

BioFrontiers - Biology Seminar

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Life Sciences Building - A117



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Mechanisms of Plant Lipid Droplet Biogenesis

Lipids are stored in plant cells in organelles called lipid droplets (LDs) that are also known as oil bodies, oleosomes or lipid bodies. These LDs are unique hydrophobic compartments that are covered by a single monolayer of phospholipids effectively emulsifying the storage lipids in an aqueous cytoplasm. LDs are particularly abundant in seeds and oleaginous fruits but are present in varying amounts in essentially all plant cell types. While the major structural proteins of seed LDs—the oleosins-- have been known for many years, oleosin genes are not expressed in many cell types that contain LDs, suggesting that a comprehensive understanding of LD formation and function requires a look beyond these structural proteins. Given the importance of plant storage lipids both for human nutrition, and more recently, for bioenergy applications, an understanding of how these neutral lipids are compartmentalized at the subcellular level may offer new ideas about how to enhance the caloric/energy density of plant tissues. Over the past 15 years, our group has identified several parts of the protein machinery that facilitate the biogenesis of LDs in plant cells, some of which are conserved in other eukaryotes. For my seminar, I will describe the various approaches we have taken to develop our current understanding of the cellular mechanisms for packaging lipids into cytoplasmic LDs in plant cells.

