

2026



CONVOCATORIA DE PRÁCTICAS INTERNACIONALES

Convenio UAM/CERFA (Alemania)

Convenio UAM/CEBE (Bélgica)

Convenio UAM/SRSI (Irlanda)

Convenio UAM/CERU (Reino Unido)



Facultad de Ciencias

Universidad Autónoma de Madrid

CONVOCATORIA DE PRÁCTICAS INTERNACIONALES

Plazo de presentación de solicitudes: del 10 de febrero al 25 de febrero de 2026.

Se ofertan un total de 35 estancias de prácticas en los siguientes destinos:

Convenio UAM/CERFA 2026: se ofertan 7 estancias de prácticas para movilidades con destino Alemania.

Convenio UAM/SRSI 2026: se ofertan 3 estancias de prácticas para movilidades con destino Irlanda.

Convenio UAM/CEBE 2026: se ofertan 11 estancias de prácticas para movilidades con destino Bélgica.

Convenio UAM/CERU 2026: se oferta 14 estancias de prácticas para movilidades con destino Reino Unido.

Para cada convenio, este documento incluye una tabla resumen y la información detallada de cada una de las ofertas de prácticas.

En algunos casos de los convenios, los supervisores podrán acceder a supervisar a dos estudiantes tras el proceso de entrevista de candidatos.

En el índice, pinchando en cada oferta de prácticas, se accede a la información detallada de la misma.

Las fechas y duración propuestas de estancia son orientativas, y podrán acordarse con el supervisor en el momento de la entrevista.

CONVOCATORIA DE PRÁCTICAS INTERNACIONALES	1
PRÁCTICAS EN ALEMANIA CONVENIO UAM-CERFA	4
<i>Proyecto AL-1: Impacts of water browning on phytoplankton microbiomes.....</i>	<i>5</i>
<i>Proyecto AL-2: Unlocking Past Ocean Temperatures and Circulation Using Geochemical Signals from Marine Sediments and Foraminifera of the Drake Passage.....</i>	<i>8</i>
<i>Proyecto AL-3: Role of GABA signaling in regulating the light input into the circadian clock of the fruit fly.....</i>	<i>10</i>
<i>Proyecto AL-4: Targeted drug combinations for cancer cells.....</i>	<i>12</i>
<i>Proyecto AL-5: Immediate Early Gene Mapping and Tissue Processing in a Mouse Model of Major Depressive Disorder</i>	<i>14</i>
PRÁCTICAS EN IRLANDA CONVENIO UAM-SRSI	16
<i>Proyecto IR-1: Citometría de Flujo / Nanocitometría.....</i>	<i>17</i>
<i>Proyecto IR-2: Inmunología.....</i>	<i>19</i>
PRÁCTICAS EN BÉLGICA CONVENIO UAM-CEBE	21
<i>Proyecto BE-1: Growth-promoting endophytes in maize under drought stress conditions. ...</i>	<i>22</i>
<i>Proyecto BE-2: Chilling Stress Responses In The Maize Leaf Growth Zone</i>	<i>24</i>
<i>Proyecto BE-3: The role of sugar supply and signalling to the growth zone in the regulation of maize leaf growth.....</i>	<i>26</i>
<i>Proyecto BE-4: Impact Of Climate Change-Induced Extreme Precipitation On Plant Growth</i>	<i>28</i>
<i>Proyecto BE-5: Nanoporous materials for tailored hydrogen storage applications</i>	<i>30</i>
<i>Proyecto BE-6: Corrosion protection strategies for 3D printed metallic materials.....</i>	<i>32</i>
<i>Proyecto BE-7: Morphological investigation of Josephson junctions for superconducting technologies</i>	<i>34</i>
<i>Proyecto BE-8: Current in plane tunnelling benchmarking of superconducting Josephson junctions</i>	<i>36</i>
<i>Proyecto BE-9: Transforming basketball analytics through privacy-respecting AI and synthetic data</i>	<i>38</i>
<i>Proyecto BE-10: OpenTPS: an open-source treatment planning system for radiation therapy against cancer</i>	<i>40</i>
<i>Proyecto BE-11: Improving Adoption of Domain-Specific AI Model Cards in Radiotherapy ...</i>	<i>42</i>
PRÁCTICAS EN REINO UNIDO CONVENIO UAM-CERU	44
<i>Proyecto RU-1: Establish the potential of novel prodrug strategy to improve brain cancer patient survival.....</i>	<i>45</i>
<i>Proyecto RU-2: Investigating mitochondria-nucleus membrane contact sites – Form and function</i>	<i>47</i>
<i>Proyecto RU-3: Investigating mitochondria-nucleus membrane contact sites – Retrograde signalling and lipid exchange</i>	<i>50</i>
<i>Proyecto RU-4: Mechanobiochemistry of focal adhesion proteins</i>	<i>53</i>

<i>Proyecto RU-5: Development of advanced nanocarriers for drug delivery.....</i>	<i>55</i>
<i>Proyecto RU-6: Microbial Source Tracking in rivers: development of a DNA method to quantify faecal pollution</i>	<i>57</i>
<i>Proyecto RU-7: Investigating bioremediation capabilities of biofilms in constructed wetlands</i>	<i>59</i>
<i>Proyecto RU-9: Understanding the co-evolution between Acinetobacter baumannii's CRISPR-Cas systems, membrane proteins and the bacteriophages that target it.....</i>	<i>63</i>
<i>Proyecto RU-10: Human milk oligosaccharides (HMOs) in IBS: integrated microbiome and metabolome analysis from a crossover dietary intervention.....</i>	<i>65</i>
<i>Proyecto RU-11: Investigation of photoreceptor functionality in retinal organoids for cell transplantation therapies.....</i>	<i>67</i>
<i>Proyecto RU-12: Genome Editing in hemp.....</i>	<i>69</i>

PRÁCTICAS EN ALEMANIA CONVENIO UAM-CERFA

Número de Proyecto	Supervisor	Área de Conocimiento	Lugar de realización	Número de plazas
AL-1	Dr. Clara Martínez Pérez	Biology, Microbiology, Environmental Sciences, Biotechnology	University of Bayreuth	2
AL-2	Dr. María H. Toyos Simón	Environmental Science, Chemistry, Biology, Biochemistry.	University of Bremen	1
AL-3	Dr. Maite Ogueta Gutierrez	Biology, Neurosciences	University of Münster	2
AL-4	Dr. Samuel Peña-Llopis	Biochemistry, Biotechnology, Informatics	University Hospital Essen	1
AL-5	Dr. Marta Méndez Couz	Biology, Biochemistry, Biotechnology.	University of Münster	1

Gracias a la colaboración entre CERFA y la **Fundación Ramón Areces**, estas estancias de prácticas tendrán un complemento adicional a la financiación Erasmus +Placement.

<https://cerfa.de/ayudas-traineeship-cerfa>

Complemento adicional

(i) ayuda económica a los estudiantes de 400 euros en concepto de ayuda de viaje y (ii) un curso práctico destinado a ofrecer formación sobre gestión de carrera profesional.

A continuación, aparece toda la información de cada una de las ofertas

Proyecto AL-1: Impacts of water browning on phytoplankton microbiomes

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Clara Martínez Pérez

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

University of Bayreuth, www.limno-stat.uni-bayreuth.de

Título del Proyecto/ Project Title

Impacts of water browning on phytoplankton microbiomes

Se ofrecen dos plazas

Perfil preferencial del estudiante

Biology, Microbiology, Environmental Sciences, Biotechnology

Fechas orientativas/Available Dates

01.06.2026 - 31.07.2026

Programa/ Detailed program of the traineeship period

As climate change and human activities intensify, terrestrial inputs of dissolved organic matter (DOM) to lakes are expected to increase. This elevated input leads to water browning and reduced light availability in the water column, posing challenges to lake ecosystems and impacting their ecological health and societal value. Aquatic microorganisms can be particularly vulnerable to lake browning, with consequences for primary production, food webs, and the occurrence of toxic algal blooms. However, our ability to predict the ecological consequences of lake browning is hindered by limited knowledge about the mechanisms underlying community responses to it, as well as the resilience of these communities in the face of environmental changes. We propose that the response to environmental stress in aquatic microorganisms is strongly influenced by biotic interactions.

Therefore, this project will investigate ecological interactions among lake unicellular algae (phytoplankton) and bacteria experiencing increased DOM and reduced light availability. Interactions between phytoplankton and associated bacteria occur within the immediate vicinity of the algal cell, or "phycosphere," similar to the rhizosphere around plant roots. While microbial interactions have primarily been studied in simplified systems focusing on specific algal species and bacteria, the sensitivity of algal-associated bacterial communities to environmental stressors and their impact on algal physiology remain largely unexplored.

To address this gap, the trainee will participate in ongoing laboratory experiments investigating interactions between freshwater phytoplankton and associated bacterial communities under controlled DOM and light conditions. These experiments will involve continuous culturing approaches to monitor algal growth and the composition of algal-associated bacterial communities. Our experiments will test whether overall community functionality remains stable despite shifts in composition, and will identify which bacterial taxa and traits are likely to respond stronger to change. This project will integrate the knowledge on microscale phycosphere interactions into an ecosystem-wide perspective of freshwater lakes.

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 acquire practical experience in sterile culturing techniques for freshwater phytoplankton, including the setup and maintenance of continuous culturing systems (chemostats), as well as basic light microscopy. The trainee will be introduced to sampling strategies for downstream molecular applications and receive training in DNA extraction and 16S rRNA gene sequencing workflows, including an introduction to basic sequence data analysis. The level of hands-on involvement in molecular work will be adapted to the student's background and progress.

Seguimiento/ Monitoring Plan

The host applicant will be responsible for the day-to-day guidance of the trainee. This will involve provision of background theoretical information and hands-on supervision during laboratory work, especially at the beginning of the traineeship. Informal feedback will be provided throughout the placement, complemented by regular weekly meetings to review progress, adjust tasks to the trainee's skill level, and troubleshoot experimental challenges.

Evaluación/ Evaluation plan

The evaluation of the trainee will be based on their engagement and motivation, their ability to ask questions and seek guidance when needed, and their understanding of experimental design and underlying concepts.

The aim is for the student to develop research skills beyond the specific experiments, including critical thinking and gradual independence. Progress will be assessed through weekly discussions, observation during laboratory work, and evaluation of laboratory notebook keeping. At the end of the traineeship, the trainee will prepare a short summary, either as a written report or an oral presentation.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

No specific technical expertise is required beyond basic laboratory skills (e.g. pipetting). Motivation to learn, capacity to carry out careful experimental work, and interest in microbial ecology are essential. Basic knowledge of programming languages such as R or bash may be beneficial for molecular data analysis but is not mandatory.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

If the student enrolls at UBT as an exchange student, documents need to be submitted for the application and enrollment process. More information on the application process, deadlines etc: <https://www.international-office.uni-bayreuth.de/en/come-to-bayreuth/exchange-students/index.html>

if the trainee is enrolled as an exchange student, he/she will enjoy benefits (access to library, semester ticket etc.) that are also enjoyed by regular degree students at the University of Bayreuth:

<https://www.studierendenkanzlei.uni-bayreuth.de/en/prospective-students/application-enrolment-wise/enrolment/index.html>

Please note: also exchange students need to pay the so called semester fee: <https://www.studierendenkanzlei.uni-bayreuth.de/en/students/semester-fees/index.html>

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes.

Otra información relevante / Any additional important information

Students will benefit from the ["Ayudas Traineeship CERFA"](#) consisting of 500 € and a career development course.

Proyecto AL-2: Unlocking Past Ocean Temperatures and Circulation Using Geochemical Signals from Marine Sediments and Foraminifera of the Drake Passage

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

María H. Toyos Simón

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

University of Bremen

Título del Proyecto/ Project Title

Unlocking Past Ocean Temperatures and Circulation Using Geochemical Signals from Marine Sediments and Foraminifera of the Drake Passage

Perfil preferencial del estudiante

Bachelor's students who have ideally completed at least half of their respective degree programs or Master's students (no specific progress requirement). (Environmental Science, Chemistry, Biology, Biochemistry).

Fechas orientativas/Available Dates

16.08.2026 - 15.11.2026

Programa/ Detailed program of the traineeship period

Climate and ocean change are major societal challenges, particularly in understanding how the Earth system responds to rising greenhouse gas concentrations. The geological record provides key insights into past climate transitions, including the Mid-Pleistocene Transition (MPT, approximately 1.25 to 0.7 million years ago). This interval is marked by a shift from 41,000-year climate cycles driven by Earth's obliquity to dominant 100,000-year cycles associated with orbital eccentricity, coinciding with the development of larger ice sheets and colder glacial periods, through mechanisms that remain incompletely understood.

Marine sediment cores are important archives of past climate variability, preserving microfossils and geochemical signals that record past environmental conditions. Proxies such as Mg/Ca ratios and stable oxygen and carbon isotopes measured in foraminifera (calcifying unicellular marine microfossils) allow reconstructions of ocean temperature, ice volume, carbon cycle dynamics, and ocean circulation.

The primary goal of this internship is to reconstruct interglacial ocean conditions over the past approximately 1.4 million years at the Subantarctic Pacific entrance to the Drake Passage, using sediment core material from the PS97 expedition. The work will focus on Mg/Ca temperature reconstructions and stable isotope analyses in benthic and planktonic foraminifera to investigate changes in ocean temperature, carbon cycling, and circulation across the MPT.

Planned Activities

- Weeks 1–2: Orientation, laboratory tours and safety training, project planning, sediment sample washing and preparation
- Week 3: Continued sediment washing and preparation
- Weeks 4–5: Identification of foraminifera species, picking, and preparation of samples for Mg/Ca and stable isotope analyses
- Weeks 6–8: Automated sample preparation and Mg/Ca measurements
- Week 9: Laboratory tours of the stable isotope laboratory and sediment geochemistry laboratory
- Weeks 10–12: Data analysis, interpretation, and preparation of the final presentation

This traineeship provides practical laboratory experience, data interpretation skills, and collaboration within a multidisciplinary research environment.

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 receive practical laboratory training, including sample preparation, application of diverse protocols, and troubleshooting. He or she will develop skills in data interpretation and gain experience collaborating in a multidisciplinary, international team. The internship will enhance the student's ability to effectively present research findings and improve their English and German language skills. Additionally, the internship will enhance the student's understanding of Earth's past climate variables and their relevance to the current context of climate change.

Seguimiento/ Monitoring Plan

The monitoring plan will include weekly meetings to review the student's progress, provide feedback, and align the project with their interests. Additional sessions will be scheduled as needed to coordinate with other personnel or scientists for specialized training, such as safety protocols, laboratory techniques, or computer skills necessary for the work.

Evaluación/ Evaluation plan

The evaluation will consist of a brief presentation to the working group, during which the student will discuss the scientific results obtained during their research stay and their implications. The presentation will conclude with a summary of how the traineeship has impacted and benefited the student's professional and personal development.

Prior to the presentation, the student is encouraged to discuss its structure during the weekly monitoring meeting with the scientific supervisor or other working group members at any time.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

No prior technical knowledge is required, as we will provide comprehensive training in all necessary techniques and protocols during the internship. However, we are looking for a student who is enthusiastic about laboratory work, possesses a strong interest in scientific inquiry, and approaches learning with curiosity and initiative. Such traits will help the student fully engage with the research and make meaningful contributions to the project.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

The University of Bremen requires the signature of a Learning Agreement with the Spanish University under the Erasmus + Program.

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes.

Otra información relevante / Any additional important information

Students will benefit from the [*"Ayudas Traineeship CERFA"*](#) consisting of 500 € and a career development course.

Proyecto AL-3: Role of GABA signaling in regulating the light input into the circadian clock of the fruit fly

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Maite Ogueta Gutierrez

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

University of Münster

Título del Proyecto/ Project Title

Role of GABA signaling in regulating the light input into the circadian clock of the fruit fly

Perfil preferencial del estudiante

Biology, Neurosciences

Fechas orientativas/Available Dates

01.06.2026 - 01.08.2026 (Plaza 1)

01.09.2026 - 01.11.2026 (Plaza 2)

Programa/ Detailed program of the traineeship period

Life on Earth is determined by the daily changes in light and temperature. In order to prepare and respond to these changes, almost all living organisms have developed a circadian clock, which is able to anticipate to the changes and prepare the organism accordingly, in terms not only of behaviour, but also regulating most physiological mechanisms. Both in mammals and in fruit flies, the visual system as well as specific photoreceptors are involved in the light input pathway into the clock. The circadian clock of *Drosophila* comprises about 150 neurons in the central brain, which are characterized by rhythmic clock gene expression. In the lab, we are interested on studying the role of the GPI anchored protein Quasimodo (QSM). QSM is involved in the light input pathway into the clock, although is not clear how. It genetically interacts with some membrane proteins to regulate the electrical activity of some of the clock neurons. This interaction leads to a daily switch in the response of these neurons to the neurotransmitter GABA, from inhibitory to excitatory. This GABA-switch depends on the intracellular chloride concentration and it occurs also in mammals and is necessary for the adaptation to long and short days.

The trainee will study the physical interaction of these proteins and their localizations within the brain of the flies, as well as the connections with GABAergic neurons. Additionally the effect of the available mutants will be tested by studying the behaviour of the flies under different environmental conditions (long vs short days and “jet-lag” experiments among others). To test if the Chloride plays a role, two specific sensors will be tested at different times of day.

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 trainee will learn how to work in a laboratory and how to work with flies. In the lab he/she will work with *Drosophila* genetics, perform behavioural and imaging experiments, as well as molecular and cellular biology. The project will as well involve the critical reading and discussion of scientific papers and the presentation and discussion of the results.

Seguimiento/ Monitoring Plan

The trainee will have to write a detailed lab book that will be checked every week to discuss the development of the project so far. Additionally, in the weekly meetings we will speak about next steps and propose solutions about how to proceed in case of problematic results. It is expected that the trainee contributes with his/her own ideas.

Evaluación/ Evaluation plan

The trainee will give a presentation two weeks into the project, to present it to the other members of the lab, as well as in the last week, to show the results obtained. The lab book will be also evaluated, in terms of clarity, details and accuracy, as well as the day-to-day lab work. He/She will also take part in the regular journal clubs, where new literature has to be explained.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Not applicable

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable).

Not applicable

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes.

Otra información relevante / Any additional important information

Students will benefit from the [“Ayudas Traineeship CERFA”](#) consisting of 500 € and a career development course.

Proyecto AL-4: Targeted drug combinations for cancer cells

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Samuel Peña-Llopis

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

University Hospital Essen

Título del Proyecto/ Project Title

Targeted drug combinations for cancer cells

Perfil preferencial del estudiante

A Master is desirable, but not necessary (Biochemistry, Biotechnology, Informatics)

Fechas orientativas/Available Dates

01.06.2026 - 20.12.2026

Programa/ Detailed program of the traineeship period

The Translational Genomics research group uses a multifaceted approach that combines genomics and bioinformatics to understand the processes that lead to tumor development and metastasis in renal cell carcinoma and uveal melanoma. The group validates its findings using molecular biology and biochemistry methods, as well as preclinical models such as patient-derived organoids. The ultimate objective of this research is to translate these findings into clinical applications.

Renal cell carcinoma and uveal melanoma are characterized by recurrent mutations in the BAP1 tumor suppressor and epigenetic modifier gene, which contribute to increased tumor aggressiveness, enhanced metastasis, and reduced patient survival. We have identified vulnerabilities in tumors with BAP1 loss and plan to conduct targeted drug combination screens using several cell lines from different cancer types, as well as patient-derived organoids from renal cell carcinoma and uveal melanoma tumors. These organoids were obtained in collaboration with surgeons and pathologists from the departments of Urology and Ophthalmology at the University Hospital Essen.

The primary objective of this study is to validate the synergistic effects of specific drug combinations using a high-throughput platform across various cancer types.

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)

Cell culture of mammalian cell lines and patient-derived organoids, cell viability and proliferation (CellTiter-Glo luminescent assay), drug treatment, high-throughput screening, synergism analysis, cancer genomics, experimental design and data interpretation.

Seguimiento/ Monitoring Plan

Daily direct supervision of the trainee until sufficient capacity and independence is achieved to work with minimal supervision. Regular meetings thereafter, at least weekly and as needed, to discuss data analysis, interpretation and problem solving.

Evaluación/ Evaluation plan

Evaluation of the trainee's progress towards the project's goals through weekly meetings and a final evaluation of the entire project.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)
Basic laboratory experience is required

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable).
Enrolment as intern at University Hospital Essen and lab member in the laboratory of Translational Genomics.

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)
Yes.

Otra información relevante / Any additional important information
Students will benefit from the [“Ayudas Traineeship CERFA”](#) consisting of 500 € and a career development course.

Proyecto AL-5: Immediate Early Gene Mapping and Tissue Processing in a Mouse Model of Major Depressive Disorder

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Marta Méndez Couz

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

University of Münster

Título del Proyecto/ Project Title

Immediate Early Gene Mapping and Tissue Processing in a Mouse Model of Major Depressive Disorder

Perfil preferencial del estudiante

Last year of Bachelor or Master student (Biology, Biochemistry, Biotechnology).

Fechas orientativas/Available Dates

01.05.2026 - 30.11.2026

Programa/ Detailed program of the traineeship period

This traineeship is embedded in a funded translational neuroscience project investigating neurobiological mechanisms underlying Major Depressive Disorder (MDD) using a genetically defined mouse model (CACNA1C). The project examines how genetic vulnerability and stress exposure alter brain activity and peripheral physiology. The traineeship focuses on molecular and histological readouts associated with behavioural state transitions.

The trainee will join a neuroscience laboratory and receive structured training in animal research ethics, experimental workflows, and the role of immediate early genes (IEGs; e.g. cFos) as markers of neuronal activation. The student will be introduced to how behavioural states and stress exposure are linked to changes in neural circuit activity and peripheral biological systems. The practical programme will centre on tissue collection, processing, and analysis. Under close supervision, the trainee will be involved in the preparation of biological samples including brain tissue, blood, and peripheral organs (e.g. spleen). Training will include tissue fixation, cryoprotection, sectioning, and sample storage following standardized protocols.

A core component of the traineeship is the analysis of immediate early gene expression in brain regions relevant to emotion regulation (e.g. prefrontal cortex, amygdala). The trainee will assist in immunohistochemical staining procedures, microscopy-based image acquisition, and quantitative analysis of IEG expression patterns. Depending on background, exposure to additional downstream analyses (e.g. region-of-interest quantification or integration with behavioural data) will be provided.

The trainee will participate in lab meetings and data discussions, gaining insight into how molecular and cellular data are interpreted in the context of behavioural phenotypes and psychiatric disorder models.

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 trainee will acquire advanced knowledge of mouse models of Major Depressive Disorder and gene × stress interactions involving CACNA1C. The trainee will acquire in-depth knowledge of immediate early genes as markers of neuronal activation in mouse models of psychiatric disorders. Technical skills include tissue collection, brain sectioning, immunohistochemistry, microscopy, and basic quantitative image analysis. The student will gain experience handling central and peripheral biological samples (brain, blood, spleen) and understanding their

relevance to stress and mental health research. Additional competencies include experimental design, laboratory documentation, and data interpretation. The student will develop competencies in data preprocessing, statistical analysis, visualization, and interpretation of complex behavioural datasets.

Seguimiento/ Monitoring Plan

The student will conduct work in the laboratories of the Institute of Physiology I, under the constant supervision of the applicant, the principal investigator, and experienced laboratory technicians from the department.

Evaluación/ Evaluation plan

At the end of the stay, a short report is required. This report should include the background literature, the objective of the work, a description of the materials and methods used, the results, and the conclusions of the study. The student will present this work in front of fellow students and professors from the Department of Physiology. Additionally, the student should be prepared to explain the key points and answer questions from the audience.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Previous lab experience will be favoured.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable).

None.

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes.

Otra información relevante / Any additional important information

Students will benefit from the [“Ayudas Traineeship CERFA”](#) consisting of 500 € and a career development course.

PRÁCTICAS EN IRLANDA CONVENIO UAM-SRSI

Número de Proyecto	Supervisor	Área de Conocimiento	Lugar de realización	Número de plazas
IR-1	Alfonso Blanco	Biología, Bioquímica	University College Dublin	2
IR-2	Vanessa Zaiatz Bittencourt	Inmunología	University College Dublin	1

A continuación, aparece toda la información de esta oferta

CONVENIO UAM/SRSI – DESTINO IRLANDA

Proyecto IR-1: Citometría de Flujo / Nanocitometría.

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Dr. Alfonso Blanco

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

UCD Conway Flow Cytometry Core, University College Dublin

<https://www.ucd.ie/conway/research/coretechnologies/flowcytometrycore/>

Título del Proyecto/ Project Title

Citometría de Flujo / Nanocitometría.

Perfil preferencial del estudiante

Biología, Biotecnología, Veterinaria, Medicina, Biología Marina

Fechas orientativas/Available Dates

Flexible

Programa/ Detailed program of the traineeship period

Training in the usage and maintenance of flow cytometers and cell sorters: The trainee will be trained in the usage of multiple instrumentation from different brands, characteristics and complexities. To do so, the trainee will work instrument set up, instrument optimization, data analysis and data interpretation for the multiple applications of the facility. Trainee will be involved in the project, protocol and data discussion and it's expected, by the end of the training period will be able to provide expert advice to novel users.

To provide a deeper knowledge of the full process, the trainee will be involved in different projects. The trainee will process, prepare and analysis samples of cell culture, tissue and/or whole blood. The participant will be fully involved in the optimization of the method, data analysis, data reanalysis and reporting.

By the end of the traineeship, the trainee will prepare a summary report and present her job.

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 trainee will be familiar with the full cytometry technology and methodology, from sample collection, establishment of protocols, instrument optimization and maintenance, data acquisition, data analysis and reporting.

The trainee will be familiar with the full process of sample analysis by flow cytometry as will be highly exposed to multiple applications from several groups that are using the core facility, so he/she will increase communication and interpersonal skills.

The trainee will be supervised working, but must learn also to work alone, so it's expected he/she will increase his/her capabilities of teamwork and self-supervision.

The trainee will be working with state-of-the-art instrumentation: the trainee might need to read, interpret, criticise, and take some responsibilities on board. Timing is crucial in these experiments, so the trainee will increase his/her ability to organise working plans and experiments.

Seguimiento/ Monitoring Plan

Students will be working with Dr. Blanco as well as users of the UCD Flow Cytometry Core Lab.

Evaluación/ Evaluation plan

It will be a continued evaluation process. The generation of good data and capabilities of reproducibility of certain patterns will be the best way to evaluate trainee's progression and knowledge.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Conocimientos (preferible a nivel de 3º o 4º curso) en Biología, Biotecnología, Veterinaria, Medicina, Biología Marina/Ciencias del Mar

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

NA

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) /

Availability to evaluate credit covalidation reports (Yes / No)

Si

Otra información relevante / Any additional important information

Proyecto IR-2: Inmunología.

Nombre y apellidos del Supervisor

Vanessa Zaiatz Bittencourt

Afiliación del supervisor y Enlace a afiliación / UCD Clinical Research Centre

<https://www.ucd.ie/medicine/crc/>

Título del Proyecto/ Mechanical Forces as Hidden Drivers of Intestinal Cancer Progression

Perfil preferencial del estudiante

Biología, Biotecnología, Veterinaria, Medicina, Biología Marina

Fechas Disponibles /Available Dates

July to December 2026.

Programa/ Detailed program of the traineeship period

Intestinal cancer develops and progresses within a mechanically dynamic environment, where tumor growth generates cyclic strain and solid stress that profoundly alter cellular behavior. However, most preclinical cancer models rely on static culture conditions, failing to capture the mechanical forces experienced by tumor cells in vivo. This limitation contributes to poor translatability of drug response data and an incomplete understanding of how physical cues regulate tumor survival, phenotype, and therapy resistance.

Emerging evidence suggests that mechanical strain and compression regulate key cancer hallmarks, including proliferation, epithelial–mesenchymal transition (EMT) – metastasis relevance, metabolic adaptation, and resistance to chemotherapy. Yet, the mechanistic contribution of these forces in intestinal cancer remains poorly defined.

This project aims to establish a mechanobiological framework for intestinal cancer by systematically quantifying how defined mechanical forces—cyclic strain and compression—regulate tumor cell survival, phenotypic plasticity using a dynamic in vitro culture system. Human intestinal cancer cell lines will be exposed to controlled mechanical stimuli that mimic tumor-associated deformation and solid stress, enabling direct comparison with conventional static cultures.

- Aim 1: Determine if cyclic mechanical strain regulates intestinal cancer cell proliferation and survival
- Aim 2: Determine if cyclic mechanical strain induces epithelial-mesenchymal transition (EMT)
- Aim 3: Determine if cyclic mechanical strain alters cell metabolism.

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 receive practical laboratory training, including sample preparation, application of diverse protocols, and troubleshooting. He or she will develop skills in data interpretation and gain experience collaborating in a multidisciplinary, international team. The internship will enhance the student's ability to effectively present research findings and improve their English language skills.

Seguimiento/ Monitoring Plan

Students will be cosupervised by Dr Bittencourt and Dr Blanco as well as core staff members of the UCD Flow Cytometry Core Lab.

Evaluación/ Evaluation plan

It will be a continued evaluation process. The generation of good data and capabilities of reproducibility of certain patterns will be the best way to evaluate trainee's progression and knowledge.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Conocimientos (preferible a nivel de 3º o 4º curso) en Biología, Biotecnología, Veterinaria, Medicina, Biología Marina/Ciencias del Mar

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

N/A

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) /

Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

PRÁCTICAS EN BÉLGICA CONVENIO UAM-CEBE

Número de Proyecto	Supervisor	Área de Conocimiento	Lugar de realización	Número de plazas
BE-1	Gerrit Beemster	Biología	University of Antwerp	1
BE-2	Gerrit Beemster	Biología	University of Antwerp	1
BE-3	Gerrit Beemster	Biología	University of Antwerp	1
BE-4	Gerrit Beemster	Biología	University of Antwerp	1
BE-5	Leticia Fernández Velasco	Química	Royal Military Academy, Bruselas	1
BE-6	Rubén Del Olmo Martínez	Química	Vrije Universiteit Brussel	1
BE-7	Daniel Pérez Lozano	Física/Matemáticas/Ingeniería Informática	IMEC, Lovaina	1
BE-8	Daniel Pérez Lozano	Física/Matemáticas/Ingeniería Informática	IMEC, Lovaina	1
BE-9	Rafa Gálvez Vizcaíno	Matemáticas/Ingeniería Informática	University of Leuven	1
BE-10	Ana María Barragán Montero	Matemáticas/Ingeniería Informática	Université catholique de Louvain	1
BE-11	Ana María Barragán Montero	Matemáticas/Ingeniería Informática	Université catholique de Louvain	1

A continuación, aparece toda la información de cada una de las ofertas

Proyecto BE-1: Growth-promoting endophytes in maize under drought stress conditions.

Nombre y apellidos del Supervisor / Name and surname of the Supervisor:

Gerrit Beemster

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link:

Laboratory for Integrated Molecular Plant Physiology Research (IMPRES)

Groenenborgerlaan 171

2020 Antwerp, Belgium

T +32 3 265 34 21 M +32 497 14 60 37 F +32 3 265 34 17

Website: <https://www.uantwerpen.be/en/rg/impres/>

Research Gate: https://www.researchgate.net/profile/Gerrit_Beemster

Título del Proyecto/ Project Title:

Growth-promoting endophytes in maize under drought stress conditions.

Perfil preferencial del estudiante/Student Profile:

Biology, with level of MSc. Good level of English (at least B1)

Fechas orientativas/Available Dates

01.06.2026 – 31.12.2026, 38/h week.

Programa/ Detailed program of the traineeship period

One of the main challenges following climate change is long, unpredictable periods of drought. In our search towards increased plant resilience against drought stress, we identified two leaf endophytic bacterial strains conferring such drought tolerance in maize. We also study a commercially available fungal strain, that is currently used to improve maize growth under drought stress in Brazil. In this project we aim to identify their mode of action (MoA) and elucidate the downstream signalling in the maize leaf.

Concerning the bacterial strains, we plan to do experiments regarding the localisation of the endophytes in the maize leaf (by fluorescent labelling) and in-depth analyses such as a transcriptome analysis, metabolite and biochemical analyses, and enzyme activity measurements.

Concerning the fungal strain, a transcriptomics analysis of the maize leaf meristem has already been performed, so the aim is to compare transcriptomic changes in planta with the genomic capacity of the fungal strain and verify our then formed hypotheses through in-depth analyses such as mentioned above for the bacterial endophytes.

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)

Plant growth analysis (with leaf length tracker), plasmid cloning and transformation, (fluorescence) microscopy and image analysis, laboratory skills including metabolite analyses and biochemical analyses, NGS data analysis and qPCR.

Scientific presenting and writing.

Seguimiento/ Monitoring Plan

- Daily supervision by PhD student.

- Weekly team meetings where progress is presented and discussed

- Weekly progress discussion with Professor and PhD student
- If needed for Spanish home institution, guidance in report writing.

Evaluación/ Evaluation plan

- Continuous evaluation
- Weekly progress
- If required, final report

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Basic understanding of plant physiology; Basic laboratory skills; Basic mathematic and computer skills.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

Registration as a visitor for insurance purposes. Can be done upon arrival.

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) /

Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

Proyecto BE-2: Chilling Stress Responses In The Maize Leaf Growth Zone

Nombre y apellidos del Supervisor / Name and surname of the Supervisor:

Gerrit Beemster

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link:

Department of Biology / Faculty of Science / University of Antwerp

Laboratory for Integrated Molecular Plant Physiology Research (IMPRES)

Groenenborgerlaan 171

2020 Antwerp, Belgium

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Website: <https://www.uantwerpen.be/en/rg/impres/>

Research Gate: https://www.researchgate.net/profile/Gerrit_Beemster

Título del Proyecto/ Project Title:

Chilling Stress Responses In The Maize Leaf Growth Zone

Perfil preferencial del estudiante/Student Profile:

Biology, with level of MSc. Good level of English (at least B1)

Fechas orientativas/Available Dates

01.06.2026 – 31.12.2026, 38/h week.

Programa/ Detailed program of the traineeship period

ckground:Chilling stress, temperatures between 0 and 15°C, negatively affects maize (*Zea mays*) yield in North-Western Europe. In contrast to the direct response to cold, the recovery from chilling stress has hardly been studied. We addressed this lack of knowledge by performing an integrated study of chilling recovery in the maize leaf growth zone. By a kinematic and genome-wide transcriptome analysis, we identified the phytohormone jasmonic acid (JA) and the enzymatic antioxidant peroxidase (POD) as potential key regulators of recovery from cold. Objectives: The objective of this project aims (1) Pioneer a novel, high-resolution leaf growth analysis using automatic leaf length tracking for studying stress recovery of mutants, (2) Characterize the role of jasmonic acid and peroxidase in cold recovery at the cellular level by kinematic analysis and at the metabolite level by series of biochemical experiments (3) Unravel the molecular mechanisms downstream of JA and POD guiding the recovery response by transcriptomic analysis.

Methods:

- Leaf growth analysis: using a ruler and/or the Leaf Length tracker
- Kinematics analysis: by measuring cell length and meristem length under microscopy, and leaf length
- Biochemical analysis: by measuring hormones, antioxidant metabolites and enzymes (e.g., POD), oxidative markers of oxidative stress (MDA, Electrolyte leakage) along the maize leaf (Division, Expansion and Maturation zone)
- Transcriptome analysis, mRNA (next generation) sequencing and qRT-PCR

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)

- Plant growth analysis
- Microscopy and image analysis
- Laboratory skills including biochemical analysis, RNA extraction for NGS data analysis and qRT-PCR.

- Statistical analysis and interpretation of the results
- Scientific presenting and/or writing.

Seguimiento/ Monitoring Plan

- Daily supervision by PhD student.
- Weekly team meetings where progress is presented and discussed
- Weekly progress discussion with Professor and PhD student
- If needed for Spanish home institution, guidance in report writing.

Evaluación/ Evaluation plan

- Continuous evaluation
- Weekly progress
- If required, final report.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Basic understanding of plant physiology; Basic laboratory skills; Basic mathematic and computer skills.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

Registration as a visitor for insurance purposes. Can be done upon arrival.

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) /

Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

Proyecto BE-3: The role of sugar supply and signalling to the growth zone in the regulation of maize leaf growth

Nombre y apellidos del Supervisor / Name and surname of the Supervisor:

Gerrit Beemster

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link:

Department of Biology / Faculty of Science / University of Antwerp
Laboratory for Integrated Molecular Plant Physiology Research (IMPRES)

Groenenborgerlaan 171

2020 Antwerp, Belgium

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Website: <https://www.uantwerpen.be/en/rg/impres/>

Título del Proyecto/ Project Title:

The role of sugar supply and signalling to the growth zone in the regulation of maize leaf growth

Perfil preferencial del estudiante/Student Profile:

Biology, with level of MSc. Good level of English (at least B1)

Fechas orientativas/Available Dates

01.06.2026 – 31.12.2026, 38/h week.

Programa/ Detailed program of the traineeship period

- Determining the impact of altered sugar signals and supply on maize leaf growth at high temporal resolution using automatic imaging.
- Kinematic analysis of cell division and expansion, using fluorescence and DIC microscopy in combination with image analysis.
- Metabolite and biochemical analysis (e.g., sugars metabolism) at contrasting time points during the day/ night cycle.
- Transcriptome analysis, mRNA (next generation) sequencing and QRT-PCR at contrasting time points during the the day/ night cycle

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)

Plant growth analysis, microscopy and image analysis, laboratory skills including metabolite analysis with HPLC and biochemical analysis, NGS data analysis and QRT-PCR. Scientific presenting and writing.

Seguimiento/ Monitoring Plan

- Daily supervision by PhD student.
- Weekly team meetings where progress is presented and discussed
- Weekly progress discussion with Professor and PhD student
- If needed for Spanish home institution, guidance in report writing.

Evaluación/ Evaluation plan

- Continuous evaluation
- Weekly progress
- If required, final report

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Basic understanding of plant physiology; Basic laboratory skills; Basic mathematic and computer skills

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

Registration as a visitor for insurance purposes. Can be done upon arrival.

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) /

Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

Proyecto BE-4: Impact Of Climate Change-Induced Extreme Precipitation On Plant Growth

Nombre y apellidos del Supervisor / Name and surname of the Supervisor:

Gerrit Beemster

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link:

Department of Biology / Faculty of Science / University of Antwerp
Laboratory for Integrated Molecular Plant Physiology Research (IMPRES)
Groenenborgerlaan 171
2020 Antwerp, Belgium
T +32 3 265 34 21 M +32 497 14 60 37 F +32 3 265 34 17
Website: <https://www.uantwerpen.be/en/rg/impres/>

Research Gate: https://www.researchgate.net/profile/Gerrit_Beemster

Título del Proyecto/ Project Title:

Impact Of Climate Change-Induced Extreme Precipitation On Plant Growth

Perfil preferencial del estudiante/Student Profile:

Biology, with level of MSc. Good level of English (at least B1)

Fechas orientativas/Available Dates

01.06.2026 – 31.12.2026, 38/h week.

Programa/ Detailed program of the traineeship period

It is increasingly clear that the global climate shifts to more extreme precipitation regimes (prs) with longer alternating wet and dry periods. In recent years, such conditions had great impact on crop production and ecosystem performance. Despite their increasing importance, the effect of more extreme prs on plant growth and performance is rarely investigated. Extreme prs are novel environmental conditions to which plants are exposed and yet we do not understand how they will impact growth and the underlying physiological and molecular processes.

We will perform a systemic, multi-organisational level investigation on the impact of extreme prs on the growth of maize plants exposed to a range of realistic extreme prs. They will be analysed at the organism level (leaf length, biomass, photosynthesis), at the tissue/cell level (cell division and expansion) and at the molecular level (gene expression, metabolite levels, enzyme activity). The IMPRES laboratory has all expertise available for such analyses.

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)

Plant growth analysis (with leaf length tracker), plasmid cloning and transformation, (fluorescence) microscopy and image analysis, laboratory skills including metabolite analyses and biochemical analyses, NGS data analysis and qPCR. Scientific presenting and writing.

Seguimiento/ Monitoring Plan

- Daily supervision by PhD student.
- Weekly team meetings where progress is presented and discussed
- Weekly progress discussion with Professor and PhD student
- If needed for Spanish home institution, guidance in report writing.

Evaluación/ Evaluation plan

- Continuous evaluation
- Weekly progress
- If required, final report

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Basic understanding of plant physiology; Basic laboratory skills; Basic mathematic and computer skills

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

Registration as a visitor for insurance purposes. Can be done upon arrival.

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

Proyecto BE-5: Nanoporous materials for tailored hydrogen storage applications

Nombre y apellidos del Supervisor / Name and surname of the Supervisor:

Leticia Fernández Velasco

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link:

Department of Chemistry / Royal Military Academy.

Avenue Renaissance 30, 1000 Brussels, Belgium

<http://www.rma.ac.be/en>

Título del Proyecto/ Project Title:

Nanoporous materials for tailored hydrogen storage applications

Perfil preferencial del estudiante/Student Profile:

Chemistry / Chemical Engineering, At minimum, the trainee should be in the last year of a bachelor's degree and preferably be enrolled in a Master's program. Good level of English (at least B2)

Fechas orientativas/Available Dates

01.09.2026 – 18.12.2026. 35/h week

Programa/ Detailed program of the traineeship period

The aim of this project is to develop and optimize nanoporous materials for hydrogen storage, thus supporting the transition towards environmentally sustainable armed forces while maintaining their operational effectiveness. The department of chemistry of the Royal Military Academy will lead this research, assisted by partners from France and Spain, forming a strong consortium providing an integral approach.

In this work, different materials ranging from carbons to Metal Organic Frameworks (MOFs), will be designed, synthesized and tested for hydrogen storage under different conditions of temperature and pressure, both individually and in a combined form to evaluate a probable synergy. Sustainable synthesis methods, including the valorisation of biomass waste, will be particularly taken into account. And additional goal of the project, highlighting its innovative character, is to obtain a material with an enhanced hydrogen storage in a suitable form for real-use (contrarily to most of the materials reported in the literature, in powder form and with low densities).

The trainee will obtain knowledge about H₂ storage technologies, synthesis, characterization and performance of nanoporous materials on H₂ adsorption. Additionally, the trainee will investigate the fundamental adsorption mechanisms of hydrogen on nanoporous materials through experimental and theoretical studies to guide material design and optimization. A through characterization of the structural and surface properties of the materials will be the main tasks to be performed by the trainee, including techniques such as XRD, TGA, FTIR, SEM-EDX.

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)

- Understanding the main principles of H₂ adsorption and consequently the selection and synthesis of promising nanomaterials.
- Acquiring expertise in different characterization techniques of materials (N₂ and H₂O Adsorption), TG-MS, PZC, XRD, SEM, among others.

- Gaining knowledge on the interpretation and discussion of scientific results, as well as in the writing of scientific reports.
 - Learning how to work in a research laboratory in teams and in complete autonomy.
 - Improving the communication skills and knowledge of languages.
- Scientific presenting and writing. Training in plant growth analysis, metabolite, biochemical and transcriptome analysis. Training in scientific research. Functioning in international laboratory setting.

Seguimiento/ Monitoring Plan

The trainee is expected to maintain regular communication with the host scientist, particularly during the initial phase of the traineeship. Weekly meetings will be arranged to monitor the trainee's progress and address their requirements. Additionally, the trainee will collaborate closely with other team members, including technicians and PhD students, who will provide support with daily laboratory tasks.

Regarding the experimental part, and since the trainee will be integrated in the routine tasks of an on-going project, the risks of not accomplishing the goals is very limited. In the case of unexpected events influencing the good progress of this particular project, the trainee would then participate in other related projects in the field of nanoporous materials or adsorption techniques.

Evaluación/ Evaluation plan

The evaluation plan will be focused on three categories:

1. State-of-art research: Supporting bibliographic material will be provided. A first evaluation will check if the basic concepts are fixed. Only once this goal is reached, we will proceed to the next step.
2. Experimental work: all the techniques and protocols will be explained in detail. Then, the trainee will gradually increase his/her participation under supervision until he/she is able to work independently.
3. Coordination and reporting: the trainee will be asked to actively participate in weekly meetings for the discussion of the results. The working group will also provide feedback on his/her performance at the laboratory. A final report will be requested.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

The student may have some experience working in a chemical laboratory, for nanomaterial synthesis and ideally in gas phase characterization/applications. Regarding the theoretical knowledge, formation in chemistry and/or chemical engineering is a must, and notions of fundamentals of nanomaterials (carbon, MOF) synthesis and characterization will be needed.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

Besides the learning agreement, and given the military character of the academy, the trainee will be asked to pass a security screening.

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

Proyecto BE-6: Corrosion protection strategies for 3D printed metallic materials

Nombre y apellidos del Supervisor / Name and surname of the Supervisor:

Ruben Del Olmo Martinez

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link:

Department of Chemistry and Materials, Research Group of Electrochemical and Surface Engineering (SURF), Vrije Universiteit Brussel (VUB), 1050 Brussels, Belgium
Bd de la Plaine 2, 1050 Ixelles. Building G. <https://surf.research.vub.be/>

Título del Proyecto/ Project Title:

Corrosion protection strategies for 3D printed metallic materials

Perfil preferencial del estudiante/Student Profile:

Chemistry, Chemical engineering, Aerospace engineering, and Mechanical engineering. Level of English (at least B1)

Fechas orientativas/Available Dates

01.06.2026 – 31.09.2026. 30/h week

Programa/ Detailed program of the traineeship period

Over the last decade, the evolution of Metal Additive Manufacturing (MAM), or metallic 3D printing, has become a reality. This technology enables the production of complex metallic components with minimal material waste and greater energy efficiency compared to conventional processing methods. Among the materials processed via MAM, stainless steel and aluminium alloys stand out due to their suitable mechanical properties for the transport industry. However, the microstructural characteristics and corrosion behaviour of specific 3Dprinted alloys remain scarcely understood.

This project aims to:

- 1- Conduct a microstructural and electrochemical analysis of different Steel and Al alloys processed by additive manufacturing technologies.
- 2- Investigate electrochemical surface and/or thermal treatments to understand and/or mitigate corrosion phenomena in-service conditions. By achieving these goals, the student will gain hands-on experience with conventional characterization techniques (SEM/EDS, XPS, SKPFM) and electrochemical methods (EIS, PDP). Furthermore, based on the project findings, the student will contribute to optimizing surface treatments for structural, aerospace, and automotive applications, drawing on literature and experimental research.

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)

Basic lab skills such as experiment planning, conventional (including sample preparation), understanding the different characterization procedures, electrochemical tests for corrosion evaluation and surface treatments (anodizing, conversion coatings, and/or plasma electrolytic oxidation). Related to transversal competencies, the student will acquire independent thinking, capacity for data curing, and scientific communication.

Seguimiento/ Monitoring Plan

The work will be monitored in weekly meetings to discuss the advances, conclusions, questions, and future steps. In detail, at the beginning, the student will learn the protocols and techniques under supervision. Then, once the supervisor confirms that the student is ready to work independently, the student will perform the experiments with the possibility of

reaching out to the supervisor.

Evaluación/ Evaluation plan

The student's technical skills will be assessed regularly—either daily or weekly—by the supervisor or other lab members to ensure they feel confident and can perform experimental work independently. Additionally, the student's progress in data analysis and management will be evaluated, along with the development of their communication skills. Finally, active participation in lab organization, cleanliness, and integration within the team will be recognized as a positive contribution.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Previous knowledge in chemistry, material science, electrochemistry, and laboratory-related skills is valued but not required

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

None

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

Proyecto BE-7: Morphological investigation of Josephson junctions for superconducting technologies

Nombre y apellidos del Supervisor / Name and surname of the Supervisor:

Daniel Pérez Lozano

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link:

IMEC. Imec R&D, nano electronics and digital technologies

Título del Proyecto/ Project Title:

Morphological investigation of Josephson junctions for superconducting technologies

Perfil preferencial del estudiante/Student Profile:

Physics/Mathematics/Computer science. Level of English (at least B1).

Fechas orientativas/Available Dates

01.06.2026 – 30.09.2026. 38h/ week

Programa/ Detailed program of the traineeship period

Superconducting computing technologies based on Josephson junctions (JJs) offer a promising route toward ultra-fast and energy-efficient processors, far surpassing the limits of conventional CMOS transistor-based CPUs. However, state-of-the-art Nb-based JJs face critical scalability barriers, including limited critical current density ($J_c < 1 \text{ mA}/\mu\text{m}^2$), relatively large device dimensions ($>250 \text{ nm}$), low kinetic inductance, and a restricted thermal budget ($\sim 200 \text{ }^\circ\text{C}$) that hinders integration with CMOS-compatible processes.

To overcome these limitations, recent developments have demonstrated NbTiN/ α -Si/NbTiN Josephson junctions fabricated using a semi-damascene process on 300 mm wafers, achieving $J_c \approx 2\text{--}3 \text{ mA}/\mu\text{m}^2$ and critical dimensions down to 210 nm, enabling denser and lower-loss superconducting circuits.

A key challenge for further technology scaling is understanding and controlling electrical variability arising from the tunnel barrier, where barrier thickness fluctuations, roughness, and local composition variations directly affect junction resistance, and device reproducibility.

The goal of this bachelor project is to investigate how deposition parameters impact the morphology of the α -Si-based JJ barrier. By analyzing TEM and EDS cross-sectional images from differently processed samples, we aim for:

1. Quantify barrier thickness, interface roughness, and material uniformity.
2. Identify correlations between process conditions and morphological variations.
3. Develop a phenomenological model that predicts electrical variability as a function of deposition parameters.

This project provides hands-on experience with advanced nanoscale characterization techniques, materials analysis, and structure–property relationships in superconducting devices contributing to the continued scaling of high-performance JJ-based computing technologies.

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)

Being this project at the frontier of industrial circuit manufacturing and physics, the student will gain insight in TEM characterization, as well as experience in working in multidisciplinary fields. In addition, the student will gain experience on the development of software tools and techniques to characterize nanostructures

Seguimiento/ Monitoring Plan

Meetings will be scheduled every week so that we ensure the correct progress of the project. The student will be integrated in a team of more than 10 members working on different areas of fabrication technologies, material characterization and circuit design.

Evaluación/ Evaluation plan

During the weekly meetings, the student will have to present the progress of the project in a powerpoint. A final presentation at the end of the internship will also be scheduled with all the members of the team.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

- advanced level of python programming
- intermediate level of physical characterization techniques. Experience in microscopy desired

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

Once the student is selected, an application to the project needs to be submitted vi: Careers | imec

Screening based on nationality will be done due to the technology domain being export control sensitive

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

Proyecto BE-8: Current in plane tunnelling benchmarking of superconducting Josephson junctions

Nombre y apellidos del Supervisor / Name and surname of the Supervisor:

Daniel Pérez Lozano

Afiliación del supervisor y Enlace a la afiliación / Supervisor affiliation and Affiliation link:

IMEC. Imec R&D, nano electronics and digital technologies

Título del Proyecto/ Project Title:

Current in plane tunnelling benchmarking of superconducting Josephson junctions

Perfil preferencial del estudiante/Student Profile:

Physics/Mathematics/Computer science. Level of English (at least B1).

Fechas orientativas/Available Dates

01.06.2026 – 30.09.2026. 38h/ week

Programa/ Detailed program of the traineeship period

Superconducting processors leveraging Josephson junctions (JJs) represent a powerful alternative to traditional CMOS-based computing, offering the potential for exceptionally high speed and dramatically reduced energy consumption. Despite this promise, conventional niobium (Nb)-based JJs encounter significant scaling challenges, such as limited critical current densities ($J_c < 1 \text{ mA}/\mu\text{m}^2$), device dimensions that typically cannot shrink below $\sim 250 \text{ nm}$, inherently low kinetic inductance, and a modest thermal budget of around $200 \text{ }^\circ\text{C}$. These limitations restrict their integration into CMOS-compatible fabrication flows and impede the realization of dense, low-loss superconducting circuits.

Recent advances provide a path forward. By using NbTiN/ α -Si/NbTiN junction stacks fabricated through a semi-damascene process on 300 mm wafers, it is now possible to achieve critical current densities of approximately $2\text{--}3 \text{ mA}/\mu\text{m}^2$ and junction dimensions as small as 210 nm . These improvements significantly enhance scalability and enable the creation of more compact, efficient superconducting circuit architectures.

The aim of this work is to establish a clear relationship between CIPT-extracted barrier properties on blanket JJ structures and the electrical behavior of fully fabricated junctions. By tracking how the resistance–area (RA) product evolves from blanket measurements to device-level results, the project will uncover which fabrication steps most strongly influence junction performance. This comparison will help identify process-sensitive stages that introduce variability—or, alternatively, demonstrate that the junctions remain robust and consistent throughout the entire fabrication Flow

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)

Being this project at the frontier of industrial circuit manufacturing and physics, the student will gain insight in electrical characterization, as well as experience in working in multidisciplinary fields. In addition, the student will gain experience on the development of software tools and techniques to characterize nanostructures.

Seguimiento/ Monitoring Plan

Meetings will be scheduled every week so that we ensure the correct progress of the project. The student will be integrated in a team of more than 10 members working on different areas of fabrication technologies, material characterization and circuit design.

Evaluación/ Evaluation plan

During the weekly meetings, the student will have to present the progress of the project in a powerpoint. A final presentation at the end of the internship will also be scheduled with all the members of the team.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

- advanced level of python programming
- intermediate level of physical characterization techniques. Experience electrical measurements is desired

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

Once the student is selected, an application to the project needs to be submitted vi: Careers | imec

Screening based on nationality will be done due to the technology domain being export control sensitive

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

Proyecto BE-9: Transforming basketball analytics through privacy-respecting AI and synthetic data

Nombre y apellidos del Supervisor / Name and surname of the Supervisor:

Rafa Gálvez Vizcaíno

Afiliación del supervisor y Enlace a la afiliación / Supervisor affiliation and Affiliation link:

Electrical Engineering, Faculty of Engineering Science, University of Leuven.
<https://www.rafaGalvez.eu>

Título del Proyecto/ Project Title:

Transforming basketball analytics through privacy-respecting AI and synthetic data

Perfil preferencial del estudiante/Student Profile:

Mathematics/Computer science. Level of English (at least B1).

Fechas orientativas/Available Dates

01.07.2026 – 31.08.2026. 35h/ week

Programa/ Detailed program of the traineeship period

The student will do research at the intersection of privacy, AI and basketball. Using the constraint-led approach (CLA) and ecological dynamics movement theory explained in *Transforming Basketball* (by Alex Sarama), the intern will identify opportunities for action in real-world publicly-available games and will create a synthetic basketball dataset modeling information flows after the Contextual Integrity (CI) framework but in the basketball setting. This privacy theory will in turn allow the student to identify privacy-sensitive data and simulate a federated learning setup that allows clubs to train machine learning models that helps coaches identify in real-time the weak points of their team. The first two weeks the student will familiarize themselves with the CI framework, the CLA and the ecological dynamics theory. After this short literature review, the focus will be on generating enough data to simulate a few key plays in a game chosen by the student. This data will then be subject to 1) a basketball analysis to identify possible causes for the movements chosen by the players, and 2) a privacy analysis to select those relevant information flows that should be kept private to the clubs in a practice setting.

If time allows, the student will simulate a federated learning setup that assumes data collection devices are deployed in the practice facilities of clubs (including the body of the players itself), so that coaches can see which information sources are not being used by players to realize the best opportunities for action. The machine learning models would be trained with the synthetic dataset developed by the student, possibly augmented with new features or new examples generated from the insights of the basketball and privacy analyses.

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 acquire hands-on experience on sports analytics for basketball using a new approach to coaching grounded in science, synthetic data generation using generative AI, privacy enhancing technologies leveraging and decentralized machine learning. In basketball, they will learn about a new approach to coaching grounded on science.

The intern will acquire knowledge of the Contextual Integrity privacy framework, ecological dynamics movement theory, constraint-led approach, and federated learning. Skills include conducting interdisciplinary literature reviews, generating synthetic datasets, performing privacy analyses to identify sensitive information flows, and analyzing basketball situations to detect opportunities for action. Competences encompass applying privacy theories to sports

contexts and developing machine learning solutions that protect practice data and provide coaches with useful data for practice design.

Seguimiento/ Monitoring Plan

The student will meet at least once per week during the internship with me, preparing a report every two or three weeks in order to show progress and identify important blockers soon enough to address them swiftly. Casual meetings during the week are also encouraged.

Evaluación/ Evaluation plan

The report should have 3 sections: the introduction and evaluation of the synthetic dataset, the basketball and privacy analyses, and recommendations for further development of the federated learning app for coaches. This report is updated every 2 weeks, and I will give feedback on it in our weekly meetings. The student should be able to build each section upon the previous one, yielding useful and realistic recommendations for the further development of the application.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

- Hands-on experience in machine learning
- Basics of cybersecurity
- Experience in basketball as player and/or coach

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

we will conduct our own interviews and, if selected, there will be paperwork to come to Leuven

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) /

Availability to evaluate credit covalidation reports (Yes / No)

No

Otra información relevante / Any additional important information

Proyecto BE-10: OpenTPS: an open-source treatment planning system for radiation therapy against cancer

Nombre y apellidos del Supervisor / Name and surname of the Supervisor:

Ana María Barragán Montero

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link:

MIRO (Molecular Imaging Radiation Oncology) - UCLouvain. MIRO | Université catholique de Louvain

Título del Proyecto/ Project Title:

OpenTPS: an open-source treatment planning system for radiation therapy against cancer

Perfil preferencial del estudiante/Student Profile:

Mathematics/Computer science. Level of English (at least C1). French desirable

Fechas orientativas/Available Dates

Flexible. 38h/ week

Programa/ Detailed program of the traineeship period

Radiation therapy is one of the main modalities to treat cancer. Because radiation needs to traverse the healthy tissue to reach the tumor, a full treatment simulation needs to be done before delivering it, in order to ensure that the tumor is well covered and the dose to the healthy organs is minimized. This is done by using dedicated software, known as treatment planning system (TPS), which comprises tools for image processing, dose calculation, and optimization algorithms to find the optimal dose distribution for a given patient. The TPSs used in most hospitals are provided by private companies, reaching a commercial value up to several hundred thousand euros. In the last 5 years, our lab has developed an in-house and open-source TPS (OpenTPS <https://www.opentps.org/>), to enable the clinical and academic research of new and promising techniques, without the need of using these expensive TPS.

The trainee will contribute to the ongoing development of OpenTPS through a set of tasks that will be adapted to their background and interests. Depending on the profile, this may include improving software robustness and maintainability through unit testing and validation, contributing to the graphical user interface and user experience, and enhancing the documentation, including API documentation for classes and methods. The internship may also involve the implementation and evaluation of new research-oriented features, such as artificial intelligence-based tools (e.g. auto-segmentation) or the development of novel treatment planning and optimization strategies, including probabilistic planning approaches.

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)

Being this project at the frontier of physics, computer science, engineering and applied medicine, the student will gain insight in all these domains, as well as experience in working in multidisciplinary fields. In addition, the student will gain experience on the development of software tools (with python programming).

Seguimiento/ Monitoring Plan

Meetings will be scheduled every week so that we ensure the correct progress of the project. The student will be integrated in a team of 4 members working on different parts of the OpenTPS project.

Evaluación/ Evaluation plan

During the weekly meetings, the student will have to present the progress of the project in a powerpoint. A final presentation at the end of the internship will also be scheduled with all the members of the team.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

- proficient level of python programming

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

No

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

Proyecto BE-11: Improving Adoption of Domain-Specific AI Model Cards in Radiotherapy

Nombre y apellidos del Supervisor / Name and surname of the Supervisor:

Ana María Barragán Montero

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link:

MIRO (Molecular Imaging Radiation Oncology) - UCLouvain. MIRO | Université catholique de Louvain

Título del Proyecto/ Project Title:

Improving Adoption of Domain-Specific AI Model Cards in Radiotherapy

Perfil preferencial del estudiante/Student Profile:

Mathematics/Computer science. Level of English (at least C1). French desirable

Fechas orientativas/Available Dates

Flexible. 38h/ week

Programa/ Detailed program of the traineeship period

The increasing use of artificial intelligence (AI) in radiotherapy has highlighted the need for transparent, standardised, and clinically meaningful documentation of AI models. Recently, we proposed AID-RT, a consensus-driven, domain-specific model card for AI in radiotherapy, aimed at improving transparency, reproducibility, and safe clinical adoption.

The goal of this internship is to support the evaluation, alignment, and broader adoption of the AID-RT model card by comparing existing initiatives, identifying barriers to uptake, and contributing to the design of a usability study involving clinical and industrial stakeholders.

The trainee will first conduct a structured review and comparison of existing AI model documentation frameworks relevant to radiotherapy and medical imaging, including AID-RT, DLinRT.eu, and ASSESS-AI (American College of Radiology). This will involve mapping and comparing field names, required information, and levels of detail, and identifying overlaps, gaps, and opportunities for harmonisation across initiatives.

Building on this analysis, the trainee will support the design of a preliminary usability study involving multiple clinical centres and AI vendors. This will include contributing to the definition of evaluation criteria, preparation of study materials (e.g. guidance documents and questionnaires), and coordination with participating stakeholders.

The trainee will assist in collecting and analysing feedback from clinical teams and industry partners to identify barriers and facilitators to adoption in both research and commercial contexts. Particular attention will be given to understanding usability challenges, documentation burden, and perceived value for different stakeholder groups.

Finally, the trainee will contribute to iterative improvements of the model card template and its digital implementation, including the Streamlit-based platform (<https://rt-modelcard.streamlit.app/>) and potential alignment with DLinRT.eu. The traineeship will provide hands-on experience at the interface of AI, clinical translation, and standardisation efforts in radiotherapy.

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)

Being this project at the frontier of computer science, engineering and applied medicine and physics, the student will gain insight in all these domains, as well as experience in working in multidisciplinary fields. In addition, the student will gain experience on the development of software tools for both research and clinical use.

Seguimiento/ Monitoring Plan

Meetings will be scheduled every week so that we ensure the correct progress of the project. The student will be integrated in a team of 15 members working on different related topics to radiation therapy, including artificial intelligence applications.

Evaluación/ Evaluation plan

During the weekly meetings, the student will have to present the progress of the project in a powerpoint. A final presentation at the end of the internship will also be scheduled with all the members of the team.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

- proficient level of python programming

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

No

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

PRÁCTICAS EN REINO UNIDO CONVENIO UAM-CERU

Número de Proyecto	Supervisor	Área de Conocimiento	Lugar de realización	Número de plazas
RU-1	Goreti Ribeiro Morais	Biochemistry or biotechnology	University of Bradford	1
RU-2	Danilo Faccenda	Molecular Cell Biology	University of Hertfordshire	1
RU-3	Danilo Faccenda	Molecular Cell Biology	University of Hertfordshire	1
RU-4	Ines Martinez Martin	Biochemistry, biophysics, mechanobiology	King's College London	1
RU-5	Amalia Ruiz Estrada	Biology, Chemistry, Chemical Engineering	University of Bradford	1
RU-6	Isabel Douterelo	Environmental Sciences / Microbiology	University of Sheffield	1
RU-7	Isabel Douterelo	Environmental Sciences /Microbiology	University of Sheffield	1
RU-8	Marta Vallejo	ALS, Bioinformatics, Machine learning	Heriot-Watt University	2
RU-9	Ruben de Dios	Microbiology, Molecular Biology, Genetics	University of Southampton	1
RU-10	Patricia Sanz Morales	Microbiología, nutrición, bioinformática, metabolómica	The University of Reading	2
RU-11	Patricia Garcia Jareno	Neuroscience and Cell Transplantation Therapie	University College London	1
RU-12	Cristina Barrero Sicilia	Plant Biotechnology	University of Hertfordshire	1

Importante: Debido a las imposiciones generadas tras la entrada en vigor del BREXIT, solo podrán acceder a estas prácticas estudiantes que están matriculados en la UAM. No podrán acceder estudiantes en la opción de recién graduados.

A continuación, aparece toda la información de esta oferta

Proyecto RU-1: Establish the potential of novel prodrug strategy to improve brain cancer patient survival

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Goreti Ribeiro Morais

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

Institute of Cancer Therapeutics, University of Bradford, UK

<https://www.bradford.ac.uk/ict/>

Título del Proyecto/ Project Title

Establish the potential of novel prodrug strategy to improve brain cancer patient survival

Perfil preferencial del estudiante

Biology

Fechas orientativas/Available Dates

Available year-round, subject to student availability

Programa/ Detailed program of the traineeship period

A continuación, aparece toda la información de cada una de las ofertas

This project aims to investigate the potential of peptide conjugates as targeted prodrugs for brain cancer treatment. A series of tests (WP) will be carried out, to ensure the prodrugs are activated in tumour cells and tissues, and are relatively stable in normal tissues (e.g. liver, lung, kidney, brain), before assessing their ability to kill a series of brain cancer cells that will be grown in the laboratory (with different levels of MMP-14 expression).

WP 1 –Kinetic studies: This work will assess the chemical stability and in vitro half-life of the peptide conjugates in pH 7.4 isotonic phosphate buffer and 80% human plasma (absence of MMP-14) by fluorescence spectroscopy. Prodrugs that prove chemically stable will be further evaluated.

WP 2 – Ex-vivo metabolism studies: Prodrugs will be evaluated with homogenates of normal tissues (liver, kidney, plasm, blood, brain) and tumour tissue (human xenograft, MMP-14 positive) to inform which prodrugs are selectively activated by MMP-14.

WP 3 - Cellular studies using the glioblastoma U87-MG cell line (MMP-14 positive and temozolomide sensitive) and normal human neuronal cell line (HCN2) (MMP-14 negative) to demonstrate proof-of-concept that the cytotoxicity of the prodrug is mediated by the MMP-14 activation, with temozolomide as positive control.

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 have the opportunity to:

- Develop a solid understanding of cancer biology and key pharmacological principles relevant to anticancer drug development.
- Learn to critically evaluate scientific literature related to cancer therapeutics and experimental models.
- Develop theoretical and practical skills in:

High-Performance Liquid Chromatography (HPLC), including method development, sample preparation, data interpretation, and troubleshooting.

Fluorescence spectroscopy.

Cell culture techniques.

Moreover, the student will develop and strengthen their communication and presentation skills through regular progress updates, journal clubs, and project presentations, as well as improve their ability to respond to questions effectively. This will be also a great opportunity to improve spoken and written english.

Seguimiento/ Monitoring Plan

The plan will be reviewed through regular weekly meetings with the supervisor, to assess progress, discuss any challenges or potential setbacks, and identify training needs and ensure the student receives appropriate support to develop required skills. Also, the supervisor maintains an open-door policy and is available for discussion at any time.

Evaluación/ Evaluation plan

Evaluation of the student will combine performance in the laboratory practice, adaptability, engagement within the host institution and report writing. Progress will be assessed through regular meetings, project outcomes, and reflective reports. Communication, teamwork, and cultural integration will be also considered towards the student's personal and professional development and learning experience, and therefore evaluation.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

The student should have a background in biochemistry or biotechnology, but this is not essential. Adequate training will be provided.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

All work will be carried out at the Institute of Cancer Therapeutics (ICT) within the University of Bradford. The ICT is a multidisciplinary institute with an international reputation for translational research leading to the identification of novel therapies and additionally is part of an Experimental Cancer Medicine Centre (ECMC) to provide laboratory support to early phase clinical trials. The Institute is housed in a self-contained purpose-built facility with dedicated resources for medicinal chemistry, target validation, drug analysis, tumour biology and pharmacology.

The ICT has a long-standing tradition of welcoming postgraduates from the York University and from abroad, specifically from the Universities of Madrid and Barcelona (Spain), University of Turin (Italy), and ESCOM (France).

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports

Yes

Otra información relevante / Any additional important information

n/a

Proyecto RU-2: Investigating mitochondria-nucleus membrane contact sites – Form and function

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Danilo Faccenda

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

Department of Medicine, Public Health and Life Sciences, School of Health, Medicine and Life Sciences, University of Hertfordshire (<https://www.herts.ac.uk/>)

Título del Proyecto/ Project Title

Investigating mitochondria-nucleus membrane contact sites – Form and function

Perfil preferencial del estudiante

Biology, Molecular Cell Biology

Fechas orientativas/Available Dates

01.06.2026 – 31.12.2026

Programa/ Detailed program of the traineeship period

Membrane contact sites (MCS) define the communication between intracellular organelles, functioning both as connectors and signalling checkpoints. The crucial role of MCSs in the preservation of cellular homeostasis is now vastly accepted, as well as the implications of their disruption in the pathogenesis of various common conditions. In recent years, there has been increasing interest in indentifying the molecular repertoire governing their function, which would ultimately shed light on biological mechanisms underpinning disease. We recently uncovered the presence of MCS between mitochondria and the nucleus, which we named nucleus-associated mitochondria (NAM). Based on our observation, we propose that NAM support homeostatic retrograde communication between mitochondria and the nucleus, priming the expression of genes required for cellular resistance to stress, thereby promoting cell survival. Nevertheless, little is still known around the full role of NAM in cell physiology, and investigating their form and function is therefore paramount to expand current knowledge of intracellular signalling.

This project aims at developing molecular tools to investigate the structural and functional organisation of NAM function. Molecular cloning will be used to develop (a) spacers to stabilise or impair NAM membrane interaction, and/or (b) fusion protein linkers to study the signalling role of NAM. The effects of these spacers/linkers will be evaluated in immortalised human cell lines (e.g. HeLa, SH-SY5Y) via biochemical techniques, such as functional assay and Western blotting, and fluorescence microscopy.

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)

Upon successful completion of the training period, the trainee will be able to:

- Demonstrate in-depth understanding of molecular cloning (K).
- Explain advanced concepts in cell biology relevant to the experimental model being studied (K).
- Critically evaluate biochemical and microscopy techniques (K).
- Interpret relevant scientific literature to inform experimental design and methodology (K).
- Independently design and execute molecular cloning and imaging experiments (S).
- Culture, manipulate, and genetically modify mammalian cell lines with minimal supervision (S).

- Analyse experimental data using appropriate statistical and visualization tools (S).
- Troubleshoot common technical issues in cloning, cell culture, and imaging workflows (S).
- Design experiments incorporating appropriate controls and reproducibility considerations (C).
- Critically interpret experimental results and assess their biological significance (C).
- Integrate multiple experimental approaches to address a defined research question (C).
- Communicate scientific findings clearly and professionally in written reports and oral presentations (C).

Seguimiento/ Monitoring Plan

Initial monitoring:

- Introduction to laboratory organization.
- Review of trainee's academic background and prior experience.
- Observation of basic laboratory skills.

Supervised skill acquisition:

- Direct observation during key techniques (e.g. PCR, cloning steps, cell passaging, microscopy).
- Weekly meetings to review progress and challenges.
- Regular review of laboratory notebook entries.

Promoting independence:

- Reduced direct supervision during routine procedures.
- Weekly progress meetings focused on experimental planning and data interpretation.
- Evaluation of troubleshooting ability and experimental reasoning.

Final monitoring:

- Review of overall progress relative to initial learning objectives.
- Assessment of trainee's ability to integrate multiple techniques.

Evaluación/ Evaluation plan

Assessment methods:

- Direct observation of laboratory work.
- Laboratory notebook review.
- Progress meetings and discussions.
- Written reports and presentations.
- Identified gaps will be addressed through targeted training or protocol repetition.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Knowledge of principles of cell and molecular biology

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

- Completion of Health and Safety induction and relative forms (Control of Substances Hazardous to Health and Risk Assessment).
- Completion of laboratory induction.

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports

Yes

Otra información relevante / Any additional important information

n/a

Proyecto RU-3: Investigating mitochondria-nucleus membrane contact sites – Retrograde signalling and lipid exchange

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Danilo Faccenda

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

Department of Medicine, Public Health and Life Sciences, School of Health, Medicine and Life Sciences, University of Hertfordshire (<https://www.herts.ac.uk/>)

Título del Proyecto/ Project Title

Investigating mitochondria-nucleus membrane contact sites – Retrograde signalling and lipid exchange

Perfil preferencial del estudiante

Biology

Fechas orientativas/Available Dates

01.06.2026 – 31.12.2026

Programa/ Detailed program of the traineeship period

Membrane contact sites (MCS) define the communication between intracellular organelles, functioning both as connectors and signalling checkpoints. The crucial role of MCSs in the preservation of cellular homeostasis is now vastly accepted, as well as the implications of their disruption in the pathogenesis of various common conditions. In recent years, there has been increasing interest in indentifying the molecular repertoire governing their function, which would ultimately shed light on biological mechanisms underpinning disease. We recently uncovered the presence of MCS between mitochondria and the nucleus, which we named nucleus-associated mitochondria (NAM). Based on our observation, we propose that NAM support homeostatic retrograde communication between mitochondria and the nucleus, priming the expression of genes required for cellular resistance to stress, thereby promoting cell survival. Nevertheless, little is still known around the full role of NAM in cell physiology, and investigating their form and function is therefore paramount to expand current knowledge of intracellular signalling.

This project aims at investigating the role of NAM in promoting retrograde signalling between mitochondria and the nucleus, evaluating the potential transfer of lipid between the two subcellular compartments. For the purpose, NAM formation will be promoted or inhibited in immortalised human cell lines (e.g. HeLa, SH-SY5Y), before proceeding to mitochondrial and nuclear purification. Biochemical techniques, including chromatography and Western blotting, will be employed to characterise the lipid and protein composition of the two subcellular fractions, to determine potential lipid signatures involved in NAM-mediated signalling.

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)

Upon successful completion of the training period, the trainee will be able to:

- Demonstrate in-depth understanding of cellular biochemistry and lipid membranes (K).
- Explain advanced concepts in cell biology relevant to the experimental model being studied (K).
- Critically evaluate biochemical and lipidomics techniques (K).
- Interpret relevant scientific literature to inform experimental design and methodology (K).
- Independently design and execute lipid purification and chromatography protocols (S).

- Culture, manipulate, and genetically modify mammalian cell lines with minimal supervision (S).
- Analyse experimental data using appropriate statistical and visualization tools (S).
- Troubleshoot common technical issues in cell culture, lipid extraction and chromatography workflows (S).
- Design experiments incorporating appropriate controls and reproducibility considerations (C).
- Critically interpret experimental results and assess their biological significance (C).
- Integrate multiple experimental approaches to address a defined research question (C).
- Communicate scientific findings clearly and professionally in written reports and oral presentations (C).

Seguimiento/ Monitoring Plan

Initial monitoring:

- Introduction to laboratory organization.
- Review of trainee's academic background and prior experience.
- Observation of basic laboratory skills.

Supervised skill acquisition:

- Direct observation during key techniques (e.g. PCR, cloning steps, cell passaging, microscopy).
- Weekly meetings to review progress and challenges.
- Regular review of laboratory notebook entries.

Promoting independence:

- Reduced direct supervision during routine procedures.
- Weekly progress meetings focused on experimental planning and data interpretation.
- Evaluation of troubleshooting ability and experimental reasoning.

Final monitoring:

- Review of overall progress relative to initial learning objectives.
- Assessment of trainee's ability to integrate multiple techniques.

Evaluación/ Evaluation plan

Assessment methods:

- Direct observation of laboratory work.
- Laboratory notebook review.
- Progress meetings and discussions.
- Written reports and presentations.
- Identified gaps will be addressed through targeted training or protocol repetition.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Knowledge of principles of cell and molecular biology

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

- Completion of Health and Safety induction and relative forms (Control of Substances Hazardous to Health and Risk Assessment).

-Completion of laboratory induction.

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) /

Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

Proyecto RU-4: Mechanobiochemistry of focal adhesion proteins

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Inés Martínez Martín / Rafael Tapia Rojo

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

Faculty of Natural, Mathematical & Engineering Sciences

King's College London

Strand | London | WC2R 2LS

<https://tapia-rojolab.com/>

Título del Proyecto/ Project Title

Mechanobiochemistry of focal adhesion proteins

Perfil preferencial del estudiante

- Background in Biochemistry, Biophysics, or related disciplines.
- Previous experience in protein biochemistry and/or protein nanomechanics will be considered but is not required.
- Programming and/or experience in computational biology is beneficial but not required. Students interested in these areas will have the opportunity to develop these skills during the project.

Fechas orientativas/Available Dates

For undergraduate students: Any 2-3 months period between 1st of June 2025 to 15th of October 2025 (flexible)

For master students: Any 2-4 months period between 1st of June 2025 to 15th of October 2025 (flexible)

Programa/ Detailed program of the traineeship period

Mechanical forces are increasingly recognized as key regulators of cell behaviour, acting alongside chemical and electrical cues to shape how cells grow, adhere, and communicate. At the heart of this mechanosensitivity are focal adhesions, dynamic structures that physically connect cells to their extracellular surroundings, converting mechanical stimuli into biochemical signals. Yet, despite their importance, we still lack a detailed understanding of how mechanical forces alter protein structure, function, and interactions at the molecular level.

In this project, the student will apply novel single-molecule magnetic tweezers developed by the host lab to investigate how mechanical forces tune the function of focal adhesion proteins by modifying their interactions with partner molecules or making them susceptible to certain post-translational modifications.

Throughout the project, the student will have the opportunity to combine biophysical, biochemical, and computational approaches, gaining hands-on experience while contributing to a deeper understanding of how cells sense and respond to their mechanical environment.

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)

By the end of the traineeship, the student will have acquired in-depth knowledge of protein biophysics and mechanobiology. They will also gain hands-on experience with instrumentation used to study biological systems under force, particularly single-molecule force-spectroscopy techniques. They will learn to integrate biochemical and biophysical data, interpret their findings critically, and develop testable hypotheses based on their results.

In addition, the project will provide the opportunity to work within a highly interdisciplinary research environment, collaborating with students and researchers from backgrounds including biology, biochemistry, chemistry, and physics. It will also contribute to develop transferrable skills such as critical thinking, quantitative data analysis and presentation of results.

Seguimiento/ Monitoring Plan

The student will receive direct day-to-day training from a postdoctoral researcher, covering laboratory and data-analysis protocols. Progress and results will be discussed daily with the postdoctoral supervisor and during regular meetings with the principal investigator. The student will also participate in weekly lab meetings to receive feedback from the entire group.

Evaluación/ Evaluation plan

Evaluation will take place informally throughout the traineeship. At the end of the project, the student will present a summary of their results to the group. If a written report is required, it will be reviewed by the supervisor, who will provide detailed feedback.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

A good level of written and spoken English is required to ensure effective communication within the research group and during presentations.

No specific prior technical experience is required. However, exposure to protein biochemistry, protein biophysics, or programming will be considered valuable.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

N/A

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

No

Otra información relevante / Any additional important information

Proyecto RU-5: Development of advanced nanocarriers for drug delivery

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Amalia Ruiz Estrada

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

Institute of Cancer Therapeutics (<https://www.bradford.ac.uk/staff/gruizestrada/#biography>)

Título del Proyecto/ Project Title

Development of advanced nanocarriers for drug delivery

Perfil preferencial del estudiante

Interest in interdisciplinary areas such as biotechnology and biomedicine in combination with machine learning, bioinformatics or statistics. For people with an interest in machine learning, programming is desirable. However, willingness to learn is also acceptable.

Fechas orientativas/Available Dates

There's flexibility for joining the group between the 1st of June 2026 and the 31st of December 2026

Programa/ Detailed program of the traineeship period

The projects focus on the design and development of smart (stimuli-responsive) nanocarriers to improve anticancer treatments, and on introducing new targeting approaches to enhance efficacy and reduce the side effects of existing chemotherapeutics. The research involves the application of novel formulations of nanoparticles to fabricate multifunctional nanoparticles for combinatory therapy with photothermal or photodynamic therapy.

Workplan:

1. Synthesis of nanoparticles co-loaded with a photothermal agent and a chemotherapeutic drug.
2. Characterisation of the colloidal properties and Encapsulation Efficiency.
3. In vitro evaluation of nanoparticle cell uptake using live fluorescence microscopy and flow cytometry.
4. Assessment of cell viability after irradiation with a laser via resazurin assay and evaluation of tumour growth using advanced spheroid models.

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 host research group is based at the Institute of Cancer Therapeutics. Our expertise combines cell biology, formulation, and pharmacology to take medicines and diagnostics from concept to clinic. The applicant will have access to top-notch training in diverse techniques such as synthesis and functionalisation of nanomaterials with different bioactive compounds, live-cell imaging, cytotoxicity assays, and the biological evaluation in 2D and 3D spheroid models of cancer. The applicant will have access to the facilities of the Analytical Centre for research support with several techniques available for nanomaterial characterisation (DLS, Raman spectroscopy, UV-vis and fluorescence spectroscopy, among others).

Seguimiento/ Monitoring Plan

The applicant's research progress will be monitored by weekly lab meetings supervised by Dr Amalia Ruiz. The dynamics of the group also include journal clubs and scientific seminars, and the applicant will benefit from a medium-sized research group comprising technical staff, and MSc and PhD students.

Evaluación/ Evaluation plan

The applicant will submit a report at the end of the internship summarising the research outcomes in the format of a research article.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Ideally, students with a background in Biology, Biomedicine, Pharmacy, Chemistry, Chemical Engineering or any related area.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

not applicable

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) /

Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

Proyecto RU-6: Microbial Source Tracking in rivers: development of a DNA method to quantify faecal pollution

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Isabel Douterelo Soler

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

The University of Sheffield

<https://www.sheffield.ac.uk/mac/people/civil-academic-staff/isabel-douterelo-soler>

Título del Proyecto/ Project Title

Microbial Source Tracking in rivers: development of a DNA method to quantify faecal pollution

Perfil preferencial del estudiante

- Qualifications: BSc/Msc in Biological or Environmental Sciences.
- Have knowledge of molecular biology, including basic laboratory skills
- Knowledge and/or be willing to analyse data using bioinformatics tool is necessary.

Fechas orientativas/Available Dates

01.06.2026 – 30.09.2026

Programa/ Detailed program of the traineeship period

The objective of the research is to advance understanding on the impact of faecal pollution in rivers (environmental and public health). The student will learn how to monitor microorganisms in rivers using a range of methods including DNA sequencing and digital droplet PCR (ddPCR). We will use molecular methods to identify pollution sources and evaluate how faecal contamination affects these river ecosystems. Physico-chemical monitoring (e.g., pH, temperature, conductivity) will be used to determine the influence of environmental drivers on microbial ecology and resulting water quality. After collection of samples (water and biofilms), We will employ DNA sequencing to characterise the microbial community structure and identify pollution sources, while ddPCR will provide quantification of specific faecal indicators to assess public health risks. After sequencing, samples will be analysed using a range of bioinformatics tools including the study of microbial diversity and patterns of species co-occurrence.

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 get experience on monitoring freshwater ecosystems and tackling microbial pollution risks. They will learn how to assess water quality issues through physico-chemical testing and microbiological analysis of samples using molecular methods. The project also involved data analysis, bioinformatics and scientific writing.

Seguimiento/ Monitoring Plan

Regular Meetings: 1-hour weekly meetings with supervisor and monthly meetings with project collaborators at Brighton university.

Scientific report: the student will write a brief report formatted as a scientific paper.

Evaluación/ Evaluation plan

The student will present her/his research at the Sheffield Water Centre at the University of Sheffield, and the group will give feedback on the presentation. At the end of the scholarship. the supervisor will evaluate the scientific report written by the student and this will be subject to corrections.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

- Basic laboratory skills
- Experience in molecular methods (e.g. DNA extractions, PCR).

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

None

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

We are unable to accept placements lasting less than 8 weeks.

Proyecto RU-7: Investigating bioremediation capabilities of biofilms in constructed wetlands

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Isabel Douterelo Soler

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

The University of Sheffield

<https://www.sheffield.ac.uk/mac/people/civil-academic-staff/isabel-douterelo-soler>

Título del Proyecto/ Project Title

Investigating bioremediation capabilities of biofilms in constructed wetlands

Perfil preferencial del estudiante

- Qualifications: BSc/Msc in Biological or Environmental Sciences, Biotechnology, Molecular Biology,
- Knowledge of molecular biology, including basic laboratory skills (e.g, DNA extractions, PCR)
- Knowledge and/or be willing to analyse data using bioinformatics tool is necessary.

Fechas orientativas/Available Dates

01.06.2026 – 30.09.2026

Programa/ Detailed program of the traineeship period

Overall, the study aims to evaluate the effectiveness of biofilms in constructed wetlands to enhance natural pollution treatment. We will investigate how biofilms can be used within constructed wetlands to improve the removal of pollutants from wastewater and surface water runoff. Biofilms are communities of microorganisms that grow attached on surfaces and play a key role in breaking down contaminants through biodegradation.

The project combines fieldwork with laboratory-based experiments to study wetland biofilms under controlled conditions. It involves promoting biofilm growth in small scale soil columns with different substrates, measuring changes in pollutant concentrations, and assessing the extent of biodegradation capabilities. Molecular techniques will be used to characterise the microbial communities within the biofilms and to identify pathways involved in pollutant degradation.

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 learn about water quality analysis in wetlands, by learning fieldwork skills and how to monitor physico-chemical parameters. They will also learn laboratory skills, particularly in microbiology and genetics (DNA extractions from environmental samples, sequencing), data analysis and basic bioinformatics. The student will gain skills on how to integrate data and analyse it using statistics and scientific report writing.

Seguimiento/ Monitoring Plan

Regular Meetings: 1-hour weekly meetings with supervisor and monthly with Henkel (industry partner).

Scientific Report: At the end of the studentship, the student will write a brief report formatted as a scientific paper.

Evaluación/ Evaluation plan

The student will present her/his research at the Sheffield Water Centre at the University of Sheffield, and the group will give feedback on the presentation. At the end of the scholarship, the supervisor will evaluate the scientific report written by the student and this will be subject to corrections.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

- Basic laboratory skills
- Experience in molecular methods (e.g. DNA extractions and PCR).

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

N/A

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes.

Otra información relevante / Any additional important information

We are unable to accept placements lasting less than 8 weeks.

Proyecto RU-8: Using machine learning for biomarker discovery in ALS: integrative analysis of TDP-43 pathology across central and non-central nervous system tissues

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Marta Vallejo

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

Heriot-Watt University

<https://researchportal.hw.ac.uk/en/persons/marta-vallejo>

Título del Proyecto/ Project Title

Using machine learning for biomarker discovery in ALS: integrative analysis of TDP-43 pathology across central and non-central nervous system tissues

Perfil preferencial del estudiante

Interest in interdisciplinary areas such as biotechnology and biomedicine in combination with machine learning, bioinformatics or statistics. For people with an interest in machine learning, programming is desirable. However, willingness to learn is also acceptable.

Fechas orientativas/Available Dates

Flexible

Programa/ Detailed program of the traineeship period

The proposed work seeks to develop innovative computational techniques to address pressing challenges in neurodegenerative diseases, specifically amyotrophic lateral sclerosis (ALS). ALS is a devastating and progressive condition that is classified as a rare disease, with limited research efforts and scarce data due to its low prevalence. This research represents a critical contribution at the intersection of machine learning, computational science, and clinical neuroscience, aligning with key trends in personalised medicine to overcome these challenges.

This summer project will explore whether proteinopathy data from non-CNS tissue (gut) can support improved characterisation of TDP-43 pathology in ALS. Using a curated dataset of gut tissue images and/or extracted quantitative features, the trainees will develop and evaluate a compact machine learning pipeline to detect patterns linked to TDP-43 aggregation and assess whether these patterns capture meaningful heterogeneity across samples. The project will also include an explainability component, using interpretable models or post-hoc methods to highlight which regions or features drive predictions, supporting outputs that could be reviewed by clinical collaborators.

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 trainee will enhance their understanding of immunohistochemistry images and protein aggregation in ALS, focusing on data preparation, visualisation, and the use of applied machine learning or advanced statistical techniques to characterise proteinopathy. They will gain hands-on experience with cutting-edge methods, contributing to meaningful insights in the field. The trainee will be encouraged to generate publishable results, with mentorship extending beyond the traineeship to support this goal. Previous students in similar roles have successfully produced high-quality results and are currently preparing publications from related datasets, demonstrating the potential for impactful contributions.

Seguimiento/ Monitoring Plan

The trainees will take part in weekly group meetings to share updates on their activities and receive feedback and guidance. Opportunities for peer and clinical partners interaction will be encouraged.

Evaluación/ Evaluation plan

The applicants are expected to contribute towards research and generate material to be published in a suitable journal/conference. Finally, the applicant will conclude their visit at Heriot-Watt University by giving a talk to the department. The applicant will be able to present their work during events at the school.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Programming skills are recommended, particularly for tasks involving data analysis, visualisation, and the application of machine learning techniques.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

n/a

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes)

No

Otra información relevante / Any additional important information

n/a

Proyecto RU-9: Understanding the co-evolution between *Acinetobacter baumannii*'s CRISPR-Cas systems, membrane proteins and the bacteriophages that target it

Nombre y apellidos del Supervisor / Name and surname of the Supervisor –
Rubén de Dios (affiliated to the research group of Prof Ronan McCarthy)

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link –
University of Southampton (<https://www.southampton.ac.uk/>)

Título del Proyecto/ Project Title

Understanding the co-evolution between *Acinetobacter baumannii*'s CRISPR-Cas systems, membrane proteins and the bacteriophages that target it

Perfil preferencial del estudiante –

The student should be in the 3rd or 4th year of their undergraduate degree or enrolled in a Master's degree programme on Biology, Biotechnology, Microbiology or related areas. The student should have theoretical and conceptual proficiency in these areas. Preferentially, the student should have prior experience working in a research laboratory in a related field. The ideal candidate should show enthusiasm and interest for the project and be able to work individually as well as in a team. The candidate should be in a position to apply for the Erasmus+ scholarship to cover their visit.

Fechas orientativas/Available Dates

The stay will last for at least 4 months, taking place between June 1st 2026 and December 31st 2026 as agreed with the student.

Programa/ Detailed program of the traineeship period

Recently, a co-evolution pattern between the priority pathogen *Acinetobacter baumannii*'s CRISPR-Cas systems, its membrane proteins and the bacteriophages that can infect it has been discovered. We have identified a bacteriophage which can putatively infect the clinical isolate *A. baumannii* AB5075. The project assigned to the student will aim to optimise a purification protocol for the bacteriophage and to optimise an assay to test the infection of AB5075 by this bacteriophage. During the first part of the stay, the student will learn how to induce the replication of a prophage (bacteriophage inserted in a bacterium's genome) for its purification. Once purified, the student will learn how to identify events of infection of a target strain. This will be done using established prophage induction protocols and quantitative bacteriophage infection techniques using bacterial cultures on soft agar. After the optimisation of the infection protocol, the student will test the ability of the bacteriophage to infect a panel of AB5075 mutants with disruptions in the endogenous CRISPR-Cas system, which protects against bacteriophage infections, and in potential membrane protein coding genes that the bacteriophage may recognise to attach to AB5075 and infect it. For this, the student will use the techniques learnt in the first part of the stay. In the final week, the student will prepare and deliver a presentation to the research group about their work.

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)

During this stay, the student will learn the routine microbiological and genetic modification techniques used in a microbiology laboratory (bacterial culturing, bacterial transformation, molecular cloning), as well as other specific techniques related to the project (induction of gene expression, prophage induction and purification, phage infection, specificities for the work with *A. baumannii* as a bacterial pathogen). Furthermore, the trainee will be integrated in a dynamic

international group and develop soft skills of interest for the scientific career, such as scientific communication skills, task management, problem-solving abilities, experimental design and critical result analysis. These skills will be invaluable to the student as they make the next steps in their career

Seguimiento/ Monitoring Plan

The student will be daily trained and their work monitored. Additionally, the student will have weekly meetings with their supervisor and mentor to assess the progress and the results. During these meetings, the student will be asked to present and discuss their results.

Evaluación/ Evaluation plan

There will be a continuous evaluation of the student's handling of the newly acquired microbiology and genetics techniques. Interest on the project and soft-skill development (team work, communication, troubleshooting) will be considered. At the end of the stay, the student will present their results to the host group as a final evaluation.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

The ideal candidate will have a high level of knowledge on Microbiology, Genetics and Molecular Biology. Although it is not mandatory, the ideal candidate will have previous experience working in a research laboratory on the related fields.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

The student must demonstrate their knowledge of English language prior to their admission. To avoid admission fees, the student must receive an Erasmus+ scholarship covering their stay at the University of Southampton.

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

Candidates progressing to interview will be asked to prepare a 5 minute presentation to introduce themselves and their background to evidence they are suitable for the position. Unfortunately, due to internal policies, stays shorter than 4 months will not be considered.

Proyecto RU-10: Human milk oligosaccharides (HMOs) in IBS: integrated microbiome and metabolome analysis from a crossover dietary intervention

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Patricia Sanz Morales

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

Department of Food and Nutritional Sciences, The University of Reading (UK).

<https://www.reading.ac.uk/food/>

Título del Proyecto/ Project Title

Human milk oligosaccharides (HMOs) in IBS: integrated microbiome and metabolome analysis from a crossover dietary intervention

Perfil preferencial del estudiante

Microbiology / Nutrition / Bioinformatics / Metabolomics (BSc/MSc level). Interest in gut microbiome research and data analysis.

Fechas orientativas/Available Dates

Flexible

Programa/ Detailed program of the traineeship period

The student(s) will integrate into our vibrant community in the Department of Food and Nutritional Sciences, contributing to two linked projects that combine clinical translation with mechanistic lab work. First, they will support analysis and communication of multi-omics outputs from a human dietary intervention study in irritable bowel syndrome (IBS). Under supervision, they will: (i) curate and explore 16S rRNA amplicon data (diversity, ordination, differential abundance); (ii) quantify and visualise taxa of interest (including methanogens associated with constipation-predominant IBS); (iii) work with metabolomics datasets (NMR buckets/assignments and targeted organic acids by GC-MS), including QC, univariate testing and effect-size reporting; and (iv) integrate findings into publication-ready figures, tables and concise interpretation for a manuscript. In parallel, the student will assist with in vitro gut fermentation experiments (batch cultures) testing probiotic-based strategies to improve gut and cognitive health, gaining hands-on experience in anaerobic workflows, sampling, and basic downstream processing. Tasks will be tailored to the student's skills and will include reproducible scripting in R and short literature synthesis to contextualise findings.

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)

By the end of the placement, the trainee will be able to: (1) explain key concepts in microbiome and metabolomics analysis for dietary intervention studies; (2) run and document a basic 16S workflow in R (import, filtering, diversity/ordination, statistical testing, visualisation); (3) interpret metabolomics readouts and report results with appropriate QC, effect sizes and clear graphics; (4) understand the rationale and practical considerations of in vitro gut fermentation models, including anaerobic handling, sampling and data recording; and (5) communicate integrated findings in a concise scientific report and short presentation, following reproducible and responsible research practices.

Seguimiento/ Monitoring Plan

Weekly 1:1 supervision meetings will set priorities and troubleshoot analysis/lab tasks. The trainee will also attend group meetings and journal clubs. Progress will be tracked using a shared

task board and a reproducible analysis/wet-lab log (R scripts/notebooks and lab records), with a mid-placement check-in.

Evaluación/ Evaluation plan

Evaluation will include: (i) a mid-placement review against agreed learning outcomes; (ii) a final written report (2–3 pages) summarising methods, results and interpretation across both projects; and (iii) a short presentation to the group. Assessment will focus on data quality/QC, appropriateness of analyses, and clarity of scientific communication.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Basic statistics and familiarity with R (or willingness to learn rapidly). Interest in microbiome/metabolomics is essential; prior exposure to OTU/ASV tables and/or metabolomics outputs is helpful but not required. For wet-lab work, willingness to follow safety procedures and learn anaerobic techniques; prior microbiology experience is advantageous.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

The University of Reading will provide full onboarding, including induction to research integrity, GDPR/confidentiality, and good data management. Desk-based and wet-lab activities are supported, subject to completion of local safety training and risk assessments. Wet-lab work will be supervised and conducted in appropriate facilities, with mandatory training in laboratory safety and (where relevant) anaerobic handling procedures. The placement can be adapted to the trainee's background, with structured support to build skills progressively.

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Yes

Otra información relevante / Any additional important information

The University of Reading has a long-standing reputation for the quality of its research in food science. 95% of our research is of international standing. We have experience hosting international students and have received very positive feedback. We are a short train journey away from London and well-connected, particularly to Heathrow airport.

Proyecto RU-11: Investigation of photoreceptor functionality in retinal organoids for cell transplantation therapies

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Patricia García Jareño

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

University College London (UCL)

Great Ormond Street Institute of Child Health (<https://www.ucl.ac.uk/population-health-sciences/child-health>), Laboratory of Professor Jane Sowden

Título del Proyecto/ Project Title

Investigation of photoreceptor functionality in retinal organoids for cell transplantation therapies

Perfil preferencial del estudiante

The Sowden lab has two main research interests, (i) developing of gene therapies for Norrie Disease, and (ii) developing of cell therapies for retinal dystrophies, in which the student will take part. Our work is very translational, we have different in vitro and in vivo projects, using rodents and also large animal models as the pig, as part of our preclinical work.

In our group we use human pluripotent stem cell (hPSC)-derived retinal organoids (ROs), which mimic retinal composition and are a promising source of photoreceptors for cell transplantation studies. However, successful transplanted photoreceptors need not only to survive, but to integrate into the host retina, extending synaptic processes to inner cells in order to recover visual functionality of the area. Nevertheless, assessing photoreceptor functionality is one of the biggest challenges in the field due to their small size and their complex and delicate multilayered anatomy.

Neuronal tracers are a common neuroscience tool used to assess neuronal connectivity, and nowadays tracers can be genetically modified to target a specific neuronal population. The monosynaptic tracer based in the modified rabies virus (Δ G-rabies) is one of them and has only been tested in the retinal field in dissociated ROs, but there is no published study assessing photoreceptors connectivity within ROs. In this project, Δ G-rabies will be used to assess photoreceptors connectivity with inner retinal cells.

We are looking for a student interested in Neuroscience and Cell Transplantation Therapies, motivated and happy to work in a team.

Fechas orientativas/Available Dates

01.06.2026 - 30/09/2026 or from 06.07.2026 - 30.11.2026

Programa/ Detailed program of the traineeship period

- **June:** Literature reading and cell culture training.
- **July-August:** Use of neuronal tracer to assess photoreceptor connectivity with inner retinal cells. Use of multielectrode arrays.
- **August-September:** Use of immunostaining and imaging to characterize retinal organoids. Data analysis and report writing.

From 06/07/2026 to 30/11/2026

- **July:** Literature reading and cell culture training.
- **August-September:** Use of neuronal tracer to assess photoreceptor connectivity with inner retinal cells. Use of multielectrode arrays.
- **September-November:** Use of immunostaining and imaging to characterize retinal organoids. Data analysis and report writing.

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) (aprox. 100 palabras)

The student not only will learn how to work with stem cells and obtain retinal organoids, but also how to characterize them by immunostaining, microscopy and multielectrode arrays. We will use a neuronal tracer to assess connectivity between photoreceptors and inner retinal cells. Apart from the technical skills, student will learn about retinal development, retinal anatomy and physiology, as well as cell transplantation.

We also run weekly lab meeting and departmental seminars that the student will attend, to learn about other research projects and to have scientific discussions with their colleagues. We are a very collaborative team and work constantly as a team.

Seguimiento/ Monitoring Plan

We have weekly lab meetings and once every 4-5 weeks the student will have the opportunity to present their progress and weekly meetings to catch up about technical issues or lab issues. Every three months we write a report (around 1500-2000 words) to keep track of our results or prepare any possible publications, grants or grants reports.

Evaluación/ Evaluation plan

The student will have to write a report with all collected data at the end of the internship.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

Prior cell culture experience and working under sterile conditions.

Desirable: the knowledge on electrophysiology, immunostaining and microscopy.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

N/A

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

Otra información relevante / Any additional important information

Proyecto RU-12: Genome Editing in hemp

Nombre y apellidos del Supervisor / Name and surname of the Supervisor

Cristina Barrero Sicilia

Afiliación del supervisor y Enlace a afiliación / Supervisor affiliation and Affiliation link

University of Hertfordshire

Título del Proyecto/ Project Title

Genome Editing in hemp

Perfil preferencial del estudiante

Biology, Molecular Biology, Genetics

Fechas orientativas/Available Dates

01.07.2026 - 31/10/2026

Programa/ Detailed program of the traineeship period

Phase 1: Orientation and Basic Training

- Introduction to plant biotechnology and safety protocols.
- Training on laboratory techniques: sterile handling, tissue culture, and basic molecular biology.

Phase2: Design and cloning of genome editing guides

- Designing of guide RNA (gRNA) into appropriate vectors for transformation
- Verification of construct through restriction enzymes digestion and sequencing

Phase 3: Agrobacterium-Mediated Transformation

- Preparing Agrobacterium cultures and plant tissues for transformation.
- Execution of transformation experiments with selected plant species.

Phase 4: Selection and Regeneration

- Techniques for selecting transformed plant cells (e.g., antibiotic selection).
- Regeneration of transgenic plants and monitoring growth.
- Data collection on transformation efficiency and plant morphology.

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 will acquire:

- Knowledge: Understanding of genome editing techniques, particularly those mediated by Agrobacterium transformation.
- Skills: Expertise in molecular biology techniques, including gRNA design, cloning, RNA extraction, and qPCR analysis.
- Competences: Ability to conduct plant transformation experiments, and communicate findings effectively. The trainee will also develop critical thinking and problem-solving skills in a research setting, preparing them for future careers in plant biotechnology and genetic engineering.

Seguimiento/ Monitoring Plan

The monitoring plan includes regular training sessions by the supervisor, supplemented by weekly meetings with team members and collaborations with related research groups.

Evaluación/ Evaluation plan

The evaluation plan involves presenting work at group meetings and participating in a journal club, where the trainee will discuss state-of-the-art research and relevant background information.

Conocimientos técnicos o experiencia requerida (si procede) / Technical knowledge or experience required (if applicable)

No experience is needed.

Especificaciones extra de la institución de acogida (si procede) / Additional specifications of the host institution (if applicable)

n/a

Disponibilidad para evaluar informes de covalidación de créditos (Si/No) / Availability to evaluate credit covalidation reports (Yes / No)

No

Otra información relevante / Any additional important information

Preferred long internships (longer than two months, but a minimum of 2 months).

