

## Applied Biology Senior Research Presentations

The applied biology capstone research sequence is three academic terms in length. As juniors, students create a proposal. As seniors, they complete the research, write a thesis, and deliver a presentation to the Institute. To see abstracts of the research projects, click on the appropriate year below. For more information, please contact Dr. Ella Ingram @ [ingram@rose-hulman.edu](mailto:ingram@rose-hulman.edu) or Dr. Jennifer O'Connor @ [oconnor@rose-hulman.edu](mailto:oconnor@rose-hulman.edu).

### 2009 SENIOR RESEARCH PROJECTS

Morgan Coan: Analysis of the Amphibian Community Surrounding J.I. Case Wetland Wildlife Refuge.

Ross Heskett: Detecting Drug Resistance with RT-PCR.

Kara Horn: Effect of agricultural run-off on the occurrence of viral infection in Terre Haute amphibian populations

Kay Jang: Functional substitution of yeast Rps23 with human homologues.

Sarah Rosbottom: Development and assessment of a microbial genetics module for a sophomore-level microbiology course.

Harrison Sand: Bacterial species identification and richness related to the chemical properties of the J.I. Case Wetland Wildlife Refuge.

Sara Sanders: Patterns of facial symmetry in U.S. presidents.

### 2008 SENIOR RESEARCH PROJECTS

David Bander: Bacterial Diversity of the Human Oral Cavity in a Small Community.

Melissa Chrisman: Functional Comparison of a Homologous Ribosomal Protein in Yeasts and Humans .

Jill Floyd: Degree of Foraging in *Podophyllum peltatum*.

Cherie Garvis: Analysis of the Bacterial Content of a Constructed Wetland.

Meagan Gallagher: Developing a PCR-based assay to identify iridoviruses in amphibian populations.

Elise Guzman: Quantification of Bacterial Adherence to Biomaterials.

Brittany Hofmann: Analysis of the biological function of a constructed wetland.

Anita Isch: Genetic and Biochemical Characterization of *Arabidopsis thaliana* NDR1 and NDR1-Like Genes in Resistance to *Pseudomonas Syringae*.

Chandra Lesniak: Development of a PCR-Based Assay for the Detection of Unknown Viruses in Amphibians.

Brittany Moline: Relationship Between Structural Changes in the Lateral Eye of Horseshoe Crabs and Light Intensities.

Spencer Perkins: Random Mutagenesis of a Mini-Insulin Gene.

Amy Schnegg: In-Vitro Generation of Amoebocytes from the American Horseshoe Crab, *Limulus Polyphemus*.

### 2007 SENIOR RESEARCH PROJECTS

Jenny Finkbiner: Mechanical Characterization of Fabricated Collagen Fibers: Investigating the Effect of Shape, Hydration, and Strain Rate.

Barry Fricke: Characterization and Physiological Relevance of UVB Light-Induced T-Cell Membrane H<sub>2</sub>O<sub>2</sub> Production.

Jean Jendry: Characterization of Putative Disease Resistance Genes of *Arabidopsis Thaliana*.

Danny LaPlante: The physiological effects of bioenergy healing on tumor injected mice: lack of evidence for a treatment effect.

Steve Lewis: Demonstration of sexual selection in a sex-ratio biased human population.

Jeff Liao: GFP-tagging of NDR1, a Disease-Resistance-Related Protein in *Arabidopsis* .

Bridget Mayer: Angiogenesis in Engineered Tissue.

Brian Murphy: Physiological Improvement of Endothelial Colony Forming Cell (ECFC)-Derived Vasculature in-Vitro via substrate supplementation and in Vivo via co-culturing with pericytes and mesenchymal cells.

Ethan Murnahan: Investigation of Saccaromyces of Cervesiae MEC1P as an Analog to Human ATR Protein.

Emily Paris: Effects of arbuscular mycorrhizal fungi on sexual and asexual reproduction of mayapple.

Abby Rebhorn: Investigating the Properties of Gelatin Composites as Analogs for Engineered Tissues.

Jamie Smolin: Evidence that structural rhythms are independently controlled by light input in the lateral eyes of horseshoe crabs.

### 2006 SENIOR RESEARCH PROJECTS

Amber Brannan: In-Vitro Generation of Amoebocytes From the American Horseshoe Crab, *Limulus Polyphemus*.

Adelle Maynard: Measurement of Retinal Blood Velocity Using Particle Tracking.

Katie McNutt: Measurement of Retinal Blood Velocity Using Particle Tracking.

Mercedes Reeder: Acupoint Anatomy: Qualitative Evaluation of a Proposed Histological Model.

Derek Trobaugh: Biological Water Oxidation: A Novel Mechanism of T Cells and Antibodies.

Stefani Vande Lune: Anterior Cruciate Ligament Regional Deformation.

Roger Wiltfong: Finding the Critical Amount of Artificial Light Necessary to Trigger Circadian Rhythm Enhancements in *Limulus*.

### 2005 SENIOR RESEARCH PROJECTS

Alana Burke: Functional Substitution of Ribosomal Protein Rps23 in Yeast.

Lauren Clark: Antibiotic Resistance in *E.Coli*.

Elizabeth Deaton: The effects of ambient light levels and circaannual patterns on the retinal parameters of the horseshoe crab, *Limulus polyphemus*.

Sara Rohrabough: Characterization of Paromomycin-dependent Yeast Mutants.

Rita Strack: Growth Characterization and Genetic Analysis of Six Paromomycin-Dependent Yeast Mutants.

Matthew Sung: A comparison of electroretinographic recordings from intact, excised, and dissociated lateral eyes of horseshoe crabs.

Vince Wagner: Indiana's Spring Wildflowers – A Digital Identification Key.

Brandi Williams: Examination of Inflammatory properties of PRIMM (Polymeric Rigid Inorganic Matrix Material), a Novel Biomaterial with Potential Use in Tissue Engineering.

Chad Zarse: Light intensity appears to be more important than an endogenous seasonal clock for regulating structural rhythms in the lateral eye of the horseshoe crab.

### 2004 SENIOR RESEARCH PROJECTS

Elizabeth Cozzie: Localization of Annexin IV Protein in Healthy and Alzheimer's human brain.

Michael Invergo: Modeling Long-Distance Seed Dispersal Events.

Amanda Stephens: Genotype decay prediction program: design, construction, programming of GeneSim.

Michael Tranter, Jr.: An Evaluation of PRIMMTM (Polymeric Rigid Inorganic Matrix Material) as a Scaffold for Cell Culture.