Scientists identify enzyme that could help grow biofuel crops in harsh environments

Scientists at BNL have identified a novel enzyme responsible for the formation of suberin — the waxy, cell-wall substance found in cork. While effective at keeping wine inside a bottle, found in cork. While effective at keeping wine inside a bottle, suberin’s most important function in plants is to control water and nutrient transportation and keep pathogens out. Adjusting the permeability of plant tissues by genetically manipulating the expression of this enzyme could lead to easier agricultural production of crops used for biofuels.

The research was led by Chang-Jun Liu and Jin-Ying Gou of the Biology Department who published their results with co-author Xiao-Hong Yu, also of Biology, in the Proceedings of the National Academy of Sciences, 106 (44):18855-18860, and online on October 19, 2009. The research was funded by the DOE-United States Department of Agriculture Plant Feedstock Genomics program and by the DOE Office of Science.

Plants use different polymers in constructing cell walls, each with unique qualities essential for growth and survival. Suberin, the polymer analyzed in this study, is mostly located in the cell walls of seed and root systems. It moderates the substances that pass into the organism, acting as a barrier to harmful substances and microorganisms while facilitating the intake and storage of water and other nutrients.

"We sought to understand the synthesis of the ‘wall-bound’ phenolic component of different biopolymers, including this important suberin polymer, by identifying the enzymes responsible for their construction," said Liu. This information could...

Popping the Cork

On Biofuel Agriculture

Scientists identify enzyme that could help grow biofuel crops in harsh environments

On 23-24 November, 50 scientists from more than 10 leading climate research centers in Europe and the U.S. met at a “kick-off” workshop at BNL of the new “FASTER” (Fast-physics System Testbed & Research) project — a new multi-institutional project aimed at accelerating the development and improvement of fast physics processes in climate models.

Leading the FASTER project is Yangang Liu of the Atmospheric Sciences Division (ASD) in BNL’s Environmental Sciences Department (ESD). Liu, together with more than 20 scientists from 10 institutions, will work to accelerate improvements in climate models. The FASTER project is a major effort of the Earth System Modeling Program of DOE’s Office of Biological & Environmental Research (BER) to bridge the research undertaken within BER’s Atmospheric System Research Program and Janul Ramas of the Earth System Modeling program.

"Evaluating model performance and improvement representing of fast processes — especially those related to cloud and precipitation processes — are complex in terms of both science and management. Scientists work with many different areas of expertise, ranging from observations to theory to modeling, need to work in concert, and there are major bottleneck problems involved," said Liu. "To achieve our goal, we’ll be building and maintaining a fast-physics testbed and using a 1M (multi-scale, multi-model and multi-institution) approach to tackle the 3M (multi-body, multi-scale, and multi-type) scientific complexity."

All the tasks will be done under the umbrella of the Brookhaven Climate Consortium formed for the FASTER project, Liu added.

"This new program is an important addition to the portfolio of climate programs that we have at BNL as it will enable us to enhance our climate modeling capabilities at BNL," said Peter Daum, acting ESD Chair. "We think that the partnerships that develop under funding from this program will open new avenues for collaborative climate-change research in the future."

"For us, this new program is an exciting opportunity to apply our traditional areas of expertise, namely with the meteorological, microphysical, and chemical aspects of aerosols and clouds, by directing that process-level understanding towards the improvement of models for climate simulation," said Bob McGraw, ASD acting head, who is part of the project.

A vital resource that facilitates this work is the massive amount of climate research data collected by the ACEF since the early 1990s at locations from the tropics to the southern Great Plains to the Arctic. These data cover clouds, radiation, and many other geo-physical variables, and are critical for this project.

BNLer’s Spouse Saved With Blood Donations

In September 2008, John Skaritka, an employee at the National Synchrotron Light Source (NSLS), fell ill on a journey with his wife Maryann that would make both keenly aware of the importance of being a blood donor.

At that time, Maryann Skaritka was feeling tired, and her doctor ordered some routine blood tests, suspecting that she might be anemic. The results of the tests required her to be admitted to a hospital, where she received three units of blood.

"At that moment, I truly realized the importance of blood donors," said Skaritka. But, after many additional tests, the doctors were still...

Don’t Miss Inside Stories

- Meet BNL Retiree, WWII Vet Sorensen
- RSA 2010 Scholarship Application Date Extended to 12/30, matching SBU Scholarship for 2010 RSA Scholars at SBU

Self-Assembly of Nanostructured Electronic Devices

Given suitable atmospheric conditions, water vapor from the air will crystalize into beautiful structures that we call snowflakes. Nature provides many other examples of this spontaneous organization of materials into regular patterns — a process known as self-assembly.

Self-assembly works at all scales and, under the appropriate circumstances, it can be a useful tool for organizing materials at the nanometer-scale. In particular, self-assembly provides a precise method for designing materials with improved electronic properties, thereby enabling advances in semiconductor, electronics and solar devices.

On Wednesday, December 16, join Charles Black of the Center for Functional Nanomaterials (CFN) for the 454th Brookhaven Lecture, titled “Self-Assembly of Nanostructured Electronic Devices.” All are invited to attend this free talk, which is open to the public and will be held in Berkeley Hall at 4 p.m. Refreshments will be offered before and after the lecture. Visitors to the Lab ages 16 and older must carry a photo ID while on site. To join Black for lunch at an off-site restaurant following the lecture, contact Lois Caligiuri, brokers@bnl.gov, Ext. 5415.

During this talk, Black will discuss examples of integrating self-assembly into semiconductor microelectronics, where advances in the ability to define circuit elements at ever-higher resolution have largely fueled more than 40 years of persistent performance improvements. Self-assembly also holds promise for advances in the performance of solar devices, and he will describe the recent experimental results from his group in the CFN exploring demonstrations of nanostructured photovoltaic devices.

Black earned a Ph.D. in physics from Harvard University.
Innovative Ways to Improve Climate Models FASTER

Participants in the FASTER (Fast-physics System Testbed and Research) workshop of November 23 and 24

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Controlled Area Postings at RHIC Since Operations Began, 1/4

Operations for Run 10 at the Relativistic Heavy Ion Collider (RHIC) began on Friday, December 4, and are expected to continue until late May 2010. With the exception of the Collider Center (Bldg. 1059), adjacent parking lot, and Renaissance Road approaching Bldg. 1005, the entire RHIC site will be posted as a Controlled Area. The Controlled Area includes the Collider (Bldg. 1059), as well as the northern portion of Thompson Road. This portion of Thompson Road is closed to routine traffic.

All personnel must follow the requirements before entering the posted Controlled Areas. Failure to comply could lead to a Reportable Occurrence and a Price Anderson Amendment (PAA) Violation.

- Visitors or deliverers may enter RHIC-Controlled Areas only with an escort who has a current working visa or permit. An escort is provided by the Collider-Accelerator Department (CAD). Contact Ann-Marie Luhrs, Ext. 7007, at least one day in advance to request access.
- Users and Lab employees intending to enter the RHIC-Controlled Areas without an escort must complete General Employee Radiation, Training (GER) and additional facility-specific training. Users should contact the RHIC & AGS Users’ Center, Ext. 3333, and Lab employees should contact the Lab Protection Department.

For additional information, contact Raymond Karon of C-AD, Ext. 5227, or karonal@bnl.gov.

Defensive Driving Course: Two Parts, 1/12 & 17

Two six-hour sections of the defensive driving (Insurance Reduction) course will be held in two parts on Monday and Thursday, December 14 and 17, in the Brookhaven Center South Room, from 10 a.m. to 4 p.m. on Monday and 1 p.m. to 5 p.m. on Thursday. For more information, call Ext. 5600, 2596, 4564, or 5159.

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TIAA-CREF One-on-One Retirement Counseling

A TIAA-CREF consultant will visit BNL on Tuesday and Wednesday, December 2 and 3, and Thursday and Friday, January 5 and 6, to answer employee questions about their retirement financial matters. The consultant will help you understand the impact that your retirement decisions may have on your future financial security. The consultant will be available to answer your questions against inflation, find the right allocation mix, learn retirement strategies, evaluate your retirement income flexibility, and compare lifetime income vs. cash withdrawal options. For a consultation, call 1-800-732-8531 or visit our micro-site at http://www.tiaa-cref.org/BNL and select “Set up a Meeting.”
Urgent: 2010 BSA Scholarship Alert
Deadline for Applications Extended to 12/30/09
Also, Matching $2,500 Scholarships Available

The deadline for applications for 2010 BSA Scholarships has been extended until December 30, 2009. If you have not already requested and received an application form, forms are available at the Reception Desk, 400B, Brookhaven National Laboratory, or contact Leesa Allen at (631) 344-2700 to be sent an application form immediately. Completed forms must be sent to BSA Scholarships, Office of Occupations and Programs, P.O. Box 6730, Princeton, NJ 08541-6730, by December 30. All who have not already done so, please submit the yellow copy of the application form to Leesa Allen, Bldg. 400B, BNL.

Applicants must be secondary school seniors who will be graduating during the current academic year and planning to enter college by fall 2010. No specific academic field is required. BSA Scholarship recipients will be chosen by the BSA Scholarship Committee and notified by December 30, 2009. When you first meet Waldemar “Walter” Sorenson, his beard, red jacket, and demeanor may remind you of Santa Claus, in a way, he is. Sorenson is one of many Americans who gave us a special gift — the gift of military service for the preservation of freedom.

Sorenson, born in Southampton Hospital, is now 88 years old. He remembers his time in the industry division of the Army vividly. “I was inducted at Camp Upton and shipped off to the Philippines in 1942,” he said. “I spent almost two years in Okinawa. I served in the military until 1946, when he retired to Camp Upton and spent a brief period in the convalescent hospital. “I remember these days distinctly,” said Sorenson. “They were days of great friendship and camaraderie.”

But the Camp Upton site holds added memories for the World War II veteran. Six years after being discharged from the Army, Sorenson got a job at Brookhaven’s Hydraulic Engineering Division where he worked as a rigger from 1955 to 1982. “Those were the early days of the Lab and it was interesting to be part of the evolution,” said Sorenson. It was a great pleasure to return to the Lab this November to participate in the Veterans Day ceremony.”

Sorenson now lives in retired surrounded by his family in Yaphank. He was living in Middle Island when his house burned down a little over two years ago. “I remembered seeing the sign for the Veterans Place, so I literally walked down there to see if they could help me,” he said. “I told them that I had no roof over my head and no place to go, so I moved in and have been there ever since.”

Most of the veterans who stay at the Yaphank location are there temporarily while looking for jobs and trying to get back on their feet, but for Sorenson, it’s been the place he has called home for over two years.

BNU’s Veterans Association Partners With Suffolk County Veterans To Relocate Housing

Recently, the Lab’s Veterans Association volunteered to refurbish and update the Yaphank location. “The Brookhaven Veterans Association (BVA) partnered with Suffolk County United Veterans,” said Scott Bradley, a member of the BVA and coordinator of the refurbishing project. “We have worked at several locations. It’s been very rewarding for us as individuals and as a group because we feel that we have made a difference for these veterans. I am most appreciative of BVA Commander Don Farnam and my fellow BVA veterans and support we couldn’t have made this happen.”

Sorenson agrees. With help from BNL and the Suffolk County United Veterans, the Yaphank location is comfortable. “I’m considered the old-timer here,” he said. “I thoroughly enjoy sharing stories over meals with the others in our large kitchen.” Joanne Massimo, who works for Suffolk County United Vet- erans, Inc. thinks that Sorenson is a pretty interesting guy. “At 88 years old, he still keeps busy,” she said. “We call him our resident historian.”

D1101209

Roger Stoutenburgh

Nanomaterials at Brookhaven National Laboratory

Science-Based Shopping — WEEK OF 12/14 —
Tuesday, 12/15
Gift Wrapping Service
11 a.m.-2 p.m. “ artillery Center. Bring your gifts to be wrapped and grab-to-go snacks. Donations of paper, ribbon and boxes will be accepted. For more details, see pg. 4. Also, see story, pg. 7.

Wednesday, 12/16
Gift Wrapping Service
11 a.m.-2 p.m.  artillery Center. See notice on pg. 2.

Friday, 12/18
“Science-Based Shopping
Noon-2 p.m.  Bldg. 935. See below.

Science-Based Shopping — WEEK OF 12/21 —
Monday, 12/21
Holiday Dinner on Monday, December 21, from 5 to 8:30 p.m. in the Recreation Hall is open to Suffolk County United Veterans. Adults will be in your party, and tickets are $10 per adult. Tickets are available at the Recreation Hall, 6 -9:15 p.m. Brookhaven Center. See notice on pg. 2.

Friday, 12/25
2 p.m.-5 p.m.  Bldg. 935. See below.

Science-Based Shopping — WEEK OF 12/28 —
Monday, 12/28
IBEW 6 p.m. Centennial Knights of Columbus Hall, 41 Horshall Rd., Centereach. A meeting for shift workers will be held at 1 p.m. in the union office. The agenda includes news of the National Federation of IBEW, business, committee reports, and the president’s report.

Thursday, 12/24
“Science-Based Shopping
Noon-2 p.m.  Bldg. 935. See below.

Friday, 12/25
Hall Dinner, 4:30-7:30 p.m.  Bldg. 400A. See notice on pg. 2.

Thursday, 12/17
“Illness at the Table — WEEK OF 12/14 —
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