Organization of microtubules during lateral root development in Arabidopsis

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The *A. thaliana* root system consists on a primary root from which lateral roots branch. Lateral root primordia (LRP) originate from perycicle cells deep in the parental root. As these cells divide and originate a primordium, the adjacent overlying tissue, the endodermis needs to accommodate to the growth of the LRP and suffers a dramatic change of shape.

I focus in the role cortical microtubules dynamics in the endodermis and the perycicle during the development of LRP in Arabidopsis.

Previously to first cell division, perycicle cells swell transversally to the root axis. I observed that cortical microtubules in these cells reorient in parallel arrays following the direction of the swelling. In endodermal cells, when the LRP grows beneath, cortical microtubules form parallel arrays orient transversally to the root axis. After reorientation of microtubules, these endodermal cells undergo a strong loss of volume.

The katanin mutants, who fail to organize microtubules in parallel arrays, produce less number of LRP and cell division orientation is severely affected. In these mutants the endodermis remains stiff and as a consequence LRP shape is strongly affected and emergence is very delayed. This mutant phenotype suggest that microtubules organization is not only important for ensuring the correct division of perycicle cells but also for the spatial accommodation of the endodermis to the growth of the LRP.

In the katanin mutants, microtubule dynamics are affected in the perycicle and the endodermis and it is difficult to determine the particular contribution of microtubule dynamics in each tissue for the whole developmental process. To approach this question I created transgenic lines in which katanin expression is affected in a tissue specific manner. The LRP phenotype in these lines is currently being analysed.