Characterization of a novel cytolysin, physcomitrin, from the moss *Physcomitrella patens*

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We have identified and isolated a novel plant cytolysin, physcomitrin, from gametophore tissued of the moss *Physcomitrella patens* by comparative proteomic analysis. The full-length cDNA of physcomitrin was 884 bp and contained an ORF encoding a protein of 178 amino acids. The physcomitrin protein has a predicted molecular mass of 20.5 kDa with a pI of 4.91. Physcomitrin, with typical characteristics of cytolysin group-II proteins, including the presence of conserved motif (WYSNWWN) that has been found in all known cytolysin proteins family. Northern blot analysis confirmed that physcomitrin is up-regulated transcriptionally only in gametophore tissue. Southern and genomic sequence analyses suggested that physcomitrin is a single-copy gene containing three introns. Both recombinant physcomitrin and crude extracts from gametophores but not those from protonemal crude extracts exhibited hemolytic activity against pig red blood cells. Subcellular localization analysis using green fluorescent protein fused physcomitrin confirmed the expression into the cytosol. Treatment of plant with abscisic acid, mannitol or NaCl additionally elevated *Physcomitrin* levels, suggesting that *Physcomitrin* is sensitive to ABA and general osmotic stress. The biological functions of physcomitrin are currently investigating through its over-expression and knock-down plant in the moss P.patens.

Fig. 1
Identification of physcomitrin
By comparative 2-DE analysis.