

Séminaire de Biologie des Plantes

Les séminaires ont lieu sur le Campus Agro-M/INRA de La Gaillarde (2, place P. Viala Montpellier)

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Jeudi 7 février 2008

Amphi 208 (Cœur d'Ecole) à 14h00

Elizabeth A.H. Pilon-Smits

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(Chercheuse en séjour sabbatique -B&PMP)

Plant Selenium Metabolism: Genetic and Genomic Studies, Phytoremediation Applications and Ecological Implications

The element selenium (Se) is essential for many organisms but toxic at higher levels. Plants readily accumulate Se, and so-called hyperaccumulator species can even accumulate Se up to 1% of their dry weight. We aim to better understand plant mechanisms of Se tolerance and (hyper)accumulation, as well as ecological implications of plant Se accumulation. Since Se is thought to be taken up and metabolized like sulfur, various enzymes involved in sulfur metabolism were overexpressed in model species *Arabidopsis thaliana* and in crop species *Brassica juncea*. The resulting transgenics showed enhanced Se tolerance, accumulation and/or volatilization in lab and field studies, and thus may be useful for environmental cleanup of Se or as Se-fortified foods. To identify additional genes important for Se tolerance, we compared taxa that vary in Se tolerance and accumulation in *Arabidopsis* and in the related hyperaccumulator *Stanleya*, using a combination of genetic, genomic and biochemical approaches. From these studies JA and ethylene appear to play important roles in Se tolerance, via upregulation of genes involved in defense and in sulfur uptake and assimilation. This may result in less toxic replacement of S by Se in proteins, and higher levels of S-rich antioxidants. Ecological aspects of Se accumulation were investigated via lab and field studies. Se accumulation protected plants from a variety of invertebrate and vertebrate generalist herbivores, owing to both deterrence and toxicity. However, several potential specialist herbivores were found to be Se-tolerant and to accumulate substantial Se levels, perhaps forming a portal for Se into the local ecosystem.

Contact

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SEMINAIRES A VENIR :

Jeudi 14 février : Marinus Pilon

Jeudi 6 mars : Christian Fournier

Jeudi 13 mars : Stéphane Blanc

Jeudi 20 mars : Christophe Brugidou

Jeudi 27 mars : Alessandro Vital