

Webinar « Development and Adaptation »

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The role of cell layers during petunia petal development

Flowering plants' aerial organs are all organized in independent cell layers, derived from the meristematic L1, L2 and L3 layers. How these layers differentiate during organ development, and coordinate their growth to build up an organ with a functional and reproducible shape, stands unresolved. Here, we use the model species petunia that makes fused petals organized in a basal tube and distal pigmented limbs. We have isolated layer-specific mutants in the MADS-box gene *PhDEF*, encoding a major petal identity regulator. Strikingly, these flowers present very different phenotypes: flowers expressing *PhDEF* in their epidermis form proper limbs but their tube hardly grows, while flowers expressing *PhDEF* in their mesophyll form a proper tube but their limbs are very reduced and unpigmented. This reveals that the petunia petal has a modular architecture, whose development is driven by distinct cell layers. I will present the detailed characterization of these phenotypes and our recent results using this unique material, as well as the multiple questions that they raise on the role of cell layers in petal development.

