T13: The role of ARPC4 in the morphogenesis of *Physcomitrella patens*

Pierre-François Perroud and Ralph S. Quatrano

Washington University in St Louis, Dept of Biology, Campus Box 1229, One Brookings Drive, St Louis, MO, 63130, USA

E-mail: perroud@biology2.wustl.edu

Although the Arp2/3 complex has not yet been isolated from plants, recent publications show that close homologues of the seven subunits of the complex are present in the genome of *Arabidopsis thaliana*. In this organism, the disruptions of Arp2, Arp3 and ARPC5 lead to defects of cell elongation and have been linked to a disorganization of the actin cytoskeleton. In order to better understand the function of the Arp2/3 complex in plants, we decided to make use of two important features available in the moss *Physcomitrella patens*. First, the morphology of this moss permits us to easily identify any morphological change in plant cell under two distinct structures: a simple two dimensional alignment of cells in the case of protonema and a three dimensional organization of tissue in the case of the gametophore. Secondly, efficient homologous recombination makes *P. patens* a powerful tool for reverse genetics.

We present here a short molecular characterization of *Pp*-ARPC4, the homologue of ARPC4 in the moss. The deduced amino acid sequence is very close to plant and animal ARPC4. Southern analysis shows *Pp*-ARPC4 to be unique in *P. patens*, as observed in many other organisms. The full deletion of this gene in *P. patens* is presented. Interestingly, the plant is perfectly viable, but presents two major defects. First, protonemal cells, well differentiated in the wild type in chloronema and caulonema, turn into a single cell type, smaller in length in the knock out. In this tissue, cells seem to fail to elongate correctly. The second defect is linked to meiosis. Sexual organ formation and fertilization in the knockout lead to a sporophyte comparable to WT, but spores fail to germinate correctly (<1% germination) and the rare colonies issued from these spores present strong defects in cell division and a variable growth.