

MCB PLANT BIOLOGY SEMINAR

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" Structure-function analysis of key components of
the chloroplast protein import apparatus "

Monday, February 7, 2011
3:30 p.m.
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HOST: Rob Mullen

ABSTRACT:

The chloroplasts of plant cells, like many organelles, rely on post-translational delivery and import of nucleus-encoded proteins for their biogenesis, and the fidelity of all intracellular protein trafficking and translocation systems is crucial to the survival of all eukaryotes. We are interested in understanding the mechanism of protein import into chloroplasts as a model for intracellular protein trafficking and organelle biogenesis. The Toc and Tic (translocon at the outer / inner envelope membrane of chloroplasts) complexes are responsible for decoding chloroplast-targeted preproteins and translocating them into chloroplasts. Two of the core components of the Toc complex, Toc159 and Toc34, are involved in preprotein recognition and regulation of import. In Arabidopsis these receptors are represented by small gene families (Toc159 is represented by Toc159, -132, -120 & -90; Toc33 & -34 are the Toc34 representatives). Toc159 (and Toc33) is hypothesized to act as a primary preprotein receptor for photosynthetic proteins, whereas Toc120 & -132 (and Toc34) are proposed to be responsible for the import of non-photosynthetic proteins. I will discuss our on-going work aimed at understanding the basis for preprotein recognition by the Toc receptors, and how the receptors demonstrate specificity for particular groups of preproteins. We are using a combination of molecular and biophysical approaches to answer these questions.