



INROADS

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

2008 BRIN Scholars begin scientific journey

A new crop of BRIN scholars have begun their immersion in the world of scientific research at the University of Nebraska Medical Center, University of Nebraska-Lincoln and Creighton University Medical Center.

Twenty-two students from eight undergraduate institutions already have joined their assigned labs, and are now learning the language, techniques and discipline it takes to do biomedical research.

“This year’s class of scholars continues to represent the top students from around Nebraska,” said James Turpen, Ph.D., professor of genetics, cell biology and anatomy at UNMC and principal investigator of the Nebraska-INBRE grant.

The average GPA of the entering class is 3.64, he said, and many of the students have indicated a genuine interest in graduate school and careers in biomedical research.

“I look forward to working with these outstanding students over the next several years,” Dr. Turpen said.

Established in 2001, the BRIN program was created to expose students to serious biomedical research, build a statewide biomedical research infrastructure between undergraduate and graduate institutions and strengthen undergraduate institution’s infrastructure and increase its capacity to conduct cutting-edge biomedical and behavioral research.

Undergraduates enter the program after completing their sophomore year and upon recommendation of their college professors. Each undergraduate school



The 2008 BRIN Scholars gather for a group photo in the Durham Research Center. Pictured from left to right are, back row: McKenzie Jarecki, Craig Kreikemeier, Andrew Block, Frank Miller, Garrett Paulman, Ximeng Zheng, Sabreena Bathke, Katie Brown, Andie Gilkey. Middle row: Fany Iseka, Paige Mathew, Becky Fusby, Julia Warnke, Kelley Wanzeck, Roxanna Fees, Kyla Ronhovde. Front row: Lokeshchandra Kalekar, Derek Moormeier, Andrew Lescelius, John Olley and Caleb Schmid. Not pictured: Carolyn Moore.

nominates approximately three students a year for the program.

Once in the program, the students are given two-year scholarships worth \$11,000.

The scholarship provides students with \$2,500 during each of their next two undergraduate years and \$3,000 during each of their next two summers.

During the school year, the students conduct research on their home campuses.

During the summers, they have the option of staying on their home campus or coming to UNMC, UNL or Creighton and conducting research.

Here is how some scholars hope to benefit from the program:

Kelley Wanzeck, biochemistry major at Creighton University: “I see the program as a great way to become directly involved with real world science early in my academic career.”

Lokeshchandra Kalekar, biology major at the University of Nebraska at Omaha: “Programs like BRIN prepare us for the very competitive world of scientific research.”

Kyla Ronhovde, biochemistry major at Doane College: “This program will provide me with a valuable core research foundation essential for graduate school.”

Former BRIN Scholar going to Harvard

Working at her mother's kitchen table, 8-year-old Jessica Haight peers through the microscope of her simple chemistry set, fascinated by the microscopic world she sees.



Jessica Haight

Fast forward 14 years and that cheery-eyed little girl, now a 22-year-old college senior, is still looking through microscopes, this time during a semester abroad at the University of Turku and Abo Akademi in Finland.

"I wanted to be a marine biologist, but after having to do dissections in advanced biology I changed my mind and decided I wanted to work in a lab," Haight said.

"I want to work with the HIV virus to help find a cure, or be part of a team that finds

cures for the other devastating diseases out there destroying people's health."

The recent Nebraska Wesleyan University graduate and former BRIN scholar has been accepted into the biological and biomedical sciences graduate program at Harvard University.

"I want to study anything in the area of infectious diseases," Haight said. "My goal is to earn a Ph.D. in microbiology and virology so I can run my own lab researching infectious diseases, particularly HIV."

"Jessica is a great example of what can happen when our scholars are provided opportunities to do research. Our goal is to identify talented students and generate enthusiasm for science," said James Turpen, Ph.D., a UNMC professor and principal investigator of the Nebraska-INBRE grant.

"Now one of our scholars is going to one of the best graduate programs in the country," he said.

Haight credits the INBRE program for broadening her knowledge in the field of biomedical research.

"The program helped me determine that research is something I really want to pursue and allowed me the opportunity to participate in different research projects," she said.

During her two years as a BRIN scholar, Haight worked in the labs of Mike Belshan, Ph.D., Creighton University Medical Center, and Angela McKinney-Williams, Ph.D., Nebraska Wesleyan University.

With the support of her family and encouragement of teachers and mentors, Haight has found a comfortable place in the world of scientific research.

Said Haight: "I love to solve problems, and that's what science is all about, finding solutions to all sorts of problems. I also love the unknown and the excitement of trying to figure it out and understand it."

Professor lauds INBRE program

Even before she joined the faculty at Creighton University, Karin van Dijk, Ph.D., planned to join the INBRE program.

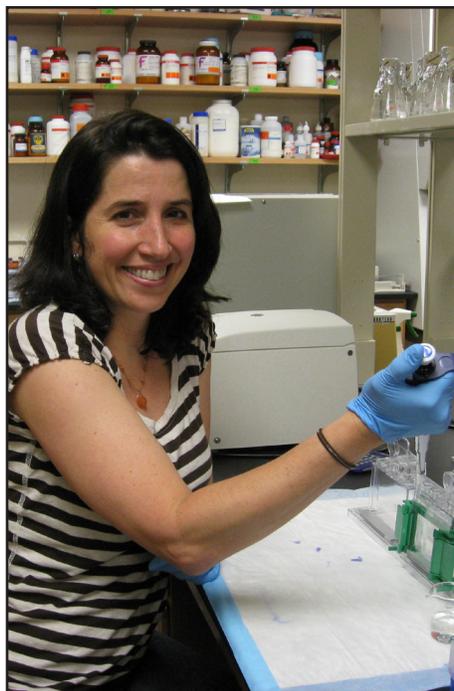
As a post-doc at the University of Nebraska-Lincoln, Dr. van Dijk was familiar with the program through a BRIN Scholar who worked with her in the lab.

"I *really, really* wanted to get involved with the program once I came to Creighton," said the assistant professor of biology.

"It's such a great program, and not just for the students," said Dr. van Dijk, "but for the faculty as well. It has helped me get more integrated at Creighton. I joined the INBRE journal club, which is made up of INBRE faculty associates and BRIN Scholars who meet once a week to discuss research."

Dr. van Dijk is one of six INBRE faculty associates at Creighton University.

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Dr. van Dijk working in her lab at Creighton University.



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Community College.

www.unmc.edu/inbre

Professor provides a mentor's perspective

James Van Etten, Ph.D., studies plant virology. Specifically, he studies the chloroviruses, which infect certain species of algae.

And he's been doing it for 25 plus years. In that time he has trained numerous graduate and post doctoral students.

Each graduate student is as unique as the next, but none more green than the undergraduates who've recently started coming to his lab through the INBRE program.

Since INBRE began five years ago, Dr. Van Etten has had several BRIN scholars come through his lab doors. Each as doe-eyed as the next, and just as eager to learn.

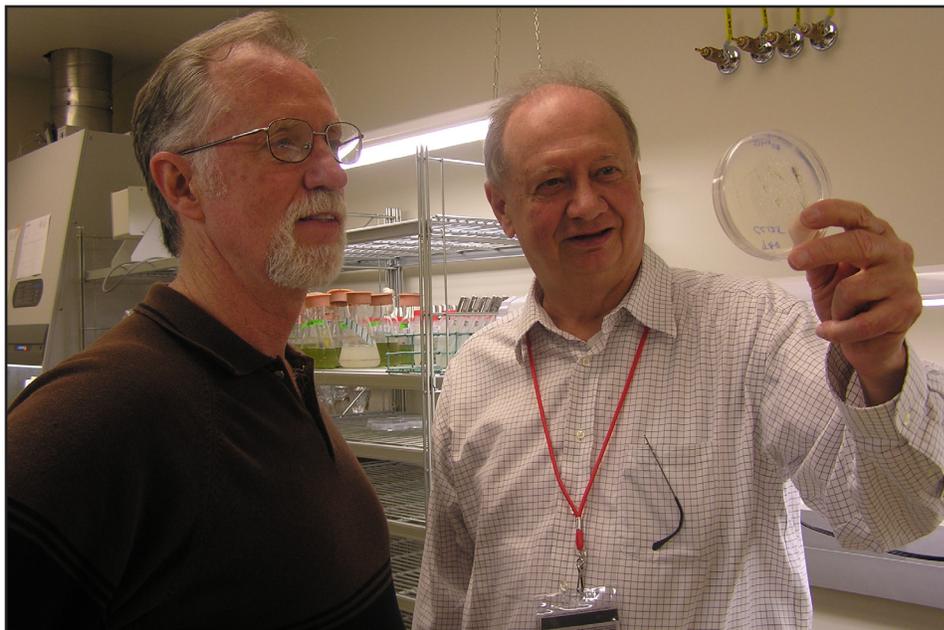
"I enjoy talking to the students. They're bright, focused and good students," said the William Allington Distinguished Professor in plant pathology and co-director of the Nebraska Center for Virology at the University of Nebraska-Lincoln.

When the BRIN scholars come into Dr. Van Etten's lab for their summer experience he makes a point to meet with each one separately for one hour every week to talk about science.

"I want to give them the opportunity to share their thoughts on science," he said. "They come up with some pretty interesting ideas about the research they want to do, or the research we are currently working on."

Not only does Dr. Van Etten mentor BRIN scholars, but he also mentors faculty associates.

One associate he is particularly proud



Gary Duncan, Ph.D., at left, a professor of biology at Nebraska Wesleyan University with his mentor James Van Etten, Ph.D., professor of plant pathology at the University of Nebraska-Lincoln.

of is Gary Duncan, Ph.D., a professor of biology at Nebraska Wesleyan University (NWU).

Through INBRE Dr. Duncan was paired with Dr. Van Etten as a way to help the NWU professor establish a research program at the smaller university.

Dr. Duncan "graduated" from the program last year, after spending five years building his research career. Most of that time has been spent in Dr. Van Etten's lab.

"Dr. Duncan has been a very active participant in my research program for the past four years," Dr. Van Etten said.

In fact, Dr. Duncan frequents the lab so much, that Dr. Van Etten considers him an active member of his research team.

"He regularly attends our lab meetings and is in the lab at least one day a week, if not more, year round," Dr. Van Etten said.

The more students and teachers who are exposed to the world of research, the better, he said.

"We want to keep our best and brightest in the state. This program does that by allowing faculty from smaller institutions the time and funding to conduct research, which in turn exposes students at those schools to science," Dr. Van Etten said.

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She has worked with one BRIN scholar and is expecting a second to join her lab this fall.

"The students in the program are very lucky," she said. "It exposes them to so much and helps them become familiar with the world of research."

Dr. van Dijk's research involves studying the type III protein secretion system in a plant pathogen called *Pseudomonas syringae*.

Specifically, Dr. van Dijk is interested in a subset of proteins, called chaperone proteins that escort the type III proteins from the pathogenic cell into the host cell.

"I'm interested in figuring out why some proteins are transferred before others, and what role the chaperones play in this process," she said.

The system, she said, is very elaborate and present in many pathogens, whether they are plant, human or animal in nature.

"This secretion system also is present in *E. coli*, *Salmonella* and *Yersinia*, the bacterium that causes the black plague," Dr. van Dijk said.

Through INBRE, Dr. van Dijk said she has been able to purchase the supplies she needs for her lab to continue to study these pathogens.

"It's been a great support," she said.

Majority of BRIN scholars pursue careers in science

On April 17, our sponsoring agency, the NIH-National Center for Research Resources, released a Funding Opportunity Announcement (FOA) inviting applications for continuation of the INBRE program.

This program has made a significant difference in the research capacity of Nebraska.

The FOA is a wonderful opportunity to apply for competitive funding to continue with the progress we have made over the past five years.

One of the most important metrics highlighting the success of our program is related to how many of our students have pursued careers in research and health related professions.

A total of 124 scholars have graduated since the inception of the program.

Of those, 75 percent have pursued careers in areas related to the health professions, either by attending graduate or professional school or by entering the

workforce in scientific related areas.

While a highly competitive research career is not a path for all of our graduates, one of our goals is to provide students with the opportunity to evaluate their interest and potential as a research scientist.



James Turpen, Ph.D.

Since attracting students into research careers is a major part of our program, I would like to highlight some of the successful aspects of the program.

Twenty one of our graduates have gone on to graduate school in Nebraska at UNMC, the University of Nebraska-Lincoln and Creighton University Medical Center.

These students clearly reflect the concept of “growing our own researchers” and it will be essential to make sure they have opportunities following successful

completion of their advanced degrees.

Fifteen of our graduates have gone on to graduate school out of the state. And while our goal is to keep our best and brightest students in Nebraska, I view those students who went elsewhere as wonderful success stories.

They highlight the quality of the students involved in our BRIN scholars program.

Our Nebraska students have entered graduate schools at such prestigious institutions as Harvard University, the University of Pennsylvania, Emory University, and Washington University in St. Louis, among others.

Nearly all of our graduates have indicated that their experience as a BRIN scholar was instrumental in their success in applying to these institutions.

When these students finish their studies we hope our institutions of higher education have opportunities available to successfully recruit these students back to Nebraska.

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