

· Contact Person/Scientist in charge (datos del IP del grupo de investigación o responsable científico)

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· Brief description of the Centre/Research Group (including URL if applicable)

Established in 1996, academic activities of the University began in the 1997/98 academic year. The Miguel Hernández University of Elche has 4 campuses (Elche, Sant Joan d'Alacant, Orihuela, and Altea) and 75 buildings whose total surface area covers 947,635 m². Its constructed surface area is 209,876 m². There are 16,000 full-time students and 24,500 alumni since the university's creation. The University has 7 faculties (Faculty of Fine Arts, Faculty of Experimental Sciences, Faculty of Social and Legal Sciences of Elche, Faculty of Social and Legal Sciences of Orihuela, Faculty of Health and Social Sciences, Faculty of Pharmacy and Faculty of Medicine) and 2 schools (School of Engineering of Elche and School of Engineering of Orihuela). Regarding academics, the Miguel Hernández University of Elche offers 25 bachelor's, 44 master's, and 16 doctoral programs. The International Relations Office advises foreign students and investigators about all matters related to their transfer to Spain and offers courses on official languages. All this to facilitate the social integration of researchers during their stay.

Our team from Universidad Miguel Hernández represents a teaching and research unit. We are experienced in teaching Genetics and in the utilization of a high variety of laboratory experimental techniques, comprising so diverse fields as Mendelian and Molecular Genetics, Genomics, Biochemistry, morphological analysis, etc. The group is particularly interested in the study of plant reproductive development, using the crucifer *Arabidopsis thaliana*, with special interest in the participation of post-transcriptional regulation of gene expression in these developmental processes.

In the last few years, we have characterized the *INCURVATA4 (ICU4)* gene. In collaboration with Dr. J.L. Micol, through the study of semidominant alleles (*icu4-1* and *icu4-2*), we showed that this gene regulated by miRNAs codes for the HD-Zip III family transcription factor ATHB15, and specifies adaxial identity in lateral organs, including leaves and pistils. We also have studied in our laboratory different strains bearing mutations modifying the Ful phenotype. One of them was identified as a null allele of *ASYMMETRIC LEAVES1 (AS1)*, whose role in gynoecium and fruit morphogenesis had not been analyzed previously. From our results, a model for the development of the medio-lateral axis of the fruit has been put forward. The model postulates the antagonism between valve and replum factors.

We have identified the *PEPPER (PEP)* gene, coding for a polypeptide with three RNA-binding KH motifs, highly conserved between dicots and monocots. Expression studies (RT-PCR, *in situ* hybridization and GUS staining) corroborated the presence of its transcript in all major organs, although particular effects were observed in the gynoecium, affecting the number of valves probably through the *CLV* pathway. Moreover, *PEP* affects pistil specification and determinacy through the *AG* pathway, and flowering time. *PEP* antagonizes its paralog gene *FLK*, operating in the autonomous pathway by decreasing transcript levels of *FLC*, a MADS-box

gene very similar structurally to AG. Our data support a role for PEP as a post-transcriptional regulator in cooperation with other RNA-binding proteins (HUA-PEP activity).

· Project description

UMH is searching for a top-class senior post-doctoral researcher interested in developing collaborative Marie Skłodowska Curie individual fellowship application to elucidate and dissect, using “state-of-the-art” genetic and molecular tools, the post-transcriptional mechanisms orchestrating reproductive development in the reference plant *Arabidopsis thaliana*.

The research team is currently focused on dissecting the roles of two sets of key post-transcriptional regulators (RBPs, RNA Binding Proteins; and small RNAs) and how these regulatory molecules sculpt gene regulation and, thus, development in coordination with the transcriptional gene regulation.

The incumbent will be fully involved in the following two aims:

- 1) The goal of the first aim is to identify the list of putative down-stream targets of a RBP post-transcriptional regulatory complex that the hosting team has identified recently (referred to as CPH) to be key in reproductive development, controlling splicing and mRNA maturation. To do it, the candidate will generate tagged versions of the two key members of the complex to generate the genome-wide binding map for these two proteins. The resulting data set will be then combined with the available profiling genome-wide data already generated by the hosting team to identify putative down-stream direct targets. The incumbent will be fully involved in the design of a set of molecular and genetic experiments to validate the results for the top 5 candidates obtained in this section.
- 2) In this second aim, the incumbent will be part of the research effort aimed at identifying additional partners of the CPH complex via genetic, molecular and biochemical approaches. Related to this is the fact that current members of the CPH complex have been recently found to interact with RBPs forming part of the core of the small RNA biogenesis/maturation pathway. The implication of the CPH complex in small RNA biogenesis will be dissected.
MicroRNAs are a class of small RNAs key in regulating gene expression post-transcriptionally. However, in spite of the surge of interest in the roles of miRNAs and RBPs, how they are transcriptionally controlled in developmental contexts, or how they interplay with the transcriptional layer are topics largely unexplored. One of the goals of this aim will be to initiate the steps for the identification of the upstream transcriptional architecture regulating RBP and miRNA gene expression.

· Research Area (en base a las 8 áreas científicas establecidas en MSCA. Se podrán seleccionar una o más áreas científicas por EOI) o Chemistry (CHE) o Social Sciences and Humanities (SOC) o Economic Sciences (ECO) o Information Science and Engineering (ENG) o Environmental Sciences and Geology (ENV) o Life Sciences (LIF) o Mathematics (MAT) o Physics (PHY)
Life Sciences (LIF)

· Applications: documents to be submitted and deadlines (documentación que los investigadores deberán enviar al centro para establecer el contacto: CV, cartas de referencia...)
Full CV, two reference letters, and motivation letter with indication of candidate's suitability