**Isolation and knockout of *Physcomitrella patens* histidine kinase genes homologous to *AtCre1***

F. Brun¹, F. Nogué², M. Laloue¹ and M. Gonneau¹

1 Laboratoire de Biologie Cellulaire,
2 Laboratoire de Génétique et Amélioration des Plantes,
INRA Versailles, Route de Saint-Cyr, 78026 Versailles-Cedex, France.
Contact e-mail gonneau@versailles.inra.fr,

Recent studies have demonstrated that cytokinin signaling involves a multistep two-component signaling pathway and that hybrid histidine protein kinases (AHKs/CRE) serve as cytokinin receptors in *Arabidopsis thaliana* (Inoue *et al.*, *Nature* 2001). In *P. patens*, cytokinins control the critical developmental stage of bud formation on protonema filaments and development to the leafy gametophores. These properties and the ease of gene replacement make *P. patens* a highly attractive model to study cytokinin mechanism of action, at the cellular and molecular level, and prompted us to look for *AtCre1* homologous genes. Using degenerate oligonucleotides designed from *AHK4* and other *AHK* plant homologs, we identified two *P. patens* *AHK* homologs (*PpCRE1* and *PpCRE2*) and full length cDNAs have been cloned. We obtained knockout transformants for these genes using corresponding genomic DNA fragments, interrupted by a positive selection marker. The molecular characterization of the knockout plants will be presented and their developmental phenotype in response to cytokinin will be discussed.