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What's new in Plant-Soil-Microbe Interactions

GRR VASI Végétal - Agronomie - Sols - Innovation

Do you know ...

that Christelle Leroux, a PhD student working on pollen germination and pollen tube growth in the Glyco-MEV laboratory has successfully completed her PhD program and presented her work (thesis defense) on September 7th, 2015 at the Faculty of Sciences and Technology, University of Rouen (Mont-Saint-Aignan, France).

Christelle Leroux has been awarded the PhD degree (mention très honorable et félicitations orales du jury).

Congratulations Christelle!

Abstract of the thesis work: Plants During plant sexual reproduction, pollen germination and pollen tube elongation in the pistil are essential for delivering the sperm cells to the ovule. Pollen grain is composed of two sperm cells and a vegetative cell limited, from the inside to the outside, by a plasma membrane, the intine and the exine. The degradation of the intine, composed of complex polysaccharides including homogalacturonans, is of main importance to insure a proper germination. Homogalacturonan (HG) is assumed to be synthesized under a methylesterified form in the Golgi apparatus before its secretion to the cell wall. De-methylesterification of HGs is catalyzed in the cell wall by Pectin Methylesterases (PMEs). Upon block-wise action of PME, the blocks of de-methylesterified HGs can interact with Ca^{2+} , promoting the formation of the so-called 'egg-box' structure and thus rigidifying the cell wall. Upon random action, the partially de-methylesterified HGs may become a target for pectin-degrading enzymes, such as polygalacturonases, affecting the texture and rigidify of the cell wall. Interestingly, 14 of the 66 Arabidopsis PMEs are specifically expressed in pollen grain and pollen tube.



We have analyzed the expression of these 14 PMEs by RT-PCR in dry pollen grains, during imbibition and pollen tube growth. The expression is gene- and time- dependent. Based on this, we have studied knock-out mutants PMEs (*ppme1*, *pme48* and *pme23*), under *in-vitro* and *in-vivo* conditions. These mutant lines present a strong delay in germination compared o the wild type and a remarkable phenotype with multiple pollen tube tips emerging from the pollen grain and an important bursting pollen tubes rate. The objective of this project was to clarify the role of PMEs and PMEIs during the regulation of dynamic properties during cell traffic and remodelling of the pollen grain cell wall during its germination and during the growing pollen tube cell wall.

See also her paper. [Leroux et al., 2015. Plant Physiol. 167: 367-380](#)

