

MCB PLANT BIOLOGY SEMINAR

Joss Rose

Department of Biology
Cornell University

"Peeling apart the structure, function and evolution of plant cuticles"

Monday, March 21, 2011

3:30 p.m.

SCI2315

ABSTRACT:

The plant cuticle, a lipophilic layer that covers all aerial organs, forms the outermost barrier between a plant and its environment. As such, it provides the primary line of defense against pathogens, plays critical roles in restricting water loss and protects plants from a range of other abiotic stresses. Moreover, the cuticle has been shown to be an important factor in regulating organ development and integrity. However, remarkably little is known about cuticle biosynthesis, particularly with regard to trafficking, assembly, restructuring and interactions with polysaccharide cell wall components. Tomato fruits offer an excellent experimental system to address these questions as unlike other model plants, such as *Arabidopsis*, whose cuticle is very thin, tomato fruits have a relatively thick astomatous cuticle, providing a pore-less uniform material that is easy to isolate and handle. Additionally, tomato is an important crop with a growing collection of genetic resources and is readily transformable for functional genomics studies. We have been developing a multi-pronged strategy to investigate cuticle structure and functions, including the development of new imaging tools, the characterization of cuticles from tomato mutants and wild species, and the use of cell type-specific RNA-Seq transcriptome and proteome profiling. Data generated through this 'systems' approach has shed light on various previously unsuspected functional roles of specific cuticle components as well as the remarkable structural and biochemical diversity of tomato cuticles across different genotypes. We have also gained insights into mechanisms of cuticle assembly and remodeling, as well as their evolutionary origins.

HOST: Mike Emes