Search for genes involved in abiotic stress tolerance in *Physcomitrella patens*.

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Drought tolerance was an ancient adaptation that must be considered to have played an essential role in colonization of the terrestrial environment. The most primitive of extant land plants, the bryophytes may provide resources as to how this adaptation was achieved. *Physcomitrella patens*, the model bryophyte, is highly tolerant to dehydration, salinity, low temperature and oxidative stress, and thus also a model for stress tolerance. *Physcomitrella* is also unusual in that it is the only land plant in which reverse genetics analysis is feasible.
Our objective is to better understand drought and salt stress tolerance in *Physcomitrella* so as to generate tools for increasing abiotic stress tolerance in crops. We studied the functional importance of several *Physcomitrella* genes implicated in abiotic stress tolerance, most of them identified by a *Suppression Subtractive Hybridization* library induced by the hormone abscisic acid and osmotic stress, created in our lab. We carried out functional studies of genes encoding two dehydrins (PpDHNA and PpDHNB), a small heat shock protein of 16.4 KDa (PpHSP16.4), and a protein that belong to WCOR413 family of proteins called PpCOR413. Results will be shown on the production of knockout mutants in *Physcomitrella plants*, overexpression of the same genes in *Arabidopsis*, and the subcellular localization of this proteins in tobacco protoplasts as well as in Arabidopsis stable transgenic lines overexpressing GFP fusions with the candidate genes.