



## CONVOCATORIA DE PRÁCTICAS INTERNACIONALES

### CONVENIO UCLM/CERFA 2022

#### PROYECTO 2

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

link

Organic Chemistry Institute

Heidelberg University

[https://www.uni-heidelberg.de/fakultaeten/chemgeo/oci/akblasco/index\\_Blasco.html](https://www.uni-heidelberg.de/fakultaeten/chemgeo/oci/akblasco/index_Blasco.html)

#### Título del Proyecto/ Project Title

Sustainable Materials for 3D printing

#### Perfil preferencial del estudiante

Master in chemistry or chemical engineering

#### Fechas orientativas/Available Dates

01.07.2022 to 30.09.2022

#### Programa/ Detailed program of the traineeship period (aprox. 100-200 palabras)

Three-dimensional (3D) printing, also known as additive-manufacturing, has attracted much attention not only in academia yet in industry in recent years. polymers are key materials for many 3D printing techniques. Polymers are key elements not only in our, also in 3D printing. However, the vast majority of the polymers are still derived from petrochemicals contributing negatively to the greenhouse effect and our fossil reserves. Recently, there has been a growing interest in utilizing renewable materials such as lignin-derivatives available from many trees and plants and vegetable oils and sugars as feedstock for printable polymer-based materials. In particular, we have successfully demonstrated the use of biobased inks based on five different vegetable oils, soybean, sunflower, canola, sesame and olive oil, which are very attractive as a feedstock due to their wide availability and low price. (1) The aim of this project is to continue exploring biobased materials suitable for 3D printing in order to ensure a sustainable process.

As a first step, the synthesis of biobased monomers suitable for 3D printing will be carried out. Second, the synthesized materials will be employed for the preparation of 3D structures via digital light processing and their stability and mechanical properties will be studied.

#### References:

[1] Vegetable Oils as Sustainable Inks for Additive Manufacturing: A Comparative Study. C. Vázquez-Martel, L. Becker, W. Liebig, P. Elsner, E. Blasco, *ACS Sustainable Chem. Eng.* **2021**, 15, 16840.

#### 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 project is ideal for engaging undergraduate students. The trainee will gain insights into research and scientific processes. In particular, he/she will improve the synthetic skills acquired during his/her studies and will learn how to use a wide variety of characterization techniques as well as the the interpretation of scientific data. Furthermore, he/she will become familiar with cutting edge 3D printing technologies, such as 3D laser lithography.



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

**Seguimiento/ Monitoring Plan (aprox. 50 palabras)**

The trainee will work closely in the lab with a more experienced scientist (PhD student or post-doc), who will guide him/her in the daily work. Individual meetings with the project leader (Eva Blasco) will be scheduled once per week to discuss the progress and plan the following steps (in addition to frequent informal discussions in the lab or office whenever needed). Furthermore, at the end of the stay the student will prepare a scientific report about his/her work in the lab, which will be corrected by the scientific supervisor and be part of the evaluation (see next point).

**Evaluación/ Evaluation plan (aprox. 50 palabras)**

For the evaluation of the trainee, the supervisor will take in account the progress of the student in the lab (synthetic skills, interpretation of the data, motivation, implementation of his/her own ideas,...) as well as the final report. In the final report, it is expected that the student will describe in detail all his/her work in the lab during the stay as well as a discussion of the results and outlook in a clear and scientific way. Communication skills and team working will be also assessed.

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

Language competence required: English B2, German can be useful but not absolutely necessary.

Background in chemistry (especially in organic chemistry) and materials science is desired

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

N/A

**Disponibilidad para evaluar informes de convalidación de créditos (Si/No) / Availability to evaluate credit convalidation reports (Yes / No)**

YES

**Otra información relevante / Any additional important information**

Además del soporte económico del Programa Erasmus+ Placement de la UCLM, los estudiantes recibirán el paquete de **Ayudas CERFA-Fundación Ramón Areces**. En la convocatoria 2022, éste se divide en dos conceptos:

- Ayuda económica en concepto de viaje: 400 euros
- Curso práctico destinado a ofrecer formación sobre gestión de carrera profesional

Toda la información aquí: <https://cerfa.de/ayudas-cerfa-fra/>