

APRIL 2011

MAINE INBRE

IDEA NETWORK OF BIOMEDICAL RESEARCH EXCELLENCE



The 2011 cohort of the HHMI Science Education Alliance's National Genomics Research Initiative (NGRI) gather for training at HHMI headquarters in Washington, DC in January. Maine INBRE faculty attending the training included Charlie Wray from MDIBL, Kim Borges from the University of Maine Fort Kent, Gerald Zegers and Shallee Page from the University of Maine Machias, Keith Hutchison from the University of Maine Orono, and Elizabeth Ehrenfeld from Southern Maine Community College.

Maine INBRE Forges Partnership with HHMI's Science Education Alliance

Four Maine INBRE institutions and the Mount Desert Island Biological Laboratory have joined an innovative, nation-wide program to change the way science is taught in college. As part of the Howard Hughes Medical Institute's (HHMI) Science Education Alliance, students at the University of Maine Honors College, the Southern Maine Community College, and the University of Maine at Fort Kent and at Machias will participate directly in scientific discovery when they take their first biology course.

The Science Education Alliance (SEA) provides faculty training and support for a new kind of

college science course, which participating schools usually offer as a substitute for their introductory biology course. "The National Genomics Research Initiative is a tremendously exciting opportunity for our first-year students to engage in authentic scientific research, perfectly in keeping with our mission of igniting a passion for learning," says Charlie Slavin, Dean of the University of Maine Honors College in Orono.

First year students will participate in the National Genomics Research Initiative, isolating, purifying, characterizing and sequencing soil-dwelling

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Written by Hand . . .



Principal Investigator Dr. Patricia Hand

Our INBRE group made significant progress in 2010 toward our goal of enhancing biomedical research and education in Maine. We are excited to kick off the summer season at MDIBL by

hosting the 38th Maine Biological and Medical Sciences Symposium on April 15-16. It is the largest MBMSS to date, with over 200 participants from institutions across the state, 90 posters, and 25 presentations. We are pleased to highlight seven new investigators to the state of Maine during the event, including new INBRE-funded MDIBL scientist Voot Yin, PhD. Also joining our INBRE family is Dr. Melissa Glenn, an Assistant Professor at Colby who became an INBRE investigator in November.

We have recently developed an exciting partnership with HHMI's Science Education Alliance, whose innovative National Genomics Research Initiative is a project that provides curriculum, faculty training and support for a new kind of college science course. Four Maine INBRE institutions were accepted into the program, which is in its second year. This program fits perfectly with our goal of providing state-wide under-

graduate science training programs.

As Maine institutions wrap up their spring academic sessions, we are preparing for a busy summer of continuing education within our network. The very successful Summer Academy of Genomics program, a short course for Maine high school students in its second year, is scheduled for mid-August. Eighteen INBRE student summer research fellows will soon begin new laboratory projects at partner institutions around our network. Our investigators and mentors will meet in August in Rhode Island for the 2011 Northeast Regional IDEa Meeting, a gathering of INBRE investigators from around New England. This is a great opportunity for idea sharing, network building and collaboration with other INBRE scientists.

New opportunities for sharing ideas and providing outreach for biomedical research continue to come our way. I wish you all a productive and enjoyable summer.

Honors and Awards

Merson granted tenure

Dr. Rebeka Merson was granted tenure and promoted to Associate Professor of Biology at Rhode Island College. Dr. Merson, a Rhode Island INBRE investigator, received a Maine INBRE visiting scientist award in the summer of 2009 to conduct research at MDIBL in the signaling pathways involved in toxic response and disease.

Goldwater scholarships awarded to Undergraduates

Kansas State University junior Gage Brummer and Franklin Jacoby, a junior biology student at the College of the Atlantic, were awarded 2011 Barry M. Goldwater Scholarships.

Brummer, a biochemistry and premedicine major at KSU, was a summer INBRE fellow at MDIBL in 2009 and 2010. He is researching the underlying causes of keratoconus, an eye disease, under the supervision of Gary Conrad, University

Distinguished Professor of Biology and Visiting Scientist at MDIBL. Their research is examining the current clinical treatment of the disease to try to make it more effective and less harmful to patients.

Brummer was given an award for the best student presentation at the Mount Desert Island Biological Laboratory Student Research Symposium in 2009. He also has been a Kansas Institutional Development Awards Network of Biomedical Research Excellence Undergraduate Research Scholar.

Jacoby is a Human Ecology major at INBRE institution College of the Atlantic, where his goals are to obtain a PhD in biology, conduct research and teach at the university level in biology and conservation. He is the only Maine recipient of a Goldwater Scholarship in 2011.

The scholarships cover the cost of tuition, fees, books, and room and board up to a maximum of \$7,500 per year. The scholarship program was designed to foster and encourage outstanding students to pursue careers in the fields of mathematics, the natural sciences, and engineering.

New INBRE Investigator Melissa Glenn, PhD



photo courtesy Colby College

Melissa Glenn, PhD

Melissa Glenn, Ph.D., became an INBRE investigator in November 2010. She joined Colby College as an Assistant Professor of Psychology in 1997 and also directs Colby's Behavioral Neuroscience Laboratory, where she studies the behavioral, neural, and physiological effects of choline supplementation or deficiency at different stages of life.

Dr. Glenn's INBRE project has clear relevance to human health. According to Dr. Glenn, little is known about the ways in which levels of specific nutrients available during developmental sensitive periods, when the brain is very plastic, may modulate neural, physiological, and behavioral responses to stress in adults to alter the onset or course of neuropsychiatric disorders, like depression.

Her INBRE project examines whether prenatal choline supplementation protects against depressive systems precipitated by stress in adults.

Since her arrival at Colby, Dr. Glenn has set up a fully-functional and active research laboratory. She has also mentored numerous undergraduate students, including an INBRE-sponsored student, Aaron Whitman, from the University of Maine-Machias.

Dr. Glenn is excited to be part of the INBRE program. "One excellent product of INBRE so far has been my ability to procure the materials necessary to conduct preliminary assays and begin addressing this new facet to my work," she said. "Another key product of INBRE has been my capacity to hire a research technician to facilitate my research efforts." Amanda Kimball joined the project as Dr. Glenn's research

technician in January 2011.

Dr. Glenn, who received her Ph.D. in Experimental Psychology from Concordia University in Montreal, is from Newfoundland. She is thrilled to be living in Maine, which is similar to her hometown in many ways. She says of living in Maine, "I get to complain about the weather a lot, which, like a good Newfie, I thoroughly enjoy."



photo courtesy Colby College

Amanda Kimball joined the Glenn lab as a research technician in January.



photo courtesy Colby College

Natasha Atkinson, a research assistant and Colby senior who works in the Glenn lab.

HHMI Partnership *(continued from page 1)*

bacterial viruses, called phage, from collected local soil. Given the diversity of phage, each one discovered is almost certain to be unique, and the students get to name their newly identified life form when the data is entered into an international genomics database.

“We are very pleased that students from Maine will have the opportunity to participate in a national research initiative, while benefiting from the tremendous training resources available at the Howard Hughes Medical Institute,” said Dr. Patricia Hand, Principal Investigator of the Maine INBRE. “This program dovetails perfectly with the goals of the statewide undergraduate training programs we currently offer to students throughout Maine.”

The faculty and schools involved become part of a national network, and new schools are partnered with ones that have already instituted the new course. The U Maine Honors College will be mentored by the University of Colorado, where Tom Cech, Nobel Laureate, is Distinguished Professor. Dr. Cech is also former president of HHMI.

“This is a wonderful opportunity for Maine students,” Dr. Cech says. “Revamping science

courses to ignite that spark of excitement is a critical part of keeping science dynamic and relevant.”

Faculty from the four participating colleges and MDIBL recently attended training sessions sponsored by HHMI at the Janela Farm Research campus in Virginia. Southern Maine Community College Professor Elizabeth Ehrenfed participated in the training and is excited by this opportunity for Maine educational programs. “It will not only be a great addition to our growing programs at SMCC in biology, biotechnology, and marine sciences for new models in science education, but it will also allow us to collaborate with other educational institutions to keep science exciting and interesting for students,” she says.

The opportunity to apply for membership in the Science Educational Alliance was offered to Maine institutions participating in INBRE after Dr. Hand met Dr. Tuajuanda Jordan, Director of HHMI’s Science Education Alliance, at an INBRE Principal Investigators meeting last fall. Their conversations led to further discussions with the Maine INBRE group, culminating in an invitation from Dr. Jordan to all of the degree-granting institutions in Maine INBRE to join the SEA program.

“The SEA program will not only be a great addition to our growing programs at SMCC in biology, biotechnology, and marine Sciences for new models in science education, but it will also allow us to collaborate with other education institutions to keep science exciting and interesting for students.”



At left, Dr. Tuajuanda Jordan, Director of the Science Education Alliance at HHMI, participates in an In-Situ Workshop as part of a June 2008 SEA training program at HHMI’s Janela Farm Research campus in Ashburn, Virginia.

photo courtesy HHMI

“The National Genomics Research initiative is a tremendously exciting opportunity for our first-year students to engage in authentic scientific research, perfectly in keeping with our mission of igniting a passion for learning.”

Short Course Highlights

On January 10-14, 2011, 11 students from Southern Maine Community College met at MDIBL for Molecular Biology Research Techniques, a course taught by Charlie Wray, Ph.D., Scientific Services Director at MDIBL, and SMCC faculty Elizabeth Ehrenfeld, Ph.D., and Brian Tarbox, MS.

This hands-on laboratory course focused on conducting experimental procedures, including RNA and DNA extraction, Polymerase Chain Reaction and DNA sequencing. The curriculum mixed intensive, hands-on laboratory work with several informal seminars.

Ryan Bergan, a SMCC biology major, said, "A week of doing research at MDIBL takes

"Having the opportunity to do real research inspired me and encouraged me to continue in biology."

the intimidation out of science. I went up to MDIBL somewhat apprehensive and scared, but after a week of doing "real" science, came out more confident and encouraged to continue my studies."

Nilaya Palmer, a science student added, "Having the opportunity to do real research inspired me and encouraged me to continue in biology."

2011 INBRE Student Fellows

Talented undergraduates are invited to participate in summer research programs of established scientists in a network-wide competitive program. Selection of students is based on a combination of prior academic success, letters of recommendation and research interests. Below are our undergraduate student research fellows, their institutions, and mentors.

Student	Institution	Mentor
Hannah Archibald	Bates College	Dr. Rob Wheeler - U Maine
Tracy Bantegui	Husson College	Dr. Voot Yin - MDIBL
Jennifer Baum	University of Maine-Farmington	Dr. Gary Conrad - MDIBL, Kansas State University
Breana Bennett	University of Maine-Honors College	Dr. Sharon Ashworth - U Maine
Patrick Breen	Bowdoin College	Dr. Antonio Planchart - MDIBL
Erin Carter	University of Maine-Honors College	Dr. Rob Wheeler - U Maine
Calli Coffee	Bowdoin College	Dr. Bill Jackman - Bowdoin
Brittany Colford	Colby College	Dr. Nancy Kleckner - Colby
Stephanie Corriveau	University of Maine-Presque Isle	Dr. Andrew Christie - MDIBL
Jennifer Ditano	University of Southern Maine	Dr. Kevin Strange - MDIBL
Catherine Farsaci	University of Maine-Farmington	Dr. Antonio Planchart - MDIBL
Melissa Gower	Southern Maine Community College	Dr. Robert Preston - MDIBL, Illinois State University
Gloria Kahamba	College of the Atlantic	Dr. Rick Maser - JAX
Jesse Karppinen	College of the Atlantic	Dr. Mary Ann Handel - JAX
Alyson Lowell	University of Maine-Orono	Dr. Bruce Stanton - Dartmouth Medical School
Haley Manchester	Bates College	Dr. Rebecca Sommer - Bates
Christine Reynolds	Colby College	Dr. Clarissa Henry - U Maine
Brianna Smith	Southern Maine Community College	Dr. Patrick Hassett - MDIBL, Ohio University and Dr. Alice Villalobos - MDIBL, Texas A&M

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New INBRE Investigator Voot Yin, PhD

Dr. Voot Yin joined MDIBL's resident faculty in September 2010 and was officially approved as an INBRE investigator in November. Dr. Yin, the newest member of MDIBL's Davis Center for Regenerative Biology and Medicine, studies the genetic circuitry that defines organ regeneration using zebrafish as his model organism. In particular, his work focuses on microRNAs, small molecules that influence gene regulation.

Dr. Yin joined MDIBL after studying as a post-doctoral student at Duke University in the laboratory of Dr. Ken Poss, a visiting scientist at MDIBL who studies organ regeneration in zebrafish. At Duke, Dr. Yin used the adult zebrafish fin and heart as organ systems and established the technology that enables him to manipulate miRNA function. He will be using those technologies on his INBRE project as he investigates miRNA function under conditions of regeneration.

Why certain organisms are better equipped to regenerate lost and damaged tissue has been the subject of intense study for over three centuries, according to Dr. Yin. He hopes that his studies will enhance potential therapies to increase survival and regeneration of adult cardiac



Dr. Voot Yin

muscle following ischemic injury.

Dr. Yin has hired two research assistants to help in managing his lab and conducting research. Heather Carlisle graduated from the University of Maine in 2000 with a bachelor's degree in biology and secondary education. She worked at Jackson Laboratory before joining MDIBL. Another U Maine graduate assisting Dr. Yin is Ashley Smith, who received her BS in Zoology in 2006.

Dr. Yin is looking forward to his interactions with other INBRE investigators. He is also setting up a collaboration with Julie Wells, Ph.D., a scientist at INBRE partner The Jackson Laboratory. This project will focus on trying to understand why the zebrafish heart robustly regenerates while a mammalian heart responds to injury with scar tissue.

Dr. Yin will share some of his expertise at a presentation at the upcoming Maine Biological and Medical Sciences Symposium at MDIBL on April 15-16, 2011.

Born in Cambodia, Dr. Yin and his family moved to Connecticut when he was six. He received his BS from Bates College and is enjoying living on Mt. Desert Island with his wife, Andi, and 3 year-old daughter, Ariana.



Yin Lab Research Assistant Heather Carlisle, U Maine '2000

Upcoming Short Courses

Experimental Toxicogenomics: Bates College

May 2-13, 2011

A two-week course for Bates College students to learn principles and techniques of toxicology, genomics, and developmental biology.

Molecular Mechanisms in Human Disease: UVM/Dartmouth Medical School

July 30-August 5, 2011

A one-week laboratory short course in comparative physiology for first year medical students from Dartmouth Medical School and University of Vermont College of Medicine.

Summer Academy in Genomics

August 15-19, 2011

A one week laboratory short course in genomics for Maine high school students.



University of Maine Honors College students and course faculty at the Molecular Mechanisms of Human Disease course at MDIBL on February 25-March 5, 2011.

NCCR Highlights INBRE Project

The Fall 2010 issue of the NIH's NCCR Reporter highlighted the North East Cyberinfrastructure Consortium in an article about how the infusion of Recovery Act funds has boosted biomedical research nation-wide. Its skate genome project is a collaborative project initiated by INBREs in five northeastern states, including Maine. Read it online at: www.ncrr.nih.gov/publications/ncrr_reporter/fall2010/recovery_act.asp

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
Southern Maine Community College
University of Maine Honors College
University of Maine at Farmington
University of Maine at Fort Kent
University of Maine at Machias
University of Maine at Presque Isle

Maine INBRE Director:

Patricia Hand, PhD

Maine INBRE Program Coordinator:

David Barnes, PhD

Maine INBRE Associate Program Coordinator:

James Coffman, PhD

INBRE External Advisory Committee:

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

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Pamela Baker, PhD, Bates
Patsy Dickinson, PhD, Bowdoin
Jean Doty, PhD, UMaine at 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, UMaine
Cristle Collins Judd, PhD, Bowdoin
Lori Kletzer, PhD, Colby
Chris Petersen, PhD, College of the Atlantic
Jill Reich, PhD, Bates
Charlie Slavin, PhD, UMaine - Honors College
Sherrie Sprangers, PhD, UMaine at Machias
Barbara Tennent, PhD, The Jackson Laboratory
Andrea Tilden, PhD, Colby

Core Directors:

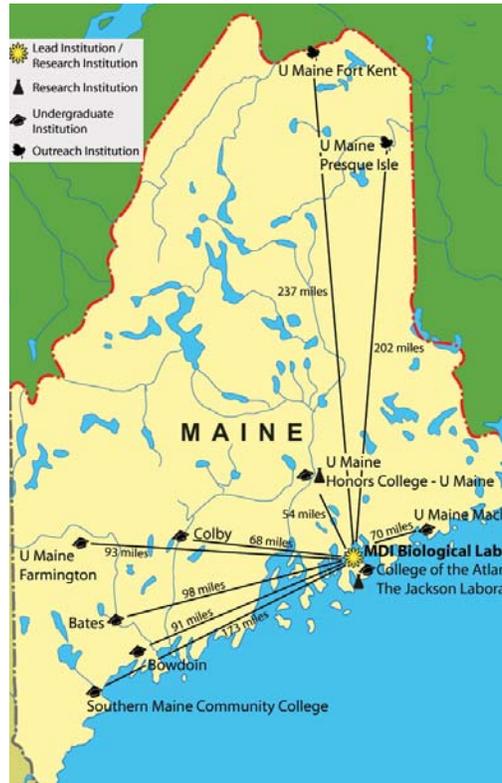
Andrew Christie, PhD
John Gregory, EdD
Carolyn Mattingly, PhD
Michael McKernan
Charles Wray, PhD

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National Institutes of Health

Who We Are

The Maine IDeA Network of Biomedical Research Excellence (INBRE) is an NCCR/NIH-supported network of Maine institutions including Mount Desert Island Biological Laboratory as lead institution, Bates College, Bowdoin College, Colby College, College of the Atlantic, The Jackson Laboratory, Southern Maine Community College, UMaine-Farmington, UMaine Honors College, 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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Maine Neuroscience Conference at Bates College in April

The new Maine Chapter of the Society for Neuroscience and the Maine Neurogenetics Consortium will host the Maine Neuroscience Conference at Bates College on Saturday, April 23, 2011. New Maine INBRE investigator Melissa Glenn (Colby College), her mentor Marie Hayes (University of Maine and the Maine Institute of Human Genetics & Health), and former INBRE investigator Nancy Kleckner (Bates College), have been involved in planning the event.

With Dr. Hayes leading the effort, the council of the Society for Neuroscience formally approved the establishment of a Maine chapter in 2010. According to Dr. Hayes, the initiative will help connect the neuroscience community in Maine by promoting collaboration and the sharing of scientific information. The Society affiliation will also be extremely useful in helping educate the public about the neurosciences.

The Society for Neuroscience has over 40,000 members and 100 regional chapters in North America, along with an expanding number of international programs. Students and faculty at Maine institutions will be able to take advantage of more funding opportunities for travel and lectures through the society's extensive selection of chapter grants and awards.