DNA methylation in poplar: genetic variability and phenotypic plasticity

Grant: Public < 25 K€ / year, 3 years
Place: University Orléans – France
Laboratory: Wood Biology and crop plants (http://www.univ-orleans.fr/lblgc/)
Domain: Molecular biology and epigenetic
Application date: 30/04/2013
Mentors: Prof S. Maury (http://www.univ-orleans.fr/lblgc/stephane-maury) and Prof F. Brignolas (http://www.univ-orleans.fr/lblgc/franck-brignolas)

Thematic and objective of the work:
Predicted climate changes and particularly drought represent a major threat to forest health. Therefore, understanding mechanisms that control trees response to variations in water availability is of great interest. These last years, epigenetic marks such as DNA methylation have been involved in plant phenotypic plasticity in response to environmental stresses. In this context, this work aimed at assessing the role of shoot apical meristem cells DNA methylation in the shoot developmental plasticity towards variations in water availability in poplar, a model tree. The impact of variations in water availability or different pedoclimatic context on shoot apex DNA methylation in different hybrids (P. × euramericana) or P. nigra will be studied. Loci and gene networks affected by DNA methylation and expression changes will be characterized. Different approaches using MethylDNA immunoprecipitation (MeDIP), methylation microarray, next generation sequencing will be apply.

Keywords: chromatin, DNA methylation, drought, epigenetics, gene expression, genotypic variability, morphogenesis, poplar, phenotypic plasticity, shoot apical meristem, water availability

Profile of candidate:
Candidate should have validated a master degree in plant Sciences and have a basic knowledge in molecular biology concepts and methods (PCR, cloning…). Abilities in bioinformatics or epigenetics are welcome. Candidate should send CV, motivation letter and the results of their master exams before 30/04/2013 by email to stephane.maury@univ-orleans.fr

Few references: