T8: The role of arabinogalactan proteins in protonemal tip growth of *Physcomitrella patens*.

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Our work focuses on arabinogalactan proteins (AGPs), a large and heterogeneous family of extracellular proteoglycans implicated in plant cell extension. Through the use of monoclonal antibodies and synthetic inhibitors or AGP function we have demonstrated that AGPs play a key role in protonemal tip extension in *Physcomitrella*. In summary, AGPs have been immuno-detected at the cell wall surface of protonemal filament apices; AGP binding inhibitors block tip extension and growing filaments specifically secrete AGPs. Our current hypothesis is that AGPs are abundant on all plasma membranes but it is their specific cleavage at the apex of the protonemal filament that is a key event in coordinated cell wall assembly and cell extension.

In silico analysis of the public *Physcomitrella patens* Expressed Sequence Tag database (PEP, URL: www.moss.leeds.ac.uk) using all known AGP core peptide sequences from Genbank lead to the identification of the first candidate AGP in *Physcomitrella* which we named PpAGP1. Following this discovery, another 5 putative AGP sequences were identified in the database.

We currently have a collaboration with Professor Ralph Quatrano and Dr. Yoichi Sakata (Washington University in St. Louis) to elucidate the function of PpAGP1. Dr Sakata has designed and made an AGP1:GFP construct which we have used to transform *Physomitrella.* Analysis of the transgenic lines is underway and early results show that AGP1:GFP is located on the plasma membrane.

We have also purified AGPs from *Physcomitrella* protonema and are currently sequencing the core peptides. This work is a collaborative effort with Professor Anthony Bacic (University of Melbourne, Australia).

The final stages of this project will involve the use of further GFP constructs and also knock-out vectors to explore the precise function of AGPs within the cell wall in protonemal tip growth.