar entre el estudiante y el supervisor.

Detailed program and Knowledge skills and competences to be acquired by the end of the traineeship:
We use DS mouse models to study the effect of different dosages of prenatal EGCG treatment on the differently affected systems in DS, such as the bones, the heart, the brain and the lungs. We have provided the first clinical evidence of the potential benefits of EGCG treatment for facial morphology in DS (Starbuck et al. 2018). The specific goals of the research stay will be defined considering the interests of the student.
OFERTA BE 3: SUPERVISOR ADRIAN RANGA (OFRECE DOS PROYECTOS DIFERENTES)

Título del Proyecto: Designing and testing devices for organoid shaping to generate more reproducible and in-vivo-like paraxial mesoderm tissues.

Afiliación del supervisor: Biomechanics Section, KUL LEUVEN

Fechas orientativas: entre junio y octubre de 2019, a concretar entre el estudiante y el supervisor.

Perfil preferencial del estudiante: estudiantes de Másteres de Biociencias o estudiantes de último curso de Biología o Bioquímica. Conocimientos de Biología y Embriología.

Detailed program and Knowledge skills and competences to be acquired by the end of the traineeship: the student will learn how to perform a prototype testing of existing devices for organoid shaping, as well as on the design and 3D printing of new designs. During the internship, the student will learn to grow paraxial mesoderm organoids and characterize them via microscopy and immunohistochemistry.

OFERTA BE 4: SUPERVISOR ADRIAN RANGA (OFRECE DOS PROYECTOS DIFERENTES)

Título del Proyecto: Human neural tube organoids to understand morphogenesis and symmetry breaking events.

Afiliación del supervisor: Biomechanics Section, KUL LEUVEN

Fechas orientativas: entre junio y octubre de 2019, a concretar entre el estudiante y el supervisor.

Perfil preferencial del estudiante: estudiantes de Másteres de Biociencias o estudiantes de último curso de Biología o Bioquímica. Conocimientos de Biología, Embriología y Neurofisiología.

Detailed program and Knowledge skills and competences to be acquired by the end of the traineeship: The student will be involved in performing immunohistochemistry and microscopy in order to validate and expand on the results obtained by single-cell RNA-seq. Additionally, as force is an important point of investigation, the student will aid in developing a database of 3D nuclear deformations using reporter cell-lines and several mechanical cell stretching devices. This database will greatly help the team in understanding organoid level force distribution.
**OFERTA BE 5: SUPERVISOR RODRIGO BACIGALUPE**

**Título del Proyecto:** Caracterización genética y funcional de nuevas especies de la microbiota intestinal.

**Afiliación del supervisor:** Laboratory of Molecular Bacteriology (Rega Institute), KUL LEUVEN  

**Fechas orientativas:** entre junio y octubre de 2019, a concretar entre el estudiante y el supervisor.

**Perfil preferencial del estudiante:** estudiantes de Másteres de Biociencias o estudiantes de último curso de Biología, Bioquímica o Nutrición Humana y Dietética. Conocimientos de Biología, Genética y Microbiología.

**Detailed program and Knowledge skills and competences to be acquired by the end of the traineeship:**  
Recientemente nuestro laboratorio implementó un nuevo sistema de cultivo que nos ha permitido aislar más de 3.000 bacterias, de las cuales muchas pertenecen a nuevas especies. Actualmente estamos secuenciando los genomas de estos aislados y realizando su caracterización funcional. Esta información nos permitirá mejorar nuestro conocimiento de la diversidad filogenética y la complejidad metabólica del ecosistema intestinal humano, y también contribuirá a determinar el papel que juegan las nuevas especies de bacterias en la salud de los humanos.