ARKANSAS epscor ASSETs of arkansas
Spring/Summer 2010

From the Director:

As we evaluate progress in the final year of Arkansas ASSET Initiative, we continue to plan for sustained research efforts in our collaborative statewide centers. As presented at our annual state meeting in October, great strides have been made by our Plant Powered Production (P3) Center and by our Wireless Nanosensors & Systems (WiNS) Center. We are proud to again showcase these results in this newsletter.

Early in the ASSET Initiative program, the P3 Center awarded a series of seed grants which have generated pilot data allowing multiple research teams to effectively target federal funding opportunities. This has increased the support base for this research theme which began from baseline in 2007 without infrastructure and only a loose consortium of scientists with common interest. The coherence, commonality, and camaraderie of these researchers evolved from this effort and, although geographically separated, they have developed well-organized teams with shared aims.

The WiNS Center has directed their efforts toward applications of the new technologies that they are developing. One of the strongest areas of current innovation in this research center is leading them toward biomedical applications and positioning them for future NIH funding.

To expand our STEM-enabled workforce, ASSET continues to use small grants for programs such as teacher professional development workshops as well as individual awards for STEM teachers for equipment and supplies. To engage students, we have targeted summer academy and BEST robotics . The continuing fascination that robotics generates for students is featured in this newsletter. Both the successes of the research centers and the educational outreach activities speak to the unified effort that Arkansas has adopted to target a STEM-enabled workforce and to expand research that will generate economic advancement.

-Gail McClure

Communicating Science at the 2009 Arkansas EPSCoR Annual Conference

In early October, over one hundred researchers and communications professionals from around the state convened at the Doubletree Hotel in Little Rock for a series of special workshops focused on "communicating science."

The workshop, held in conjunction with the concurrent 2009 Arkansas NSF EPSCoR Annual Conference and the Arkansas Association of Public Universities (AAPU) Conference, was supported by the National Science Foundation (NSF) Office of EPSCoR, the Office of Legislative and Public Affairs (OLPA) and the American Association for the Advancement of Science (AAAS).

NSF outreach resources provided travel support to bring these experienced communications professionals, OLPA staff and AAAS facilitators to Arkansas to conduct the workshop. This was the first time that this workshop has been presented in the Southern states. The workshop format featured combined general sessions for both researchers and communications officers, as well as specialized breakout sessions for the two professional groups.

National Science Foundation's Jeff Nesbit, Director of the OLPA, talked about the changing media landscape, and building new audiences from viral media distribution on the internet. He stressed using sites like Facebook and Twitter as vital tools to spread science stories in the media. Dana Topousis, Head of Media and Public Affairs for the NSF, also showed how new web-based platforms, like Science Nation and Science 360, can be effective syndication style delivery tools when spreading a message through cyberspace.

Denise Graveline, President of the Washington DC consulting firm *don't get caught*, taught researchers how to communicate their discoveries in practical language that will generate public interest and understanding.

Continued on Page 8

Upcoming Events

March 22-24, 2010
Engaging America's Talent
National Education Outreach Conference
Peabody Hotel
Little Rock, AR

June 3-4
External Advisory Board Site Visit
Embassy Suites
Little Rock, AR

August 16-17
P3 Research Sympsium
Wintrhop Rockefeller Institute
Petit Jean Mountain

BEST Robotics Game Days
Kick-Off Day Sept. 18
Mall Day Oct. 16
Game Day Oct. 30
Little Rock BEST
UALR
Hot Springs BEST
ASMSA
Mid-South BEST
Mid-South Community College
Crowley's Ridge BEST
Arkansas State University
Golden Lions BEST
UAPB

Kick-Off Day Sept. 18
Mall Day Oct. 23
Game Day Oct. 30
NorthArk BEST
North Arkansas College

Kick-Off Day Sept. 4
Mall Day Oct. 2
Game Day Oct. 16
River Valley BEST
UA-Fort Smith

EDUCATIONAL OUTREACH

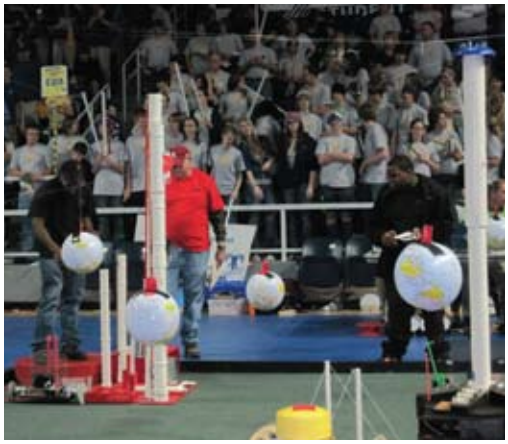
BEST Robotics Expands in Arkansas

ASSET Initiative and the Arkansas Science & Technology Authority (Authority) have worked during the past four years to expand opportunities for students to compete in robotics competions. Such competitions generate enthusiam for engineering, and information technology as well as the sciences and mathematics. To make robotics more available to a larger number of Arkansas students, ASSET and the Authority have made awards to regional organizations across the state to establish new BEST Robotics Hubs. BEST Robotics is a non-profit, volunteer-based organization whose mission is to inspire students to pursue careers in engineering, science, and technology through participation in a sports-like, science and engineering-based robotics competition. Since a hub can accomodate up to 24 teams, is a competitive team activity, and is free to school districts wishing to participate, BEST Robotics is an ideal venue for exciting students and expanding interest in STEM fields.

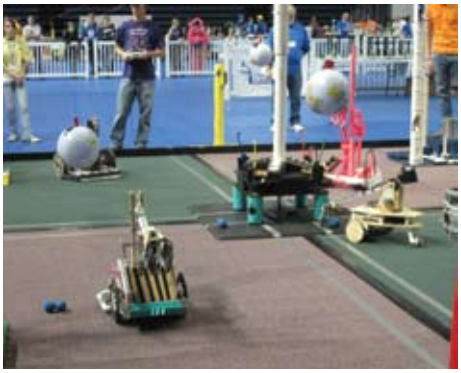
ASSET and the Authority have made awards which have created six of the seven active BEST Hubs in Arkansas. This past year, more than 50 teams involving over 700 Arkansas students participated in BEST competitions in these six hubs. Winners from local hubs then go on to compete at the regional multi-state level. Arkansas hub winners compete in the Frontier Trails BEST Regionals hosted by the University of Arkansas at Fort Smith (UAFS).

Frontier Trails BEST Regional Championships at UAFS

On December 4-5, 2009, forty teams of middle and high school students from across the central United States competed in the Frontier Trails BEST Robotics regional championships. The competition this year was particularly fierce as for the first time the top four placed teams advanced to the national BEST robotics competition. The atmosphere of the Stubblefield Center in Fort Smith reflected the urgency of this advanced level of competition. The lively and relentlessly energetic crowd of fellow students, teachers, and parents rivaled that of any typical sporting event. The crowd employed team specific cheers, signs, costumes, mascots, and noisemakers of all varieties. BEST competitions are held nationwide but this was the first time the competitions have advanced beyond the regional finals onto the national level.



Each year of the competition represents a different theme. The theme for this year was "High Octane" which focused on educating students on renewable energy resources. Each team designed, built, and operated their own robot to compete in groups of four on the competition field, a specifically designed battleground for the robots to go head to head in trying to score points as quickly as possible. The criteria of this year's theme involved students using their robots to collect various elements and catalysts to complete specific chemical equations. As teams collect the necessary components and form more complex compounds, they earn progressively more points. While it is easy to view this as solely a competition about building robots to score more points than the other teams, the actual scoring criteria for the entire competition involves much more. In addition to the actual robotics competition, teams are also scored on sportsmanship, team spirit, robot design and aesthetics, table displays, oral presentations, and a project summary notebook which is a meticulously detailed collection of the entire process leading up to the competition. Though the competition culminates in a day-long round robin style tournament, it actually begins two months earlier when the students receive the materials they must use to complete their robots, get a look at the field of play, and receive the rules for the competition.



Eighteen Arkansas schools representing the seven hubs across the state advanced to this year's regional championships. Regional Director and President of the BEST Robotics Board of Directors, John Martini commented, "I truly believe the greatest strengths of our BEST family are its dedicated volunteers and sponsors. We know that they stay involved because of our unwavering commitment to the students. As we continue to grow and position ourselves for the future, we cannot forget the basic principles our organization was built upon: student-designed, student-built, student-driven robots at a cost that allows any school to participate. And please remember that BEST exists to inspire those students to be tomorrow's technicians, engineers, scientists, scholars, and inventors."

BEST Robotics Hubs

LOCAL

Crowley's Ridge BEST
Arkansas State University
Director: E.T. Hammerand

Golden Lions BEST
University of Arkansas
at Pine Bluff
Director: Felicia Webb

Hot Springs BEST
Arkansas School for
Mathematics, Science, and Arts
Director: Carl Frank

Little Rock BEST
University of Arkansas at Little Rock
Director: Jing Zhang

Mid-South BEST
Mid-South Community College
Director: Robert Gunter

NorthArk BEST
North Arkansas College
Director: Ed Proctor

River Valley BEST
University of Arkansas
at Fort Smith
Director: John Martini

REGIONAL

Frontier Trails BEST Regional Championships
University of Arkansas
at Fort Smith
Director: John Martini

Teachers Benefit from Inquiry-Based Learning Workshop

ASSET Inititative uses $12000 grants to educational organizations across Arkansas to provide quality STEM professional development for teachers. One recent workshop funded by ASSET Initiative and the Authority was to the Southwest Education Service Cooperative to provide a workshop called, "Technology for Inquiry-Based Learning II "

Teams of teachers from ten different school districts in southwest Arkansas attended Technology for Inquiry-Based Learning II at the Southwest Education Service Cooperative in August. The focus of the workshop was to provide equipment and training to prepare middle school science teachers for more advanced and relevant student activities. The teachers were given a ProScope HR digital microscope and camera kit containing software and three different lenses in addition to a pH sensor. In an earlier workshop, these same teachers had received several other probes and the appropriate software.

The ProScope allows the student or teacher to capture images, display them on a computer or projector, and to create time lapse videos. Once the teachers were familiar with the ProScope, they completed inquiry-based hands on activities using model lessons provided by the instructor, Nona Talley, who also serves as the Cooperative's Science Specialist. In the "Solving the Liquid Trail" lesson, stains on fabric were investigated to determine which of three drinks were spilled. The ProScope was used to find pollen on plants and to complete pollination using bees.

The pH sensor measured the strength of an acid or base as a digital readout. Each participant learned at least eight specific activities that include Arkansas Department of Education science standards and that will provide students with experience in advanced science techniques.

The teams were encouraged to form a collaborative partnership within their school to support each other as well as to share new concepts with other teachers in their school. Each participant will receive follow-up classroom mentoring during the school year from Nona Talley.

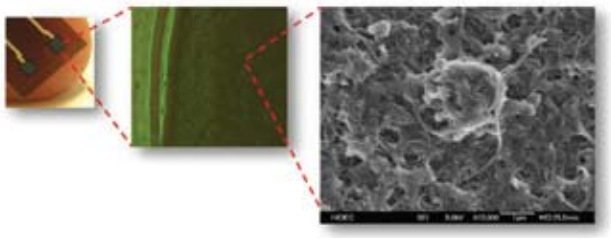
Funds for the STEM Professional Development Workshop Program at the Authority were made possible by a generous educational grant from the Winthrop Rockefeller Foundation

WiNS Researchers Create a Nano-Bio Power Cell for Making Self-sustaining Sensor Implants

Implantable sensors and actuators form an instrumental part of the concept behind point of care diagnostics and therapeutics. In the past decade, many proof-of-concept micro-nano devices have been reported for monitoring physiological conditions. Their unprecedented small size enables them to be implanted in constricted area of the body, such as inside the skull and arteries or embedded in tissue. In an implantable biosensor design, an on-board power supply is a very important but very large and cumbersome component of the payload. As an alternative solution, implantable sensors can operate with a wire in-out provision for acquiring power and sending signals. Both bulky on-board power supplies and wire-out provisions are liable to develop complications for sensor/actuator implants. Many promising opto-electro-mechanical and biomimetic techniques have failed to materialize as medical implantable diagnostic and therapeutic products because of this stop gap.

WiNS Researchers at the University of Arkansas, under the direction of Dr. Vijay K. Varadan, have successfully tested a nano-bio-power cell for harvesting energy from glucose and dissolved oxygen in a liquid medium. The cell has two electrodes, cathode and anode, that are made with Carbon Nanotube-Nafion composite. The composite for the cathode and the anode have the enzymes Catalase and Glucose Oxidase respectively. When inserted in a liquid medium containing glucose and dissolved oxygen, the reduction of oxygen to water by giving away electrons and oxidation of glucose to gluconic acid by taking up electrons occurs. As a result, movement of electrons is initiated between the electrodes in the form of an electric current. Glucose and dissolved oxygen are present in the blood stream at all times by virtue of daily nutrition and respiration. Thus, the human body will be able to drive the sensors implanted in it.

The power cell, which is less than 1 sq millimeter, produces 2.2nW at 70mV. The cell functions at glucose concentration between 3.5mM to 8mM, comparable to the level of glucose found in a normal human body (60mg/dl to 140mg/dl). The cell provides consistent power irrespective of fluctuation in glucose concentration due to food intake. The enzymes clusters attach to the surface of carbon nanotubes, like globular bodies on tubes seen in the picture, by surface treatment to form carboxyl groups on the nanotubes that form amide bond with the amine groups on individual enzyme molecules. The enzymes attached in this fashion retain their activity past 15 days. The protocol was perfected by Dr Jamie A. Hestekin and co workers in Department of Chemical Engineering at University of Arkansas. The results from performance evaluation of the nano-bio power cell were presented at the ASME 2010 First Global Congress on NanoEngineering for Medicine and Biology (NEMB2010) held Feb. 7-10, 2010 in Houston, TX.



To achieve higher output voltage or power, individual cells can be grouped together to form a battery without significant increase in the package size. Fabrication process, used for making these power cells, is a combination of thin film processing and screen printing technology. The cell was fabricated on flexible substrate, which is compatible with micro-electronics fabrication technology. This attribute favors incorporating these power cells among the sensor electronics as well as economic roll to roll printing for mass production of electronics.

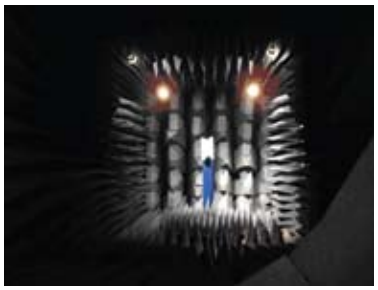
Developing Real -Time Sensors for Head Injuries

Recently the National Football League Brain Injury Panel raised awareness of potential long-term consequences from traumatic brain injuries. As research leads to the development of more applications using nanosensors, more lives can be saved from chronic devastations arising from head injury and trauma. At ASU Dr. Shivan Haran has been using sensors that can be placed inside the helmet of foot ball players to detect temperature, pressure and impact in real time and wirelessly transmit data to laptops. This will help to detect patterns and strengths of impacts associated with various movements and contacts.

To understand how this might be affecting the brain, Dr. Malathi Srivatsan and Dr. Shivan Haran are extending these studies to laboratory rats. They are designing helmets and sensors to fit the heads of rats which will allow removing and studying their brains after impacts and correlating the brain findings with the sensor data. With preliminary results they will apply for research funding from NSF/NIH to continue this important research. Broadly, the results of this research can help not only football players but all those who may have chronic head impact or major trauma.

UALR WiNS Holds Training Sessions

The UALR WiNS group held several training sessions for new equipment and techniques for their state of the art anechoic chamber and associated analysis equipment as well as their High Performance Computing (HPC) facility. The first training session was offered by Jim Puri of Agilent on network analyzer measurements. The second training session was offered by Dr. Michael Foggle of ETS-Lindgren on antenna measurements in an anechoic chamber. The anechoic chamber development and related research is led by Dr. Hussain Al-Rizzo.



Supercomputers can run much larger computational problems much faster than can a desktop computer, but the reality is that researchers often have to invest a significant amount of their time parallelizing their program in order to run it on a supercomputer. Furthermore, the developed codes may not be always optimized to fully take advantage of the power of the supercomputer. The UALR WiNS team held a parallel programming training for researchers to learn use of StarP, a very powerful parallel programming tool available at the UALR High Performance Computing facility.

Dr. Lenin Rathinasamy, provided a step-by-step instruction of StarP usage for researchers with various programming background ranging from introductory C/C++ programmers to expert MatLab users. Attendees included researchers from WiNS team as well as students and faculty from various departments. With this training, these researchers can enhance their research using Star-P to generate optimized parallel executable code. Consequently, they can save significant amount of time in developing optimized parallel code that can lead to results in a short span of time, speed up the process of discovery and dissemination of findings through publication, and secure a competitive edge in their research field.

Seeing Nano-Materials at the Cellular Level

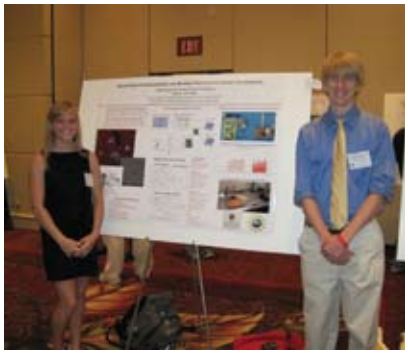
With EPSCoR funds, additional high-tech illumination components were purchased and added to Arkansas State University's WiNS Center's scanning confocal microscope. These components enable imaging and quantization of nanomaterials as they interact with live neurons in real time.

In Dr. Malathi Srivatsan's laboratory, postdoctoral fellow Dr. Sahitya Pandanaboina and graduate students Ms. Madhumita Paul and Mr. Caleb Pingel are learning fluorescence correlation spectroscopy and using this ISS Alba imaging system. With this technology the researchers will then be able to image and quantify the inter and intra cellular dynamics of nanomaterials interaction with neurons. This research will provide them with essential information as their research progresses on what happens to nanomaterials at the cellular level and fate of cells and their organelles when they interact with different kinds of nanomaterials.

UAF WiNS Center Adds Award Winning Student Researchers

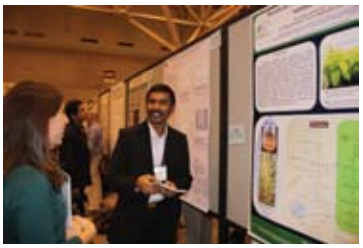
Lauren Kegley is a sophomore Honors Undergraduate Fellow who has recently joined the research group. She began her research in November 2008 and plans to continue her work through graduation. Recently she earned a Summer Undergraduate Research Fellowship (SURF) to fund her research project. Despite being one of the newest members of the team, Kegley has earned multiple conference awards for her works; including Best Undergraduate Poster at the 2009 Arkansas NSF-EPSCoR Annual Conference and Best Presentation at the FEP Research Symposium. Lauren works with laboratory rats to test different placements of neural probes. In addition to working with the research team, Lauren is an Electrical Engineering Undergraduate with a minor in Computer Science. She plans to pursue a Master's Degree within the field and then continue her education in medical school.

At the brainwave lab, Thomas Rembert has started working with the research group in the area of vertically-aligned nanowires. The research goal is to modify multielectrode arrays using nanowires and then compare the data collection accuracy and precision to that of standard multielectrode arrays in hopes of creating improved neural probes for brain activity measurement. He has applied for grants in hopes of attaining funding for this research. He hopes to continue the research efforts at the ERC in the area of nanowires.



P3 CENTER UPDATE

Arkansas EPSCoR P3 Center Hosts 9th International Plant Molecular Biologists Congress



The Arkansas P3 Center was a plenary sponsor of the 9th International Plant Molecular Biologists Congress, Oct 25-30, 2009, held in St. Louis, MO. This conference was composed of plenary lectures and 54 symposia that allowed scientists worldwide to network and share research results all under the shared dedication to facing the challenges to improve world agriculture and education. Fifty P3 Center researchers, post docs, graduate students and undergraduate students attended this conference, building the reputation of Arkansas' plant biologists on the international stage.

P3 presented thirty posters and seven students were awarded travel awards. P3 held a networking event on Monday night of the conference to network among the P3 campuses and members of the P3 Technical Advisory Committee in attendance. The sponsorship of this conference was in response to the encouragement of NSF and of the P3 Technical Advisory Committee to sponsor a national or international conference to gain national exposure of the Arkansas P3 Center in order to expand collaborative and grant opportunities.

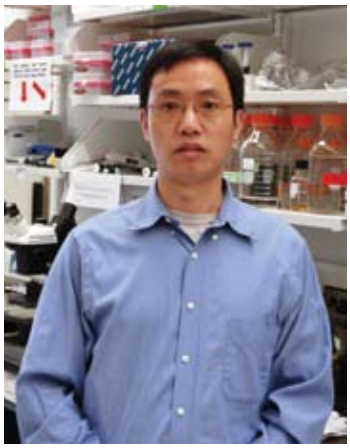
Medina-Bolivar Presents Cutting Edge Research

Dr. Fabricio Medina-Bolívar, Plant Metabolic Engineering/ABI, recently presented a research talk at the 238th American Chemical Society National Meeting held in Washington D.C. His invited talk, "Production and Bioactivity of Natural Resveratrol Analogues from Hairy Root Cultures," was part of the session "Bioactives: New Production Technologies," sponsored by the Division of Agricultural and Food Chemistry of the American Chemical Society.

Dr. Medina-Bolivar's talk covered research in his laboratory at Arkansas Biosciences Institute conducted by two of his PhD students in Molecular Biosciences at Arkansas State University, Jose Condori and Cesar Nopo-Olazabal, as well as collaborative work with ASU researchers Dr. Malathi Srivatsan, Molecular Biology, Dr. Maureen Dolan, Biochemistry/Molecular Biology/ABI, Dr. Ganapathy Sivakumar, Bioengineering/ABI, and Dr. John Hubstenberger, Plant Micropropagation/ABI, and Dr. Julie Carrier from the University of Arkansas-Fayetteville.

This ongoing research is funded by the National Science Foundation-EPSCoR Center for Plant-Powered Production and the Arkansas Biosciences Institute.

UALR P3 Welcomes New Faculty Researcher



Lirong Zeng, PhD, molecular plant pathologist, is the new P3 faculty hire at UALR. He obtained his bachelor's degree in agronomy from Hunan Agricultural University, China; his master's degree in biochemistry from Zhongshan University, China; and his doctorate in molecular plant pathology from Ohio State University. Zeng continued his research as a post-doc at Boyce Thompson Institute for Plant Research, Cornell University.

Zeng's research over the last eight years has focused on the molecular biology and biochemistry of plant-microbe interactions. His research interests include exploring and defining the molecular basis underlying plant resistance and susceptibility against bacterial and fungal pathogens. Findings from his research will eventually lead to crop improvement and less pesticide usage, which is an important component of future sustainable agricultural practices aimed at less energy-intensive production of food, fiber and biofuels. Zeng's research focus at UALR will focus on the identification and characterization of genes and signal transduction pathways involved in rice and tomato immunity, especially the roles and molecular mechanism by which the ubiquitination system regulates defense responses in these plants.

As Arkansas is considered a major rice producer in America, this is an attraction for Zeng's extensive rice research as a resource for his future work and collaborations. Considering the apparent conserved roles of ubiquitination-related components in human and plant immunity, findings from his research could therefore also benefit the understanding of some human diseases. Zeng's research has been published in various peer-reviewed journals, such as Plant Cell and Nature. The findings have contributed significantly to our understanding of the molecular mechanism by which the ubiquitination system regulates plant immunity against different pathogens.

UALR Team Fastforwards Seed Germination using Nanotubes

Dr. Mariya V. Khodakovskaya, P3 researcher, UALR assistant professor of applied science, and Dr. Alex Biris, director of the Nanotechnology Center at UALR, have demonstrated how seeds exposed to carbon nanotubes in the agar medium sprouted up to two times faster than control seed, signifying a growth enhancement having significant potential on agriculture as well as plant-based biofuel production.

The results of the UALR interdisciplinary experiments have demonstrated, apparently for the first time, that carbon nanotubes can penetrate the thick seed coat and speed up water uptake inside seeds. "The activated process of water uptake could be responsible for the significantly faster germination rates and higher biomass production for the plants that were exposed to carbon nanotubes," Khodakovskaya and Biris said. The research team placed sterile tomato seeds on standard agar medium supplemented with different concentrations of carbon nanotubes in order to test their theory that synthesized carbon nanotubes could affect germination and development of crop seedlings. The tomato seeds placed on the medium with various concentrations of carbon nanotubes (CNTs) germinated on the third day, while the tomato seeds placed on regular mediums had not germinated by that time. The germination percentage rates during the next days were dramatically higher for seeds that were treated with nanoparticles. The germination percentage for seeds that were placed on regular medium averaged 32 percent in 12 days and 71 percent in 20 days, while germination percentage of the seeds placed on medium supplemented with CNTs averaged 74 to 82 percent in 12 days and 90 percent in 20 days.

Executives of a Midwest manufacturer of innovative non-pesticide products for landscapes, horticulture and agriculture is making plans to meet with Khodakovskaya and Biris to talk about possible collaboration to further develop and commercialize the discovery. Khodakovskaya's and Biris' results have been published in The Economist and ACS Nano.

Funding for Plants

P3 Researcher and Associate Professor of Entomology, Fiona Goggin recently received funding from the National Science Foundation program for Integrative Organismal Systems, Symbiosis, Defense and Self-recognition. Her research proposal, titled "Influence of fatty acid desaturation on plant defenses against aphids" was constructed from P3-110's preliminary results and approved for funding for three years.

ASU P3 Team Receives Patent for Innovative Technique

Dr. Fabricio Medina-Bolivar, primary inventor, and Dr. Maureen Dolan, co-inventor, received a U.S. Patent on "Production of stilbenes from plant hairy root cultures". The patent was issued on February 23, 2010. The invention relates to a novel production system of stilbenes (also known as stilbenoids). The most studied of these polyphenolic compounds is resveratrol, a natural product that has been associated with a multitude of health benefits impacting various cancers, diabetes, neurodegenerative diseases and aging.

The invention describes a way to produce distinct classes of natural resveratrol analogues by exposing plant hairy root cultures with stress-inducing molecules. These resveratrol analogues are not commercially available and in nature they are produced in very low amounts. Using the hairy root culture technology large quantities of these natural products can be produced and easily purified. The invention has multiple applications in areas such as drug discovery.

The work was conducted in the laboratory of Dr. Medina-Bolivar at the Arkansas Biosciences Institute (ABI) at Arkansas State University (ASU). Additional co-inventors in this patent are Dr. Medina-Bolivar's Ph.D. student Jose Condori, ABI research associate John Hubstenberger as well as Selester Bennett. The patent has been licensed for commercialization to Nature West Inc., a start-up biotechnology company based in Jonesboro, Arkansas.

Xiuzhen Huang Presents at Dagstuhl Seminar

Xiuzhen Huang, PhD, Assistant Professor, Computer Science and Math, Arkansas State University, was invited to attend and present research at the Dagstuhl Seminar, located in Scholss Dagstuhl, Germany, for research leaders and pioneers of the parameterized computation area, organized by Erik Demaine (MIT), and partly supported by the German government. This is considered an honor for researchers in the field of parameterized computation, and Huang was one of only a very limited number of researchers invited in this field from around the world.

Huang presented Efficient Parameterized Algorithms for Protein Structure Prediction and Applications, bringing her EPSCoR P3 Center research to an international level. At this seminar, Huang had extensive research discussions on novel computational models, efficient parameterized algorithms and applications in bioinformatics with researchers from the US, Canada, Australia and Germany. Opportunities arose for potential research collaborations on bioinformatics research and parameterized complexity between the EPSCoR P3 Center and the labs in Europe and Australia.

RESEARCH SUCCESSES AND AWARDS

Dr. Argelia Lorence Honored with Prestgious Award

The first week of March, Dr. Argelia Lorence (Associate Professor - Arkansas Biosciences Institute and Department of Chemistry and Physics, Arkansas State University) taught a one week theoretical /practical course on "Plant DNA Barcoding" at the Research Center of Biotechnology (Centro de Investigación en Biotecnología) of the Autonomous University of the State of Morelos (Universidad Autónoma del Estado de Morelos), located in Cuernavaca, Morelos, Mexico.

On Monday, March 8th as part of the celebrations for Mexico's International Women's Day, Dr. Lorence received an award from the government of the State of Morelos as Distinguished Woman of the Year in part for her research done as part of Arkansas EPSCoR Center for Plant Powered Production. The award was presented at a session of the local congress in Cuernavaca.

P3 and WiNS Student Researchers Declared Winners ay Yearly Poster Competition

During the second day of the 2009 NSF EPSoR Annual Conference, Arkansas college students convened at the Doubletree hotel to take part in the annual poster competition highlighting summaries of their work to be judged by science specialists from across the state. Later in the day, Governor Mike Beebe congratulated each of the winners on stage prior to his noon address.

Winners from the WiNS center included undergraduates Alexandra Anghelescu, Andrew Shepherd and Andrew Hayes of UALR, and Lauren Kegley with the University of Arkansas – Fayetteville. UALR Graduate student Rabindra Ghimire was awarded for his poster project for the WiNS Center, while fellow UALR graduate students Jing Zhang, and Karishka Silva were awarded for their P3 poster displays. The University of Arkansas – Fayetteville was represented as graduate students Pratyush Rai, and Prashanth Shyam Kumar were awarded for the posters representing their work in the WiNS Center, while graduate students Kelly Carruthers, Milenka Arevalo and R. Louis Hirsch were acknowledged for their work in the P3 Center. Arkansas State University's P3 Center was also acknowledged with graduate students Jose Condori, Cody Ashby and Shashank Kulkarni being declared winners as well.

Communicating Science
Continued from Page 1

In a session designed to teach researchers how to communicate their ideas in a media interview format, Graveline demonstrated how to highlight the benefits of research discoveries in a way that adds perceived value and guarantees continued support. Graveline used interactive "guinea pig" models to practice research message delivery and public talks as wells as the use of language and gestures to create emphasis.

Tiffany Lohwater, Public Engagement Manager for the AAAS, led a series of separate breakout sessions targeting public information officers (PIOs). During these sessions, she used group exchange methods and worked with PIOs on ways to identify and tailor messages for specific audiences. PIOs, who work with these research professionals, had an opportunity to brainstorm new ways of "getting the message out."

Reflecting on the positive feedback he received from attendees, Nesbit was optimistic about the future of communicating science in Arkansas. "I think the PI / PIO conference in Little Rock was a great success," said Nesbit, "The researchers and communications professionals I met there were enthusiastic, receptive and insightful in their feedback. I am confident that once they return to their campuses, together we will implement effective communications strategies and a variety of new mechanisms to tell the stories of great science in this region."

Topousis sees both immediate and long term benefits of the training. "The groups that are here today will be able to go back to their campuses and really use these skills to inspire that next generation of Americans who are going to pursue a career in science in engineering. That, of course, translates into a stronger economy because universities are able to preserve and even create jobs within their departments."