

1037-92-320

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Vesicle trafficking is essential for cellular development and for maintaining cell homeostasis in all eukaryotes. The fusion process is mediated by interactions among membrane-associated proteins called SNAREs (soluble Nethylmaleimide-sensitive fusion protein attachment protein receptors). Genomic analysis suggests that higher plants and vertebrates carry divergent SNAREs in addition to the conserved SNAREs found among the eukaryotes.

The long-term goal of this project is to solve the network of SNARE-SNARE interactions in eukaryotic cells. We wish to identify new vesicle trafficking pathways that are activated by phytohormone in *Arabidopsis thaliana*. A draft map of the SNARE-SNARE interactions will be created using split luciferase in *Arabidopsis* protoplasts. SNARE complexes predicted will be genetically tested.

We HYPOTHESIZE that phytohormones activate selected SNARE-SNARE interactions that generate new pathways of vesicle trafficking in *Arabidopsis*. Our current GOAL is to predict such SNARE complexes in over 55,000 interactions.

A progress of the project and a mathematical challenge "levels of confidence in fold changes" will be presented in this meeting. (Received February 05, 2008)