

Targeting of a *Physcomitrella patens* Rop gene

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Abstract:

Replacement targeting vectors of a low copy number *Physcomitrella patens* sequence showing homology to the *Arabidopsis thaliana* Rop gene sub-family were constructed. Linear DNA fragments were transformed into *P. patens* to elucidate the target gene function. Rop, a plant specific Rho-GTPase, activity has been indicated to correlate with tip growth, cell polarity, actin cytoskeleton, pathogen defence, secondary cell wall formation and meristem signaling. The signaling pathways have not yet been elucidated. Studies of the Rop1Ps and Rop1At indicated that Rop-GTPases act as a central switch for the polar out growth of pollen tubes by coupling spatial control with temporal control (Zeng & Yang, 2000; Li, *et. al.*, 1998). Tip-localized calcium signaling act downstream of Rop to activate tip growth and is controlled by the negative feedback loop in which components include Rop-GTPases activating proteins (RopGAPs) and the putative Rop-GTPase effector Phosphatidylinositol monophosphate kinase (PtdInsPkinase). The formation of pollen tip-focused calcium gradient and the tip-localized calcium influx may therefore be regulated through the Rop-Ins(1,4,5)P₃-Ca²⁺ model by hydrolysis of the PtdInsPkinase and the localized PtdIns(4,5)P₂ to Ins(1,4,5)P₃ (Zheng & Yang, 2000; Li, *et. al.*, 1999; Aspenstrom, 1999).

PCR analysis of a group of randomly selected mutants revealed 3 types of targeting incidence occurred at the targeting locus. The phototropic response of the group to the white light direction at all different light intensities is similar to the wild-type strain. However, only in the protonemal filaments of the targeted lines have abnormal shaped chloroplasts when cultures were treated with 2.1 mW/m² white light. Analysis of the lipid profile in the *P. patens* mutants would be discussed.

References:

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