

**MASTERBIOSCIENCES
ECOLE NORMALE SUPERIEURE DE LYON**

*Offre de stage de Master / Master Internship offer
2017-2018*

Tuteur du stage et Laboratoire d'accueil / Internship supervisor and Host laboratory:

Host team and laboratory: Epigenetics, chromatin and development, Laboratoire de Reproduction et Développement des Plantes (<http://www.ens-lyon.fr/RDP>).

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Titre du projet de recherche / Research project title:

Functional dynamics of PRC2 activity in the shoot apical meristem

Keywords: Epigenetics, chromatin, Polycomb, stem cells, Arabidopsis

Description du projet / Project description:

How cell acquire and maintain their identity during development is a central question in biology. Whereas cell identity is largely dictated by the activity of specific transcription factors (TFs), the robustness of this state depends on the chromatin context in which these TFs act. Thus, the progression of a cell through successive differentiation stages, from stem cells to end-differentiated cells, is guided by changes in transcriptional programs that are regulated by the bidirectional interplay between TFs and chromatin organization.

In order to understand how the dynamics of the epigenome enable cells to respond selectively to developmental and environmental cues, we develop complementary approaches aimed at characterizing the impact of chromatin-based mechanisms and epigenetic processes on the regulation of cell differentiation within *Arabidopsis* apical meristems. A particular emphasis is put on the transcriptional switches orchestrated by Polycomb Repressive complexes (PRC).

During the internship, the trainee will participate in an integrated project of functional epigenomics that combines genetic (CRISPR-generated variants), live-imaging and cell type-specific epigenomic approaches. Specifically, the trainee will characterize the developmental and molecular consequences of bypassing PRC-based transcriptional repression at selected candidate genes and/or in specific meristem territories.

Publications du laboratoire / Lab publications (related to the topic)

- de Lucas M., Pu L., Turco G., Gaudinier A., Morao A. K., Harashima H., Kim D., Ron M., Sugimoto K., Roudier F. and Brady S. M. Transcriptional regulation of the Arabidopsis polycomb repressive complex 2 coordinates cell type proliferation and differentiation. The Plant Cell, In Press.
- Ikeuchi M., Iwase A., Rymen B., Harashima H., Shibata M., Ohnuma M., Breuer C., Morao A.K., de Lucas M., De Veylder L., Justin Goodrich J., Brady S. M., Roudier F. and Sugimoto K. 2015. PRC2 represses dedifferentiation of mature somatic cells in Arabidopsis. Nature Plants, 1 DOI: 10.1038/NPLANTS.2015.89.
- Marquès-Bueno M.M., Morao A.K., Cayrel A., Platre M., Barberon M., Caillieux E., Colot V., Jaillais Y., Roudier F. and Vert G. 2015. A versatile Multisite Gateway-compatible promoter and transgenic line collection for cell-type specific functional genomics in Arabidopsis. Plant J, 85, 320-333.
- Bouyer D., Roudier F., Heese M., Ellen D. Andersen E. D., Gey D., Nowack M. K., Goodrich J., Renou J-P., Grini P. E., Colot V. and Schnittger A. (2011). Polycomb Repressive Complex 2 controls the embryo to seedling phase transition. PLoS Genet. 7: e1002014.