UNIVERSIDAD POLITÉCNICA DE MADRID

**Expression of Interest – UPM Supervisor**

# Marie Skłodowska Curie Action –Postdoctoral Fellowship 2023 (MSCA-PF-2023)

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| **Contact Person/Scientist in charge** | **Name** | Luis |
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| **Department /Institute /Centre** | **Name** | Center for Plant Biotechnology and Genomics (CBGP) |
| | **Address** | Campus Montegancedo, autovía M40, Km 36-38, 28223, Pozuelo |
| | **Province** | Madrid |
| **Research Area** | | Social Sciences and Humanities (SOC)<br>Economic Sciences (ECO)<br>Information Science and Engineering (ENG)<br>**Environment and Geoscience (ENV) X**<br>**Life Sciences (LIF) X**<br>Mathematics (MAT)<br>Physics (PHY)<br>Chemistry (CHE) |
| **Brief description of the Centre/Research Group** | | Our research group "Associations of symbiotic bacteria with plants" is led by Professor José M. Palacios. He has supervised 9 thesis and authored 63 articles in JCR journals, 33 of which are in Q1 in the JCR classification. The publications have collected more than1,200 citations, with an average of 50 citations / year in the last 5 years, and an h-index is 22. He has participated in 27 national and international research projects, being IP in 9 of them. Information of the group is in https://www.cbgp.upm.es/index.php/es/?option=com_content&view=article&id=15&x=1403<br>The group develops its scientific work in the Centre for Plant Biotechnology and Genomics (CBGP). The CBGP is a joint research centre between the Universidad Politécnica de Madrid (UPM) and the Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA/CSIC), located in Montegancedo Campus in Madrid. It has been awarded a new accreditation as Centre of Excellence Severo Ochoa 2022-2025.<br>The CBGP is an interdisciplinary research center focused on providing fundamental knowledge and solutions to achieve a more sustainable agricultural production and to improve food quality.<br>CBGP offers modern and fully equipped facilities to carry out state of the art research in plant molecular biology, plant-associated microorganisms and agronomic sciences, and provide an international environment to work ( www.cbgp.upm.es). |

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| **Project description** | The main research of the group is to study the adaptation mechanisms of Rhizobium to symbiosis with legume plants, a process of high environmental and agricultural importance and that significantly contributes to the sustainability of agroecosystems. Three specific objectives are pursued: i) analysis of rhizobial mechanisms of stress tolerance derived from energy limitations, metal acquisition, and competition in the rhizosphere; ii) identification of functions linked to rhizobial secretion systems (type III and type VI systems); and iii) generation of effective and competitive rhizobia inoculants.<br>Our working hypothesis is that differential sets of plant-dependent compounds/conditions control the activity of the bacteria in a host-specific way. The bacteria respond to these different conditions by expressing defined sets of proteins that contribute to its adaptation to the host. We are also interested in the role that rhizobial proteins (effectors) secreted through type III/type VI secretion systems that might have a role in the rhizosphere, on the establishment of effective symbiosis and on the definition of host range.<br>Preliminary data obtained from the comparison of the symbiosis with two hosts (pea and lentil) have allowed us to establish a catalog of more than 100 bacterial proteins differentially expressed in both hosts. These proteins include substrate transporters, transcriptional regulators, and stress response proteins (sHSPs, USPs) as well as different enzymes involved in bacterial C and N metabolism.<br>Analysis of type VI secretion systems indicates that mutants are compromised in symbiotic capacity and interbacterial competition. We are very interested in identifying the effectors in involved in these bacterial activities. |
| **Applications: documents to be submitted and deadlines** | Applicants should send a detailed curriculum vitae, a letter of motivation and at least two reference letters before the **30th of April 2023.** |