

Abstract for Andrew Groover

“What genes make a tree a tree?”

While we often treat “trees” as a group of plants for practical purposes, tree species are found scattered among various gymnosperm and angiosperm taxa. What are the evolutionary origins of trees, and what are the genes and biological mechanisms responsible for woody, perennial growth? In the first part of this talk, I discuss the evolutionary origins and diversification of trees and woody growth. This background is used to develop expectations about the general features of developmental mechanisms regulating woody growth. Next, findings from ongoing research will be presented that identify key genes and mechanisms regulating woody growth in the model forest trees of the genus *Populus*. Insights from these studies include recognition that important genes that regulate the shoot apical meristem have been co-opted during vascular plant evolution to function in the lateral meristem of tree stems, the vascular cambium. These results confirm to predictions based on the evolutionary origins of woody growth, and provide insights for future research. At the conclusion of the talk, I will point to important new technologies that are being applied to more comprehensively understand the developmental mechanisms regulating tree growth and development.