Séminaire Biologie des Plantes

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

Contact IBIP :

Sabine Zimmermann (zimmerma@supagro.inra.fr)
Philippe Nacry (nacry@supagro.inra.fr)
Christine Granier (granier@supagro.inra.fr)
Chantal Baracco (baracco@ supagro.inra.fr)

Jeudi 24 novembre 2011
Amphi 2 (A gauche du bâtiment Administratif) à 14h00

Sandrine Ruffel
($B_{\&}$PMP- Equipe *Intégration*)

Signaling mechanisms controlling root development and nitrogen metabolism in response to heterogeneous NO_3^- availability in *Arabidopsis*.

For all living organisms, the capacity to sense and adapt to environmental change is one of the foremost challenges for survival and propagation. The short-term adaptation of the physiology and development to external fluctuations is even more critical for sessile organisms like plants, giving a particular interest to network signaling controlling these mechanisms. Belowground, root plasticity is primordial to optimize water and nutrient acquisition and depends on the integration of local and systemic signaling. Indeed, it is well established that roots have the ability to sense and proliferate in nutrient-rich zones (local signal) and invest more of these resources in roots when the internal nutrient availability is limited (systemic signal). One major challenge remains to understand how plants coordinate this nutrient signaling network in the infinite scenario that they may encounter.
At the Center for Genomics and Systems Biology of New York University (Gloria Coruzzi group), I focused on signaling mechanism controlling root development and nitrogen metabolism in response to contrasted NO_3^- environments, in *Arabidopsis*.
In the main project, I used the split-root system (in which physically isolated root systems of the same plant were challenged with different environments) as the experimental framework to characterize developmental and transcriptomic responses to nitrogen-related signaling in roots. The split-root conditions highlighted plants ability to integrate information from isolated appendages and tune their molecular and developmental strategies to heterogeneous environments. I will present how I showed

that cytokinin signaling forms one critical component of root-shoot-root communication in this system.
In parallel, I mined and integrated the transcriptomic data using the bioinformatic tool that has been developed by G. Coruzzi lab (*i.e.*, VirtualPlant; Katari et al., 2010, Plant Physiology, 152: 500-515). This approach allowed me to built genes network and identified 2 transcription factors (TFs) as potentially key regulators of the gene responses in the split-root plants.

Contact :

Sandrine Ruffel
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

sandrine.ruffel@supagro.inra.fr
Phone: + 33 (0)4 99 61 26.04
Fax : + 33 (0)4 67 52 57 37
http://www1.montpellier.inra.fr/ibip/bpmp/equipes/integration.htm