

## Summer Research Projects

**2008**

### **HHMI Fellowship:**

Chaiyaboot

Ariyachet

Exploring the function of hydrophobic residues in the arginine-glycine-rich (RG) domain of the RNA-binding Np13

Khristianna Jones

Testing Episodic-like Memory in Rats by Acquiring a Taste Aversion

Terrance Pleasant

The role of the hippocampus in the expression of episodic-like memories in rats

Pawat Seritrakul

Functional analysis of retinoic acid signaling in zebrafish tooth development

Tamlyn Frederick

The Role of Trehalose in Bioremediation

Han Guo

Synthesis and analysis of unnatural azidosugars in *Helicobacter pylori* pseudaminic acid biosynthetic pathway

Alex Keeney

Isotocin and its Effect on Social Approach Behavior in Goldfish

Nick Sanchez

Evolutionary origins of demodex peromysci taken from nine subspecies of mice from the genus peromyscus

Rachel Ackerman

Identification and localization of a new myosuppressin analog in the Maine lobster, *Homarus americanus*

Claire Lewkowicz

The Role of Trehalose in the Mycobacterial Cell Wall

Pablo Obregon

The Role of WAKs in Cell Expansion

Adam Kaplan

Examination of cilia diversity between *C. elegans* populations

Maria Koenigs

A New Glow: Using azidosugar metabolism in conjunction with the Staudinger ligation to selectively image *H.pylori*

### **Hughes Family Fellow:**

Ross Cowman

Aquatic Plant (*Vallisneria americana*) colonization and transplantation in Merrymeeting Bay

### **Paller Fellowship:**

Nicholas Simon

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

Matthew Ginther

The Hippocampus and the Memory for Sequence of Events

Julia Bond

The Relationships between Female Pheromones and Testosterone in Eliciting an Approach Response in Male Goldfish

### **Doherty:**

Rachel Dicker

Egg capsule distribution in *Nucella lapillus* as a strategic maternal investment

James Anderson

A survey of aquatic invertebrates in Merrymeeting Bay and their relationship to submerged aquatic vegetation

Elizabeth Barton

The Characterization of Truncated and Modified Orcokinin Neuropeptides in the tissues from the American Lobster, *Homarus americanus*

Drew Trafton      Trophic Web Structure and Anadromous Fish Distributions in Merrymeeting Bay

**James Stacy Coles:**

Nicholas Selden      Enzymatic synthesis of a committed, unnatural pseudamino acid substrate

**Chamberlain Scholar:**

Jamilah Gurwala      The role of the hippocampus is episodic-like memory

**Maine Space Grant:**

Jaelyn Davis      Understanding recovery capabilities of the cricket auditory system

Daniel No      Variation in Vasotocin Receptor Genes of Goldfish and its Implications for Variation in Receptor Expression and Basic Social Behavior

Erin Taylor      Mathematical Modeling of the Neurologic Feedback Loop in the Cardiac Ganglion of the Lobster

**Surdna:**

Christopher Carlin      Examining the effects of over-expression of an arginine methyltransferase on filamentation in the pathogenic yeast *Candida albicans*

Daniel Hetherman      Further Characterization of the role of Synaptobrevin in Cricket Auditory System Neuronal Regeneration

Liza Shoenfeld      Hormonal stress responses and social behavior in the goldfish, *Carassius auratus*

Tanya Todorova      OG induced, WAK2 dependent mechanism of ROS burst response in *Arabidopsis thaliana*

**INBRE-Junior BioMedical:**

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

**INBRE-Predoc:**

L.D. Lord      Rapid Steroidal Influences on Visually-Guided Social Behavior in Male Goldfish

James Harris      The Role of a Pushover Homologue in Compensatory Dendritic Regeneration in *Gryllus bimaculatus*

**INBRE:**

Julie Endrizzi      Demodex: a Species Comparison using Genetic Methods

Hayley McHugh      The *Candida albicans* Protein IPF12319 and its Relationship with Fluconazole Resistance

Matthew Shew      Identifying the substrates of ppGalNAcT-2 using the novel Golgi two-hybrid assay

Caitlin Stauder      Functional analysis of the role of BMP signaling in zebrafish tooth development

Teerawat Wiwatpanit      Effects of neuropeptide GAHKNYLRamide on American lobster, *Homarus americanus* Cardiac Ganglion

James Yoo Analysis of Hedgehog Function in Zebrafish Tooth Development

**INBRE-Mentored:**

Emily Gabranski Neuromodulatory Effects of SIFamides on Motor Patterns of the Stomatogastric Ganglion in the crab *C. irroratus*

Molly Kwiatkowski Hormonal control in the American lobster by midgut-derived peptides

**Beckman Fellowship:**

Sam Minot Transmission of *Demodex folliculorum*, the human follicle mite, is restricted between hosts and continents

**Faculty Grants:**

Elita DeFeo The Role of the Extracellular Domain in the Wall Associated Kinase (WAK)

Rhysly Martinez Investigation of Wall-Associated Kinases (WAKs) and Mechanisms of Post-transcriptional Control using Microarrays

Claire Williams Characterization of Serine Peptidase in Cricket Neuronal Regeneration

**2007**

**HHMI Fellowship:**

Charles Parrish Interaction of orbitofrontal cortex and perirhinal-entorhinal cortices during and odor recognition memory task in rats

Hande Ozergin Effects of Subliminal Perception of Facial Expression

Ian Haight How does temperature influence larval growth and survival of Maine sea stars

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

Nathan Krah Psbs function correlates with overall plant fitness in *Arabidopsis thaliana*

Rachel Donahue The temporal dynamics of cortical-hippocampal interactions in rats learning an odor-sequence memory task

Rhysly Martinez Investigation of Wall-Associated Kinase-Activated Genes: Using *Arabidopsis thaliana* Genome Chips to Record Altered Expressions

T. Duncan Smith Isolation and Identification of WAK Associated Proteins

Tanya Todorova OG Induced WAK2 Dependent ROS

Andrea Aduna Characterizing the transcription of *plg-1* in the nematode *Caenorhabditis elegans*

Emily Gabranski Neuromodulatory Effects of Sulfakinin in Nerve-evoked Muscles Contractions of the Stomatogastric Musculature in *Homarus americanus*

Nick Alcorn How do reductions in parental investment affect development in *Strongylocentrotus drobachiensis*

Khristianna Jones Acquiring a Taste Aversion to test Episodic-like Memory in Rats

Ahmad Hassan

Muhammad Olfactory Learning in Mice

**Merck Fellowship:**

Dylan Masters Sediment retention of phosphorus and other elements as a dynamic source/sink

Heidi Mills The effects of SIFamide neuropeptides on the cardiac ganglion in the crabs *Cancer irroratus* and *Cancer borealis*

Kathryn Nichols How reduce or remove phosphorus in intertidal sediments of MMBand see how the microbial community responds

Laura Onderko Neuropeptide Release and Processing: An Investigation of Tachykinin-related peptides in the Crab, *Cancer borealis*

**Freedman Fellowship:**

W. Scott McFarlane Trophic web structure in Merrymeeting Bay

**INBRE Fellowship::**

Abhishek Sharma Physical mapping of the plg-1 gene in *Caenorhabditis elegans*

Chaiyaboot (Tee) Characterization of RG domain

Ariyachet

Claire Cutting Using RNA Interference to Examine Semaphorin Expression in the *Brain of an Adult Cricket*

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

Kristen Huber Investigation of the modulation of rhythmic behavior in the stomatogastric nervous system in *Homarus americanus*

**INBRE Pre-Doc Fellowship:**

Michael Reutershan  $\beta$ -turn peptides as asymmetric catalysts

Szymon Rus Characterization of the sulfakinin neuropeptide in decapod crustaceans through molecular cloning

**INBRE Mentored Fellowship:**

Jacqueline Brosnan Gene Regulation during neuronal regeneration in the cricket auditory system

Roberta Dennison The identification and effects of neuropeptides that modulate rhythmic motor patterns in decapod crustaceans

**INBRE Junior BioMedical:**

Chris Cashman Orcokinin Family Peptides in Decapod Crustaceans: Biological Processing and MALDI-FTMS

**Paller:**

Jacob Stevens Differential cardioexcitatory effects of sulfakinin neuropeptides on the cardiac ganglion in the American lobster *Homarus americanus*

L.D. Lord The Effects of Pheromones and Hormones on Sensory Processes Related to Reproduction in Male Goldfish

**Beckman Fellowship:**

Chris Cashman Orcokinin Family Peptides in Decapod Crustaceans: Biological Processing and MALDI-FTMS

Sam Minot Transmissibility of *Demodex folliculorum* between human hosts

**Doherty Fellowship:**

Nick Alcorn How do reductions in parental investment affect development in *Strongylocentrotus drobachiensis*

Molly Seaward Historical macrophyte distribution in Merrymeeting Bay and its minor tributaries

**Rusack Fellowship:**

Ben Stormo Eastern dwarf mistletoe hinders the normal response to parasitic infection in white spruce by altering the abscisic acid signaling pathway

**American Society of Microbiology Grant:**

Alex Wilkinson Identificatin of a Methylated Protein in *Candida albicans*

**SOMAS Grant:**

James Harris Role of UBR1 in neuronal regeneration in the cricket auditory system

**Maine Space Grant :**

Brandon Waxman A Study of VT and Social Behavior

Emily Gabranski Neuromodulatory Effects of Sulfakinin in Nerve-evoked Muscles Contractions of the Stomatogastric Musculature in *H. Americanus*"

**Faculty Grants:**

Anthony Carrasquillo Sorption of cationic amines to aluminosilicates

Liza Shoenfeld Stress dependent effects of vasotocin on social behavior in goldfish

**2006**

**HHMI Fellowship:**

Joseph Adu Influence of Anxiety on Social Approach Behavior in Goldfish (*Carrasius auratus*)

Rachel Donahue Hippocampal-dependent anticipatory neuronal firing in the orbitofrontal cortex of rats learning an odor-sequence memory task

Ian Haight Effects of Competition and Cooperation on Growth Rates of Two Species of Small Sea Stars (*Asterias rubens* and *Asterias forbesi*)

Scot McFarlane Understanding the Value of Submerged Aquatic Vegetation in Merrymeeting Bay

Erin Prifogle Declarative Memory and the What, Where, When (3W) Task: What Role Does the Hippocampus Play in Episodic Memory in Rats?

Eric Robinson Predation on marine invertebrate larvae on the benthos and in the plankton: investigating the function of vertical migrations

- Jacob Stevens Comparing modulatory effects of Gly1 and Val1-SIFamide isoforms on the stomatogastric ganglion of *Homarus americanus* and *Cancer borealis*
- Alex Wilkinson Identification of a methylated protein in *Candida albicans* by tagging with Green Fluorescent Protein
- Gail Winning Testing the Role of the Hippocampus in Episodic Memory in a 3W Task: What, When, and Where

**Merck Fellowship:**

- Syzmon Rus Comparison of SIF-amide peptide isoform functions through identification and expression of SIF-amide receptors
- Keirnan Willett Microbial Response to Nitrogen and Phosphorus Fertilization across an Estuarine Salinity Gradient

**Langbein Fellowship:**

- Carolyn Hricko Studying the Effects of Eastern Dwarf Mistletoe on Red and White Spruce

**INBRE Fellowship:**

- Andrea Aduna Evolution of the *plg-1* polymorphism in the nematode *Caenorhabditis elegans*
- Raashi Bhalla Exploring the Biology of Emotional Responses in Goldfish
- Jessica DePalo Identification of the *plg-1* gene on Chromosome III in *Caenorhabditis elegans*
- Eve Lake Exploring the Biology of Emotional Responses in Goldfish
- Wendy Mayer Testing for correlated evolution of sperm competitive ability and ejaculate toxicity in the nematode *Caenorhabditis elegans*
- Jenna Pariseau Mechanisms of Axonal and Synaptic Regeneration
- Anthony Regis The effects of Npl3 mutations and Hmt1 deletion on Npl3 localization in *Candida albicans*
- Matthew Wang Development of Pattern in the Mouse Cerebellum

**INBRE Pre-Doc Fellowship:**

- Emily Bruns Development of derivatization and enzymatic methods for the detection and sequencing of neuropeptides in crustaceans by MALDI-FTMS
- Kelly McGrath Effects of arginine methylation on intranuclear protein interaction of RNA-binding proteins

**INBRE Undergraduate Fellowship:**

- Charles Johnson Identifying protein-protein interactions and function of Thylakoid Associated Kinases (TAKs) in *Arabidopsis thaliana*
- Tamlyn Frederick Development of an Experimental System to Evaluate the Kinetic Parameters of Picomavirus 3C Protease-Catalyzed Reactors

**Paller:**

- Vijay Kotecha Is electrical coupling responsible for the communication between two independent central pattern generators in the lobster stomatogastric nervous system?

Sheryl Stevens      Quantification of the Truncated Vasotocin Receptor in Goldfish (*Carassius auratus*)

**Beckman Fellowship:**

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

Rebecca Selden      Growth and Metabolism of the green sea urchin, *Strongylocentrotus droebachiensis*: Flow Environments and Predation pressure”

Chris Cashman      The Comparative Study and Identification of Decapod Orcokinins

**Doherty Fellowship:**

Nick Alcorn      Predation on marine invertebrate larvae on the benthos and in the plankton: investigating the function of vertical migrations

Nastasha Horvath      The Distribution of Orcokinins in Stomatogastric Nervous System of Crustaceans

Roberta Dennison      Effects of Competition and Cooperation on Growth Rates of Two Marney Pratt Species of Small Sea Stars (*Asterias rubens* and *Asterias forbesi*)

**Surdna Fellowship:**

Alice Lee      The Role of WAK4 in cell growth and invertase activity in *Aribidopsis thaliana*

Justin Kievits      The Effects of Isotocin on the Social Behavior of Goldfish (*Carassius auratus*)

**2005**

**HHMI Fellowship:**

Ryan Dunlavey      Eastern dwarf mistletoe-induced alterations in water relations of red, white and black spruce

Ekaphan Kraichak      Evolution of Sperm Competition and its Effects on Female Fitness in *Caenorhabditis elegans*

Aye TinMaung      Mapping the plg-1 Gene in *Caenorhabditis elegans*

Henry Perry-Friedman      Biogenesis of Wall Associated Kinases

Vanessa Lind      Relating Vasotocin Gen Activity to Social Behavior in Goldfish

**Merck Fellowship:**

Madelein Pott      Comparative Study of the Effects of the Neuropeptide Val1-SIFamide on the Cardiac Sac Pattern Generator in the American lobster, *Panulirus interruptus*

Keirnan Willett      Microbial Response to Nitrogen and Phosporus Fertilization across an Estuarine Salinity Gradient

**Langbein Fellowship:**

Ellen Beth      Vasotocin Behavioral Mechanisms in Goldfish

**INBRE Fellowship:**

- Thu-Nga Ho Systems of *Homarus americanus*, *Panulirus interruptus*, *Cancer borealis*, and *Cancer irroratus*”
- Katie Mitterling Declarative Memory and the What, Where, When Task: What Role Does the Hippocampus Play in the Memory System in Rats”
- Elizabeth Sheldon The role of semaphorin as a molecular guidance cue for dendritic regeneration in the cricket auditory system
- Alison Witkin Molecular Evolution of the spe-9 gene in *Caenorhabditis remanei*

**INBRE-MDIBL Fellowship:**

- Alexandra Smith Cell Migration Movements during hindgut morphogenesis
- Justin Kievits The Effects of Peptide Gene Knockouts on Social Behavior in Goldfish
- Melissa Coito VAL-SIFamide's effects on the rate and strength of cardiac contractions in the *Homarus americanus*

**INBRE Pre-Doc Fellowship:**

- Molly Wright Metabolism, Growth, and Flow in the green sea urchin, *Strongylocentrotus droebachiensis*
- Braulio Peguero Patterns and Modulation: Val1-SIFamide alters neuronal output in the Stomatogastric Nervous System

**Paller Fellowship:**

- Whitney Rabacal Mapping the distribution and co-localization of a novel neuropeptide Val-SIFamide with other neuropeptides in the stomatogastric nervous system of the crab *Cancer borealis* and other crustaceans through immunocytochemistry

**Beckman Fellowship:**

- 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
- Rebecca Selden Impact of flow on metabolism in the green sea urchin *Strongylocentrotus droebachiensis* and consequences for cryptic behavior

**Kibbe Fellowship:**

- Alex Bender Pheromone Induced Vasotocin Release in Newt Brains
- Priscilla Chan Autonomic Influences on Social Behavior in Goldfish
- Ruth Jacobson Cell Migration Movements during hindgut morphogenesis
- Alla Lescure-Smith Construction of a Phylogeography for *Arceuthobium pusillum*

**Faculty Grants:**

- Szymon Rus Cricket DNA Transfection through a Helios Gene Gun
- Joe Adu Autonomic Influences on Social Behavior in Goldfish

## **Summer Research 2004**

### **HHMI Fellowship:**

Justin Berger	The Role of Mutated Wall-Associated Kinase in Sucrose-dependent Strains of <i>Arabidopsis thaliana</i>
Andrew Combs	Light use in Loblolly pine raised in the field under elevated CO <sub>2</sub>
Catherine DelVecchio	Two-Dimensional Analysis of the TAK protein complex in <i>Arabidopsis thaliana</i>
Ruth Jacobson	Signaling in the posterior node during chick development
Rose Kent	Photoprotection Under Elevated CO <sub>2</sub>
Steve Mallon	Molecular Characterization of Invertebrate Regeneration
Camden Ramsay	Molecular Phylogenetics of Follicle Mites
Evangeline White	Thylakoid Associated Kinases and light harvesting in <i>Arabidopsis thaliana</i>
Suen Wong	Compensatory Regeneration of Cricket Auditory Interneurons

### **Doherty:**

Dan Hall	Evolution of the Vertebrate Digestive Tract
Heather Provencher	A Comparative Study of Neuropeptides in Lobsters <i>Homarus americanus</i> and <i>Panulirus interruptus</i> by MALDI-FTMS
Ben Stranges	Modeling sea urchin growth under different growth factor conditions
Jon Harris	The effect of brown tail moth herbivory on apple leaf physiology and morphology
Noah Gardner	Extraction and analysis of neuropeptides in lobsters by MALDI-FTMS
Christina Souther	Seasonal Plankton Dynamics in Merrymeeting Bay

### **COLES Fellowship:**

Alissa Waite	Simultaneous Recordings in the Parahippocampal Region and the Orbitalfrontal Cortex: A study of Learning and Memory
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### **BRIN Fellowship:**

Pieter Scheerlinck	The Effect of Proctolin on the Stomatogastric Nervous System in Lobsters <i>Homarus americanus</i>
Ellen Beth	Anxiety-Related Effects on Social and Nonsocial Appetitive Behavior in Goldfish

### **LUCE Fellowship:**

Ben Martens	GIS applications on the Maine coast: Maine SeaGrant Island monitoring Project and Merry Meeting Bay
Ethan Galloway	Growth, Photosynthesis and leaf biochemistry in nitrogen-fertilized wild rice in Merry Meeting Bay

**Paller Fellowship:**

Rebecca Bartlett Tracing AVT cell activity by medullary fibers in response to female newt scented water in *Taricha granulose*

**Rusack:**

Molly Wright Metabolic scaling and growth in the sea urchin

Lucy Van Hook Population status, home range mapping and nesting success of snapping turtles in Merrymeeting Bay

**Surdna:**

Nicole Byers Brassinosteroid Receptor fusion to Wall Associated Kinase (WAK) and the Effect of Stimulation on Plant Growth

Claire Discenza Correlates of Olfactory Sequence Memory in the Rat Orbitofrontal Cortex domain and Hippocampus

Melissa Hayden Evolution of host-parasite interactions between mammals and follicle mites *Demodecidae*

Andy Segerdahl The Effects of Olfactory Stimuli on Somatosensory Nerve Activity in the Newt, *Taricha granulose*

Sarah Solomon Molecular Characterization of Invertebrate Regeneration

**Faculty Grants:**

Caitlin Woo Evolution of mating behavior in Nematodes

Kelly McGrath Mutational analysis of an arginine-rich RNA-binding protein

Hilary Wilson Mapping sites of protein methylation by immunoblot analysis

Braulio Peguero The Effect of Proctolin on the Stomatogastric Nervous System in Lobsters *Homarus americanus*

Sarita Fu Cell Wall Associated Kinase Dominant Mutations