



In Planta Degradation of Lignin Using Fungal Enzymes

Production of biofuels from renewable biomass is attracting considerable interest worldwide. It is now widely recognized that biomass production for fuels should not compete with food crops. Switchgrass and other wild grasses can be grown on non-agricultural lands and are potentially a sustainable and inexpensive supply of feedstock for biofuels. One of the major obstacles in using cellulose of plant cell walls for bioethanol production is the presence of lignin that, in combination with hemicelluloses, makes a matrix surrounding cellulose and restricts its access to the cellulolytic enzymes crucial to synthesizing bioethanol.

Researchers in the Department of Biology at Colorado State University are developing a solution to this problem and are investigating several fungi, such as white-rot fungi and others that offer a unique capability to produce several potent lignin-degrading enzymes. These enzymes efficiently digest the lignin component of plant cell walls, mitigate matrix formation and expose cellulose and hemicellulose to the vital cellulolytic enzymes. By assaying the activities of the best fungal enzymes, these researchers are developing the *in planta* deployment of lignin-degrading enzymes by transferring the most active combinations into switchgrass and other bio-fuel crops. In so doing, this technology will reduce the cost incurred in the pretreatments of biomass and will improve the release of monomeric sugars from biomass treated with cellulases/hemicellulases.

Contact us for more information on this exciting technology.

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Patent information
Patent pending.

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Features and Benefits

- Biofuels from switchgrass offer a sustainable alternative to bioethanol from corn or other food crops.
- Currently, expensive pre-treatments are necessary in order to process lignin component of cell walls.
- This technology solves the lignin problem by employing enzymes from white-rot and other fungi.
- These enzymes digest lignin and improve the release of the sugars necessary for bioethanol production.
- Development of *in planta* deployment of these enzymes will dramatically reduce the cost of pretreatment.

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