

INTERNSHIP PROPOSAL

Institute and Group: BIG, group LPCV

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Research project title: Harnessing the power of making flowers

5 Keywords to describe the project: Flower development, Inducible flowers, Transcription factors, Biotechnology, Ubiquitination

Description of the project (aims, experimental techniques, recommended background):

Flowering plants are the most successful group of plants. Flowers are the basis for fruits and seeds used for human and animal consumption. The architecture of the structure bearing the flowers (the inflorescence) has aesthetic importance, but also a strong influence on yield or harvest mode. Key regulators of floral development are known. Among them, the LEAFY (LFY) transcription factor stands out as THE cardinal actor orchestrating this process. However, as shown in many species, LFY activity highly depends on its physical interaction with the UFO protein, a subunit of an ubiquitin ligase complex. Strikingly, a variant of UFO is sufficient to trigger flower development onto the surface of leaves!! **The goal of the project is double: engineer an artificial regulator based on LFY and UFO to trigger flower development from any plant tissue and use this system to start understanding how LFY and ubiquitination pathways interact.** This project will require molecular biology to create the “flower-maker” construct, plant transformation and characterization and protein post-translational analysis.

Relevant publications of the team:

1. Denay, G., Chahtane, H., Tichtinsky, G. and Parcy, F*. **2017**. A flower is born: an update on Arabidopsis floral meristem formation. **Current Opinion in Plant Biology**. 35, 15–22.
2. Sayou, C., Monniaux, M., Nanao, M.H., Moyroud, E., Brockington, S.F., Thévenon, E., Chahtane, H., Warthmann, N., Melkonian, M., Zhang, Y., Wong, G.K.-S., Weigel, D., Parcy, F* and Dumas, R. **2014**. A promiscuous intermediate underlies the evolution of LEAFY DNA binding specificity. **Science** 343, 6171, 645–8.
3. Sayou, C., Nanao, M.H., Jamin, M., Posé, D., Thévenon, E., Grégoire, L., Tichtinsky, G., Denay, G., Ott, F., Peirats Llobet, M., Schmid, M., Dumas, R. and Parcy, F*. **2016**. A SAM oligomerization domain shapes the genomic binding landscape of the LEAFY transcription factor. **Nature communications**. 7,, 11222.