

CONVOCATORIA DE PRÁCTICAS INTERNACIONALES/ CALL FOR INTERNATIONAL INTERNSHIP

CONVENIO CEBE 2021 / CEBE 2021 AGREEMENT

I. HOST APPLICANT INFORMATION

This person is responsible for signing the Learning Agreement, amending it if needed, supervising the trainee during the traineeship and signing the Traineeship Certificate.

Department/Faculty. Institution	Experimental Soft Matter and Thermal Physics group (EST), Physics Department, Faculty of Sciences, Université Libre de Bruxelles				
Organization Type (see annex I)	EPLUS-EDU-HEI				
Public body	X YES <input type="checkbox"/> NO	Non-Profit	<input type="checkbox"/> YES <input type="checkbox"/> NO	Size	<input type="checkbox"/> < 250 employees X >250 employees
Address; website	Biointerfaces Lab (ulb.be)				

II. PROJECT DESCRIPTION

Description of the project that will be done by the student-trainee at the host institution.

Wished period for mobility ⁽¹⁾ : from (day/month/year) 15/09/2022.. to (day/month/year) .15/12/2022.....
1. Project title: Defect mediated lipid transfer
2. Number of working hours per week: 35

3. Detailed programme of the traineeship ⁽²⁾ (max. 300 words):

Understanding spontaneous protein-free lipid transfer is essential for elucidating the active role of lipids in biological processes such as Tcell signaling and related development of new generation of lipid-based immunotherapies. The majority of studies involving interbilayer interactions in the absence of proteins is devoted to transfer between lipid vesicles in bulk using fluorescently-based assays. Despite their relevance, scenarios including confined membrane systems mimicking adhered cells to other membranes or an extracellular matrix and membranes systems bearing defects are poorly explored experimentally and open questions remain to be addressed.

This traineeship will be framework on a larger project 'DELTA' that will contribute to the understanding of the role of lipid membrane defects in the pathways of interfacial interactions involving membrane adhesion, lipid transfer, and eventual fusion. It aims at establishing clear structure-function relationships, correlating local structural features to global lipid transfer kinetics by means of a combination of robust, label-free techniques.

The student will use a multi-scale approach combining complementary techniques quartz crystal microbalance (QCM-D) and atomic force microscopy (AFM).

Well-designed experiments will provide a more complete picture of lipid transfer mediated by membrane defects occurring at a global and local scale. Specifically, our proposed experimental approach will enable 1) decoupling the role of adhesion strength of the underlying surface on transfer involving confined lipid systems and 2) decoupling the role of topographical inhomogeneities and compositional heterogeneities in the transfer mechanism and kinetics of processes mimicking endocytosis.

4. Knowledge, skills and competences to be acquired by the end of the traineeship (expected Learning Outcomes)(max 100 words):

- During the stay abroad the student is expected to acquire fundamental knowledge on lipid membrane biophysics (structure, adhesion, mechanical properties and phase behavior)
- The student will become familiar with the use of characterization techniques: dynamic light scattering, quartz crystal microbalance with dissipation monitoring, atomic force microscopy, tensiometry (contact angle)
- Effective lab work (sample preparation, surface cleaning)
- Communication skills
- The student is expected to present his/her results in front of the group members during a seminar towards the end of his/her stay

5. Monitoring plan (max 100 words):

The student will be supervised by the principal investigator as well as by a postdoctoral researcher. Weekly meetings will be scheduled to assess the progress of the student and plan his/her following steps accordingly.

Weeks 1-2:

- Become familiar with the existing literatura in the subject (50% time)
- Become familiar with the experimental techniques to be used (40% time)
- Design of experiments to be carried out (10 % time)

Weeks 3-6:

- Sample preparation (10 % time)
- Experiment time (40 % time)
- Data analysis (40 % time)
- Discussion of results with PI and postdoc (10 % time)

Weeks 7-8:

- Prepare presentation and report
- Propose follow-up work

6. Evaluation plan (max 100 words):

The student will be evaluated based on four main criteria:

- Motivation, initiative, problem solving and lab skills (20 %)
- Fundamental understanding of the topic and creativity (30 %)
- Experimental work, data analysis (30 %)
- Communication skills in presenting his/her work (20 %)

7.a. Impacts and benefits of the traineeship to the host applicant (max 100 words):

The host applicant will benefit from different viewpoints

- The supervising team will gain experience in international student tutoring
- Once familiar with the research topic, the trainee is supposed to actively contribute to the research Project, which will help the supervising team achieve the research goals

- This traineeship can be an opportunity long term student exchange with the Spanish Universities participating in the program

7.b. Impacts and benefits of the traineeship to the trainee (max 100 words):

The student will have the opportunity to work in a new international environment with highly qualified researchers sharing knowledge, research questions and goals. Apart from the enriching life experience, the student will learn how to adapt to a daily work dynamics in a research lab and, if successful and relevant results are obtained during her/his stay, benefit from being part of scientific publications.

The student will become familiar with state-of-the art experimental techniques used in Materials Science: QCM-D, tensiometry and AFM, which will be useful if he/she decides to pursue an academic career or a career in the research and development sector.

III. STUDENT PROFILE AND REQUIREMENTS

This section refers to specific knowledge or expertise that the student/trainee must have in order to proceed successfully with the proposed project.

8. Research Area (see annex II):	
9. Is the host applicant / scientific supervisor willing to evaluate the project performance so that the student could validate the traineeship as ECTS credits (3):	<input type="checkbox"/> YES <input type="checkbox"/> NO
10. Student required expertise and technical knowledge: Basic knowledge in Materials Physics, Biophysics	
11. Level of studies: 4th Bachelor in Physics, Chemistry or Bioengineering	

1st or 2nd year Master in Materials Physics, Biophysics, Physical Chemistry or Bioengineering

12. Language: English

(4) The level of **language competence** in English (indicate here the main language of work that the trainee already has or agrees to acquire by the start of the mobility period is: A1 A2 B1 B2X C1 C2
Native speaker

13. Does the host institution require any other language besides the language of work?

YES NO

Which one?:

14. Does the host institution require any further paperwork done or any other relevant information to host a student/trainee (under the condition of this programme)

YES NO

14. A

If YES, please detail:

Learning agreement

IV. Consent to publish Traineeship Data.

I agree that my name, title of the project, its duration and the name of the Receiving Institution / Enterprise can be published on the CEBE website as awarded supervisor of the Traineeship Programme 2020.

(1) a) Related to UAM: A minimum of 2 months and up to 4 months (only the first 3 are funded). The planned period in this call should be between 1st of June 2020 and 30th of December of 2021. After the matching of host candidates with students and by mutual agreement between the two parties, the exact dates can be changed and the total stay could be prolonged up to 6 months; b) Related to UCLM: A minimum of 2 months and up to 4 months (all 4 months are funded). The estimated start date of the internship is 1st July and can be extended up to a total of 12 months.

(2) Consider that this must be read by the selection committee but also by the students, who will apply to the project.

(3) If NO, only students who will not validate the project as ECTS credits will be assigned for matching with this applicant. The application to validate the project as ECTS credits will come exclusively from the student.

(4) Level of language competence: a description of the European Language Levels (CEFR) is available at: <https://europass.cedefop.europa.eu/en/resources/european-language-levels-cefr>

Annex I: List of Organisation Types

CODE	Organisation type
EPLUS-EDU-HEI	Higher education institution (tertiary level)
EPLUS-EDU-GEN-PRE	School/Institute/Educational centre – General education (pre-primary level)
EPLUS-EDU-GEN-PRI	School/Institute/Educational centre – General education (primary level)
EPLUS-EDU-GEN-SEC	School/Institute/Educational centre – General education (secondary level)

EPLUS-EDU-VOC-SEC	School/Institute/Educational centre – Vocational Training (secondary level)
EPLUS-EDU-VOC-TER	School/Institute/Educational centre – Vocational Training (tertiary level)
EPLUS-EDU-ADULT	School/Institute/Educational centre – Adult education
EPLUS-BODY-PUB-NAT	National Public body
EPLUS-BODY-PUB-REG	Regional Public body
EPLUS-BODY-PUB-LOC	Local Public body
EPLUS-ENT-SME	Small and medium sized enterprise
EPLUS-ENT-LARGE	Large enterprise
EPLUS-NGO	Non-governmental organisation
EPLUS-FOUND	Foundation
EPLUS-SOCIAL	Social partner or other representative of working life
EPLUS-RES	Research Institute/Centre
EPLUS-YOUTH-COUNCIL	National Youth Council
EPLUS-ENGO	European NGO
EPLUS-NET-EU	EU-wide network
EPLUS-YOUTH-GROUP	Group of young people active in youth work
EPLUS-EURO-GROUP-COOP	European grouping of territorial cooperation
EPLUS-BODY-ACCRED	Accreditation, certification or qualification body
EPLUS-BODY-CONS	Counselling body
EPLUS-INTER	International organisation under public law
EPLUS-SPORT-PARTIAL	Organisation representing the sport sector
EPLUS-SPORT-FED	Sport federation
EPLUS-SPORT-LEAGUE	Sport league
EPLUS-SPORT-CLUB	Sport club

Annex II: Research Areas

Area of knowledge	University
Agricultural and agri-food engineering	Universidad Castilla La Mancha
Aerospace engineering	Universidad Castilla La mancha
Biochemistry	Universidad Autónoma de Madrid, Universidad Castilla La mancha
Biology	Universidad Autónoma de Madrid
Biomedical engineering	Universidad Castilla La Mancha
Chemical Engineering	Universidad Autónoma de Madrid, Universidad Castilla La mancha
Chemistry	Universidad Autónoma de Madrid, Universidad Castilla La mancha
Computer Engineering	Universidad Autónoma de Madrid, Universidad Castilla La mancha
Computer Engineering and Mathematics	Universidad Autónoma de Madrid
Electrical Engineering	Universidad Castilla La mancha
Environmental Sciences	Universidad Autónoma de Madrid, Universidad Castilla La mancha
Food Science and Technology	Universidad Autónoma de Madrid, Universidad Castilla La mancha
Forestry and environmental engineering	Universidad Castilla La mancha
Human nutrition and dietetics	Universidad Autónoma de Madrid
Industrial and automatic electronics engineering	Universidad Castilla La mancha
Mathematics	Universidad Autónoma de Madrid
Mechanical engineering	Universidad Castilla La mancha
Medicine	Universidad Castilla La mancha
Nursing	Universidad Castilla La mancha
Pharmacy	Universidad Castilla La mancha
Physics	Universidad Autónoma de Madrid
Physiotherapy	Universidad Castilla La mancha