

# NEWS RELEASE

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## **NC State Researcher Receives \$700,000 to Develop Alternative Fuel Resources**

### FOR IMMEDIATE RELEASE

A scientist at North Carolina State University has received a \$700,000 grant funded jointly by the U.S. Department of Energy (DOE) and the U.S. Department of Agriculture (USDA) to develop woody biomass “feedstock” that can be easily converted into ethanol.

Dr. Vincent Chiang, professor of forest biotechnology in NC State’s College of Natural Resources, hopes that the grant will enable him and his team to discover the genes that control wood production in trees, leading the way to producing trees with greater amounts of cellulose and hemicelluloses that can be extracted more efficiently.

Cellulose and hemicelluloses are sugar polymers that can be converted into simple sugars, such as glucose, and then fermented to become ethanol. Collectively, cellulose and hemicelluloses are called polysaccharides. Wood is a great source of these polysaccharides – the substances comprise approximately 70 percent of wood’s weight.

Extracting polysaccharides from wood or from any plant biomass is difficult because they are contained within lignin, a polymer that “glues” polysaccharides together to form wood. The lignin needs to be broken down with the use of acids or other environmentally harmful substances, which makes extracting the polysaccharides challenging.

“We have engineered trees with less lignin, and as a result we know that those trees are very useful for ethanol production,” Chiang says. “Now we’re interested in looking not just at genes that control lignin production, but at the genes that regulate how polysaccharides are made in wood.”

To do that, Chiang is working with the eastern cottonwood, the only tree species with a sequenced genome. He wants to isolate the genes that regulate the manufacture of the three major components of wood: lignin, cellulose, and hemicelluloses.

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“We want to understand at the genome level what controls the synthesis of the three major components of wood,” Chiang says. “If we can find the regulators that tell a tree to make more of one component and less of another, then we can engineer trees that are enriched with polysaccharides – a perfect feedstock for ethanol production.”

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