

Cloning and targeted disruption of two genes encoding Snf1-related protein kinases in the moss *Physcomitrella patens*

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The Snf1 protein kinase is a key regulator of the energy and carbon metabolism in fungi. In animals, the homologous AMP activated protein kinase, AMPK, plays a similar role. In plants, there are three subfamilies of Snf1-related kinases. The members of one such subfamily, the SnRK1 kinases, are particularly closely related to Snf1 and AMPK, and are therefore thought to have a similar function. We have cloned two highly similar genes, *PpSNF1a* and *PpSNF1b*, that encode Snf1-related kinases of the SnRK1 type in the moss, *Physcomitrella patens*. Both genes have 9 introns that are perfectly conserved in position, when compared to homologous genes from *Arabidopsis*. They encode proteins of 242 and 245 amino acid residues respectively.

We found that both genes are constitutively expressed at a low level in chloronemal tissue. The *PpSNF1a* and *PpSNF1b* cDNAs can both complement a *snf1* deletion and suppress a *snf4* deletion in yeast. Furthermore both encoded proteins appear to be negatively regulated by their C-terminal domains similar to the yeast Snf1 kinase. Both genes have been deleted using targeted gene disruptions and in the case of *PpSNF1a*, a limited growth phenotype was observed. Construction of a double knock-out mutant strain is in progress and we hope to describe the associated phenotypes if it is viable.