**Investigation of Activation Mechanism of Heterotrimeric G-protein Signaling in Plants**

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In this talk, we will present some problems from our current research program on the heterotrimeric G-protein dependent signaling in plants that require use of SR based X-ray structural techniques. These are:

i) Determination of structures of the individual subunits of the heterotrimeric complex from Arabidopsis and rice *O. sativa*. Subunit proteins from these species do not readily crystallize and have a tendency to oligomerize.

ii) Interactions of subunits with the plasma membrane. Two subunits from the heterotrimeric complex have lipid modifications which facilitate interactions with the plasma membrane. Elucidation of membrane bound protein structures is necessary for a better understanding of the activation of the signaling pathway.

iii) Understanding the structure of the heterotrimeric complexes from the two plant species.

iv) Time-resolved studies of structural changes during heterotrimeric complex assembly, activation and deactivation.