

The use of the heat-inducible promoter to modulate gene expression in *P. patens*

Younousse Saidi, Andrija Finka, Didier Schaefer, Jean-Pierre Zryd and Pierre Goloubinoff

Department of Plant molecular Biology, UNIL 1015 Lausanne, Switzerland.

Younousse.Saidi@unil.ch

We have previously developed a heat-inducible expression system in *Physcomitrella patens* based on an *hsp* promoter (Saidi et al. 2005 PMB). We present here recent data showing the use of the *hsp17.3B* promoter as a powerful modulator of gene expression.

By performing daily cycles of one hour heat-induction and 23 hours recovery, we maintained a constant “constitutive-like” expression of two reporter genes during one week. The expression of these genes could be switched off by transferring moss plants to 22°C non inducing temperature. The one week constitutive-like expression could be either weaker or stronger depending on the intensity of the heat shock applied. This tight modulation would allow to correlate protein amounts with phenotypes and to avoid dominant negative effects related to the uncontrolled constitutive expression.

Additionally, we demonstrated that the induction of the *hsp17.3B* promoter is also possible at non inducing temperatures by addition of chemicals that induce the heat shock response. We confirmed thus that these chemicals operate in plants through the same pathway as in mammalian cells. We will show that this alternative is suitable to modulate gene expression when heat treatment should be avoided.