

Isolation and knockout of the MSH2 gene in *Physcomitrella patens*

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In the moss *Physcomitrella patens*, integrative transformants from homologous recombination are obtained at an efficiency comparable to that found for yeast. This property, unique in the plant kingdom, allows the knockout of specific genes. It also makes the moss a relevant model to study homologous recombination in plants. We previously isolated the *P. patens* MSH2 (PpMSH2) cDNA (Brun *et al.* , 2001). In eukaryotes the MSH2 protein play a critical role in homologous recombination and in the detection of mismatch between sequences. Here we describe the characterisation of the PpMSH2 gene and its knockout. The molecular characterisation of the knockout transformants will be presented. The ability of the PpmsH2 mutants to perform homologous recombination will be tested. For this purpose we are using a construct containing a partial APT (adenine phosphoribosyl transferase) gene disrupted by a dominant marker (neomycin) as a reporter of the targeting efficiency. *Apt* disruptants can be identified by growth on 2-fluoroadenine (2-FA), a toxic compound for wild-type mosses. Targeted integration frequency can be measure by number of 2-FA resistant colony versus neomycin resistant colony. In second time, and in order to test the role of PpMSH2 in homologous recombination, we will use a mutated version of the APT construct showing mismatch with the resident APT gene.