

P7: Chloroplast Protein Transport in *Physcomitrella patens*: Toc64 Targeting

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Most proteins that reside in the chloroplast are encoded in the nucleus as precursors and are post-translationally targeted to the plastid. Toc64 has been suggested to be a part of the protein translocation machinery at the chloroplast envelope. This protein consists of a short hydrophobic domain followed by an amidase-like region and three tetratricopeptide repeats (TPRs). TPRs in other systems have been implicated in protein-protein interactions, leading Sohr and Soll (2000) to suggest that this region mediates precursor protein docking at the translocon of the chloroplast envelope.

We are using the moss, *Physcomitrella patens* as model system for studying these proteins. The *P. patens* EST database includes almost all of the known components of chloroplast protein targeting systems. We have cloned two genes from *P. patens* that encode proteins similar to Toc64. We have shown that one of these, PpToc64-1, is targeted to the chloroplast in an *in vitro* targeting assay and that this targeting is mediated by the N-terminal hydrophobic domain. This targeting does not appear to require proteins that are sensitive to either trypsin or thermolysin proteolysis. In addition, it does not require nucleotides. We are in the process of knocking out these two genes in moss, to determine whether either plays a role in chloroplast biogenesis.

Sohr K, Soll J (2000) Toc64, a new component of the protein translocon of chloroplasts. *Journal of Cell Biology* 148: 1213-1221