

TROJAN HORSE PROJECT: BIOREFINERAY IN A PLANT

US Pat. No.: 9,024,111

Technology Readiness Level: 4

Key elements have been demonstrated in a laboratory environment

Sandia researchers have developed a technology that could potentially turn agricultural waste, weeds and other plant products that are typically discarded or destroyed into fuel. The idea is to create consolidated bio-refinery process inside plant cells.

This project seeks to embed into the plant cells synthetic circuits constructed using parts from extremophilic organisms that can break down the complex carbohydrates. The unique aspects of Sandia's approach are the rationally engineered enzymes that are prepared and integrated into plant cells by multiple transformation techniques to become "Trojan Horses" during pretreatment conditions.

TECHNICAL BENEFITS

- Significant reductions to cost and complexity
- Dedicated biofuel crops will not compete with agricultural crops used for human/animal use
- Synthetic biology not conducted on food-source plants
- Enzyme will not be expressed in the grain, only in stalks and leaves

INDUSTRIES & APPLICATIONS

- Sustainable production of fuel materials from renewable resources, chemicals, biofuels
- Development of dedicated energy crops with significant advantages in a consolidated bio-processing system