

MAINE

# INBRE

IDEA NETWORK OF BIOMEDICAL RESEARCH EXCELLENCE

## Three stimulus grants strengthen Maine INBRE with \$2.6M

Maine INBRE has been awarded three supplement grants by the National Center for Research Resources through the American Recovery and Reinvestment Act, the economic stimulus package requested by President Obama and authorized by Congress earlier this year. The awards total \$2.6 million in new research and development support for Maine. The funded initiatives create two new jobs and help retain 10 existing positions. In addition, new equipment purchases, career training and infrastructure investments will create ripple effects in other parts of the local economy.

### WORKFORCE DEVELOPMENT

For more than five years, Maine INBRE has provided a breadth of laboratory training opportunities for

undergraduate students, leading many to pursue higher education or careers in research. 33% of INBRE participants who have graduated now work in a laboratory, while 48% have gone on to higher education in biological or biomedical sciences. For many, their INBRE lab experience was the foundation that allowed and encouraged them to pursue a career in science. Now stimulus funding has allowed INBRE to hire its first Training Lab Manager. Angela Parton, M.S., will work with course leaders to plan, organize and implement the resources and equipment to meet course goals, and provide instruction. Ms. Parton has over two decades of experience in research and general laboratory techniques and is co-author of 25 research articles.



NEW TRAINING LABORATORY MANAGER, ANGELA PARTON

The lab she'll manage is MDIBL's first dedicated training laboratory, built as part of its new green building, dedicated in 2008. Now the INBRE grant and stimulus funding have poised the lab to take on an even greater role in training the next generation of scientists.

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*"I will never be grateful enough to the INBRE program for providing me with so many opportunities."*

Innocent N'Dzana, '08

*(More student news on page 6)*



PRINCIPAL INVESTIGATOR, PATRICIA HAND, PHD,

The first six months of our INBRE renewal have flown by – as you’ll see from the enclosed stories, we’ve been busy!

We’re extraordinarily grateful to the National Center for Research Resources for its support which is enabling us to build upon the programs and accomplishments of Maine INBRE’s first five years. The supplemental funding we were awarded under the American Recovery and Reinvestment Act will expand the

resources we can provide to scientists and students around the state, and increase the outreach of our educational initiatives. The additional funding will create several new jobs, help us retain existing positions and provide training for the future biomedical and biotech workforce.

Our annual External Advisory Committee (EAC) meeting at Southern Maine Community College (SMCC) in September was a wonderful gathering, and provided opportunities for new Investigators, Mentors and Steering Committee members to get to know our EAC, share their program progress, and brainstorm with colleagues about potential challenges in their work.

The meeting also provided a wonderful opportunity for participants from around the state to tour the facilities at SMCC, our newest INBRE partner. Outreach coordinators Charlie Wray and Mike McKernan also traveled to SMCC last month to meet with students and faculty, and reported a high level of enthusiasm and motivation to participate in upcoming INBRE programs.

As the academic year began, we held our first laboratory training

course of the year with students from the University of Maine-Fort Kent and University of Maine-Presque Isle. As you’ll read on the next page, participants greatly appreciated the opportunity and expanded their skills and knowledge tremendously.

Finally, in October we welcomed a review panel from the American Association for the Advancement of Science (AAAS) who will be helping us to meet our goals over the next five years. The panelists spent two days meeting with members of our staff, core directors and Steering Committee members to get to know our program, and help us assess where there may be challenges or obstacles to our progress. We’re looking forward to their recommendations, and to using their expertise as a resource as we move forward.

Our new INBRE network is off to a great start, and I’m very grateful to all our partners for their hard work. I’m looking forward to continuing our efforts to support biomedical research and training in Maine.

Best wishes,  
*Patricia Hand, PhD*  
Principal Investigator

## EAC member pens column for The Huffington Post

External Advisory Committee member James Gentile, PhD, has added a new hat to the many he already wears as a scientist and longtime proponent of research and education: columnist for The Huffington Post. Dr. Gentile, who is President of the Research Corporation for Scientific Advancement – a leading advocate for the sciences and a major funder of scientific innovation and of research in America’s colleges and universities – shares his perspectives on current issues in science and education under the “Technology” section twice a month.

Dr. Gentile has indicated that his motivation for doing this is his belief that it is “the responsibility of all scientists to inform the general public (including legislators and other

decision-makers) about issues in science that can affect society and, importantly, attempt to change attitudes and perspectives about science for the betterment of all.”

His recent column topics have included:

- \* Tackling the Threat to U.S. Scientific Competitiveness
- \* Young Science USA
- \* Transformational Science and the U.S. Economy
- \* Improving Science Teaching in America’s Schools

Read more at:

<http://www.huffingtonpost.com/james-m-gentile>

## “You made us feel like scientists, not students!”



UNIVERSITY OF MAINE-PRESQUE ISLE AND UNIVERSITY OF MAINE-FORT KENT STUDENTS SPENT THEIR OCTOBER BREAK IN THE LAB AT MDIBL

Eighteen students from the University of Maine-Fort Kent and University of Maine-Presque Isle spent their fall break at the MDI Biological Laboratory for a one-week lab training course, Molecular Biology Research Techniques. Led by MDIBL regenerative biologist, Randall Dahn,

PhD, the group learned gene expression analysis step-by-step, beginning with isolating RNA from embryonic cells and ending with determining DNA sequence. Along the way, students learned to generate cDNA to amplify with PCR techniques, to clone the cDNA, grow a bacterial

culture, and isolate plasmid DNA from that culture.

Guest lecturers included Denry Sato, PhD, and Markus Davis, PhD.

Students were amazed with their lab experience. As one student wrote “The experiments helped me understand my genetics course much better than before. The course solidified my understanding of different concepts and methods, and really closed up all of my gaps in knowledge. I feel extremely confident in being able to explain these methods and concepts to others due to this course.”

Another student also remarked on the increased self-assurance the course provided noting that “the hands-on experience with the tools and instruments combined with learning to follow a protocol has greatly increased my lab confidence which will be invaluable as I continue to pursue a career as a physician.”

## Honors and Awards

Former INBRE External Advisory Committee member **KERRI-ANN JONES, PhD**, was sworn-in as President Obama’s Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs at the State Department on August 20, 2009. Dr. Jones earned her Ph.D. in Molecular Biophysics and Biochemistry from Yale University and a B.A. in Chemistry from Barnard College. Dr. Jones began her government career as a Science, Engineering, and Diplomacy fellow for the American Association for the Advancement of Science. As the biotechnology advisor for the U.S.

Agency for International Development from 1989 to 1995, Dr. Jones worked on science and technology development in New Delhi, India.

During the Clinton Administration, she was Associate Director for National Security and International Affairs at the White House Office of Science and Technology Policy (OTSP). After leaving the White House, Dr. Jones became Director of the Experimental Program to Stimulate Competitive Research (EPSCoR) for the State of Maine. Most recently, Dr. Jones was Director of International Science and Engineering at the National Science Foundation.



ASSISTANT SECRETARY OF STATE FOR OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS, KERRI-ANN JONES, PhD

## 2009 Annual Meeting



ABOVE: INBRE EXTERNAL ADVISORY COMMITTEE MEMBERS CHRISTOPHER BAYNE, BARBARA BELTZ, LYNETTE HIRSCHMAN AND JAMES GENTILE TRAVELED TO SOUTHERN MAINE COMMUNITY COLLEGE IN SEPTEMBER TO MEET WITH INVESTIGATORS, MENTORS AND STEERING COMMITTEE MEMBERS.

External Advisory Committee (EAC) Members came to Maine in September to meet with the new INBRE Investigators, their research mentors, and institutional representatives. The gathering took place at Southern Maine Community College's stunning McKernan Center overlooking Casco Bay. Janet Sortor, Vice President and Dean of Academic Affairs at SMCC, welcomed the participants, many of whom had never been to the campus before.

The investigators each made a 30-minute research presentation, followed by lively discussions and individual meetings with EAC members. The session gave the EAC an opportunity to learn about the investigators' research, help them assess challenges to their work, and make recommendations for tools and approaches as they move forward.

Throughout the day Investigators and research mentors had the opportunity to meet informally and brainstorm about such issues as how to balance their teaching and research commitments, and how to manage a large lab group.

EAC member Christopher Bayne, PhD, reiterated how pleased he was to participate, saying "I find it refreshing to interact in such an affirmative enterprise with lively minds who share high aspirations. The individuals comprising the new INBRE team are, without exception, bright and energetic. I believe that this INBRE program will be as successful (or more) than the previous one."

## IDeA Network of Biomedical Research Excellence

### Research Institutions:

Mount Desert Island Biological Laboratory  
The Jackson Laboratory  
The University of Maine

### Academic Institutions:

Bates College  
Bowdoin College  
Colby College  
College of the Atlantic  
Honors College - University of Maine  
Southern Maine Community College  
University of Maine at Farmington  
University of Maine at Machias

### Outreach Institutions:

University of Maine at Fort Kent  
University of Maine at Presque Isle

### Maine INBRE Director:

Patricia Hand, PhD

### Maine INBRE Program Coordinator:

David Barnes, PhD

### INBRE External Advisory Committee:

Barbara Beltz, PhD, Chair  
Christopher Bayne, PhD  
James Gentile, PhD  
John G. Hildebrand, PhD  
Lynette Hirschman, PhD  
Leonard I. Zon, MD

### INBRE Steering Committee:

Allen Berger, PhD, UMaine-Farmington  
Pamela Baker, PhD, Bates  
Patsy Dickinson, PhD, Bowdoin  
Jean Doty, PhD, UMaine - Farmington  
Michael Eckardt, PhD, UMaine  
Elizabeth Ehrenfeld, PhD, SMCC  
Mary Ann Handel, PhD,  
The Jackson Laboratory  
Ken Hill, PhD, College of the Atlantic  
Keith Hutchison, PhD, U of Maine  
Cristle Collins Judd, PhD, Bowdoin  
Chris Petersen, PhD, College of the Atlantic  
Jill Reich, PhD, Bates  
Charlie Slavin, PhD, UMaine - Honors College  
Sherrie Sprangers, PhD, UMaine - Machias  
Barbara Tennent, PhD,  
The Jackson Laboratory  
Andrea Tilden, PhD, Colby  
Edward Yeterian, PhD, Colby

### Core Directors:

Andrew Christie, PhD  
John Gregory, EdD  
Carolyn Mattingly, PhD  
David Towle, PhD

### Supported by:

National Center for Research Resources  
National Institutes of Health

## Continued from page one: Stimulus grants strengthen INBRE

The Workforce Development... stimulus initiative will also support a new short course. *Molecular Mechanisms of Human Disease* will provide a new laboratory training class for medical students from Northeastern INBRE states, Vermont and New Hampshire, in partnership with Dartmouth Medical School and

*“The course will provide Vermont Medical Students important cross-training in laboratory techniques and will expose the students to comparative models not available at medical school.”*

the University of Vermont Medical School (UVM). First year medical students often have limited exposure to laboratory research and lack the opportunity to delve into specific scientific topics in great detail. The course will give students an insight into fundamental elements underlying the molecular mechanisms of disease, and strengthen their ability to apply this knowledge to future research and clinical applications.

“The course will provide Vermont Medical Students important cross-training in laboratory techniques,” says Robert Low, PhD, Interim Senior Associate Dean of Medical Education at UVM, “and will expose the students to comparative models not available at medical school.”

### CYBERINFRASTRUCTURE

A second stimulus grant of \$1.7 million dollars will significantly expand cyberinfrastructure in Maine dedicated to research and education, and enable the expansion of regional and national collaborations. Although improvements have been made in the last few years, a lack of

redundant and expansive bandwidth still impedes resource sharing and collaborative research programs among distant institutions. Under the grant, INBRE will create two new fiber-optic routes with Dense Wave Division Multiplexing (DWDM) network equipment. One route will connect the University of Maine (UMaine) campuses in Bangor and Presque Isle with multiple 10Gbps wavelengths, positioning Maine to establish a connection across the Canadian border to Canada’s research and education backbone network, CANARIE. The second will close a redundant ring between Portland and Ellsworth to increase network reliability serving research and education institutions in Maine.



BENJAMIN KING, M.S., BIOSTATISTICIAN

In addition the cyberinfrastructure grant provides funding to support a new staff position of Biostatistician. To meet the need for additional statistical expertise to assist with analysis of large datasets from research projects using high throughput experimental technologies, INBRE has hired Benjamin King, M.S. He will work with collaborators from Maine, Delaware and Vermont to increase the pace of sequencing of the dog-

fish shark and skate genomes, among other projects.

### CORE FACILITY IMPROVEMENTS FOR TRANSLATIONAL RESEARCH

\$617 thousand dollars of stimulus funding will be used to improve core facilities at MDI Biological Laboratory. Maine INBRE will benefit from additional staff support to meet the increased need for services for four new INBRE laboratory training courses. The DNA Sequencing and Analysis Center will get some new equipment to better serve the needs of the scientific community, including a Shimadzu microchip electrophoresis system and software for DNA/RNA analysis.

In addition, funds will augment the infrastructure of MDIBL’s zebrafish facility, doubling the holding capacity of the colony to 8,000 fish. Staff support for this facility will also be increased with the hiring of a new animal care technician. Zebrafish are being used in research by six current and former INBRE scientists, and have become an increasingly popular model organism for studies in toxicology, developmental biology, stem cell and regenerative biology and genetics. Several INBRE lab training courses have used zebrafish, but use has been limited by the status of the current facility. Core facility development will greatly expand availability of zebrafish for teaching, adding an important model organism to the training experience of many undergraduates.

We are very grateful to NCCR, NIH for this supplemental funding.



## INBRE student and alumni news

### 2009 SUMMER STUDENT SYMPOSIUM



THE MDI BIOLOGICAL LABORATORY COMMUNITY GATHERED IN JULY TO LEARN ABOUT STUDENTS' SUMMER RESEARCH

**I**NBRE Undergraduate Fellows presented their research to each other and the community on July 28 at the MDI Biological Laboratory. Mentors, parents, and friends gathered to learn about the work students had done during their summer research

experiences.

Between morning and afternoon sessions of platform presentations, participants had a chance to mingle and ask students questions about their research during a lunchtime poster session outside the MDI Biological Laboratory's dining hall.

Newly appointed MDIBL Director Kevin Strange applauded the students' work and their interest in science. He urged them to use their love of science to encourage scientific literacy and broaden awareness of the importance of research to improving our lives.

### ALUMNI WRITE



INNOCENT N'DZANA,  
UNIVERSITY OF MAINE-MACHIAS '08

**Name:** Innocent N'Dzana, University of Maine-Machias '08

**INBRE Summer Fellow:** 2005, 2007

**Mentors:** Dr. Patricio Silva, Dr. Franklin Epstein, Dr. Gregory Cox, Dr. Terry Maddatu

**Employment:** University of Connecticut Health Center

**Position:** Research Assistant

**“I** have been working as a research assistant at the Craniofacial Sciences Department at UCHC for more than a year now. It is undeniable that the research experience acquired at both The Jackson

Laboratory and MDIBL, through the INBRE program, was the main reason I was hired at UCHC. We are currently investigating the role of C/EBP beta, a transcription factor, in odontogenesis. My past research experience absolutely gives me an edge over my fellow researchers here at UConn.

I am currently in the process of applying to medical schools for the year 2010.

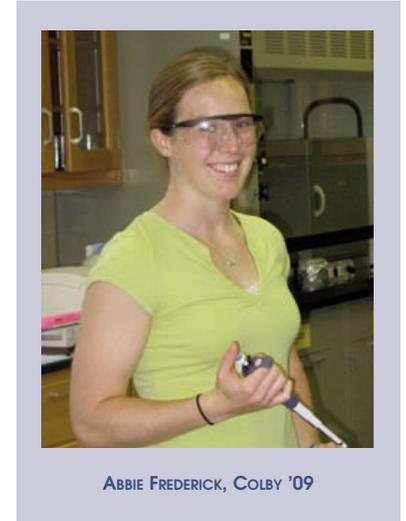
I will never be grateful enough to the INBRE program for providing me with so many opportunities.”

## Recent Publications

INBRE Investigator **JACK BATEMAN**, PhD, Bowdoin College, and a team of collaborators published a paper entitled “THE TWIN SPOT GENERATOR FOR DIFFERENTIAL DROSOPHILA LINEAGE ANALYSIS” in *Nature Methods* 6: 600-602, 2009.

The Colby College lab of INBRE Investigator, **KEVIN P. RICE**, PhD, published “INHIBITION OF HUMAN DNA POLYMERASE  $\beta$  ACTIVITY BY THE ANTICANCER PRODRUG CLORETAZINE” in *Biochemical and Biophysical Research Communications* v378: 419-423, 2009. INBRE Alumnae **ABBIE M. FREDERICK '09** and **MARGUERITE L. DAVIS '07** were first and second authors on the paper.

Students from the Bowdoin College 2009 INBRE Short Course, “Molecular Biology of Crustacean Neuropeptides” have just learned that the paper resulting from their laboratory training research has been accepted by the *Journal of Experimental Biology*. “IDENTIFICATION OF A CALCITONIN-LIKE DIURETIC HORMONE THAT FUNCTIONS AS AN INTRINSIC MODULATOR OF THE AMERICAN LOBSTER, HOMARUS AMERICANUS, CARDIAC NEUROMUSCULAR SYSTEM,” will be published in an upcoming issue. Course instructors **ANDREW CHRISTIE**, MDIBL, and **PATSY DICKINSON**, Bowdoin College, INBRE Pre-Doctoral Fellow **JAKE STEVENS** and eight undergraduates – including **MATTHEW BOWERS**, **JEANETTE GOLDWASER**, **MOLLY KWIATKOWSKI**, **TERRENCE PLEASANT, JR.**, **LIZA SHOENFELD**, **LYNNE TEMPEST**, **CLAIRE WILLIAMS**, and **TEERAWAT WIWATPANIT** – are co-authors on the paper, along with MDIBL collaborators **CHRISTINE SMITH**, **KRISTIN BEALE**, and **DAVID TOWLE**; and University of Nevada collaborators David A. Schooley, Derek A. Jensen and Kathleen M. Schegg.



ABBIE FREDERICK, COLBY '09

*Congratulations to all!*

## 2010 Events Schedule: Save the Dates!

**APRIL 23 - 24TH: MAINE BIOLOGICAL AND MEDICAL SCIENCES SYMPOSIUM**  
MDI BIOLOGICAL LABORATORY, SALISBURY COVE, MAINE

**JUNE 16 - 18TH: 3RD BIENNIAL NATIONAL IDEA SYMPOSIUM OF BIOMEDICAL RESEARCH EXCELLENCE (NISBRE)**  
MARRIOT BETHESDA CONFERENCE CENTER, BETHESDA, MARYLAND

**AUGUST 8: MAINE INBRE ANNUAL MEETING**  
MDI BIOLOGICAL LABORATORY, SALISBURY COVE, MAINE

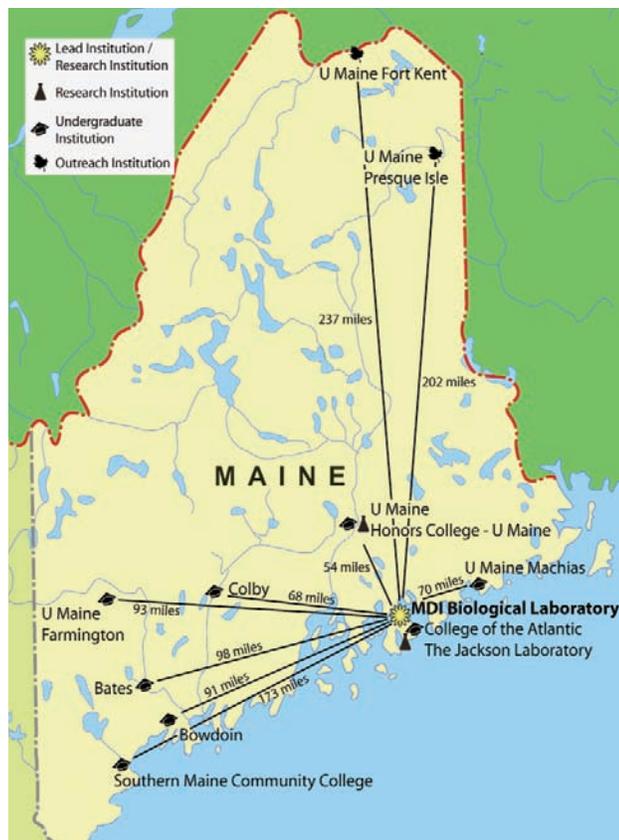
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## Who we are

The Maine IDeA Network of Biomedical Research Excellence (INBRE) is an NCRR/NIH-supported network of twelve Maine institutions including Mount Desert Island Biological Laboratory (lead institution), Bates College, Bowdoin College, Colby College, College of the Atlantic, The Jackson Laboratory, Southern Maine Community College, UMaine-Farmington, UMaine-Machias, UMaine-Fort Kent, UMaine-Presque Isle and The University of Maine.

The overall goal of the Maine INBRE is to strengthen Maine's capacity to conduct NIH competitive biomedical research. Maine's INBRE provides research support and core facilities to junior faculty, creates research and training opportunities for undergraduate and graduate students, serves as a pipeline for students to pursue health research careers and enhances the scientific and technical knowledge of Maine's workforce.



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