Protein Prenylation in the moss Physcomitrium patens

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Protein Prenylation in the Moss *Physcomitrium patens*

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**ABSTRACT**

Protein prenylation is the addition of a 15 or 20 carbon lipid to a cysteine near carboxyl terminus of target proteins. Prenylation increases hydrophobicity, which facilitates membrane associations and protein-protein interaction. Protein prenylation is generally conserved among eukaryotes, and mutations in genes that carry out prenylation are lethal in animals and yeast. In plants prenylation mutations are not always lethal, but they do affect development, disease resistance, biofuel production, and drought response, among other processes of agricultural interest. To understand the evolutionary and developmental implications of plant protein prenylation, we used the sequenced, annotated, and translated genome of the moss *Physcomitrium patens* to search for proteins that meet minimal criteria for prenylation; specifically the presence of a sequence that includes cysteine and one of six specific amino acids at the C terminus. We then analyzed these proteins with an online prenylation prediction program to assess their likelihood of being prenylated based on additional sequence motifs. Although the number of prenylated proteins has not been confirmed, we estimate that there are 300. We then determined potential biological function of putative target proteins by using BLAST sequence similarity searches to identify related genes with known function. We plan to use these data to select prenylated proteins with functions of interest for *in vivo* studies using genetic and molecular tools to investigate their roles in plant development and environmental response.

**REFERENCES**

[http://www.jbc.org/cgi/doi/10.1074/jbc.M115.673491](http://www.jbc.org/cgi/doi/10.1074/jbc.M115.673491)