

# Researchers using nanotechnology in biofuel process to save money, environment

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Dr. James Palmer, associate professor of chemical engineering at Louisiana Tech University, is collaborating with fellow professors Dr. Yuri Lvov, Dr. Dale Snow, and Dr. Hisham Hegab to capitalize on the environmental and financial benefits of "biofuels" by using nanotechnology to further improve the cellulosic ethanol processes.

Biofuels will play an important part in sustainable fuel and energy production solutions for the future. The country's appetite for fuel, however, cannot be satisfied with traditional crops such as sugar cane or corn alone. Emerging technologies are allowing cellulosic biomass (wood, grass, stalks, etc.) to also be converted into [ethanol](#).

Cellulosic ethanol does not compete with food production and has the potential to decrease [greenhouse gas](#) (GHG) emissions by 86 percent over that of today's fossil fuels. Current techniques for [corn ethanol](#) only reduce greenhouse gases by 19 percent.

The nanotechnology processes developed at Louisiana Tech University can immobilize the expensive enzymes used to convert cellulose to sugars, allowing them to be reused several times over and, thus significantly reducing the overall cost of the process.

Savings estimates range from approximately \$32 million for each cellulosic ethanol plant to a total of \$7.5 billion if a federally-established goal of 16 billion gallons of cellulosic ethanol is achieved. This process can easily be applied in large-scale commercial environments and can

immobilize a wide variety or mixture of enzymes for production.

The innovative research taking place at Louisiana Tech, along with an excellent growing season, a strong pulp/paper industry, and one of the nation's first cellulosic ethanol demonstration plants, has the state of Louisiana well positioned to become a national contributor in cellulosic ethanol.

This technology, along with other important research being conducted to meet future energy needs, will be highlighted at Louisiana Tech's Energy Systems Conference on November 5 at the Technology Transfer Center in Shreveport.

Source: Louisiana Tech University

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