



## Roadmap to Bio-Based Economy Proposed in Journal Article

Four research scientists from the Forest Products Laboratory have proposed an approach to meeting global energy needs and creating a sustainable, bio-based economy that would reduce emissions of greenhouse gases, reduce dependence on oil and other fossil fuels, and enhance the health of the world's forests.

Writing in the current issue of Forest Products Journal, they propose an approach called "integrated biomass technologies," or IBT, that provides a roadmap to a bio-based economy founded on the systematic use of renewable forest-based and agricultural resources, including residues, to produce high-value products, including energy, liquid biofuels, chemical feedstocks, advanced biocomposites, and advanced structures. The article can be viewed at <http://www.forestprod.org/features.html>

## Genome Sequencing of White Rot Fungi to Advance Understanding of Biomass Conversion

A genome sequencing project by Dan Cullen, a microbiologist at FPL, has been included in the U.S. Department of Energy's Joint Genome Institute's (DOE JGI) latest portfolio of DNA sequencing projects that it will undertake in the coming year. The portfolio includes a total of 44 projects, culled from nearly 150 proposals received through the Community Sequencing Program. Sequencing projects are chosen based on scientific merit—judged through independent peer review—and relevance to issues in bioenergy, global carbon cycling, and bioremediation.

The most abundant source of carbon is plant biomass, composed primarily of cellulose, hemicellulose, and lignin. Many microorganisms are capable of utilizing cellulose and hemicellulose as carbon and energy sources, but a much smaller group of filamentous fungi has evolved with the ability to depolymerize lignin, the most recalcitrant component of plant cell walls. Collectively known as white rot fungi, they possess the unique ability to efficiently depolymerize lignin in order to gain access to cell wall carbohydrates for carbon and energy sources.

Cullen is focusing on *Ceriporiopsis subvermispora*, which rapidly depolymerizes lignin with relatively little cellulose degradation. The annotated gene set of *C. subvermispora* and comparative analyses with the lignin degraders *P. chrysosporium* and *Pleurotus ostreatus* (both sequenced by DOE JGI) will advance the understanding of these complex oxidative mechanisms involved in lignocellulose conversions.

Visit [http://www.jgi.doe.gov/News/news\\_7\\_2\\_08.html](http://www.jgi.doe.gov/News/news_7_2_08.html) for more information on DOE JGI sequencing projects.

## Embassy Science Fellow Conducts Biofuels Research in Finland

Dr. Alan Rudie, research chemist at the Forest Products Laboratory, spent six weeks in Finland as an Embassy Science Fellow researching emerging wood-based biofuel technology. Dr. Rudie collaborated with leading Finnish scientists and companies on biofuel development to produce a state-of-the-art report on forest biorefinery activities in the U.S. and Finland. Finland is a leader in biofuel development, and this visit provided significant opportunities for tangible collaboration and future joint R&D projects between the U.S. and Finland.

## Researcher's Paper Recycling Work Patented

July 2008

### In this issue:

- Roadmap to bio-based economy proposed in journal article
- Genome sequencing of white rot fungi to advance understanding of biomass conversion
- Embassy Science Fellow conducts biofuels research in Finland
- Researcher's paper recycling work patented
- International Academy of Wood Science elects researcher as Fellow
- Researcher receives ASTM International L.J. Markwardt Award
- NFBA's highest honor awarded to FPL researcher
- Russian delegation explores potential for joint research

A U.S. Patent was issued for "Method and Apparatus for Monitoring Liquid and Solid Contents in a Froth" invented by FPL engineer JunYong Zhu, engineering technician Roland Gleisner, and Freya Tan. The invention relates to a froth flotation deinking (ink removal) process for use in paper recycling, and, in particular, to monitoring the liquid and solid content in a froth to improve recycling rates. The recycling of secondary fibers, such as wastepaper, is important for environmental protection as wastepaper is the largest contributor of solid waste to landfills each year.

### **International Academy of Wood Science Elects Researcher as Fellow**

Dr. R. Sam Williams, research chemist at the Forest Products Laboratory, has been elected a Fellow of the International Academy of Wood Science (IAWS). The election is regarded as a high honor in the wood science community and is a reflection of Dr. Williams' contributions to his field. IAWS is a non-profit assembly of wood scientists, recognizing all fields of wood science and securing a worldwide representation.

### **Researcher Receives ASTM International L.J. Markwardt Award**

ASTM International Committee D07 on Wood has honored Robert H. White, Ph.D., research scientist at FPL, with the L.J. Markwardt Award. White was recognized for his extensive contributions to the committee, particularly related to the development of standards for fire performance of wood in building construction. To see a press release on this accomplishment, visit <http://69.7.224.88/default.aspx?pageid=1385&year=2008&category=Awards%2fMember+News>

### **NFBA's Highest Honor Awarded to FPL Researcher**

The National Frame Building Association awarded the 2008 Bernon G. Perkins Award to FPL engineer Douglas Rammer. The award recognizes an individual who has contributed "conspicuous and exemplary service to the post-frame construction industry." Rammer specializes in research related to design and use of wood, wood-based products, and timber connections, and has recently been focusing on design criteria for timber connections, near-infrared spectroscopy, and corrosion.

### **Russian Delegation Explores Potential for Joint Research**

A Russian delegation from the Kirov, Russia, region (including the Dean of Biology at Vyatka State University, the Deputy Leader of the Kirov Region Assembly, and several CEO's of companies in the region) recently visited the Forest Products Laboratory. The delegates met with FPL Director Chris Risbrudt and microbiologist Tom Jeffries to discuss biofuels research; Kirov is resource rich in timber and forestry and is very interested in biofuels research. The delegation visited Madison as part of a trip sponsored by the U.S. State Department with the goal of finding opportunities for joint research collaborations between Kirov and the U.S., and Dr. Jeffries will likely be paying a reverse visit to Kirov, Russia, in August to further discussions of possible partnership opportunities.



**Forest Products  
Laboratory**



Forest Products Laboratory  
One Gifford Pinchot Drive  
Madison, Wisconsin 53726  
Phone: (608) 231-9200  
Fax: (608) 231-9592  
<http://www.fpl.fs.fed.us>