Cell proliferation and chromatin dynamics during organ growth

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The transition to multicellularity required the evolution of novel structures and mechanisms to coordinate cell division, acquisition of cell fates and the establishment of complex regulatory networks. Organogenesis relies on the production of new cells together with the formation of organ domains and cell types directed by patterning genes. A fundamental question in cellular and developmental biology is to understand the coordination between cell patterning cues and cell division. The mechanisms linking the local activity of stem cell regulators with the cell cycle machinery and the control of division of stem cells and their derivatives remain largely unknown. We focus our studies on the root of the plant model Arabidopsis thaliana to understand how cell proliferation, transcriptional regulation, genome replication and epigenetic information are coordinated during root development. I will describe recent results in this line and discuss the complexity, larger than anticipated, in understanding root growth that depends on multiple layers of control.

Relevant references

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