



Hibiscus Cannabinus Gene Discovery to Enable Altered Plant Lignin

WARF: P120103W001

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a transferase discovery useful for altering lignin structure and/or content in plants.

Plants with such altered lignin are more easily and economically processed into useful products such as biofuels and paper.

Overview

Plant cell wall utilization in a variety of natural and industrial processes is hampered by the lignin component. To make lignin easier to degrade, Wisconsin researchers discovered how chemically reactive bonds can be introduced into the lignin backbone through genetic modification. This discovery has been developed and patented as Zip-lignin™ hybrid poplar (see WARF reference number [P100225US02](#)).

The researchers have continued to investigate how their pioneering concept may be extended to other plant species.

The Invention

Building on their work, the researchers have identified a gene that appears to have arisen independently during evolution in a different plant species (kenaf, or *Hibiscus cannabinus*). The gene produces a feruloyl-CoA: monolignol transferase (FMT) enzyme that could be harnessed to make modified, readily cleavable lignin.

Incorporation of FMT nucleic acids and/or polypeptides in plants can simplify the processes used for making biofuels and paper. Other cloned or isolated enzymes with these beneficial properties are not currently available.

Applications

- Conversion of lignocellulosic biomass to biofuels and industrially important chemicals
- Production of pulp for papermaking
- Production of animal feeds and forages

Key Benefits

- By reducing the severity of the required pretreatment step, this discovery should lead to savings in both energy costs and water consumption.
- May enable sustainable local processing without massive facility costs
- Processing low-density plant materials locally may decrease transportation costs and reduce greenhouse emissions.
- May make animal feed more digestible

Stage of Development

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The kenaf FMT gene has been isolated and shown to express active FMT protein.

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The development of this technology was supported by WARF Accelerator. WARF Accelerator selects WARF's most commercially promising technologies and provides expert assistance and funding to enable achievement of commercially significant milestones. WARF believes that these technologies are especially attractive opportunities for licensing.

Additional Information

For More Information About the Inventors

- [John Ralph](#)

Tech Fields

- [Clean Technology : Biobased & renewable chemicals & fuels](#)

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854

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