

Séminaire de 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 (philippe.nacry@supagro.inra.fr)

Christine Granier (granier@supagro.inra.fr)

Corinne Dasen (dasen@supagro.inra.fr)

Chantal Baracco (baracco@supagro.inra.fr)

Jeudi 09 décembre 2010
Amphi 208 (Cœur d'Ecole) à 14 h00

Alex Costa

(Dipartimento di Biologia, Università degli Studi di Padova, Padova, Italie)

New strategies for imaging of Ca^{2+} and H_2O_2 in different subcellular compartments of plant cells

In order to gain insight into the roles played by Ca^{2+} and H_2O_2 in plant cells, it is necessary to have reliable, specific and non-invasive methodologies for their *in vivo* detection. In the last years a great development of new tools for the detection of such molecules has taking place. In particular new genetically-encoded probes for Ca^{2+} (Cameleons) and H_2O_2 (HyPer) have been developed.

Oxidative stress is a major challenge for all cells living in an oxygen-based world. Among reactive oxygen species, H_2O_2 , is a well known toxic molecule and, nowadays, considered a specific component of several signalling pathways. Hence, the genetically-encoded H_2O_2 sensor HyPer was expressed in plant cells in different subcellular compartments. We demonstrated that the induction of cytoplasmic Ca^{2+} increase is followed by Ca^{2+} rise in the peroxisomal lumen. The analyses of HyPer fluorescence ratios were performed in leaf peroxisomes of tobacco and pre- and post-bolting Arabidopsis plants. These analyses allowed us to demonstrate that an intraperoxisomal Ca^{2+} rise *in vivo* stimulates catalase activity, increasing peroxisomal H_2O_2 scavenging efficiency.

Ca^{2+} is a versatile second messenger involved in the control of a variety of physiological and pathological cellular processes. The use of genetically encoded Ca^{2+} indicators (e.g Cameleon) has greatly contributed to the study of Ca^{2+} handling in plant cells. Compared with mammalian cells, where a large set of data have been produced

regarding the Ca^{2+} dynamics in different subcellular compartments, in plant cells there is still a poor comprehension of the role/s played by the organelles in the shaping of intracellular Ca^{2+} signals. Here the use of a new generation of Cameleon probes targeted to peroxisomes and mitochondria of plant cells will be presented.

Contact :

Tou-Cheu Xiong

Équipe *Signalisation électrique et calcique*

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

xiong@supagro.inra.fr

Phone: + 33 (0)4 99 61 27 11

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

<http://www1.montpellier.inra.fr/ibip/bpmp/equipes/signalisation.htm>

Séminaires prévus pour 2011:

Janvier

Catherine Perrot-Rechenmann (contact Cathy Curie curie@supagro.inra.fr)

Joe Morrissey (contact Alicia Sivitz alicia.sivitz@supagro.inra.fr)

Bertrand Muller (contact Christine granier granier@supagro.inra.fr)