

# MCB PLANT BIOLOGY SEMINAR SERIES W2009

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“Cellular specialization is required for plant metabolism.”

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**ABSTRACT:** Plants have remarkable capabilities to organize metabolic pathways for enhancing their biological processes. This is clearly exemplified in the case of primary metabolism in the evolution of carbon dioxide concentrating mechanisms that enhance the rate of photosynthesis by diminishing the oxygenase activity of Ribulose biphosphate carboxylase. Similarly, many types of cellular specialization have been discovered that reorganize metabolic pathways for production of particular secondary metabolites that confer an advantage to the plant in response to a particular environmental condition. The reorganization of metabolism may occur as a result of mobilization of particularly versatile central intermediates that can be used for the biosynthesis of a large range of diverse biologically active end-products. Alternatively certain cell types may be harnessed to produce different metabolites, depending on the environmental cue being sensed by the plant. The glandular trichomes that produce and accumulate secondary metabolites offer particularly interesting examples in plants of the concept of cellular specialization. In addition these processes appear to be controlled by specific developmental cues during plant growth. The presentation will focus on the tools that are available in non-model plant systems for studying and elucidating the basis for plant cell specialization for secondary metabolite production.