ABSTRACTS - Session I: Plant and Environment

PI27

THYLAKOID PROTEIN PHOSPHORYLATION: IMPACTS ON SHORT- AND LONG-TERM ACCLIMATION OF PHOTOSYNTHESIS

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Thylakoid, Phosphorylation, Acclimation.

Changes in the reversible phosphorylation of thylakoid proteins is observed in response to different environmental conditions. These differential changes in protein phosphorylation are implicated in a number of regulatory and adaptative responses of the photosynthetic apparatus. In the short term, phosphorylation of light-harvesting (LHCII) proteins is associated with the redistribution of excitation energy (state transitions) between the photosystems. In the long term, imbalances in energy distribution between the photosystems are counteracted by adjusting photosystem stoichiometry, changing the accumulation of reaction centre and light harvesting proteins. Recent data obtained from studies on Arabidopsis indicate that both short- and long-term processes involve the plastoquinone-mediated redox activation of the STN7 kinase. Mutant plants depleted of the STN7 kinase, indeed, do not show any relocation of antenna proteins and readjustment of photosystem stoichiometry when illuminated with PSII or PSI preferentially absorbed lights.

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DOES MTN5 PLAY A DOUBLE ROLE IN ROOT RESPONSES TO SYMBIONTIC AND PATHOGENIC MICROORGANISMS?

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Lipid transfer protein, rhizobia, symbiosis, pathogen response.

MtN5, a new Lipid Transfer Protein, has been identified in nodulated roots of *Medicago truncatula* and preliminarily classified as early nodulin, which is expressed in response to rhizobial symbiosis. We have shown that the recombinant MtN5 exerts antifungal and antimicrobial activity in vitro against *Fusarium semitectum* and *Rhizobium leguminosarum*, respectively. In vivo, the fungal infection leads to the expression of MtN5 in the whole root apparatus of *M. truncatula* plants, whereas the inoculation with rhizobia induces an early and nodule-specific expression of the protein, that is also maintained in mature nodules. These two different expression patterns suggest a putative double role for MtN5, which could be involved both in a general response mechanism against fungi and in sensing or controlling the infection of the symbiont. This last hypothesis is supported by the observation that *M.truncatula* roots transformed with an hairpin construct aiming to silence endogenous MtN5, are impaired in nodule formation respect to control roots. Therefore, MtN5 is hereby proposed as a novel, multifunctional protein taking part in the symbiotic process.