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INBRE Scholar Travis Kirchner holds boxes containing vials of frozen cells used for studying the transport of proteins in various diseases. Kirchner worked in the lab of Steve Caplan, Ph.D., associate professor of biochemistry and molecular biology at the University of Nebraska Medical Center. The cells are kept in cold storage at -133 °F.



INBRE INROADS

Richard Holland
winners for 2010

Oral Presentations:

- 1st Anne James, Creighton
- 2nd Michael Stewart, UNL
- 3rd Christina Nguyen, Creighton

Poster Presentations:

- 1st Anya Burkart, Creighton
- 2nd Reed Stubbendieck, UNL
- 3rd Cady Sargus, UNL

Former INBRE scholar, Andie Gilkey, reaches for the stars

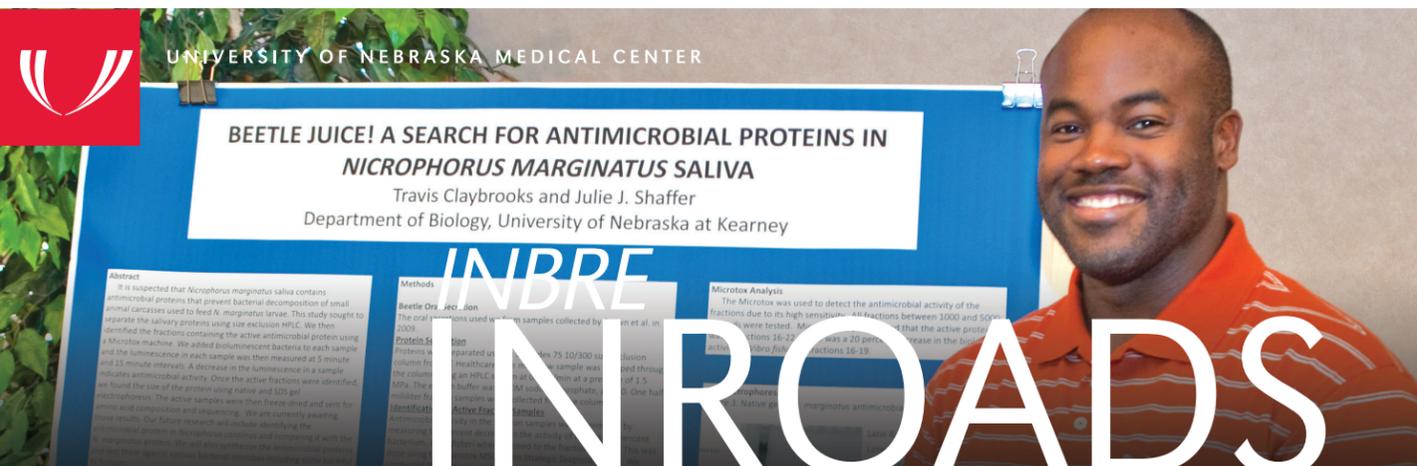
“I was fortunate to take a year-long course that explores health careers during my senior year of high school. It was from this course that I decided to pursue a degree in biomedical engineering. At the time, I wanted to learn to design devices to improve the quality of life.”

While at the University of Nebraska-Lincoln I became an INBRE Scholar and began doing research in a biomaterials and non-viral gene delivery lab. My project was to design a vehicle for non-viral gene delivery. I found that I learned more about biomaterials and tissue engineering doing research in the lab than I could have ever learned in the classroom alone. Taking part in research such as gene therapy, which can benefit people worldwide, is absolutely essential for me, so that I can play a role in improving the lives of individuals suffering from disease. I have found through my INBRE experience that conducting meaningful research and teaching others about the research is very appealing to me, which is why I decided to pursue graduate studies.

I currently attend the Massachusetts Institute of Technology where I am pursuing graduate studies in aeronautics and astronautics. I work in the man vehicle laboratory and study the interaction between humans and their environment,

specifically as it relates to outer space. Patients that have difficulty walking due to movement impairments can directly benefit from biomechanics studies on methods to improve the ability of astronaut crew members to walk in space. This opportunity will allow me to combine my knowledge of biological systems and engineering with my passion for the space program and manned spaceflight.

My desire to help others with medical disorders has not changed since high school. There are many medical disorders people suffer from worldwide, ranging from diseases caused by genetic mutations in the area of gene delivery to movement disorders in the area of biomechanics. Researchers are vital to finding cures to these diseases. Pursuing a Ph.D. can most effectively help me help others both in the research conducted in graduate school and the experience gained in preparation for work in the industry.



INBRE INROADS

in this
issue

Non-traditional college student mixes dream with scientific research

Travis Claybrooks, pictured above, plans to apply his newfound research skills with his dream of opening a whole life wellness center.

Future scientists receive awards at annual INBRE meeting

Six students receive monetary awards and recognition from the Nebraska Coalition for Lifesaving Cures.

The INBRE program is funded by the National Center for Research Resources. NCR is part of the National Institutes of Health, U.S. Department of Health and Human Services.



Richard Holland Future Scientist award winners from left to right: Christine Nguyen, Creighton, third place-oral, Anne James, Creighton, first place-oral, Mike Stewart, UNL, second place-oral and Cady Sargus, UNL, third place-poster. Not pictured: Anya Burkart, Creighton, first place-poster and Reed Stubbendieck, UNL, second place-poster.



From the director

A while back we started a feature that highlighted Honors and Awards that have been received by our students and faculty. A quick glance at this month's feature shows how successful our program participants have been in this area.

Their accomplishments speak volumes about the quality of the NE-INBRE. Anya Burkart is the fourth INBRE Scholars to receive a Goldwater Scholarship. These Scholarships were authorized by Congress in 1986 to honor Sen. Barry M. Goldwater to pay tribute to his leadership, courage, and vision and to establish in his name an endowed recognition program to foster and encourage excellence in science and mathematics. For more information about this scholarship go to the website:
<http://www.act.org/goldwater/yybull.html>

The awards are made on the basis of merit to students who have outstanding potential and intend to pursue careers in mathematics, the natural sciences, or engineering. Based on my discussions with the past winners, their participation in INBRE was instrumental in showing their potential and demonstrating their commitment to pursuing research careers.

Kudos as well, to Julie Shaffer (UNK) on her election as president-elect to the Missouri Valley branch of the American Society of Microbiology and to Dhundy Bastola (UNO) for his appointment as an associate editor for International Journal of Life Sciences.

Congratulations are in order to all recipients for a job well done. Keep it up!

INBRE INROADS

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INROADS participating institutions 2010

Creighton University College of Arts and Science; College of Saint Mary's, Doane College; Little Priest Tribal College; Nebraska Wesleyan University; the University of Nebraska at Kearney; the University of Nebraska at Omaha; the University of Nebraska-Lincoln; Wayne State College; Chadron State College; Western Nebraska Community College.

brin.unmc.edu

INBRE scholar plans to incorporate research into whole life wellness center

It would seem that a wellness center and scientific research are at different ends of the spectrum. But not if you're Travis Claybrooks, who sees a clear link between his dream of opening a whole life wellness center and the research he does as a fellow in the INBRE program.

Claybrooks, a non-traditional student at the University of Nebraska at Kearney, plans to incorporate alternative therapies in his wellness center, like those used by osteopathic physicians. But he wants to know how well those therapies work, and that is where knowing how to do research comes in handy.

"For example, hydrotherapy helps the body do certain things, but there is very little science behind why. I want to document the success or failure of alternative therapies," said the 38-year-old pre-medicine major.

He hopes that the time he spends in the INBRE program will give him the tools necessary to successfully conduct research on the alternative therapies he hopes to one day use in his wellness center.

Over the summer Claybrooks learned the basics of scientific research in the lab of Julie Shaffer, Ph.D., a biology professor at UNK. There he studied the antimicrobial proteins the burying beetle uses to keep the carcasses

of dead animals from decomposing. The beetles then use the carcass as housing for their larvae.

"Being new at research I spent a lot of time learning techniques and improving my lab skills," Claybrooks said.

He credits Dr. Shaffer for teaching him the importance of failure.

"She's an excellent mentor," Claybrooks said. "She'd say, 'here's how you do it, now go learn' and you know you're going to mess up, you're going to fail, but figuring out your mistakes leads to answers."

Recognizing a problem, figuring out the best approach to answering those key questions and coming up with a solution is a skill that is not just beneficial to science, he said, but to life in general.

And Claybrooks gets to spend the next two years as an INBRE scholar honing that skill.

HONORS AND AWARDS

University of Nebraska at Kearney

Kimberly Carlson, Ph.D.
UNK Undergraduate Research Fellow Mentor of Becky Fusby, 2009-2010

UNK Undergraduate Research Fellow Mentor of Joshua Bauer, 2009-2010

UNK Thompson Scholar Mentor of Samantha Mitchell, 2009-2010

Nominated for Pratt Heins Award for Research, 2010

Marquis Who's Who in America, 64th Edition, 2010

UNK Mortar Board Faculty Recognition Award, Fall 2009

2009 Research Innovation Award from UNMC and UNeMed Corporation

Julie Shaffer, Ph.D.
Missouri-Valley Branch of the American Society of Microbiology, president-elect 2009-2010

Dawn Simon, Ph.D.
UNK Undergraduate Research Fellow Mentor of Travis Kirchner, 2009-2010

Becky Fusby, INBRE Scholar
Excellent Poster Award - Sigma Xi Annual Research Conference, Houston, Texas, November 2009

Undergraduate Research Council Travel Award, \$300, November 2009

Student Talent Development Award, \$500, November 2009

2nd Place Poster Award - UNK Evolution Symposium, Kearney, Neb., September 2-5, 2009

UNK Undergraduate Research Fellow, January 2009-May 2010

Doane College

Kyla Ronhovde, INBRE Scholar
Richard Holland Future Scientist Award for undergraduate students, August 2009. (Presented at the Annual INBRE Meeting)

Dr. David Smith Memorial Research Award, May, 2009

Robert Muckel Beta Beta Beta Award for Excellence in biological Sciences, October 2009

Garrett Paulman, INBRE Scholar
Makosky Prize, May 2009. Presented by Doane College to top chemistry student.

University of Nebraska at Omaha

Dhundy Bastola, Ph.D.
Associate editor for International Journal of Life Sciences

Dhananjay Nawandar, INBRE Scholar
Top prize for student poster at the Conference on Biotechnology and Human Development, Vellore, India

Schultz Memorial Collegiate Scholarship, Nebraska Academy of Sciences

Mark Pauley, Ph.D.
Associate director of the Undergraduate Bioinformatics Program at UNO

Keynote speaker at the Biotechnology and Bioinformatics Symposium 2009

Workshop co-chair for "Workshop on Multi-Criteria Programming in Bioinformatics" at the International Conference on Multiple Criteria Decision Making, Chengdu-Jiuzhaigou, China, June 21-26, 2009

Creighton University

Julie Soukup, Ph.D.
Nominee, Creighton University Research Award

Nominee, Carnegie Foundation U.S. Professors of the Year Award

Grant reviewer, National Institutes of Health Challenge grants

Natalie German, INBRE Scholar
American Chemical Society Undergraduate Award in Analytical Chemistry

American Institute of Chemists Award

Creighton University Dept of Chemistry Distinguished Academic Achievement Award

Kelley Wanzeck, INBRE Scholar
Creighton University Clare Boothe Luce Scholarship for Women in Science

Anya Burkart, INBRE Scholar
DAAD Rise Summer Research Internship to study in Germany

Creighton University Clare Boothe Luce Scholarship for Women in Science

C. Bertrand and Marian Othmer Schultz Collegiate Scholarship (NAS)

Barry M. Goldwater Scholarship

Schultz Memorial Collegiate Scholarship

Wayne State College

Doug Christensen, Ph.D., Professor of Biology
Nebraska State Bank Teaching Excellence Award

Science educators and students enriched through summer research experience

Eustice-Farnam High School science teacher Dan Widick would like his students to talk to university professors about science. He never imagined that one day a few of them would actually get to work in a research lab.

Thanks to a \$600,000 educational supplement through the National Center for Research Resources, (a division of the National Institutes of Health), Widick and several other high school students were able to spend the summer working in the research labs of Kim Carlson, Ph.D., and Julie Schafer, Ph.D., at the University of Nebraska at Kearney.

The educational supplement, "Recovery Act Funds for Administrative Supplements Providing Summer Research Experiences for Students and Science Educators," is designed to recruit students

and science teachers to spend two summers doing research in INBRE-supported laboratories on undergraduate campuses.

High school senior Ashley Ferrell joined Widick to learn the latest lab techniques about the cleaning habits of *Drosophila virilis* (fruit flies).

"Almost everything we did in our project with the flies was a new experience for me," Ferrell said.

At the end of the summer she and Widick presented their findings in a poster session at the annual INBRE conference in Grand Island, Neb.

"That was one of the best parts of the program, getting to listen and talk to other groups about their research," Ferrell said.

Ferrell and Widick's research focused on the flies' ability to carry bacteria and disease. The two exposed the flies to *E. coli* and hypothesized that through their cleaning habits the flies would ingest the bacteria and then deposit it in their droppings. What they discovered was that the flies did not ingest the bacteria but instead somehow cleaned it off and left it in the surrounding environment.

"The experience gave me a refresher course on microbiology, showed me new ways of doing things and brought home the fact of just how long research takes," Widick said.

"The faculty at UNK is very willing to help and the students get so much out of it. I wish more students could participate in a program like this," he said.