

MAINE
INBRE
 IDEA NETWORK OF BIOMEDICAL RESEARCH EXCELLENCE

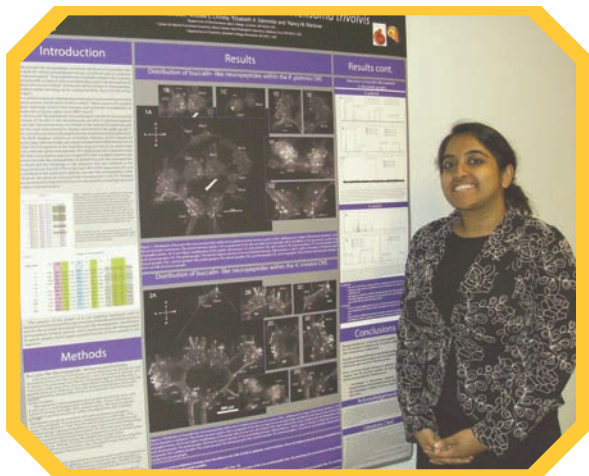
Maine Senator Susan Collins Visits MDIBL

U.S. Senator Susan Collins and her staff visited MDIBL on April 6 to learn about the Lab's current research and meet its faculty. Collins was particularly fascinated by the work of INBRE Investigator Randy Dahn, PhD, who is examining the genetics of limb regeneration using primitive vertebrates such as skates, whose biology has remained essentially the same for 150 million years.

While the skate shares 95 percent of its genes with humans, the marine organism has retained a greater ability to regenerate tissue. Dahn's research into the genetic mechanisms involved in regeneration could lead to insights into potential therapies to trigger the regrowth of both limbs and organs, such as kidneys.



DR. RANDALL DAHN DISCUSSES THE CARTILAGINOUS SKELETON OF A BLUE-DYED SKATE WITH SENATOR COLLINS.



HARITA DHARANEESWARAN, BATES '10 WITH HER AWARD-WINNING MBMSS POSTER

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Written by Hand . . .



PRINCIPAL INVESTIGATOR, PATRICIA HAND, PHD,

As we start the second year of our INBRE grant, I'm pleased to report that we have made significant progress in achieving our goals.

Publications and presentations are one quantitative measure of the INBRE program's achievements. We submitted our first progress report at the end of February, and for the first

year of the new program these tangible accomplishments were impressive. Since May 1, 2009 Maine INBRE participants reported:

- * **56 published** abstracts and journal articles (33 with student co-authors);
- * **11 in-press** abstracts and journal articles (7 with student co-authors)
- * **150 presentations** (73 with student presenters or co-authors).

Over 100 students from ten undergraduate institutions participated in laboratory training short courses throughout the year. Many other student opportunities were initiated, such as undergraduate thesis fellowships (see story, page 6) and travel awards for graduate students (below). You'll read in these pages about some of the many accomplishments of Maine INBRE faculty and students.

The Maine Biological and Medical Sciences Symposium at the end of April was a fantastic opportu-

nity to see the breadth and depth of research going on around the state. Undergraduates made up over half of the participants and the symposium was an especially wonderful showcase for their research.

We're looking forward to another highlight of the year when we attend the National IDeA Symposium of Biomedical Research Excellence (NISBRE) in D.C. this week. Over 15 representatives from Maine INBRE will attend, and have the opportunity to interact with colleagues from around the country. It is always a wonderful event, and so many participants have told me how much it stimulated new research directions and partnerships.

Our INBRE Investigators, Steering Committee and External Advisory Committee will meet at MDIBL in August. I'll see many of you there, if not at NISBRE.

Best wishes,
Patricia Hand, PhD
 Principal Investigator

Four UMaine Graduate Students Receive Travel Awards

As part of INBRE's efforts to expand support for graduate students in Maine, students from the University of Maine's Graduate School of Biomedical Sciences, founded in 2006, can apply for travel stipends. Applications will be considered twice a year to support travel to attend, or present at, a conference or professional meeting, to gather data or conduct research, or to meet with a specific researcher in a field pertinent to the student's interests. Four awards were made in the 2010 spring competition:

JOSH BOUCHER: "THE miR-143/145 CLUSTER IS REGULATED BY NOTCH SIGNALING IN A SERUM RESPONSE FACTOR INDEPENDENT MANNER IN VASCULAR SMOOTH MUSCLE CELLS," 16TH INTERNATIONAL VASCULAR BIOLOGY MEETING, UNIVERSITY OF CALIFORNIA, LOS ANGELES, CA, JUNE 20-24, 2010.

KIMBERLY BROTHERS: "TAMING THE FILAMENTOUS EXPLOSION: IMAGING THE ROLE OF NADPHOXIDASE IN PHAGOCYTE-MEDIATED INHIBITION OF FUNGAL GERMINATION," DISEASE MODELING IN ZEBRAFISH: CANCER, BLOOD DEVELOPMENT AND IMMUNE RESPONSES MEETING, CHILDREN'S HOSPITAL OF BOSTON, BOSTON, MA, JUNE 21 - 23, 2010.

CHRISTOPHER McCARTY, "CHARACTERIZATION OF SELECTED CIS-REGULATORY MODULES IN THE CYCLIN D GENE OF THE PURPLE SEA URCHIN *STRONGYLOCENTROTUS PURPURATUS*," NIH-NCRR THIRD BIENNIAL NATIONAL IDeA SYMPOSIUM OF BIOMEDICAL RESEARCH EXCELLENCE (NISBRE), BETHESDA, MD, JUNE 16 - 18, 2010.

HEIDI TAIT, "MECHANISMS BEHIND THE INDUCTION OF AND DIFFERENTIAL EXPRESSION OF *Ttc7* TRANSCRIPTION DURING B LYMPHOCYTE DEVELOPMENT," AMERICAN ASSOCIATION OF IMMUNOLOGY MEETING, IMMUNOLOGY 2010, BALTIMORE, MD, MAY 7-11, 2010.

Honors and Awards

STEERING COMMITTEE MEMBER AND MENTOR HONORED BY AAAS



Steering Committee Member and INBRE Mentor, **MARY ANN HANDEL, PhD**, of The Jackson Laboratory has been awarded the distinction of Fellow by members of the American Association for the Advancement of Science. Dr. Handel was recognized by her peers for "distinguished contributions to the understanding of mammalian gametogenesis and its genes, and service to reproductive biology research, including as Editor-in-Chief of *Biology of Reproduction*."

"This is a most well-deserved honor," said Jackson Laboratory President and CEO Rick Woychik, Ph.D. "Mary Ann is not only a distinguished scientist in her field, but is also a generous mentor and collaborator."

Dr. Handel was the only Mainer on the list of 2009 AAAS Fellows.

AAAS is the world's largest general scientific society, founded in 1848, and includes some 262 affiliated societies and academies of science. The non-profit AAAS is open to all and fulfills its mission to "advance science and serve society" through initiatives in science policy, international programs, science education, and more.

BATES UNDERGRADUATE WINS PFIZER TRAVEL AWARD FROM SOCIETY OF TOXICOLOGY

ANNIE CARLTON, Bates '10, was awarded a Pfizer Undergraduate Student Travel Award to attend the National Meeting of the Society of Toxicology, Salt Lake City, Utah, March 7-11, 2010.



The award covered travel, lodging, meeting registration and a per diem stipend. In addition, honorees participated in a special Undergraduate Education Program and were recognized at the SOT Awards presentation as well as a special Pfizer event. Each award winner is also assigned a scientific mentor from Pfizer.

Carlton – whose research project was "Low-dose Arsenic Exposure Induces Symptoms Consistent with Type II Diabetes" – conducted her research under the guidance of INBRE Mentor and former INBRE Project Leader, Rebecca Sommer, PhD, an environmental toxicologist, who has trained and mentored many INBRE students.

BOWDOIN UNDERGRADUATE AWARDED PRESTIGIOUS GOLDWATER SCHOLARSHIP



2009 INBRE Summer Fellow **MOLLY KWIATKOWSKI**, Bowdoin '11, has been awarded a Goldwater Scholarship. Kwiatkowski, of Camden, Maine, is a double major in neuroscience and Spanish, and plans to pursue a doctorate in neuroscience. She wants to conduct research in Alzheimer's disease to develop potential therapeutic strategies.

Her INBRE mentor, MDI Bio Lab Investigator Andrew Christie says "It has been a pleasure to watch Molly mature from a summer high school fellow in my lab to the neuroscientist that she has become. Molly is one of the best students to come through my lab and I have no doubt that she will continue to achieve great things as she progresses through her career. I cannot think of anyone more deserving of a Goldwater Scholarship than Molly."

Congress established the Barry M. Goldwater Scholarship in 1986 to provide a source of highly qualified scientists, mathematicians and engineers by awarding scholarships to college students in these fields. The scholarship from this highly competitive program is considered the premier undergraduate award of its type in the scientific disciplines.

2010 INBRE Undergraduate Summer Research 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 2010 undergraduate student research fellows, their institutional affiliation, and mentor.

ANDREW ALBERT, UNIVERSITY OF MAINE-FORT KENT

MENTOR: CAROL KIM, PHD, UNIVERSITY OF MAINE

EMILY BRADFORD, COLBY COLLEGE

MENTOR: JOSH KAVALER, PHD, COLBY COLLEGE

MICHAELA CALNAN, BOWDOIN COLLEGE

MENTOR: PATSY DICKINSON, PHD, BOWDOIN COLLEGE

JUSTINE CYR, UNIVERSITY OF MAINE-PRESQUE ISLE

MENTOR: SHARON ASHWORTH, PHD, UMAINE/MDI BIO LAB

RYAN DAWES, UNIVERSITY OF MAINE

MENTOR: HADLEY HORCH, PHD, BOWDOIN COLLEGE

SAMUEL ENTWISLE, UNIVERSITY OF MAINE

MENTOR: ANTONIO PLANCHART, PHD, MDI BIO LAB

SARAH HARMON, COLBY COLLEGE

MENTOR: ANDREW CHRISTIE, PHD, MDI BIO LAB

KATHLEEN KELLEY, UNIVERSITY OF MAINE-FARMINGTON

MENTOR: CHRIS LAGE, PHD, UMAINE AUGUSTA/MDI BIO LAB

JOHN LESO, UNIVERSITY OF MAINE-FARMINGTON

MENTOR: RYAN BAVIS, PHD, BATES COLLEGE

AMY LUCE, UNIVERSITY OF MAINE

MENTOR: RICH THOMPSON, PHD, BOWDOIN COLLEGE

JAMIE NICKERSON, BATES COLLEGE

MENTOR: PAMELA BAKER, PHD, BATES COLLEGE

DALE QUINBY, COLLEGE OF THE ATLANTIC

MENTOR: CHRIS PETERSEN, PHD, COLLEGE OF THE ATLANTIC

ROHIT SANGAL, BOWDOIN COLLEGE

MENTOR: HADLEY HORCH, PHD, BOWDOIN COLLEGE

DIANE SAUNDERS, BATES COLLEGE

MENTOR: JAMES COFFMAN, PHD, MDI BIO LAB

ROBIN VANDYKE, COLLEGE OF THE ATLANTIC

MENTOR: CHRIS PETERSEN, PHD, COLLEGE OF THE ATLANTIC

AARON WHITMAN, UNIVERSITY OF MAINE-MACHIAS

MENTOR: MELISSA GLENN, PHD, COLBY COLLEGE

ERIC WILLIAMS, SOUTHERN MAINE COMMUNITY COLLEGE

MENTOR: ANDREA TILDEN, PHD, COLBY COLLEGE

JENNIFER WILLIS, SOUTHERN MAINE COMMUNITY COLLEGE

MENTOR: ROBERT PRESTON, PHD, ILLINOIS STATE U./MDI BIO LAB

MAINE INBRE NEWS EDITOR: AIMÉE PICARD

MOUNT DESERT ISLAND BIOLOGICAL LABORATORY, P.O. BOX 35, SALISBURY COVE, MAINE 04672.

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

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Two New INBRE Courses Begin This Summer

RESEARCH TRAINING FOR MEDICAL STUDENTS

With the support of a supplemental grant from the American Recovery and Reinvestment Act (ARRA), Maine INBRE will be hosting a new course for medical students from other Northeast region IDEa states. First-year students from Dartmouth Medical School and the University of Vermont College of Medicine will come to the MDI Biological Laboratory for a one-week laboratory training to learn first-hand about biomedical research and comparative physiology.

Dr. Bruce Stanton, MDIBL Visiting Faculty and Professor of Physiology at Dartmouth Medical School, is the new course's director. He says, "It's our hope that this course will give students a better appreciation for research and provide them with the tools to evaluate

biomedical research critically."

The new course will give students an insight into the fundamental elements underlying the molecular mechanisms of disease and strengthen their ability to apply this knowledge to future research and clinical applications. The medical students will use a number of techniques and animal models, including zebrafish and killifish, to study water balance, kidney function, and development. They will learn to use molecular biology to understand the scientific processes behind genetic screening for human disease.

Invited speakers will supplement the curriculum with evening Bench-to-Bedside lectures, discussing the relevance of research findings to current medical treatments.

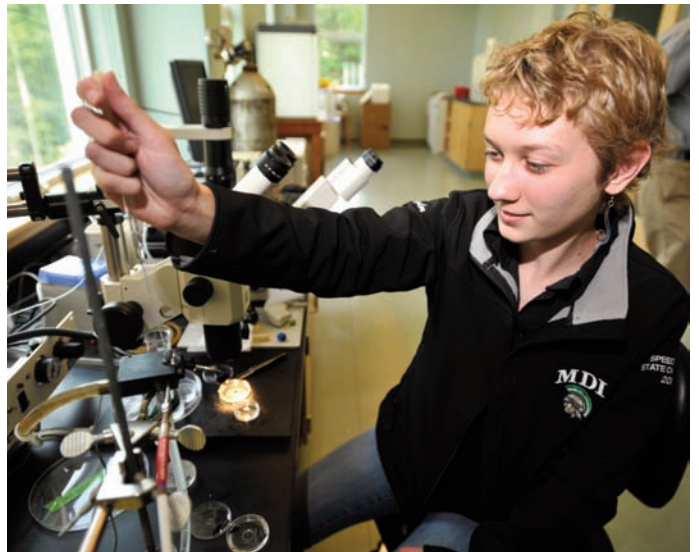
Medical students will use a number of techniques and animal models, including zebrafish and killifish, to study water balance, kidney function, and development.

SUMMER INSTITUTE FOR GENOMICS: INTRODUCTION TO BIOMEDICAL RESEARCH FOR HIGH SCHOOL STUDENTS

The INBRE Summer Institute for Genomics will introduce Maine high school students to the excitement of biological research and demonstrate that one does not have to leave Maine to pursue great science. The one-week course will bring twelve high school juniors from across the state to MDI Biological Laboratory, where they will learn advanced biomedical techniques from Maine scientists and experience the Lab's vibrant scientific community. A response to concerns about the out-migration of Maine youth, the course will be held for the first time in August 2010 and offered annually thereafter.

Based on INBRE's successful undergraduate courses, the Summer Institute will utilize the same hands-on training approach with high school students, fully engaging them and encouraging them to discover the rewards of research for themselves. Students will learn laboratory techniques for genetic sequencing, and how to incorporate bioinformatics into genomic research.

They will also learn about outstanding undergraduate science programs in Maine from assisting faculty, who will give presentations about academic and research opportunities at their home institutions. To make it clear that one does not have to leave Maine to find a good job



in science, representatives from some of Maine's leading biomedical employers, including The Jackson Laboratory, the Maine Institute for Human Genetics and Health, the Maine Medical Center Research Institute, and IDEXX, will participate in a session on careers in science.

For application information, please contact Mike McKernan, Director of Education, at 207-288-9880 x102 or mmckernan@mdibl.org.

Around the INBRE Network

COA/INBRE ALUM CONDUCTS ENVIRONMENTAL STRESS RESEARCH IN ANTARCTICA



Nishad Jayasundara, College of the Atlantic '05, was one of only 25 applicants from around the world selected to participate in the January 2010 International Graduate Training Course In Antarctic Marine Biology. Sponsored by the National Science Foundation, the one-month course at the McMurdo Research Station in Antarctica focuses on integrative biology, with field-based projects focused on studying adaptations in extreme environments.

While at McMurdo, Jayasundara worked under mentor George Somero, PhD, who with Art DeVries, PhD, discovered the thermal limits of Antarctic fish more than forty years ago. Jayasundara's research project at McMurdo examined cardiac responses to temperature in notothenioid fishes. His research will provide insight into the cardiac stress organisms may face in a changing environment.

Jayasundara, a former INBRE fellow and short course participant, is currently a PhD student at the Hopkins Marine Station of Stanford University as part of the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) program.

FIRST CLASS OF UMAINE HONORS COLLEGE THESIS AWARDEES



Six University of Maine Honors College students finished their senior year thesis research under awards made in the first round of INBRE thesis fellowships. A faculty committee chaired by INBRE Steering Committee Member Keith Hutchison made the awards. "The committee considered the strength of the students' proposals and their fundamental relationship to the area of functional genomics," writes Hutchison. "That we were able to fill all six slots in this inaugural year is a testament to both the wide-spread interest in genomics and the quality of students within the Honors College."

The awards were part of a new INBRE program at the University of Maine Honors College initiated in May 2009. Previously, Honors College students participated in laboratory training courses offered by INBRE, but now they also have additional opportunities to pursue individual research. Each year the college will offer seven Junior year research fellowships, as well as two summer research fellowships, in addition to the thesis fellowships.

Charlie Slavin, Dean of UMaine's Honors College, anticipates that the variety of opportunities for research in comparative functional genomics will coalesce a community around this general research area. This year's Honors thesis program has already created interdisciplinary relationships among faculty and students. "We have high hopes that this initiative will flourish during the five year term of the grant," says Slavin. Recipients were:

ERIN BRUNK, MENTOR: SHARON ASHWORTH

THE ROLE OF CFL1L IN ZEBRAFISH EMBRYONIC DEVELOPMENT AND KIDNEY FUNCTION

ANKITA CHOWDHURY, MENTOR: ROB WHEELER

ENGINEERING OVALBUMIN-EXPRESSING *CANDIDA ALBICANS*

CHRISTOPHER DEMERS, MENTOR: ROSEMARY SMITH

COMBINATORIAL CELL MICROENVIRONMENT GENERATOR

REBECCA DYER, MENTOR: HAROLD DOWSE

IDENTIFICATION OF THE MELATONIN RECEPTOR IN *DROSOPHILA MELANOGASTER*

KATHERINE NADEAU, MENTOR: CLARISSA HENRY

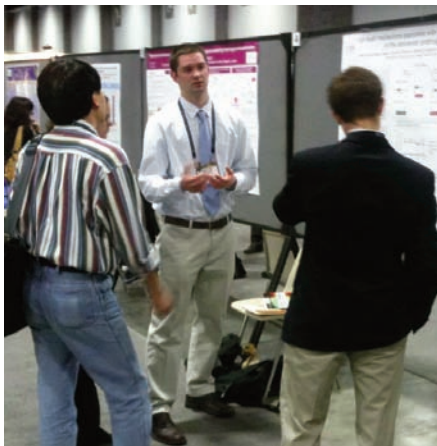
MATRIX METALLOPROTEINASE EXPRESSION AND LOCALIZATION IN *DANIO RERIO*

RYAN WHIPKEY, MENTOR: TOURADJ SOLOUKI

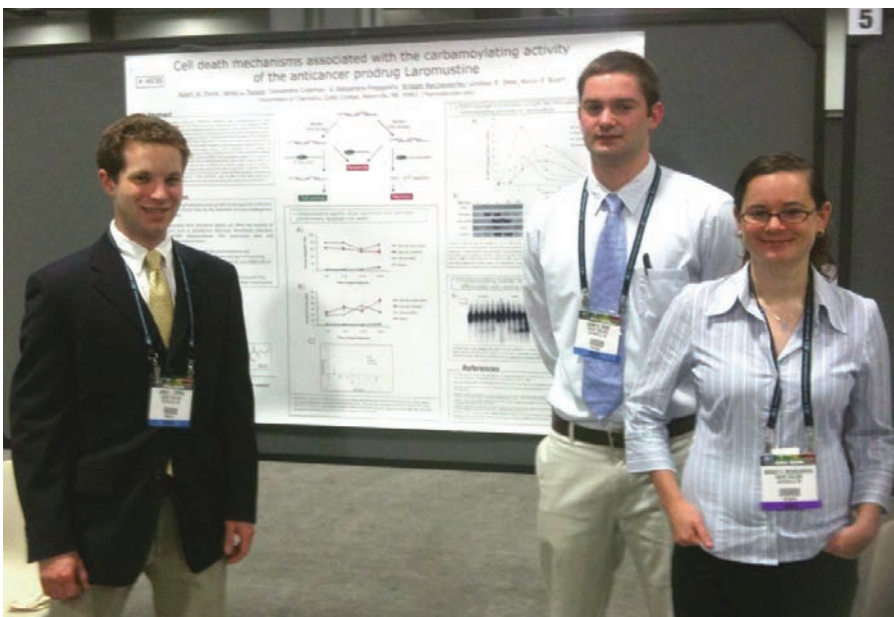
OVARIAN CANCER BIOMARKER DISCOVERY

COLBY COLLEGE'S RICE LAB PRESENTS RESEARCH AT AACR

INBRE Investigator Kevin Rice, PhD, and undergraduate students working in his lab, presented their research at the 2010 national meeting of the American Association for Cancer Research (AACR) in Washington, D.C. in April.



The theme of the meeting was “*Conquering Cancer Through Discovery Research*,” which attracted over 18,000 participants.



LEFT TO RIGHT: JARED TEPPER '10, ADAM PAINE '10 AND BRIDGET REICHELDERFER '10.

The Rice Lab presented a poster of their work "Cell death mechanisms associated with the carbamoylating activity of the anticancer prodrug Laromustine."

Participation in the meeting gave the undergraduates, all Colby seniors, valuable experience in presenting their research at a national meeting.

RECENT GRANTS: DIOXIN DAMAGE DURING DEVELOPMENT

The National Institute of Environmental Health Sciences has awarded Antonio Planchart, PhD and Carolyn Mattingly, PhD – MDIBL Investigators and former INBRE Project Leaders – a grant of \$220,000 for their research into the effects of dioxin on craniofacial (head and face) development.

Dioxin is the name given to a class of highly toxic and environmentally widespread compounds resulting from manufacturing processes such as paper bleaching and herbicide production. Known to cause cancer and birth defects, dioxin is also suspected of causing several human craniofacial syndromes.

Drs. Planchart and Mattingly are exploring the hypothesis that dioxin disrupts jaw development by affecting the activity of the FoxQ1b gene, known to be important in craniofacial development. They are using zebrafish (*Danio rerio*) as their model organism, whose jaw development has already been shown to be sensitive to levels of dioxin that are often found in the environment.

Results from this project will be instrumental in understanding exactly how dioxin affects developing organisms and what the role of the FoxQ1b gene is in jaw development and dioxin-induced deformities.

The Planchart/Mattingly Lab

published a paper in March which indicated that FoxQ1b is upregulated in the presence of TCDD, the most toxic form of dioxin.* Ongoing studies are focusing on defining the pathways regulated by FoxQ1b in order to understand how perturbation of FoxQ1b levels results in jaw abnormalities. They are also investigating regulation of other genes with critical roles in vertebrate development.

*Planchart A, Mattingly CJ. 2,3,7,8-Tetrachlorodibenzo-p-dioxin Upregulates FoxQ1b in Zebrafish Jaw Primordium. *Chem Res Toxicol* 2010 Mar 15;23(3):480-7.

Understanding the NIH Public Access Policy

Each year over 80,000 scientific manuscripts are published based on research funded by the National Institutes of Health. The NIH Public Access Policy ensures that the public has access to the published results of NIH funded research. It requires scientists to submit final peer-reviewed journal manuscripts that arise from NIH funds to the digital archive PubMed Central *upon acceptance for publication*. To help advance science and improve human health, the Policy requires that these papers are accessible to the public on PubMed Central no later than 12 months after publication.

PubMed Central is an archive of full-text biomedical journal papers available online without a fee, unlike many other archives which provide access to abstracts only or to full-text for a charge.

The NIH Public Access Policy applies to all manuscripts accepted for publication since April 7, 2008. Researchers must submit publications arising from NIH funding to PubMed Central no later than 12 months after the official date of publication. The policy applies to all peer-reviewed journal manuscripts, but does not apply to non-peer-reviewed materials such as editorials and book chapters.

It is critical to note that PubMed and PubMed Central are not the same. PubMed includes only citations and abstracts: PubMed Central carries the full text of the paper.

Before researchers sign publication or copyright transfer agreements it is important that they make sure that the contract allows the paper to be submitted to NIH in accordance with this policy.

Many journals will submit manuscripts for you automatically. A full list of cooperating journals is available at:

<http://publicaccess.nih.gov/> You may also submit manuscripts yourself at <http://www.nihms.nih.gov/> where tutorials and step-by-step instructions are available.

Please also remember that all grants and grant reports must include the PubMed Central reference number (PMCID) in each reference citation. Publications submitted to PubMed Central but not yet assigned a reference number can be included by indicating “PMCID: PMC Journal – In Process” at the end of the citation, or by indicating the NIHMS ID number (the confirmation number given by the NIH Manuscript Submission System when a publication is submitted to the PubMed Central database).

It is critical to note that PubMed and PubMed Central are not the same. PubMed includes only citations and abstracts of articles, while PubMed Central carries the full text of the paper. The NIH Public Access Policy requires submission of publications to PubMed Central and the inclusion of the PMCID, not a PMID, in citations.

For more information and answers to “Frequently Asked Questions” please visit <http://publicaccess.nih.gov/>

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

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Maine INBRE Program Coordinator:

David Barnes, PhD

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The Jackson Laboratory
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Edward Yeterian, PhD, Colby

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Carolyn Mattingly, PhD
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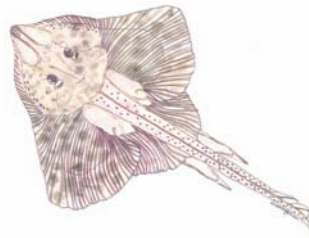
National Center for Research Resources
National Institutes of Health

Skate Genome Sequence Assembly Gets Underway

Scientists and students from Delaware, Maine, Rhode Island, New Hampshire and Vermont met in Delaware May 24-28 to analyze and annotate the emerging genomic sequence of the little skate, *Leucoraja erinacea*. Over five days, ten instructors trained the 27 participants to predict genes and infer their function from homologous genes using a number of bioinformatic tools and resources. After three days of training and practice, participants dove into re-annotating the genomic sequence of the homeobox A cluster.

The sequencing workshop and jamboree was the first of three the North East Bioinformatics Collaborative (NEBC) will conduct as part of an initiative to sequence the skate genome. Funded by American Recovery and Reinvestment Act supplements to the five INBRE and COBRE states in the Northeast, the sequencing project represents not just an important collaboration that makes the most of each state's strengths, but also a significant step in providing a key tool for genetics' research.

The skate was selected because it belongs to the first group of primitive vertebrates that developed jaws, a key step in vertebrate evolution. This group of animals also has an adaptive immune system similar to humans, as well as a closed and pressurized circulatory system and a developed nervous system.



DRAWING BY KIM HENSON

Understanding the skate's genetics could help scientists uncover how similar physiological systems evolved in humans and help identify the roles of specific genes in the development and regulation of these systems.

Scientists in Maine collected DNA samples and sent them to the Delaware Biotechnology Institute for sequencing; data is then stored and organized at regional data centers in

Delaware, Maine and Vermont. The first flow cell from the Illumina Genome Analyzer yielded over 511 million pairs of paired-end reads. Following assembly, teams of participants from all five states will start annotating the assembled sequence during periodic day-long events. The next workshop will be held in October at Mount Desert Island Biological Laboratory.

Benjamin King, Maine INBRE Biostatistician, helped lead the first workshop in Delaware. "There was a lot of energy and enthusiasm in the group," he reported. "Many of the participants had little or no previous experience with bioinformatics. With this project they are able to develop skills critical to research in the genomics era, while making an important contribution to science as a whole." Participants from Maine included Dr. Clare Bates Congdon and Ingrid Olson of the University of Southern Maine, Dr. Shallee Page and Julie Kennedy of the University of Maine at Machias, and Pierson Petropoulos and Vanessa Coats of the University of Maine.

INBRE Summer Events Schedule

3RD BIENNIAL NATIONAL IDEA SYMPOSIUM OF BIOMEDICAL RESEARCH EXCELLENCE

JUNE 16 - 18TH, 2010

MARRIOTT BETHESDA CONFERENCE CENTER, BETHESDA, MARYLAND

SUMMER STUDENT SYMPOSIUM AND RECOGNITION DINNER

JULY 27, 2010

MOLECULAR MECHANISMS OF HUMAN DISEASE: REGIONAL MEDICAL SCHOOL COURSE

AUGUST 1-7, 2010

9TH MOUNT DESERT ISLAND STEM CELL SYMPOSIUM

AUGUST 6-7, 2010

MAINE INBRE ANNUAL MEETING

AUGUST 8, 2010

SUMMER ACADEMY IN GENOMICS

AUGUST 16-20, 2010

ALL EVENTS TAKE PLACE AT THE MOUNT DESERT ISLAND BIOLOGICAL LABORATORY UNLESS OTHERWISE NOTED

New in print

Bowdoin INBRE Investigator **WILLIAM JACKMAN, PhD**, and undergraduate **PAWAT SERITRAKUL**, Bowdoin '11, recently co-authored a paper with collaborators showing that retinoic acid is specifically required to induce the pharyngeal tooth developmental program in zebrafish:

Yann Gibert, Laure Bernard, Melanie Debais-Thibaud, Franck Bourrat, Jean-Stephane Joly, Karen Pottin, Axel Meyer, Sylvie Retaux, David W. Stock, William R. Jackman, Pawat Serittrakul, Gerrit Begemann and Vincent Laudet. (2010). Formation of oral and pharyngeal dentition in teleosts depends on differential recruitment of retinoic acid signaling. *The FASEB Journal*, doi:10.1096/fj.09-147488

The Bates College laboratory of **RYAN BAVIS, PhD**, released two papers this spring. Undergraduates **KRISTIN YOUNG**, **SAMANTHA PIRO**, and **NELISH PRADHAN** were co-authors. Previously funded by INBRE, Dr. Bavis has now graduated from the INBRE program and is the PI of an R15 research grant.

Bavis RW, Dmitrieff EF, Young KM, and Piro SE. 2010. Hypoxic ventilatory responses of rats and mice after perinatal hyperoxia: does the level of hypoxia matter? *FASEB Journal*, *FASEB J.* 2010 24:799.2.

Bavis RW, Pradhan N, Nawreen N, and Donnelly DF. 2010. Carotid body O₂ sensitivity during chronic hyperoxia and after recovery in normoxia. *FASEB Journal*, *FASEB J.* 2010 24:613.3.

The Laboratory of **ANTONIO PLANCHART, PhD** and **CAROLYN MATTINGLY, PhD** – both former INBRE Investigators – has recently linked dioxin to the regulation of FoxQ1b, an important gene in craniofacial development (*see story, p. 7*):

Planchart A, Mattingly CJ. 2,3,7,8-Tetrachlorodibenzo-p-dioxin Upregulates FoxQ1b in Zebrafish Jaw Primordium. *Chem Res Toxicol* *Chem Res Toxicol.* 2010 Mar 15;23(3):480-7

INBRE Undergraduate Mentor, **GARY CONRAD, PhD** (Kansas INBRE and MDIBL), University of New England/INBRE alumna **MEGAN CHASE DIONNE** and College of the Atlantic/INBRE alumna **ZINAIDA DEDEIC** published a paper on research done in collaboration with other MDIBL scientists and undergraduates:

McCall AS, Kraft S, Edelhauser HF, Kidder GW, Lundquist RR, Bradshaw HE, Dedeic Z, Dionne MJ, Clement EM, Conrad GW. Mechanisms of corneal tissue cross-linking in response to treatment with topical riboflavin and long-wavelength ultraviolet radiation (UVA). *Invest Ophthalmol Vis Sci.* 2010 Jan;51(1):129-38. Epub 2009 Jul 30

INBRE Investigator **KEVIN RICE, PhD**, Colby College, published a review article with recent Colby/INBRE graduate **ALEXANDRA PRAGGASTIS, '10**:

Praggastis, V Alexandra; and Rice, Kevin P (March 2010) Small-molecule Inhibitors of DNA Base Excision Repair. In: *ENCYCLOPEDIA OF LIFE SCIENCES 2010*, John Wiley & Sons, Ltd: Chichester <http://www.els.net/>

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"This publication was made possible by NIH Grant Number P20 RR-016463 from the INBRE Program of the National Center for Research Resources," or **"The project described was supported by NIH Grant Number P20 RR-016463 from the INBRE Program of the National Center for Research Resources."**

Maine Biological and Medical Sciences Symposium

The 39th Annual Maine Biological and Medical Sciences Symposium (MBMSS) was a huge success, with over 175 participants taking part in the two-day event highlighting research in Maine. Almost 100 of the attendees were students, which energized the crowd, many of whom remarked on the high quality of the student research presented.

Twenty-eight speakers presented talks in four sessions: *Molecular Genetics, General Biology and Ecology, Developmental Biology, and Neuroscience*. Speakers, who included undergraduates, grad students and postdocs as well as faculty, represented the diverse research interests and backgrounds of the participants. Nine faculty members new to Maine gave invited platform presentations.

In addition, 70 research posters were presented over three poster sessions, a record number of submissions for the symposium.

The keynote speaker was Kevin Strange, Ph.D., Professor and Director, Mount Desert Island Biological Laboratory. Dr. Strange was named MDIBL's first resident director in July 2009. Dr. Strange is a comparative physiologist who utilizes *C. elegans*, a small round-worm, as a model organism to study the effects of osmotic stress on cells



KEYNOTE SPEAKER, KEVIN STRANGE, PHD,
PROFESSOR AND DIRECTOR, MDIBL

LEFT TO RIGHT: BATES ASSOCIATE PROFESSOR OF BIOLOGY, NANCY KLECKNER, PHD AND UMAINE-PRESQUE ISLE PROFESSOR OF BIOLOGY, BONNIE WOOD, PHD MEET WITH ANNE CHANGE, COLBY '10, AT THE POSTER SESSION



and their proteins. He discussed the powerful experimental advantages *C. elegans* presents for defining the genetic bases of fundamental physiological processes, as well as his laboratory's recent work showing that cell dehydration causes rapid damage to cytoplasmic proteins.

Matthew Bowers, Bowdoin '10, received the award for Best Student Presentation; Brian Powers, Bowdoin '10, and Harita Dharaneeswaran, Bates '10 garnered the Best Student Poster awards.

The conference also featured

several special workshops. Ben King, MDIBL's Biostatistician, led a training in Comparative Genome Analysis for INBRE faculty and staff. In addition, faculty and graduate students held a "Graduate School Q & A" session, to answer undergraduates' questions about how to select and apply to a graduate school, as well as how to finance education.

Maine INBRE PI, Patricia Hand remarked that the symposium "truly gets better every year – the 2010 symposium was even more outstanding than the last MBMSS."

BEST STUDENT PRESENTATION AWARD

Matthew Bowers, Bowdoin College '10

EFFECTS AND DISTRIBUTION OF HOMARUS AMERICANUS CALCITONIN-LIKE DIURETIC HORMONE (HOMAM CLDH), AN INTRINSIC NEUROMODULATOR IN THE CARDIAC SYSTEM OF THE AMERICAN LOBSTER, HOMARUS AMERICANUS

BEST STUDENT POSTER AWARDS

Brian Powers, Undergraduate Student, Bowdoin College, '10

THE C-TYPE ALLATOSTATIN (AST-C) PQIRYHQCYFNPISCF AND THE AST-C-LIKE PEPTIDE SYWKQCAFNAVSCFAMIDE ARE ENCODED BY DIFFERENT MRNAS, ARE DIFFERENTIALLY DISTRIBUTED, AND ELICIT DISTINCT CARDIOTROPIC RESPONSES IN THE LOBSTER HOMARUS AMERICANUS

Harita Dharaneeswaran, Undergraduate Student, Bates College, '10

CONFIRMATION AND LOCALIZATION OF COTRANSMITTER BUCCALIN IN THE CENTRAL NEURAL NETWORK THAT UNDERLIES THE FEEDING BEHAVIOR OF POND SNAILS, HELISOMA TRIVOLVIS AND BIOMPHALARIA GLABRATA

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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