

Oklahoma NSF EPSCoR Research Connection

Volume 6, Issue 1

Semi-annual Newsletter for the Oklahoma National Science Foundation
Experimental Program to Stimulate Competitive Research

Fall 2009

NSF EPSCoR Progress: Making Molecular Markers for Switchgrass Development as a Biofuel

Submitted by: Dr. Yanqi Wu, Assistant Professor, Grass Breeding and Genetics, Oklahoma State University

Switchgrass, a native 'big mass' grass in the United States, has been selected as a dedicated cellulosic crop by the Department of Energy to supply feedstock for producing advanced biofuels, which are anticipated to play an important role in the future. Scientists are working to develop efficient and effective molecular tools to better understand the plant and its mechanisms controlling important economic traits. As part of the current NSF EPSCoR Research Infrastructure Improvement project, Dr. Yanqi Wu's research group in the Plant and Soil Sciences Department, Division of Agriculture and Natural Resources at Oklahoma State University is developing molecular markers to map the switchgrass genome. In the image below, Drs. Yunwen Wang, Visiting Research Scholar and Tim Samuels, Senior Molecular Genetics Specialist, are working together to isolate DNA molecular markers using technologies including library construction, sequencing, primer design, PCR reaction, gel electrophoresis, and data analysis.



EPSCoR Bioenergy researchers, Dr. Yunwen Wang, Visiting Research Scholar (left) and Dr. Tim Samuels, Senior Molecular Genetics Specialist (right) point out a significant marker scored in the DNA analyzer connected to the monitor in Dr. Yanqi Wu's research lab at Oklahoma State University. (Photo courtesy Dr. Yanqi Wu)

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NASA astronaut and Oklahoma EPSCoR join forces to ignite girls' interest in science careers

Submitted by: Ms. Shelley D. Wear, Special Programs Coordinator, Oklahoma EPSCoR

Science Museum Oklahoma located in Oklahoma City hosted over 500 middle and high school students and teachers from 60 Oklahoma schools who attended the annual Oklahoma EPSCoR Women in Science (WIS) Conference 2009 entitled, "Lift Off to Science!"

With standing room only, attendees sat on the edge of their seats as keynote speaker NASA Astronaut Shannon W. Lucid shared her experiences as a female space pioneer with five space flights that included Space Shuttle missions and time on the Russian Mir Space Station. Dr. Lucid was the first woman to hold international and world records for flight hours in orbit until June of 2007 with a total of 5,354 hours (223 days) in orbit. She shared amazing video footage from space and a short video on the NASA's future direction and how the next generation will contribute to the mission. Dr. Lucid encouraged students to work hard in school and to pursue as many math and science classes as possible to aid the aspiring young women in their own pursuits of science careers.

The program also featured panel discussions with 15 other successful women in science, hands-on science experiments, college planning sessions, and a college and career fair that featured over 30 college and educational outreach booths that included the Federal Aviation Administration, Oklahoma NASA Space Grant, and Louis Stokes Alliance for Minority Participation (NSF Award #O832871).

Panel sessions engaged students in interactive discussions about careers in science with suc-

cessful women who represented careers in engineering, medicine, forensics, aviation, physics, chemistry, geology, apparel design and plant and environmental sciences.

Students also enjoyed hands-on science sessions that allowed them to select three activities from twelve interactive exhibits. The most popular exhibit was the hovercraft exhibit, designed and presented by a team of eighth grade students from Oklahoma's Tech Success Program (NSF Award # 0525014). Tech Success, engages middle school students with disabilities in hands-on science experiences to facilitate student success in science education and encourage them to pursue college and obtain advanced degrees in science.

Teachers attended breakout sessions entitled "The Teachers'

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Oklahoma EPSCoR Women in Science Conference 2009 keynote speaker, NASA Astronaut, Dr. Shannon W. Lucid, was the first woman to hold international and world records for flight hours in orbit with a total of 5,354 hours (223 days) in orbit. (Photo courtesy of NASA)



Aboard the Base Block Module on Russia's Mir Space Station, astronaut and cosmonaut guest researcher Dr. Shannon W. Lucid works out on a treadmill device. (Photo courtesy of NASA)

EPSCoR partners with the Oklahoma Museum Network to bring mobile science museum to rural students and teachers

Submitted by: Ms. Lorri Clark, Media Specialist, Oklahoma Museum Network

Blasting off in December 2008 stocked with amazing experiments and interactive exhibits, the Science Matters Mobile Museum is providing a highly immersive science experience to schools across Oklahoma! The Oklahoma Museum Network funded by the Donald W. Reynolds Foundation (OMN) launched Science Matters, a traveling interactive science museum, to bring exciting discovery learning to all Oklahoma students.

Through a partnership with Oklahoma EPSCoR, OMN is bringing Science Matters specifically to rural areas where museum facilities may not exist. In addition the partnership offers teacher professional development, aimed at helping teachers incorporate inquiry activities into curriculum. With EPSCoR's support, teacher guides that feature hands-on bioenergy experiments are provided to schools across Oklahoma, showcasing the importance of the subject matter and the ease of incorporating it into school curriculum and state educational guidelines.

"Filled with hands-on experiments, Science Matters engages students, allowing them to experience true discovery learning. With EPSCoR's help, even more students will get this opportunity," says Sherry Marshall, Director of Oklahoma Museum Network.

The development of future scientists and engineers is vital for the nation to compete in a global economy. The 40-foot mobile museum employs ten interactive exhibits allowing students to experiment with everything from pulsing lasers to bubbling flasks. Science Matters



(Above) A museum educator facilitates student exploration of the bubble flask exhibit. (Left) The "Science Matters" mobile museum hands-on science experiences for students and teachers in the most rural areas of Oklahoma. (Photos courtesy of Oklahoma Museum Network)

engages students by nurturing their curiosity, resulting in science becoming an open door, providing more opportunities for the future in Science Technology, Engineering and Math.

For information on OMN or Science Matters visit www.oklahomamuseumnetwork.org.

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Lounge", where they networked with peers and received information on professional development opportunities and classroom resources such as DVDs from the Howard Hughes Medical Institute on topics such as evolution, stem cell research and science labs and the NSF produced (Award # HRD-0631603) CD, "Sounds of Progress, The Changing Role of Girls and Women in Science and Engineering". The K20 Center showcased a Smart Board and other technologies for the classroom.

In addition to the Oklahoma NSF EPSCoR program, other collaborators on the Women in Science Conference included the Oklahoma State Regents for Higher Education, Science Museum Oklahoma, Oklahoma NASA EPSCoR, and OU College of Engineering. The planning committee featured 20 faculty and staff from colleges and universities statewide.



Maggie Lewis (left) and Lisa Bray (right), students from Gordon Cooper Technology Center, explore circuitry during the hands-on breakout session at the Women in Science Conference 2009, Feb. 3.

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This publication, printed by Oklahoma Experimental Program to Stimulate Competitive Research, was issued by the Oklahoma State Regents for Higher Education in May 2009, as authorized by 70 O.S. Supp. 2001, Section 3206. One thousand three hundred copies have been printed at a cost of approximately \$1,300.00. Copies have been deposited with the Publications Clearinghouse of the Oklahoma Department of Libraries.