

STUDENTS HONORS PROJECTS

2008-2009

Biology:

- Chris Carlin Investigation of a Putative Arginine Demethylase in the Opportunistic Commensal *Candida albicans*
- Julie Endrizzi Genetic analysis of the human follicle mite *Demodex brevis*
- Adam Kaplan Morphological differences of the AWB chemosensory neurons between natural isolates of the nematode *Caenorhabditis elegans*
- Alexa Kaubris Soil carbon sequestration and turnover in a pine forest under elevated CO₂
- Jenna Lord Secondary Structures of Internal Transcribed Spacer Region 1 rRNA in Symbiotic Dinoflagellates
- Hayley McHugh *Candida albicans* Orf19.216 Protein and its Relationship with Fluconazole Resistance
- Sami Nichols Causes and consequences of nest site selection in an island bird population
- Marie Sears *Eucalyptus saligna* drought tolerance and photosynthetic temperature optima are affected by future predicted atmospheric CO₂ concentrations and warming
- Nick Selden Towards enzymatic synthesis of a novel *Helicobacter pylori* antibiotic
- Tanya Todorova Differential Gene Expression in WAK mutants
- David Zonana The impacts of eastern dwarf mistletoe (*Arceuthobium pusillum*) infection on host white spruce (*Picea glauca*) radial growth: effects at whole-tree and branch levels
- Biochemistry:**
- Rachel Ackerman Genetic sequencing and distribution of C-type allatostatin neuropeptides in the Maine lobster, *Homarus americanus*, using mass spectral and immunohistochemical methods
- Elita DeFeo WAK2 Mutations that Effect Cell Wall Binding
- Cody Desjardins Ectomycorrhizal community composition in *Tsuga canadensis* stands with varying levels of Hemlock woolly adelgid-induced mortality
- Tamlyn Frederick Increased Trehalose Production in Bacteria Expedites Bioremediation of Hexavalent Chromium
- Han Guo Synthesis of unnatural azidosugars designed to hijack *Helicobacter pylori*'s pseudaminic acid biosynthetic pathway
- Maria Koenigs Metabolic profiling of *Helicobacter pylori* glycosylation
- Pablo Obregon The WAK-2 Extracellular Matrix Domain, and its role in Cell Expansion
- Matthew Shew Validating the Golgi two-hybrid assays's utility in studying glycosylated proteins

James Yoo Analysis of Hedgehog Function in Zebrafish Tooth Development

Neuroscience:

Julia Bond Rapid behavioral influences of steroid hormones via non-genomic mechanisms in male goldfish

Emily Gabranski The neuropeptide myosuppressin functions as a cotransmitter to reconfigure two neural networks into a single pattern generator

Matthew Ginther The Role of the Hippocampus in the Memory for a Sequence of Events

Katherine Gribble Expression of the guidance factor semaphorin 2a in the cricket, *Gryllus bimaculatus* following denervation

Daniel Hetherman Morphological consequences of semaphorin knockdown on compensatory dendritic sprouting in the cricket, *Gryllus bimaculatus*

Alex Keeney The Effects of the Pheromone Androstenedione on Male Social Approach Behavior in Goldfish, *Carassius auratus*

Terrence Pleasant The role of the hippocampus in "episodic-like" memory in rats

Liza Shoenfeld Rapid testosterone modulation of the visual system in goldfish

Nick Simon Temporal Dynamics of Association Cortex-Parahippocampal Interactions in a Continuous Delayed Nonmatched to Sample Task in Rats

2007-2008

Biology:

Kenneth Akiha Fitness Effects of Sperm Competition in *Caenorhabditis elegans*

Nickolas Alcorn How do changes in parental investment influence larval development in Gulf of Maine echinoids?

Kathryn Anderson Comparing chemical and structural induced defenses of *Ascophyllum nodosum* in response to damage by herbivory and wave action

Jacqueline Brosnan Developing RNA Interference Techniques in the Cricket, *Gryllus bimaculatus*

Roberta Dennison Regulation of central pattern generators by the ganglionic sheath in the American Lobster, *Homarus americanus*

Ryan Devenyi Modulation of contractions of the gm4 muscle of the gastric mill by FLRFamides in Cancer crabs

Carolyn Hricko Light use in Eucalypts exposed to past, present and forecasted future atmospheric conditions

Nathan Krah *psbS* expression affects photosynthesis, growth, and fitness in *Arabidopsis thaliana*

Ekaphan Kraichak Community Structure of Macrolichens on a Boreal Island in the Bay of Fundy

Samuel Minot Evolutionary history and population genetics of the human follicle mite, *Demodex folliculorum*

Kendra Neff Constraints on tree recruitment on Kent Island, New Brunswick following hare-eradication

Biochemistry:

Rebecca Lewis Localization of glycine rich protein, verbascose synthase, and o-methyltransferase green fluorescent fusion proteins in *Arabidopsis thaliana*

Lincoln Pac Exploring the role of delta-nitrogen arginine methylation in yeast translation

Akira Shishido Binding Wall Associated Kinase to Pectin in vitro

T. Duncan Smith Isolation and Identification of WAK Associated Proteins

Benjamin Stormo Effects of eastern dwarf mistletoe infection on the expression of senescence-related genes in host white spruce

Alex Willkinson Characterization of a methylated protein in *Candida albicans*

Neuroscience:

Claire Cutting Identifying Differentially Regulated Genes After Denervation in the Cricket, *Gryllus bimaculatus*

Rachel Donahue Hippocampal-cortical interactions in a declarative memory task

James Harris The Role of UBR1 in Compensatory Regeneration of Cricket, *Gryllus bimaculatus*, auditory interneuron dendrites

Kristen Huber A comparison of the modulatory effects of native FMRFamide-related peptides on the stomatogastric nervous system in the American lobster, *Homarus americanus*

Kristen Lee The role of the hippocampus in "episodic-like" memory in rats

Louis-David Lord Rapid Steroidal Influences on Visually-Guided Social Behavior in Male Goldfish

Hande Ozergin The Influence of Facial Expression Perception on Social Communication in Humans

C. Robert Parrish Information flow between the orbitofrontal and perirhinal cortices in rats performing an odor recognition memory task

Jacob Stevens Complex modulation of cardiac activity by FMRFamide-related peptide hormones in the American lobster, *Homarus americanus*

Brandon Waxman A Study of the Effects of Vasotocin Receptor Expression on Social Behavior in the Goldfish, *Carassius auratus*

2006-2007

Biology:

Caitlin Jeffrey Foraging, Fog, and Fitness: Effects of Weather on Two Island Bird Species

Anthony Regis Exploring the RNA-binding protein Npl3: Intracellular localization and arginine methylation in *Candida albicans*

Nastasha Horvath Orcokinin peptides are ubiquitous in the stomatogastric nervous system of *Cancer* crabs, but do not alter its output

Ben Lake Influence of orientation and water current speed on feeding behavior and metabolism of *Semibalanus balanoides*

Jenna Pariseau Synapse reformation during spinal cord regeneration in the lamprey (*Petromyzon marinus*)

Haley Bridger Testing the Phylogenetic Placement of *Demodex folliculorum*

Biology/ES:

Thomas Buehrens Nutrient dynamics of microbial communities in intertidal sediments along the Kennebec estuary, mid-coast Maine.

Mark Burton Human Disturbance and Food Web Structure in the Merymeeting Bay Watershed, Maine

Michael Taylor The Spawning Ecology of Steelhead Trout (*Oncorhynchus mykiss*)

Biochemistry:

Sarah Burns In vitro granulopoiesis during epigenetic modifications

Chris Cashman The Identification and Comparative Analysis of Orcokinin Family Neuropeptides in Decapod Crustaceans Using Matrix Assisted Laser Desorption/Ionization-Fourier Transform Mass Spectrometry

Tim Cashman Disulfide-based Beta-sheet Peptidomimetics

Charlie Johnson Identification of Proteins that Interact with Thylakoid Associated Kinases

Michael Reutershan Beta-turn peptides as asymmetric catalysts

Ponilla Samuel An Assessment of Cervical Cancer Screening and The Prevalence of Abnormal Papanicolaou Tests among Immigrant Women

Lauren Steffel The Use of Hydrogen Bonding to Control Conformations of Peptides and Peptidomimetics

Keirnan Willett Nutrient dynamics of microbial communities in intertidal sediments along the Kennebec estuary, mid-coast Maine

Neuroscience:

Vijay Kotecha Physiological effects and mechanisms of peptide neuromodulation on the lobster stomatogastric nervous system

Szymon Rus Molecular Characterization of Neuropeptides and their Distribution in American Lobster *Homarus americanus*

E.B. Sheldon Morphological analysis of synaptogenesis after compensatory regeneration in the auditory system of the cricket *Gryllus bimaculatus*

Erin Prifogle The Role of the Hippocampus in Episodic-like Memory in Rats

Raashi Bhalla The Neural Circuitry of Social Approach Behavior in Goldfish

Sheryl Stevens Quantification of Vasotocin Receptors in Goldfish (*Carassius auratus*)

2005-2006

Biology:

Ross Butschek	The different effects of Eastern Dwarf Mistletoe on host spruce water relations
Andrew Combs	Stress induced ultra-structural cellular modifications in <i>Arabidopsis</i>
Ruth Jacobson	Pbx1 gain and loss of function phenotypes in the developing gut tube
Drew Metcalfe	Molecular Evolution of the <i>spe-9</i> sperm transmembrane protein in <i>C. remanei</i>
Henry Perry-Friedman	Biogenesis of Wall-Associated Kinase (WAK) in <i>Arabidopsis thaliana</i>
Rebecca Selden	Predator-induced changes in growth and metabolism of the green sea urchin <i>Strongylocentrotus droebachiensis</i>
Alexandra Smith	Characterization of Pbx1b and its Role in Spleen Development
Alla Smith	The antioxidant role of Ascorbate in <i>Arabidopsis thaliana</i>
Aye TinMaung	Mapping of the <i>plg-1</i> gene: Physical mapping of recombinants
Alison Witkin	Molecular Evolution of the Sperm Transmembrane Protein <i>spe-9</i>

Biology/ES:

Kiersa Benson	Growth and behavioral response of hard shell clam <i>Mercenaria mercenaria</i> in response to crab predation cues
Sarah Close	Pelagic Food Webs and Nutrient Dynamics of Lake Tanganyika, East Africa
Lucy Van Hook	The demography, nesting status and movement patterns of Snapping Turtles <i>Chelydra serpentina</i> in Merrymeeting Bay

Neuroscience:

Alex Bender	Quantification of Arginine Vasotocin Interdinalization in the Medulla of the Roughskin Newt, <i>Taricha granulose</i>
Jena Davis	Cortical Representations of Hippocampally-Dependent Declarative Memory in Rats
Meaghan Kennedy	Neuropeptides and Social Behavior: The Relationship between Expression Patterns of the Vasotocin Receptor in the Goldfish Brain and Individual Differences in Social Behavior
Vanessa Lind	Relationship of Vasotocin Gene Activity and Social Approach Behavior in Goldfish
Kristen Maynard	The role of semaphoring during compensatory regeneration in cricket auditory interneurons
Katherine Mitterling	Differences in Hippocampal Volume and Neurogenesis in Storing and Non-Storing Birds Across Seasons

Biochemistry:

- Henry Brennan Synthesis of Beta-Turn Peptidomimetic Scaffolds
- Stephen Curwen Mapping the *plg-1* gene in *Caenorhabditis elegans*: Searching for DNA rearrangements in a 76-kb region
- Sarita Fu Deletion of the Cell Wall Associated Kinase (WAK) Locus in *Arabidopsis thaliana* By Transposition
- Jason Lewis The Binding of Wall-Associated Kinase WAK2 to Pectin
- Kelly McGrath Effects of Arginine methylation on intranuclear protein interactions of RNA-binding proteins

2004-2005

Biology/ES:

- Greg Goldsmith Impacts of long-term research on the seedling dynamics of a permanent sample plot on Barro Colorado Island, Panama
- Jonathan Harris The Role of Proline in the Freezing Tolerances of Two Competing Species of Red Algae
- Iris Levin Cultural Evolution and Mate Choice in an Island Bird Population: The Role of Song
- Deb Schaeffer Restoring Access to Small Boats through Area Management: A Path to Sustainability in the Gulf of Maine Groundfishery
- Christina Souther Biogeochemistry of the Kennebec estuary
- Nancy Van Dyke The Potential for Comopost-based Disease Control within the National Organic Program: A Closer Look at Potato-Fungal Pathogen Systems on Maine Farms

Biology:

- Ben Chan Exploring tensile attributes of mutable collagenous tissue in *Eucidaris tribuloides* Spines with respect to muscle and ligament properties
- Catherine DelVecchio An investigation of Thylakoid Associated Kinases (TAKs) in *Arabidopsis thaliana* using Two-Dimensional Gel Electrophoresis
- Erin Dukeshire The effects of wave exposure, latitude, and tidal height on shell morphology of *Tegula atra* in Chile
- Dan Hall Structure and Function in the Chondrichthian Digestive Tract
- Melissa Hayden Molecular Population Genetics of a Sperm Transmembrane Protein in *Caenorhabditis remanei*
- Matthew Leach Methylation Patterns in the FMR1 Promoter in Full Mutation Fragile X Cells
- Camden Ramsay Physical Mapping of the *plg-1* gene in *Caenorhabditis elegans*
- Andrew Segerdahl The effects of Olfactory stimuli on somatosensory neuronal activity in *Taricha granulosa*
- Sarah Solomon Molecular Characterization of Slit in *Gryllus bimaculatus*

Caitlin Woo	A Laboratory Investigation of Sexual Selection in <i>Caenorhabditis elegans</i>
Mary Wright	Growth and Metabolism in the Green Sea Urchin, <i>Strongylocentrotus droebachiensis</i>
Kreshnik Zejnullahu	Characterization of T-cell factor 4 and Wnt1 1 during polarization of the gizzard epithelium
<u>Neuroscience:</u>	
Rebecca Bartlett	The effects of female pheromone on somatosensory neural activity in <i>Taricha granulose</i> and it's possible mediation by AVT
Ellen Beth	Influences of Vasotocin on Social and Anxiety-related Behaviors in Goldfish
Claire Discenza	Interactions between the hippocampus and orbitofrontal cortex in rat long-term declarative memory
Carolyn Johnson	Dopaminergic Modulation of Feeding Behaviors in the Leech, <i>Hirudo medicinalis</i>
Braulio Peguero	The effects of the novel peptide Val ¹ -SIFamide on the central pattern generators in the Stomatogastric ganglion of the American lobster, <i>Homarus americanus</i>
Pieter Scheerlinck	Val ¹ -SIFamide evokes a novel pattern in the pyloric IC neuron of the stomatogastric system in the lobster, <i>Homarus americanu</i>
Alissa Waite	Interactions between the orbitofrontal cortex and the hippocampal memory system
Suen Wong	Three-Dimensional analysis of compensatory growth in <i>Gryllus bimaculatus</i> auditory interneurons
<u>Biochemistry:</u>	
Chris Aderman	Enantioselective Conjugate Additions Using a Peptide Catalyst
Justin Berger	Creation of a Wall Associated Protein Kinase (WAK) Locus Deletion in <i>Aribidopsis thaliana</i>
Nicole Byers	Activation of a Wall Associated Kinase (WAK) by Receptor Domain Fusion Affect Cell Turgo
Kevin Draper	Nucleosome mediated condensation in the silencing of the FMR1 gene
Andrew Fischer	Cellular Localization of Wall Associated Kinase Two and Related Proteins in <i>Aribidopsis thaliana</i>
William Kapelle	Searching for the cannabinoid signaling system in <i>Caenorhabditis elegans</i>
Kirstin Leitner	Thylakoid Associated Kinases (TAKs) affect light harvesting and female gametophytic development in <i>Arabidopsis thaliana</i>
Stephen Mallon	The Role of Robo in Compensatroy Neurogenesis in the Cricket, <i>Gryllus bimaculatus</i>
Tapen Mehta	Use of the Comet Assay to Identify Pollutant-Stressed Mussels, <i>Mytilus edulis</i> , in the Field
Heather Provencher	The analysis of crustacean nervous system tissue by MALDI-FTMS: a focus on the identification of new orckinin family neuropeptides in <i>Panulirus interruptus</i>
Ben Stranges	Boundary Layer Fluid Dynamics Effects on Oxygen Metabolism and Growth Rates

in Green Sea Urchins, *Strongylocentrotus droebachiensis*

Laura Welsh Granulocytic nuclear differentiation is independent of DNA replication in HL-60 Cells

2003-2004

Biology:

- Caroline Agusti Evolution of Demodex-Human Parasite-Host System
- Emily Blum Phenotypic analysis of an arginine methyltransferase (HMT1) deletion in *Candida albicans*
- Lynne Davies Competition, diet and spine length as indicators of roe quality in the green sea urchin, *Strongylocentrotus droebachiensis*
- Anjali Dotson Regulation of WAK Gene Expression in *Arabidopsis thaliana*
- Lynn Furick Digital Animation of Zebra Fish Development
- Emily Grason Influence of an Invasive Bryozoan on *Onchidoris muricata* Prey Selection in the Gulf of Maine
- Bradley Graustein Polymorphism patterns of the spe-9 gene in *C. Remanei* and *C. Elegans*
- Katie Irving Effects of Elevated Carbon Dioxide in Carbon Sequestration in Mineral Soil
- Angie Senese The Hydrodynamics of Schooling Behavior in the Marsh Killifish, *Fundulus Heteroclitis*
- Lela Stanley Host-specific genetic differentiation in eastern dwarf mistletoe
- Sam Terry Growth and photosynthesis in *Aribidopsis thaliana* mutants with different capacities for energy dissipation
- Evangeline White Thylakoid Associated Kinases and Light Harvesting in *Arabid thaliana*

Biology/ES:

Julie Grinvalsky Plant Community Dynamics in Merymeeting Bay

Neuroscience:

- Matthew Boersma Anticipatory neuronal firing in the orbitofrontal cortex in rats
- Scott Herrick The effect of hippocampal lesions on spatial and non-spatial declarative memory tasks in rats
- Christian Johnson The effects of proctolin on gastric-pyloric interactions in *Homarus americanus*
- Kat Martens Morphological examination of axonal fusion during thin bundle nerve Regenerations in the claws of *Procamaus clarkeii*
- Jennifer Scangos Peptide Effects on Social Behavior of Female Goldfish

Biochemistry:

- Jeff Cook Arginine Methylation of a Yeast RNA-Binding Protein
- Allison Cherry Chromatin Structure of the Fragile X Mental Retardation Gene in Normal

and Diseased States

Hoon Sohn

Cholesterol and Nuclear Skeleton Structure in HL-60 Bcl 2 Cells