

CONIFER TERPENES: ENGINEERING AN ANCIENT PLANT DEFENSE PATHWAY FOR RENEWABLE CHEMICALS AND BIOFUELS

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Conifer terpenes were the first “industrial” chemical and are feedstocks for the largest nonfood based hydrocarbon industry today. Terpenes are an important class of defense molecules in plants. Conifers evolved specialized duct systems that synthesize and store oleoresin composed of monoterpenes and diterpenoids. Sapwood typically contains 3-5% of terpenes which protect the stem against boring insects and their associated fungi. We are characterizing the genetics of resin duct formation and terpene synthesis in loblolly pine with the goal of increasing the content in the stem for increased resistance to southern pine beetles and as a better source of chemical feedstocks for renewable chemicals and biofuels. I will describe our progress towards metabolic engineering of the conserved terpene precursor pathway and regulators of resin duct development.

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