

MAINE

INBRE

IDEA NETWORK OF BIOMEDICAL RESEARCH EXCELLENCE

Maine Biological and Medical Sciences Symposium, April 17 – 18th

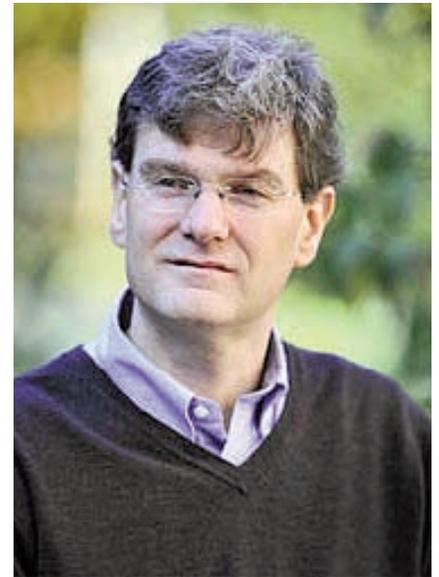
Mark your calendar and plan to join researchers from around the state for the 36th Annual Maine Biological and Medical Sciences Symposium (MBMSS) at the Mount Desert Island Biological Laboratory in Salisbury Cove, Maine. All Maine scientists, faculty, and students are invited to attend and participate in the symposium. Any abstract in the biological and medical sciences is welcome. *The abstract deadline has been extended to March 23, 2009.*

The MBMSS is an excellent forum for young scientists or junior faculty to present and discuss their research. Students who participated in summer research in 2008 and students who will complete a thesis in 2009 are especially encouraged to submit an abstract. Registration for all Maine undergraduate and graduate students is FREE (student fees are fully sponsored by Maine INBRE). On-campus housing is available to students free of charge on a

first-come first-served basis.

Simon John, Ph.D., will present this year's keynote lecture in honor of Barbara Knowles, Ph.D., entitled "Using experimental genetics to define mechanisms of intraocular pressure elevation and glaucoma." A Howard Hughes Medical Institute Investigator, Dr. John is Professor at The Jackson Laboratory where Dr. Knowles, who is now Senior PI at the Institute of Medical Biology A*STAR in Singapore, was Vice President for Education and External Scientific Collaborations.

Dr. John's laboratory investigates the molecular features of complex diseases that lead to the death of neural cells (neurodegeneration). Most of Dr. John's projects focus on glaucoma. A major cause of human blindness, glaucoma is often associated with elevated pressure within the eye itself. The harmfully high pressure damages retinal ganglion cells, (continued on page three)



SIMON JOHN, PH.D.
HHMI/THE JACKSON LABORATORY

UPCOMING EVENTS

SAVE THE DATE

*IDEa Northeast Regional Meeting
at Dartmouth College
August 5 - 7th, 2009*

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PRINCIPAL INVESTIGATOR, PATRICIA HAND, PHD.

Our annual INBRE short courses began a few weeks ago when a cohort of Colby College students came to the MDI Biological Laboratory for a workshop in biomedical research imaging. Over the next six weeks we'll host undergraduates from Bowdoin College, College of the Atlantic, and the University of Maine, including its campuses at Farmington, Machias and Presque Isle. Many of these students are giving up their spring break for a chance to increase their hands-on laboratory

experience through these intensive training sessions. Their dedication and enthusiasm are inspiring, and bring new energy to campus after a long winter.

The end of winter always means that the Maine Biological and Medical Sciences Symposium is right around the corner. The symposium is always a fantastic gathering of researchers from all over the state, and provides a great forum for sharing research results, promoting collaborations and reinvigorating our scientific imaginations. We're looking forward to welcoming everyone to the symposium and hope you will make your plans now to attend the April 17-18th event. It's always a wonderful opportunity to learn more about the breadth of scientific research going on around the state.

Another important event to put on your calendar for this year is the IDeA Northeast Regional Meeting, which will be held at Dartmouth College in New Hampshire this August 5 – 7th. This gathering provides a forum to network with colleagues from other INBRE and COBRE programs around the region. Over the past few years our region has increased collaborative efforts, working together to enhance regional cyberinfrastructure and access to core facilities. You'll read more about the progress of the Regional Core Database and the Northeast Regional Life Sciences Core Directors meeting in this issue.

We're pleased to welcome our own new Imaging Core Director, Andy

Christie, PhD. A long-time summer investigator at MDIBL and INBRE Undergraduate Mentor, Andy brings a wealth of imaging experience from his own research to guide the core.

Also in this issue, you'll read about the achievements of some of our INBRE students who continue to impress us, and many others, with their sophisticated approaches to their research. Congratulations to Naveed Davoodian, Greg Sousa, and Ashley Gard on their recent recognitions!

Finally, we spotlight in this issue the work of Ryan Bavis, PhD, an INBRE Junior Faculty Member from Bates College who was just awarded an R15 AREA grant for his work on hyperoxia. Dr. Bavis' research studying the effects of high oxygen levels on early postnatal development of the respiratory control system may have implications for human infants that receive supplemental oxygen in the neonatal intensive care unit. Furthermore, the work in Dr. Bavis' lab exemplifies the intersection of research and education that are at the heart of the INBRE program, with many students benefiting from working in his lab over the last few years.

I look forward to seeing many of you at the April symposium, and to our continued work together to enhance biomedical research and training in Maine.

Best wishes,

Patricia Hand, PhD
Principal Investigator

Honors and Awards

2008 INBRE Summer Undergraduate Research Fellow **NAVEED DAVOODIAN**, College of the Atlantic '10, is one of only 15 national recipients of the Environmental Protection Agency's coveted Greater Research Opportunities Fellowships for Undergraduate Environmental Study. Davoodian, who worked with Dr. Andrew Christie at MDIBL this past summer, will be studying mycorrhizal fungi and their host soil types to

investigate whether mycorrhizal fungi can be useful in cleaning soils that have become metallic because of pollution.

INBRE PI PATRICIA HAND, PHD, was elected to the Council of the National Association of IDeA Principal Investigators (NAIPI) as a Northeastern Region Representative. She also serves on the Strategic Planning Subcommittee.

Outreach Core Co-Director **MICHAEL MCKERNAN** has joined the board of directors of the Maine

STEM (Science, Technology, Engineering and Mathematics) Collaborative. A partnership between state government, private industry, nonprofit research institutions, and education leaders, Maine STEM aims to increase the number of graduating students who enter into STEM fields beyond high school by 10% by 2011. The organization is also seeking to raise \$2 million for STEM activities in the state.

INBRE Participants Attend Society for Neuroscience Meeting

Over twenty faculty and students from Bates College, Bowdoin College and the MDI Biological Laboratory were among the more than 31,000 participants in the 2008 Society for Neuroscience Meeting, held in Washington D.C., November 15 – 19. Attracting participants from around the world, the meeting is the premier Neuroscience event each year.

The Maine INBRE contingent presented seven posters during the three day meeting. Greg Sousa, a graduating senior at Bates College, won the Faculty for Undergraduate Neuroscience (FUN) award for Best Undergraduate Poster (see page 4 for more details).



2008 INBRE UNDERGRADUATE FELLOW ASHLEY GARD, UNIVERSITY OF MAINE '10

Ashley Gard, University of Maine '10, was the only undergraduate to present a talk at the STG (stomatogastric ganglion) Satellite Workshop. Over 200 researchers attended the session which included her presentation "USING BIOINFORMATICS TO IDENTIFY NEW NEUROPEPTIDES IN *DAPHIA PULEX*." Gard was a 2008 INBRE Summer Fellow at the MDI Biological Laboratory in the lab of Dr. Andrew Christie, Ph.D.

MAINE INBRE RESEARCH PRESENTED AT SFN 2008

MYOSUPPRESSIN MODULATES THE OUTPUT AND INTERACTIONS OF CENTRAL PATTERN GENERATORS IN THE STOMATOGASTRIC NERVOUS SYSTEM OF THE LOBSTER *HOMARUS AMERICANUS*. CASHMAN CR, STEMMLER EA, CHRISTIE AE, DICKINSON PS. SOCIETY FOR NEUROSCIENCE ABSTRACTS, 2008, # 574.10.

SYWKQCAFNAVSCFAMIDE: A BROADLY CONSERVED CRUSTACEAN C-TYPE ALLATOSTATIN. CHRISTIE AE, ACKERMAN RJ, BARTON EE, STEVENS JS, GABRANSKI ER, STEMMLER EA, DICKINSON PS, SOCIETY FOR NEUROSCIENCE ABSTRACTS, 2008, # 30.13.

RNAI-MEDIATED KNOCKDOWN OF SEMAPHORIN IN THE CENTRAL NERVOUS SYSTEM OF THE CRICKET, *GRYLLUS BIMACULATUS*. HORCH HW, WILLIAMS C, BROSNAN J. SOCIETY FOR NEUROSCIENCE ABSTRACTS, 2008, # 624.14.

CELL PROLIFERATION IN THE SEPTO-HIPPOCAMPAL PATHWAY: SEASON, LESION, AND SPECIES EFFECTS. GARDNER RD, LAW LM, MITTERLING KL, RAMUS SJ, LEE DW. SOCIETY FOR NEUROSCIENCE ABSTRACTS, 2008, # 122.6.

RAPID STEROIDAL INFLUENCES ON VISUALLY-GUIDED SOCIAL BEHAVIOR IN MALE GOLDFISH. LORD L-D, THOMPSON R. SOCIETY FOR NEUROSCIENCE ABSTRACTS, 2008, # 198.15.

DISTRIBUTION AND IMPACT OF NEUROPEPTIDE F (NPF) WITHIN THE BUCCAL FEEDING CIRCUITRY OF THE POND SNAIL, *HELISOMA TRIVOLVIS*. SOUSA GL AND KLECKNER NW. SOCIETY FOR NEUROSCIENCE ABSTRACTS, 2008, # 574.2.

PEPTIDOMIC ANALYSES OF THE NERCOUS SYSTEMS OF THE PRAWN *MACROBRACHIUM ROSENBERGII* AND THE WHITE SHRIMP *LITOPENAEUS VANNAMEI*. MA M, CHRISTIE AE, LI L. SOCIETY FOR NEUROSCIENCE ABSTRACTS, 2008 # 494.19.

Maine Biological & Medical Sciences Symposium (continued from page one)

resulting in a pressure-induced neurodegeneration. Glaucoma, which has no obvious symptoms, is typically a progressive disease that is only identified after significant loss of vision has occurred. Dr. John's lab employs genetics as an instrument to assess risk, and uses a mouse model that is genetically susceptible to glaucoma to test potential therapies.

There will be three platform sessions of short (10-15 minute) talks, organized thematically. In addition to invited speakers, some speakers will be selected

from the submitted abstracts. Speakers selected from the abstracts will be a mix of investigators and students. Due to time constraints, organizers will probably not be able to accommodate everyone who would like to give a platform presentation. We hope that anyone who can't be fit into the platform sessions will present a poster of their work.

The symposium's two poster sessions are a highlight of the meeting. They present a wonderful opportunity

for one-on-one scientific interaction and networking. All participants, even those giving platform presentations, are encouraged to present their research in the poster session. We expect a large crowd and lively conversation. An award for Best Student Poster will be given at the conclusion of the symposium.

Abstract guidelines and registration information are available on the web at:

www.mdibl.org/courses/mbmss09.shtml

In Brief: News from around the INBRE Network

**STEERING COMMITTEE MEMBER
BARBARA KNOWLES, PhD, JOINS
A*STAR, SINGAPORE**

INBRE Steering Committee member, Professor **BARBARA KNOWLES, PhD**, former Vice President for Education and External Scientific Collaborations at The Jackson Laboratory, has started a new phase of her scientific career as Senior PI at the Institute of Medical Biology, A*STAR (Agency for Science Technology and Research) in Singapore. Knowles will also serve as an Academic Mentor and Advisor to the A*STAR Graduate Academy.



“Dr. Knowles made extraordinary contributions to IDeA network programs in Maine over the past seven years, as a dedicated member of our Steering Committee, a mentor to both Junior Faculty and students, and as a lead organizer of our Maine Biological and Medical Sciences Symposium,” explains Principal Investigator, Patricia Hand, PhD.

Maine INBRE will honor Dr. Knowles this spring with an invited lecture in her honor at the Maine Biological and Medical Sciences Symposium, April 17 – 18th.



**BATES COLLEGE RECEIVES \$500,000
INSTRUMENTATION GRANT**

The Sherman Fairchild Foundation recently awarded Bates College \$500,000 to purchase seven scientific instruments that will enhance research opportunities for

students and scientific collaborations.

A scanning electron microscope used for high resolution magnification of samples will tie in with Bates' Imaging Center. It will have the capacity for energy dispersive X-ray spectroscopy for elemental analysis or chemical characterization of a sample. Other instruments to be purchased with the grant over the next five years include a multi-chamber respirometer system, an implantable telemetry system, an X-ray diffractometer, a particle size analyzer, an RF spectrum analyzer and quantitative polymerase chain reaction instrumentation.

Science faculty worked together to develop a list of equipment that would advance teaching and student research, and from that list chose instruments that could serve more than one department or program. INBRE Steering Committee member, Pamela Baker, PhD, Director of Faculty Research and Scholarship at Bates, anticipates that the addition of new equipment will play a vital role enhancing collaborations across departments.



ARSENIC AND GENE NETWORKS

INBRE Junior Faculty **ANTONIO PLANCHART, PhD**, and **CAROLYN MATTINGLY, PhD**, recently presented new findings on their analysis of effects of low-level arsenic exposure on fetal development at the annual meeting of the Society for Experimental Toxicology and Chemistry. Using curated data from the Comparative Toxicogenomics Database (CTD) and microarray technology to leverage the power of the zebrafish model, Planchart and Mattingly have identified several gene networks that are perturbed by environmentally relevant levels of arsenic. Pathway analysis suggests that these networks are critical for embryonic development and are implicated in arsenic-associated diseases. The team has validated their results using QRT-PCR, providing the groundwork for studying the involvement of epigenetic modifications in arsenic mechanisms of action and the effects of developmental exposure to arsenic on disease susceptibility later in life.

**GREG SOUSA, PAST INBRE FELLOW
AND RECENT BATES COLLEGE GRAD,
WINS TOP AWARD FROM FACULTY FOR
UNDERGRADUATE NEUROSCIENCE**



An INBRE student from Bates College took home the prize for best Undergraduate Poster at November's FUN symposium at the annual Society for Neuroscience Meeting in Washington D.C. **GREG SOUSA** was awarded the German Graduate Schools of Neuroscience/Faculty for Undergraduate Neuroscience (FUN) prize, which brings with it a one week trip to visit top neuroscience programs at German graduate schools.

Sousa's winning poster, “*Distribution and impact of neuropeptide F (NPF) within the buccal feeding circuitry of the pond snail Helisoma trivolvis*,” presented his senior thesis research conducted under the guidance of Associate Professor of Biology (and former INBRE Junior Faculty member), **NANCY KLECKNER**.

Sousa, who graduated from Bates in January, plans to visit institutions in Berlin and Munich as he considers graduate schools. For the moment, he's taken a position as Research Assistant at The Jackson Laboratory, and plans to work for a few years before embarking on graduate studies. His new position is in the lab of Dr. Simon John, PhD, whose research investigates the molecular features of complex diseases that lead to the death of neural cells.

Ryan Bavis, PhD, Awarded NIH AREA Grant



INBRE JUNIOR FACULTY AND BATES COLLEGE
ASSISTANT PROFESSOR, RYAN BAVIS, PHD

INBRE Junior Faculty Ryan Bavis, Assistant Professor of Biology at Bates College, was recently awarded an Academic Enhancement Research Award (AREA) from the National Institutes of Health. His research will study effects of high oxygen levels (hyperoxia) on early postnatal development of the respiratory control system. These experiments may provide clues to how supplemental oxygen given to infants in a neonatal intensive care unit affects them in the short term. Supplemental oxygen is a common therapy for infants born prematurely, but there is currently a lot of uncertainty about what therapeutic oxygen level is safe.

The new line of research the Bavis lab will conduct under the grant complements his INBRE project examining the long-term effects of hyperoxia. In his INBRE research Bavis is studying how exposure to high oxygen at a young age changes molecular mechanisms which affect adult physiology in the long term. One measurement his lab conducts is the size of the carotid body – the cell and nerve mass adjacent to the carotid artery that detects oxygen levels in the blood. They have determined that the carotid body in a hyperoxia-exposed

adult rat is approximately one-third the size it would be in a normal adult. The reduced size correlates with a decreased response to low oxygen in the blood. While a normal adult would start breathing more to compensate for low blood oxygen levels, rats with small carotid bodies don't increase their breathing adequately. Long-term consequences of inadequate response to low oxygen could include sleep apnea and ineffective responses to asphyxia.

Preliminary data from the INBRE project studying adults led Dr. Bavis to hypothesize that changes in respiratory control are time-dependent, with periods when responses are actually enhanced before they are attenuated. This observation led to his AREA grant, which will study the more short-term consequences of hyperoxia on newborns. The lab will use ventilation measurements and neurophysiological techniques to observe changes in respiratory control over a range of postnatal age groups and to examine the underlying mechanisms for these changes.

Dr. Bavis' INBRE research is also furthering the studies and skills of many Bates College students, with more than a dozen students working in his lab over the last four years. Currently, students are working on separate hyperoxia-related project in the Bavis lab for their senior thesis projects, including one which measures the exercise performance and metabolic rates of adult rats exposed to hyperoxia at birth.

Bavis attributes much of his lab's research progress to his INBRE funding. Under the grant he was able to hire a full-time technician who tripled the lab's productivity. His research assistant, Elizabeth Dmitrieff, had molecular biology skills and experience which significantly advanced his hypotheses and enabled them to fine tune their protocols to be much more effective.

In addition the INBRE-equipped Bates College Imaging and Computing Center has been a critical tool for the Bavis lab. "We couldn't do our nerve recording work without the microscope in the Imaging Center," Bavis says. "The Imaging Center has been invaluable."



SIXTEEN STUDENTS FROM UMAINE - MACHIAS, FARMINGTON, AND PRESQUE ISLE SPENT THEIR SPRING BREAK AT MDIBL FOR AN INTENSIVE LABORATORY TRAINING COURSE. "MOLECULAR BIOLOGY RESEARCH TECHNIQUES" WAS LED BY DAVID TOWLE, PHD. RICH ROBINSON, PROFESSOR OF BIOLOGY AT UMAINE-FARMINGTON ALSO PARTICIPATED IN THE OUTREACH COURSE.

2009 Laboratory Short Courses for Undergraduates

WORKSHOP IN BIOMEDICAL RESEARCH IMAGING

JANUARY 26 - 27TH, 2009

HOST: MDI BIOLOGICAL LABORATORY, FOR COLBY COLLEGE STUDENTS

FACULTY: ANDREA TILDEN, PH.D.

MOLECULAR BIOLOGY RESEARCH TECHNIQUES

FEBRUARY 16 - FEBRUARY 20, 2009

HOST: MDI BIOLOGICAL LAB, FOR UMAINE - MACHIAS, UMAINE - FARMINGTON
AND UMAINE- PRESQUE ISLE STUDENTS

FACULTY: DAVID TOWLE, PH.D.

FUNCTIONAL GENOMICS OF MEMBRANE TRANSPORT

FEBRUARY 28 - MARCH 7, 2009

HOST: MDI BIOLOGICAL LAB, FOR UMAINE HONORS COLLEGE STUDENTS

FACULTY: DENRY SATO PH.D., MDI BIOLOGICAL LAB, COURSE DIRECTOR

SHARON ASHWORTH, PH.D, UNIVERSITY OF MAINE

JENNIFER BOMBERGER, PH.D, DARTMOUTH COLLEGE

KEITH HUTCHISON, PH.D, UNIVERSITY OF MAINE

CAROL KIM, PH.D, UNIVERSITY OF MAINE

TONY PLANCHART, PH.D, MDIBL

BRUCE STANTON, PH.D, DARTMOUTH COLLEGE

MOLECULAR BIOLOGY OF CRUSTACEAN NEUROPEPTIDES

MARCH 7 - MARCH 18, 2009

HOST: MDI BIOLOGICAL LABORATORY, FOR BOWDOIN STUDENTS

FACULTY: PATSY DICKINSON, PH.D., BOWDOIN COLLEGE

ANDREW CHRISTIE, PH.D., MDIBL

EVOLUTIONARY MOLECULAR GENETICS

MARCH 16 - MARCH 27, 2009

HOST: MDI BIOLOGICAL LABORATORY, FOR COLLEGE OF THE ATLANTIC STUDENTS

FACULTY: CHARLES WRAY, PH.D., MDI BIOLOGICAL LABORATORY

CHRISTOPHER PETERSEN, PH.D., COLLEGE OF THE ATLANTIC

EXPERIMENTAL NEUROPHYSIOLOGY

MAY 10 - MAY 23, 2009

HOST: MDI BIOLOGICAL LABORATORY, FOR BATES COLLEGE STUDENTS

FACULTY: NANCY KLECKNER, PH.D., BATES COLLEGE

IDEA Network of Biomedical Research Excellence

Research Institutions:

Mount Desert Island Biological
Laboratory
The Jackson Laboratory

Baccalaureate Institutions:

Bates College
Bowdoin College
Colby College
College of the Atlantic
The University of Maine

Outreach Baccalaureate Institutions:

University of Maine at Farmington
University of Maine at Machias
University of Maine at Presque Isle

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Maine INBRE Program Coordinator:

David Barnes, PhD

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James Gentile, PhD
John G. Hildebrand, PhD
Lynette Hirschman, PhD
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The Jackson Laboratory
Keith Hutchison, PhD, U of Maine
Barbara Tennent, PhD,
The Jackson Laboratory
Chris Petersen, PhD, College of the Atlantic
Edward Yeterian, PhD, Colby

Core Directors:

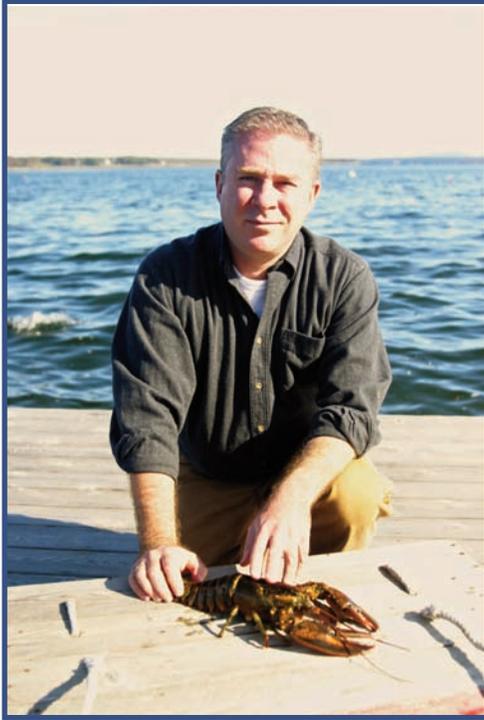
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Carolyn Mattingly, PhD
Michael McKernan
David Towle, PhD
Charles Wray, PhD

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Imaging Core at MDIBL Brings on New Core Director



Andrew Christie, PhD, joined the staff of the MDI Biological Laboratory (MDIBL) as a principal investigator this fall. A Maine native and graduate of Bowdoin College, Christie had been a seasonal investigator at MDIBL for several years before joining the lab full-time.

He's also the new director of MDIBL's Imaging Core, where he oversees more than \$1 million in state-of-the-art equipment, including two confocal microscopes, image analysis computers and smaller microscope systems.

As a neuroscientist studying mechanisms governing hormonal control of crustacean behavior, Christie himself is an expert user of imaging technology. Some of his work involves the microdissection and visualization of copepods that are barely 2 millimeters long.

Christie feels it is "an honor to serve as Director of the Imaging Core, because these sorts of centers provide such a vital resource to the community and a link between the different lab groups that use them. I'll be interacting with other people, and by interacting and collaborating, trying to help us all do better science."

Access to Regional Core Facilities is Expanding

A great advantage of the INBRE and COBRE programs to the eligible states is that it has given researchers the resources to build infrastructure. As a result, many more institutions have new cores and equipment – facilities that they often are capable of sharing with researchers outside the home institution.

In 2007 the Vermont Genetics Network initiated a project to document regional core facilities which offer access or services to outside researchers. The database has now grown to include resources in sixteen states and Canada, and includes a description of each core's particular services as well as the contact person for more information. Any researcher needing access to scientific services or equipment not available at their home institution should check <http://vgn.uvm.edu/corefacilities/> to find nearby resources and expertise. Researchers should keep in mind that many core directors would like to consult with investigators before they are in need of services; often these experienced staff can help make sure experiments are designed to get the most useful results from various processes and equipment.

Core Directors from around the region gathered in Vermont in October at the Northeast Regional Life Sciences Core Directors (NERLSCD) meeting. The focus of the conference was to share information on equipment and best practices, as well as strategies on how to make core facilities more widely accessible. Regional efforts are being made to avoid duplicating equipment and services by collaborating on shared facilities.

Maine's neighboring states of New Hampshire and Vermont offer over forty facility cores between them, located at the University of New Hampshire, Dartmouth College and the University of Vermont. Over thirty cores in nearby Massachusetts are also documented in the database.

Maine itself lists eighteen core facilities in the regional database, located at The Jackson Laboratory, MDI Biological Laboratory, and the Maine Medical Center Research Institute (a COBRE institution). Services at various sites include DNA sequencing, gene expression analysis, QPCR, bioinformatics and computational sciences, histopathology, microscopy, mass spectrometry and flow cytometry, mouse transgenics, reproductive services, imaging, and more.

Undergraduate INBRE partners also have many pieces of equipment for molecular biology, imaging and other techniques, but many of these resources are not organized into formal "cores," but are housed in departments or individual investigator's laboratories. Bates College has developed one centralized core facility in its Imaging and Computing Center which opened in 2007. The center has been very successful at facilitating cross-disciplinary interaction and collaboration through the use of this shared facility, which has become a hub for research and teaching that crosses departments. INBRE researchers are welcome to use this and the many other resources housed informally or independently at the undergraduate institutions, and can get more information by contacting their INBRE Steering Committee member.

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SUBMISSIONS OF NEWS OR PHOTOS ARE WELCOME,
AND MAY BE MAILED TO THE EDITOR AT THE ABOVE ADDRESS
OR SENT ELECTRONICALLY TO APICARD@MDIBL.ORG

Who we are

The Maine IDeA Network of Biomedical Research Excellence (INBRE) is an NCR/NIH-supported network of ten Maine institutions including Mount Desert Island Biological Laboratory (lead institution), Bates College, Bowdoin College, Colby College, College of the Atlantic, The Jackson Laboratory, and The University of Maine. Maine INBRE outreach institutions include The University of Maine at Farmington and The University of Maine at Machias.

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 undergraduates, serves as a pipeline for undergraduate students to pursue health research careers and enhances the scientific and technical knowledge of Maine's workforce.



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