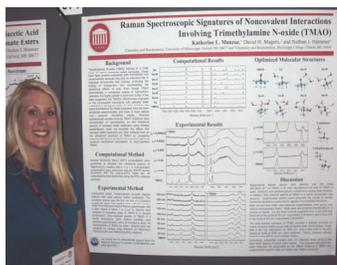


# MISSISSIPPI EPSCoR Experimental Program to Stimulate Competitive Research



## UM students present at international conference

Three students from the University of Mississippi attended the XXII International Conference on Raman Spectroscopy in Boston, MA in August. Graduate students, Katherine Munroe and Ashley Wright, along with undergraduate student Nikki Reinemann presented the results of their EPSCoR funded research. All three received travel award fellowships to attend this prestigious meeting, which coincided with the 50th anniversary of the invention of the laser. Munroe, Wright, and Reinemann heard presentations from the inventors of the laser and presented their research to conference participants from around the world.



The title of Munroe's poster was "Raman Spectroscopic Signatures of Noncovalent Interactions Involving Trimethylamine N-oxide (TMAO)".

## Mississippi EPSCoR host first fall research forum at UMMC

Mississippi EPSCoR held the first annual Fall Research Forum on September 20, 2010 at the University of Mississippi Medical Center in Jackson, MS. The day long forum included an overview of the research being conducted in each of the three research areas: Computational Biology, Computational Chemistry, and Computational BioSimulation.

The 2010 seed grant recipients, Mohammed Ali (JSU),

presented his research titled "Numerical and In-silico Simulation of Electrodynamical Effects on Inhaled Aerosol Particles Deposition in the Human Lung"; Jason Ritchie (UM and David Magers (MC) presented their research titled "Computational and Experimental Investigation of the Mechanism of Proton Conductivity in an Anhydrous Proton Conducting Electrolyte"; Nan Wang (USM) and Henry Wan's (MSU) research title was "Structural

*Determinants for Canine Influenza Infection*"; and Annette Wysocki, (UMMC), working collaboratively with Hybrid Plastics, Inc. presented her research titled "Engineering and Testing of Bionanohybrid Cartilage using POSS and Type II Collagen."

A session titled "Hot Topics" was a favorite at the forum. Researchers had five minutes to present the research that they were conducting in an effort to recruit collaboration of researchers from other institutions on the project(s) that were presented during the Hot Topics session. Following this session, researchers participated in break-out sessions to allow time for further fostering of collaborations among the researchers and the institutions.

The location for the research forum will rotate among the four research institutions each year. In Fall, 2011 the Forum will be held at the University of Mississippi where the keynote speaker will be Roald Hoffman, Nobel Prize winner, Chemistry, 1981.



National Advisory Board member, Dr. N. Radha (l), poses questions and comments during the research presentations at the 2010 Fall Forum.



## UM students participate in Student Exchange

In August, University of Mississippi graduate student, Debra Jo Scardino, and undergraduate student, Matthew McDowell, visited



three chemical physics research labs at Yale University and the University of Massachusetts, Amherst. These visits were part of the EPSCoR Student Exchange Program.

The goal of this EPSCoR-funded trip was for the students to interact with and work alongside other students and professors, performing similar research to that funded by the current MS EPSCoR award. Working with these prestigious, well-established groups, Scardino and McDowell returned to UM with a wealth of experience that has already yielded dividends in the lab.

The trip also inspired McDowell to pursue a graduate career focusing on physical/theoretical chemistry and he is now applying to top chemistry graduate schools including Yale.

Scardino and McDowell are members of Dr. Nathan Hammer's research team.

## Students and faculty travel to Belize

As part of the MS EPSCoR International Exchange Program a team of administrators, faculty, research associates, and students from Jackson State University (JSU) and Mississippi State University (MSU) traveled to Belize during the week of May 24, 2010. Institutions visited by the team were University of Belize, Belmopan; Central Medical Lab, Karl Heusner Memorial Hospital, and Agricultural Health Authority, Belize City; and Citrus Research and Education Institute, Dangriga.

The overall goal of the visit was to identify potential areas of collaboration in research and education. The team members from JSU were Ms. Rita Presley, Associate Vice-President for Research; Dr. Raphael D. Isokpehi, associate professor of Biology;

Udensi K. Udensi, research associate, and Lee C. Campbell, research associate. In addition three JSU graduate students, Baraka Williams, Centdrika Dates, and Jessica Davis were sponsored by Louis Stokes Mississippi Alliance for Minority Participation program at JSU. The team from MSU consisted of Dr. Susan Bridges, professor of computer science and engineering; Dr. Dan Peterson,

associate professor of Plant Genomics and Molecular Biology; and Katie Echols, education and outreach coordinator, Mississippi EPSCoR.

The visit helped to identify key areas for collaboration including bioinformatics research and education, translational health research, agriculture and geographical information systems for monitoring fruit flies.



Team members from Mississippi EPSCoR with students and faculty of the University of Belize, Belmopan, Central America.

## Comp Science summer workshop held

More than a dozen high school teachers from east and central Mississippi attended the professional development workshop this summer at Mississippi State University.

The focus of the workshop was on the use of the computational sciences to enhance instruction in basic science principles. Three areas of the computational sciences were addressed: computational biology, computational chemistry, and computational biosimulation.

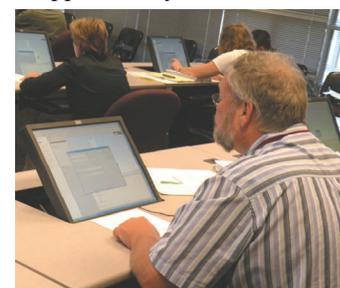
Science teachers played the role of student and learned about what the field of com-

putational science has to offer.

"This is a unique workshop," said Judy Flake, a science teacher from South Leake High School. "Very challenging, it is teaching us new information, giving us new ideas and giving us access to materials that we have not had."

In addition to class presentations and laboratory experiences, workshop participants spent time at MSU's Center for Advanced Vehicular Systems, High-Performance Computing Collaboratory and other major research areas

where computational science is applied daily.



"One of the goals was to help Mississippi's teachers reach and teach their students with technology," said Katie Echols, EPSCoR's education and outreach coordinator.

"One example of this was the

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# Bioinformatics grad students visit Goteborg Univ.

Baraka Williams and Jennifer Sims, graduate students in the Center for Bioinformatics and Computational Biology at Jackson State University, participated in the Mississippi EPSCoR International Exchange Program. The students visited the Department of Cell and Molecular Biology Laboratory of Dr. Thomas Nystrom at Goteborg University, Goteborg, Sweden to conduct phenotypic assays on universal stress proteins in bacteria. Dr. Nystrom is a pioneer and renowned researcher on genes encoding the universal stress protein (usp) domain.

The visit from July 25 to August 1, 2010 provided them with hands-on training on

phenotypic assays for *usp* mutants by performing the oxidative stress assay using t-BOOH, osmotic stress assay using PEG 8000, DNA damage UV stress test, motility test, and fimbriae-mediated adhesion test. *Escherichia coli* and *Pseudomonas putida*

were bacteria used to conduct the experiments. The short training will allow them to design experiments to validate previous bioinformatics-based modeling of functions of universal stress proteins.

Bertil Gummesson, PhD stu-

dent at Goteborg University, led the training. The experience provided a memorable cultural and research experience for the students.



Baraka Williams (left) and Jennifer Sims (right) both of Jackson State University are pictured with their host Bertil Gummesson (center), PhD student at Goteborg University in Goteborg, Sweden.

# UMMC host 40+ students during SURE program

For the past three summers, students have participated in the Summer Undergraduate Research Experience (SURE) program in the School of Graduate Studies in the Health Sciences at the University of Mississippi Medical Center (UMMC). This internship program was established for training undergraduate students in the biomedical sciences. For SURE 2010, 40+ students from a variety of colleges and universities were matched with UMMC researchers for hands-on experiences in a biomedical research laboratory. In addition to the lab experience, the students attended seminars and discussions aimed at enhancing their understanding of the current status of biomedical research and the

career opportunities available.

Two undergraduate students participating in the 2010 SURE program worked in Dr. Robert Hester's Computational Medicine laboratory. Both students, Bailey Hansen



(l) and Weston Smith (r), are currently undergraduate students at Mississippi State University (MSU). These students had the opportunity to experience firsthand the detailed physiological model, HumMod: An Integrative Mathematical Model of Human Physiology. Hansen and

Smith completed background research into burn physiology in an effort to lay the groundwork for the eventual expansion of HumMod to serve as the underlying code in a burn patient training simulator

designed by a group in Washington, D.C. They were involved in troubleshooting, documentation, and expansion of the HumMod program itself.



## Craine to present at ABRCMS national conference JSU's Cohly visits Indian universities

LaVar Craine, from Byhalia, MS and currently a senior science major at Rust College in Holly Springs, MS, has been accepted to give an oral presentation at the Annual Biomedical Research Conference for Minority Students (ABRCMS), November 10-13, 2010, Charlotte, North Carolina.

He will present research from his Summer, 2010 Undergraduate Research Assistantship at the University of Mississippi (UM) in the lab of Dr. Robert J. Doerksen, Associate Professor of Medicinal Chemistry, School of Pharmacy. His presentation is entitled *Evaluation*

*and Comparison of 3D-QSAR CoMSIA/CoMFA Models for CDK1, CDK5, and GSK-3 $\beta$  Inhibition by Paullones*; authors -- Craine, L., Doerksen, R.J., and Fu, G.

Craine's summer experience at UM was funded by NSF's EPSCoR grant. The project will also provide funding for Craine's travel expenses to attend the conference. EPSCoR funding allows university researchers to identify, develop, and use academic science and technology resources to

increase Mississippi's research, develop competitiveness, and support economic growth.

Of the abstracts submitted to ABRCMS for oral presentations, the top eight undergraduate abstracts in each of the 10 scientific disciplines were selected for oral presentations.

Last year, 270 abstracts were submitted for oral presentation and only 76 were selected.

Craine says he is very excited about this opportunity.

## JSU's Cohly visits Indian universities

Dr. Hari H.P. Cohly in the Department of Biology, College of Science, Engineering and Technology, Jackson State University visited two Indian institutions of higher learning in July: Dayalbagh Educational Institute and Hindu-



stan College of Science and Technology (HCST). The trip was sponsored by the Mississippi NSF EPSCoR Project on Modeling and Simulation of Complex Systems. He made presentations about his ongoing research at JSU.

The visit led to the establishment of collaboration discussions with Dr. Arun Chopra, Head, Department of Biotechnology, Hindustan College of Science and Technology (HCST). The



discussions since August have led to preparation of a draft memorandum of understanding; joint poster presentations; as well as a draft proposal for a follow-up visit that will include additional faculty, students and administrators.

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### Comp Science summer workshop

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day that the teachers learned about biological simulation and fluid mechanics. The teachers used computers to simulate the things that would happen when they run actual experiments in the classroom with their students. We know that "today's students

respond to technology because it's an integral part of their everyday lives," Echols added.

"Computational science in the classroom takes advantage of that relationship and shows students how science and research are cutting-edge and cool."



### UM professor/student visits Oxford middle school

UM's Dr. Nathan Hamer, Chemistry and Bio-Chemistry assistant profes-

sor and undergraduate Nikki Reinemann (m) recently visited an Oxford



Middle School. The two visited Ms. Midge Havins's (r) Career Discovery classroom where they shared information about careers in science and the EPSCoR funded research.