

**THE PLANT CUTICLE: STRUCTURE, FUNCTION AND INSPIRATION**  
**Marna Yandea-Nelson**

Associate Professor, Genetics, Development & Cell Biology  
Iowa State University



**Abstract:** The plant cuticle is a chemical barrier that covers aerial plant organs and provides a first line of defense against stressors in the external environment. The cuticle is composed of a cutin polyester matrix of epoxy- and hydroxy-fatty acids and glycerol, which is intercalated with and coated by hydrophobic cuticular waxes (including very-long-chain fatty acids, fatty aldehydes, fatty alcohols, wax esters, hydrocarbons, ketones). Different compositions of the cuticle impact its structure and function as a water-proofing layer, and protectant against pests, pathogens, and other stressors. Based on these plant-based functions, efforts are being made in engineering fields to make cuticle-inspired polymer products.

**Bio:** Yandea-Nelson received a PhD in Genetics from Iowa State University in 2005, and she studied the genetics of starch biosynthesis in maize as a postdoctoral scholar at Penn State University from 2005-2008. As faculty in the Department of Genetics, Development & Cell Biology at Iowa State University, her work focuses on the biosynthetic and regulatory genetic networks of metabolic traits, to increase both the fundamental knowledge of cellular metabolism and to use that knowledge for downstream practical applications (i.e. plant breeding for resistance to stresses and the development of biorenewable chemicals and fuels). She recently received the M. Rhoades Early-Career Maize Genetics Award from the Maize Genetics Cooperation.