Séminaire de Biologie des Plantes

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

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ATTENTION JOUR ET HORAIRE INHABITUELS

Mercredi 03 mars 2010
Amphi 206 (Cœur d'Ecole) à 12h00

Dr. Claude M. Fauquet
(Director ILTAB, Member Danforth Plant Science Center)

Better Food for a Better World
Modern tools for genetic improvement are now available for cassava, the poor farmer's crop

The first successful attempt to genetically transform cassava dates from 1995, but it took us another 10 years to be able to routinely insert genes into this root crop. Today, genetic transformation of cassava is routine at ILTAB and we produce more than 1500 independent transformation events per year. We have developed a cassava transformation pipeline producing high quality transgenic plants, with a single insert, no vector backbone, high expression levels and normal phenotype. Recently ILTAB managed to transform a number of African farmer's preferred cultivars, allowing biotechnology improvement. Furthermore, to stack up different traits in the same cultivar, ILTAB succeeded in expressing up to 5 genes in the same plant, with very high level of efficacy and expression. Future improvement of cassava, via molecular breeding, will need new technologies, currently tested, such as a mini chromosome and the zinc finger technology in order to integrate and express dozens or hundreds of genes.
Our major program is about controlling cassava viruses in Africa, namely the cassava mosaic disease and the cassava brown streak disease. We now have plants that are resistant to these different viruses, using two strategies and we are bulking up the six genes in the same plant. In addition, ILTAB is improving the nutritional value of cassava

by increasing the protein content of the roots. We have developed a technology to express any type of protein in cassava roots and it is possible to have cassava roots with more than 12% dry weight proteins. We are now studying the possibility to store even higher protein levels manipulating the nitrogen, the cyanide and the provitaminA pathways, regularly using the euphorbiaceae microarray.
The first cassava genome sequencing draft is completed and is public for the benefit of the whole cassava community. Cassava gene homologs to other crops and model plants can be retrieved to study important traits such as virus and bacterial resistance, drought resistance, response to nutrients and elevated CO2 concentrations. An additional 100 cassava sequences will be generated in the coming 12 months to produce a very high density SNP map. This map will be turn into useful tools for the cassava breeders of the world. The genome sequence will also permit to produce a specific cassava microarray and to develop new technologies for cassava such as proteomics and metabolomics, site directed transgenesis and minichromosomes.
By filling the biotechnology gap, cassava is now in a position to benefit from scientific advancements made by the whole plant research community and translational improvements can easily be envisaged in the near future to better feed the world.

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Séminaires à venir :

Jeudi 11 mars : Manuel Nieves Cordones (post-docorant $B_{\&}$PMP équipe *Canaux ioniques*)
Jeudi 18 mars : Anne KRAPP, INRA Versailles, contact Marc Lepetit