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Title of the M2 research internship:

Structure and evolution of molecular complex patterning the flowers

Project summary:

The LEAFY transcription factor is a master floral regulator in angiosperms. Its activity is required to trigger the formation of flowers and their patterning in concentric whorls of organs. The specification of whorls of petals and stamen requires the local induction of the so called B-genes. For this LFY acts in synergy with the F-Box protein called UFO. The general goal will be to study the structure and the function of this molecular complex (LFY-UFO-DNA) combining biochemistry, structural biology and plant genetics/genomics. We are also interested in the evolution of this complex and we will analyze whether it can also form using proteins from algae of mosses.

Keywords:

transcriptional complex, flower development, complex evolution

Relevant publications of the team:

Genome-wide binding of SEPALLATA3 and AGAMOUS complexes determined by sequential DNA-affinity purification sequencing. Lai X, Stigliani A, Lucas J, Hugouvieux V, Parcy F, Zubieta C. *Nucleic Acids Res.* 2020 Sep 25;48(17):9637-9648. doi: 10.1093/nar/gkaa729.

A network of transcriptional repressors modulates auxin responses. Truskina J, Han J, Chrysanthou E, Galvan-Ampudia CS, Lainé S, Brunoud G, Macé J, Bellows S, Legrand J, Bågman AM, Smit ME, Smetana O, Stigliani A, Porco S, Bennett MJ, Mähönen AP, Parcy F, Farcot E, Roudier F, Brady SM, Bishopp A, Vernoux T. *Nature.* 2021 Jan;589(7840):116-119. doi: 10.1038/s41586-020-2940-2. Epub 2020 Nov 18.

Contrasted evolutionary trajectories of plant transcription factors. Lai X, Chahtane H, Martin-Arevalillo R, Zubieta C, Parcy F. *Curr Opin Plant Biol.* 2020 Apr;54:101-107. doi: 10.1016/j.pbi.2020.03.002. Epub 2020 May 15.

The LEAFY floral regulator displays pioneer transcription factor properties. Xuelei Lai, Romain Blanc-Mathieu, Loïc GrandVuillemin, Ying Huang, Arnaud Stigliani, Jérémy Lucas, Emmanuel Thévenon, Jeanne Loue-Manifel, Hussein Daher, Eugenia Brun-Hernandez, Gilles Vachon, David Latrasse, Moussa Benhamed, Renaud Dumas, Chloe Zubieta, François Parcy doi: <https://doi.org/10.1101/2021.01.07.425699> In press at *Molecular Plant*