EB1 links microtubule network organization and touch response in *Arabidopsis thaliana*.

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In plants cells, the fine-tuning of the microtubule network organization is crucial for multiple processes such as division and growth. However, the precise molecular mechanisms sustaining this overall microtubule array organization are not well understood. We question here the involvement of AtEB1a and AtEB1b, two of the three *Arabidopsis thaliana* orthologs of the +TIPs (plus-End-Tracking Proteins) EB1 (End-Binding 1), in the cortical microtubule network architecture. Unlike animals, precise functions and regulations of EB1 plant counterparts are still to be elucidated. We tackled the study of EB1 functions in elongating epidermal cells using chimeric lines of plants expressing GFP-fused tubulin in wild type or in double mutant background. Using confocal and TIRF microscopy, combined with anisotropy calculation of fibers distribution, we observed a significant disorganization of the MT network in the double mutant. Super-resolution STED microcopy, combined with an original image analysis process, revealed a marked decrease of MT bundling. Moreover, double mutated plants display significant defects in plant growth tropism, underlying the functional relationships between MTs and plant development. Altogether, our data suggest that EB1a and EB1b contribute both to the bundling and to the 3D organization of plant microtubules, the two events being possibly linked. We are currently investigating both cell wall architecture and cell mechanical properties in order to correlate the plant growth defect to the sub-cellular phenotype.