

Supervisor(s):

Renaud Dumas, renaud.dumas@cea.fr

Francois Parcy, francois.parcy@cea.fr

Host laboratory:

LPCV

Host group/team:

Flo_Re: Floral Regulators - Function, structure and evolution

Title of the M2 research internship:

Patterning the flower: analysis of the LEAFY-WUSCHEL interaction

Project summary:

The formation of flowers involves a transcriptional cascade that culminates with the development of four types of differentiated floral organs (sepals, petals, stamens and carpels). The master floral regulator LEAFY (LFY) is responsible for the patterning of the floral bud in different regions before they become the floral whorls. For this it acts with spatially localized cofactors including the F-Box protein UFO and the WUSCHEL (WUS) Homeodomain transcription factor (Lohmann et al. Cell 2001). We have recently unraveled the molecular mechanism underlying the interaction between LFY and UFO (Rieu et al. Nature Plants 2023) but the LFY-WUS synergy remains poorly understood. We have recent preliminary data pointing towards a novel interaction mode between LFY and WUS and the goal of the project will be to test these interactions in vitro, to search for the LFY-WUS binding site using genomic techniques and to compromise their interaction in planta (transgenic Arabidopsis or transient assay)

Keywords:

transcription factor, flower development

Relevant publications of the team:

The F-box protein UFO controls flower development by redirecting the master transcription factor LEAFY to new cis-elements P Rieu, L Turchi, E Thévenon, E Zarkadas, M Nanao, H Chahtane, et al. 2023 Nature Plants, 1-15

The intervening domain is required for DNA-binding and functional identity of plant MADS transcription factors X Lai, R Vega-Léon, V Hugouvieux, R Blanc-Mathieu, F van Der Wal, et al. Nature Communications 12 (1), 4760, 13, 2021

Cauliflower fractal forms arise from perturbations of floral gene networks E Azpeitia, G Tichtinsky, M Le Masson, A Serrano-Mislata, J Lucas, et al. Science 373 (6551), 192-197 2021