

# Séminaire de Biologie des Plantes

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

Contact UMR B&PMP :

Sabine Zimmermann (zimmerma@supagro.inra.fr)

Marc Lepetit (lepetit@supagro.inra.fr.inra.fr)

Corinne Dasen (dasen@supagro.inra.fr)

Chantal Baracco (baracco@supagro.inra.fr)

Jeudi 23 octobre 2008  
**Amphi 208 (Cœur d'Ecole) à 14h00**

**Edith LAUGIER**

(Post-doctorante B&PMP - équipe *Intégration*)

## **The plastidial methionine sulfoxide reductases B from *Arabidopsis thaliana*: biochemical characterization and physiological functions.**

Plants are frequently exposed to abiotic constraints inducing metabolic changes at the expense of growth. The chloroplast, where photosynthesis takes place, is particularly subjected to metabolic disruption resulting in oxidative damage in macromolecules. In proteins, sulphur-containing residues like methionine (Met), are the most sensitive to oxidative lesions. Met oxidation to methionine sulfoxide (MetSO) is reversed by two types of methionine sulfoxide reductases (MSRs), A and B, specific to S- and R-enantiomers, respectively.

Using a biochemical approach, we identified the reductants for the two plastidial MSRB1 and MSRB2 enzymes. Compared to other organisms, plants display numerous thioredoxins (Trxs) and glutaredoxins (Grxs) that are likely to play this function.. We found that MSRB1 and MSRB2 possess distinct electron donors among the various types of Trxs and Grxs.

To assess the physiological role of plastidial MSRBs, we characterized *Arabidopsis* mutant lines knockout for one gene or both of them, and lines overexpressing *MSRB1* or *MSRB2*. Knockout and overexpressing plants display significantly decreased and increased MSR activities, respectively. No phenotype was noticed for all plant types under optimal growing conditions. Under high light or low temperature treatments, plants knockout for both *MSRB1* and *MSRB2* exhibit a substantial delay in growth. These data show the importance of the repair mechanisms of oxidized Met in the plant responses to environmental constraints.

Contact :

Marc Lepetit

Équipe *Intégration*  
Institut de Biologie Intégrative des Plantes  
Laboratoire de Biochimie et Physiologie Moléculaire des Plantes  
Agro-M/INRA/CNRS/UM2 UMR 5004  
2, Place Viala  
F-34 060 Montpellier Cedex 1  
FRANCE

[lepetit@supagro.inra.fr](mailto:lepetit@supagro.inra.fr)

Phone: + 33 (0)4 99 61 29.37

Fax : + 33 (0)4 67 52 57 37

#### SEMINAIRES A VENIR

Jeudi 27 novembre : François-Yves Bouget

Jeudi 4 décembre : Daniel Wipf

Jeudi 11 décembre : Valérie Gaudin

Vendredi 29 décembre : Nico v Wiren