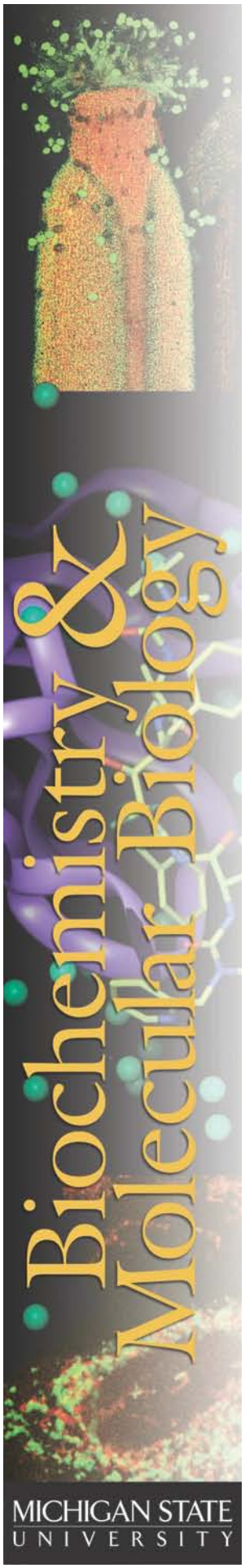

Biochemistry and Molecular Biology
Fall 2009 Colloquium Series

Dr. Beronda Montgomery
Michigan State University

Thursday, November 12, 2009
11:30 a.m.
101 Biochemistry

Seeing the Light: Color Vision and Photomorphogenesis in Photosynthetic Organisms

Research in the Montgomery Laboratory

Photosynthetic organisms exhibit finely tuned abilities to sense and respond to changes in their ambient environment. The perception of light and the resulting developmental changes that occur as a response to light signals are arguably among the most important processes for any organism that uses light for carbon fixation and generation of reductant. The long-term research interest of my group is to understand the dynamic molecular processes that photosynthetic organisms utilize in adapting to changes in their photoenvironment. Our current research targets biliproteins, light-absorbing pigments centrally involved in both photosynthesis and the regulation of photomorphogenesis in cyanobacteria, algae, and plants. Photomorphogenesis is defined as the control of growth and development by light intensity and color. Related sensory biliproteins are involved in photomorphogenic responses of plants and cyanobacteria, including the regulation of pigmentation and morphology to optimize photosynthetic efficiency and survival of these organisms. We are investigating the regulation of these responses in the model plant *Arabidopsis* and the filamentous cyanobacterium *Fremyella diplosiphon*. Recent results from the laboratory have provided new insight into sub-organismal sites of phytochrome photoperception and cellular mechanisms of localized pools of phytochromes that regulate organ-specific phytochrome responses in Arabidopsis. Furthermore, our studies with *F. diplosiphon* are advancing our understanding of the evolution of photomorphogenic mechanisms controlled by phytochrome-family proteins, which exist in organisms as simple as single-cell prokaryotes and in higher plants.

References

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