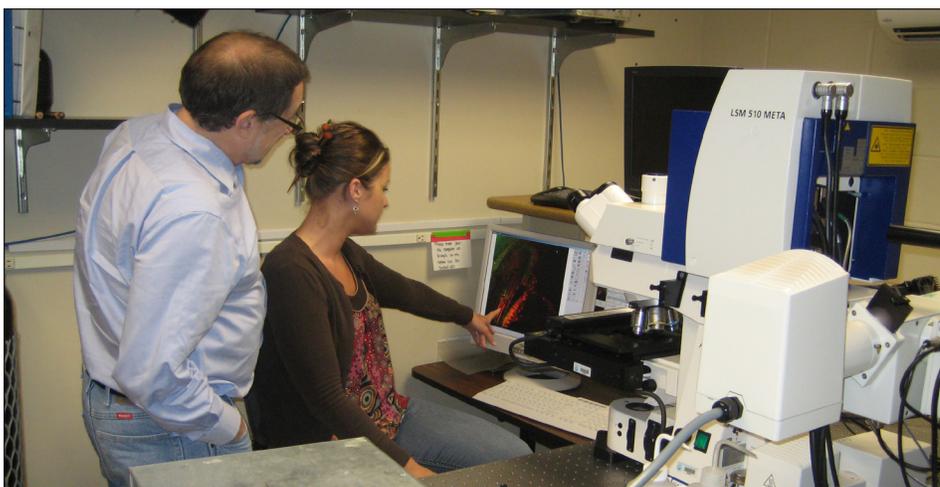




INROADS

A newsletter of Nebraska's Institutional Development Awards (IDeA) Networks of Biomedical Research Excellence (INBRE)

Creighton core facility to partner with INBRE program



Richard Hallworth, Ph.D., director of the Integrated Biomedical Imaging Facility at Creighton University's School of Medicine, and research imaging specialist Heather Smith, Ph.D., at the controls of the Zeiss LSM 510 multi-photon confocal microscope.

INBRE scholars and faculty associates soon will have a new core facility with a powerful microscope to turn to for their research.

The Integrated Biomedical Imaging Facility at Creighton University's School of Medicine will be available to everyone in the INBRE program beginning in May, said Richard Hallworth, Ph.D., director of the facility.

Dr. Hallworth, who also is a professor of biomedical sciences at Creighton, has been a faculty associate in the INBRE program for four years.

"The main instrument in the core facility is the Zeiss LSM 510 multi-photon

confocal microscope, the only one in Nebraska," Dr. Hallworth said.

The microscope, he said, is especially useful in capturing high resolution images of living cells.

Much of science, Dr. Hallworth said, is moving toward using high resolution imaging, particularly in structural biology, which is the study of how proteins function in the cell.

"This core facility will enhance the work of researchers involved in the INBRE program and help make their research more competitive for grants," he said.

Researchers who want to use the confocal microscope will be trained on its use.

An online reservation system allows researchers to book time with the microscope. The fee is \$25 per hour.

Dr. Hallworth said he uses the microscope in his own research on deafness. He is particularly interested in how the death of hair cells from aging or noise leads to deafness. He also wants to learn how to prevent those cells from dying.

Several INBRE scholars have worked on this research with Dr. Hallworth, as well as some undergraduate students at Creighton.

For more information contact Dr. Hallworth at (402) 280-3057 or visit the Web site at: <http://biomed.creighton.edu/ibif>

INBRE funding helps library

One of the most important tools in an INBRE scholar's arsenal just got better.

The McGoogan Library of Medicine at the University of Nebraska Medical Center will see an increase in the funding it receives from the INBRE program.

Since its inception in 2001, the INBRE program has donated \$55,000 a year to the medical library. That support will increase to \$70,000 for the 2010 subscription year.

Library officials use the money to pay for online subscriptions to scientific journals that they otherwise would never have

Library continued on page 2

Bioinformatician joins INBRE program as faculty associate



Dhundy "Kiran" Bastola, Ph.D.

In the world of bioinformatics, collaboration is key.

"Every question brought to us is unique and it helps to have a biologist and computer scientists working side by side to find answers," said Dhundy "Kiran" Bastola, Ph.D.

The NE-INBRE Bioinformatics Core at the University of Nebraska at Omaha (UNO)/Peter Keiwit Institute aims to provide such an environment, and promote collaborative research between life scientists and bioinformaticians.

Dr. Bastola, an assistant professor of bioinformatics, is the associate director of the bioinformatics core facility. He

joins Hesham Ali, Ph.D., the director of the core facility, as the newest INBRE faculty associate.

As an INBRE associate, Dr. Bastola is working with several undergraduate students at UNO interested in bioinformatics, two of whom are INBRE scholars.

By working in bioinformatics, Dr. Bastola is able to help scientists extract knowledge out of the data they gather from their research.

While he uses computational tools to do this, it is the collaboration between Dr. Bastola and the researcher that ultimately nets the answers the scientist seeks.

Dr. Bastola began his career in science with a degree in molecular biology and earned his Ph.D. from the University of New Hampshire.

He worked as a molecular biologist at various laboratories at the University of Nebraska Medical Center before his interest in bioinformatics led him to UNO.

There, Dr. Bastola hopes to develop better software to allow scientists to manage and analyze biological data obtained from molecular biology research.

"Bioinformatics makes the information scientists are getting from their research available in a concise way so they can ask bigger and better questions," Dr. Bastola said.

For example, many scientists use microarray technology to measure changes in the expression levels of proteins and to find polymorphism in thousands of genes.

The resulting data then needs to be read and stored in such a way that will help the scientist glean the information they seek.

"Just like a meteorologist uses multiple datasets to make weather forecasts, meaningful information from microarray data is only possible after comparing multiple datasets from similar experiments.

Computational tools allow the scientist to achieve this goal," Dr. Bastola said.

Library continued from page 1

been able to afford – journals that the INBRE scholars use regularly.

"Nature, Human Molecular Genetics, Bioinformatics, Cell and Neuron are just a few of the 26 scientific journals that we now have available," said Mary Helms, associate director of the McGoogan Library.

The best thing about having the journals, Helms said, is that everyone involved in the INBRE program can use them.

"These journals are for everybody and we wouldn't have them if it weren't for the funding we receive from the INBRE program," Helms said.

"I would not be able to do my research without the access to these journals



Mary Helms

that the library provides," said Andrea Holmes, Ph.D., a professor of chemistry at Doane College.

Dr. Holmes said that access to the variety of scientific journals available is limited at Doane and she often uses this service, especially when traveling.



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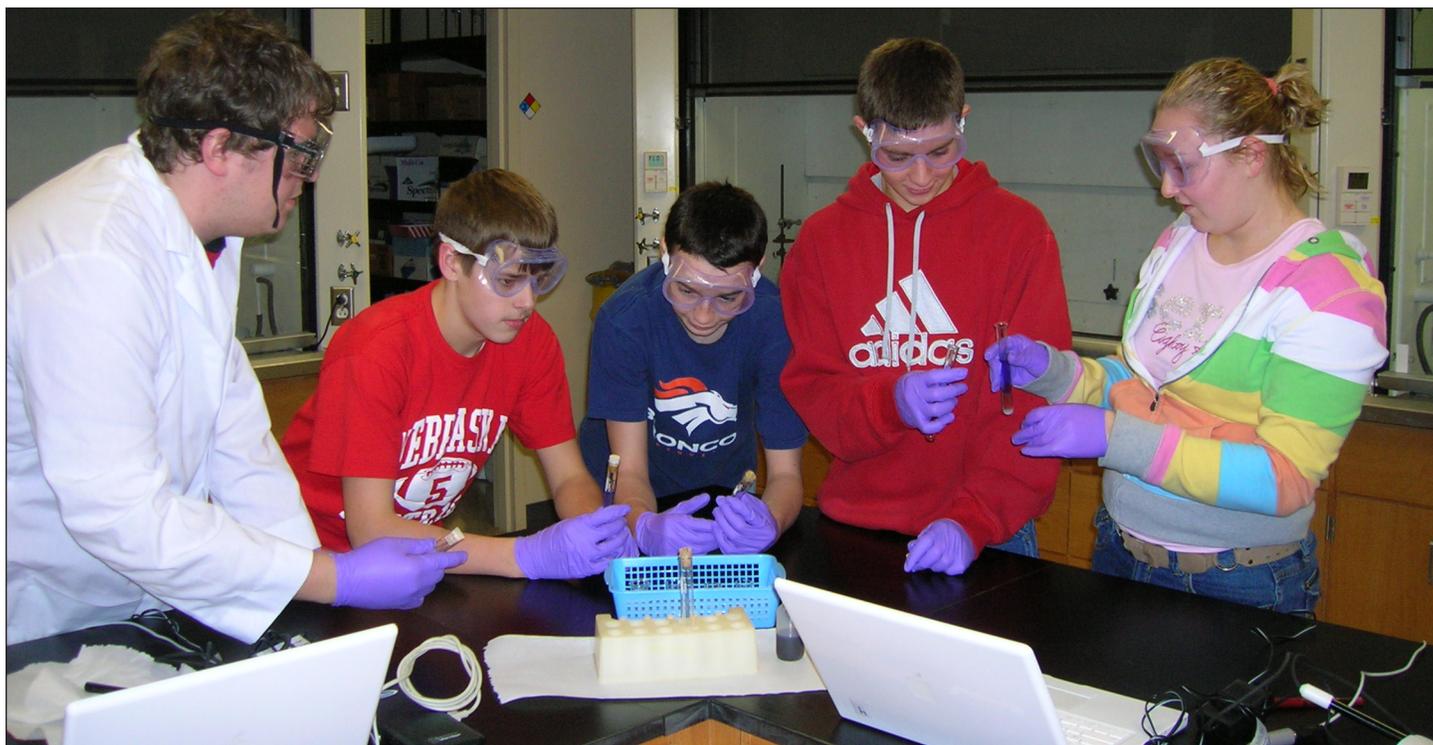
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Once a week students from Crete Middle School join INBRE scholar, Jacob Francis, (far left) in the lab of Andrea Holmes, Ph.D., at Doane College for hands-on science. Pictured, from left to right, are eighth-graders Garrett Wahl, (standing next to Francis), Nate Harms, Anthony Fitzgerald and Alexis Page.

Partnership brings college level science to eighth-graders

As any student knows, learning about chemistry can be boring or it depends on the teacher you get.

For 10 high achieving eighth-graders from the Crete Middle School Enrichment Program, chemistry class is a blast. At least on the days their teacher, Kerry Lucas, Ph.D., decides to blow something up.

Since the school year began, the students have spent an hour a week in the chemistry lab of Andrea Holmes, Ph.D., a chemistry professor at Doane College, where Dr. Lucas is completing a post-doctoral fellowship.

Dr. Holmes, a faculty associate in the INBRE program, sees the enrichment program as an opportunity to capture the interest of these students early.

"Middle school is one of the best times to get these kids excited about science," Dr. Holmes said.

Her involvement with the program began with a request from Barb Kuzma, a

retired Crete Middle School enrichment teacher, who asked Dr. Holmes if she would give a few classroom presentations.

"Middle school is one of the best times to get these kids excited about science."
Andrea Holmes, Ph.D.

Dr. Holmes' participation grew into a more formal agreement when she wrote the enrichment program into her National Science Foundation grant, which she received in March 2008.

"I thought, why not formalize the relationship I had developed with the school and make it more comprehensive," she said.

Dr. Holmes hired Dr. Lucas to teach the class and Kuzma as the outreach coordinator. A service learning grant from Doane also helps fund their work.

"Dr. Lucas is doing an exceptional job teaching the class," Kuzma said. "The middle school students are able to connect with the core concepts because of the care Dr. Lucas has taken to develop and sequence the investigations."

Dr. Lucas said she designs the experiments to include things the students would use in everyday life.

"Baking soda, salt, vinegar, sugar, even fruit juice is used to show the students that there are chemicals all around them," she said. "The students have a lot of fun and so do we."

Dr. Lucas is joined by INBRE scholar Jacob Francis, a sophomore chemistry major at Doane, who helps with the class.

Christa Flitcroft, a 2007 INBRE scholar and senior chemistry major at Doane, conducts a similar program at Crete Elementary School. Flitcroft takes simple chemistry experiments to the school and does demonstrations for the students.

Outreach activities complement national commitment to science education

As we move forward with a new administration in Washington D.C. and a renewed emphasis on the importance of science in our society, it is important to recognize once again the exceptional vision shown by our leaders at the National Center for Research Resources when they established the IDEA program and especially the INBRE.



James Turpen, Ph.D.

President Barack Obama has made a national commitment to education in science, technology, engineering and mathematics (STEM).

The president has underscored the impact that science and technology will have on our national goals and our

economic well-being in both the near future and long term.

The INBRE program has recognized the importance of providing opportunities for students at all educational levels to become exposed to the thrill of discovery and the challenges of science.

The program underscores the importance of the development of a pipeline to bring talented students into careers in science and the health professions.

In past issues of INROADS we have highlighted the accomplishments of many of our students at both the graduate and undergraduate levels and have taken pride in our success with the pipeline.

Here in Nebraska, we have focused primarily on our undergraduate campuses and our commitment to providing research experiences to college-level students.

This issue of INROADS recognizes an important activity taking place at Doane College, as faculty members bring science to the middle school classroom in Crete, Neb.

Identifying and nurturing budding scientists at the pre-college level is an important next step in the development of our commitment to STEM education.

This timely juncture illustrates how we in INBRE have science and educational programs already in place that enable us to respond to national recognition of the importance of science and the national commitment to science education at all levels.

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