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Above: 2010 Summer Undergraduate Research Program (“SURF”) Group Picture

# Biology Department News

Hope College Biology Department Visit our website at: <http://www.hope.edu/academic/biology>

## ANOTHER SUCCESSFUL SUMMER RESEARCH YEAR FOR BIOLOGY!

This past summer Hope College’s Biology Department has another successful research program! There were 26 students conducting full-time research for 10 weeks. While the majority of students came from Hope College, there were students from Wheaton College, Harry Truman College and Richard Daley College of Chicago, IL., among others.

The students worked on various projects that included environmental impact on puberty and reproductive function, competition among birds, epithelial cell signaling and specification-embryogenesis, hybrid *Stewartia* in North America, ecological patterns to guide antimicrobial bioprospecting, heat acclimation, heat exposure and thirst, investigating QUIS neurotoxicity in the rat brain and role of endophytic fungi in managed and natural ecosystems.

As part of the summer program, research participants engaged in a number of extra-lab activities, including attendance at the “Origin of Cancer” symposium held at the Van Andel Research Institute (Grand Rapids, MI), a Lake Michigan collecting trip aboard NOAA’s research vessel, the *Laurentian*, a combination research seminar hour and picnic hosted by Dr. Gary Fahnenstiel at NOAA’s Lake Michigan Field Station in Muskegon. There were also presentations on writing and research ethics by several Hope faculty and staff, and an adventurous kayak trip on the storm-swollen Black River that ended with ultra-close encounters with a large diversity of wetland plant and animal species!

The Biology Department also had a group of high school students participating in the REACH program doing research in their labs with research students and mentors. There were a total of 9 high school from local schools throughout the Holland area.

BELOW LEFT BIOLOGY GROUP PICNIC AT NOAA LAKE MICHIGAN FIELD STATION

RIGHT: NICKOLAS DAVROS SHOWING OFF HIS CULINARY SKILLS AT THE GRILL...



# 2010 Biology Summer Research Students, Mentors and Projects

**Dr. Barney's Lab:** *Heat Acclimation, Heat Exposure and Thirst:* Mazi Condelee, Elizabeth Zapata, Biology Students  
*Is Homocysteic Acid Neurotoxicity a Model for Schizophrenia?:* Guillermo Flores, REACH Program  
*Investigating QUIS Neurotoxicity in the Rat Hippocampus, Striatum and Substantia Nigra:* *Dr. Christopher C. Barney and Dr. Leah Chase, Departments of Biology and Chemistry:* Regina O'Brien, Biology Student

**Dr. Best's Lab:** *Analyses of Fundamental Transcription Factors of Giardia lamblia in Response to Host Environments:* Erica Jansen, (HHMI Science Education Scholar), Biology Student

**Dr. Bultman's Lab:** *Tritrophic Effects of a Fungal Endophyte: Parasitoid Host Preference:* Sioned Sitkiewicz, Biology Student  
*A Healthy Infection: Does Nitrogen Availability in Tall Fescue Increase Antiherbivore Defense Granted by Mutualistic Novel Endophyte Isolates?* Trinidad Gonzalez, Biology Student  
*Effects of Indole-3 Acetic Acid and Gibberillic Acid on Tall Fescue and its Fungal Endophyte:* James Engels, REACH Program

**Dr. Burnatowska-Hledin's Lab:** *Can Students at Hope College Help Find a Cure for Cancer?* Colleen McIntyre, Biology Student

**Dr. Chase's Lab:** *System Xc-. Produces Glutathione in Response to Reactive Oxygen in the Cellular Environment:* Christina Bowles, Aja Nash, Daniel Smith, Biology Students

**Dr. Fraley's Lab:** *Environmental Impact on Puberty and Reproductive Function:* Emily Leathley, Ji-min Jeong, Issurah King, Biology Students and Emily Chheng, REACH Program  
*Resveratrol Ameliorates Brain Damage Induced By Surgical Cannulae: Potential For Treatment of Parkinson's Disease:* Julia Becker, Biology Student and Kelsey Castillo, REACH Program

**Dr. Li's Lab:** *Horizontal gene transfer of chloroplast genes in the parasitic plant Balanophora:* Jeff DeYoung, Jeffrey Corajod, Pieter Norden, Biology Students, Sasha Balcazar, Rachel Delinger and Garrett Steed, REACH Program

**Dr. Murray's Lab:** *Community-level Consequences of Chemical Defense in Tropical Pioneer Plant Seeds:* Robert Muterspaugh, Anne Short, Ingrid Slette, Biology Students  
*Using Ecological Processes to Guide Bioprospecting for Medicinally Useful Compounds:* Drs. K. Greg Murray, Aaron Best, Dereje Desta, and Michael Short (Chem)

**Dr. Putzke's Lab:** *Epithelial cell signaling and specification during embryonic development in vertebrates (zebrafish) and invertebrates (C. elegans):* Roberto Bonilla, Megan Johnson, Jessica Kozack, Kelsey Moore (HHMI Hughes Research Scholar), Biology Students, Matthew Harder, REACH Program

**Dr. Winnett-Murray's Lab:** *Environmental Factors Mediating Competition Among Birds:* Nickolas Davros (HHMI Science Education Scholar), Jennifer LaRoche, Biology Students

## Faculty Travel News

Dr. Chris Barney, was a Panel Reviewer for NSF Research Experiences for Undergraduates Program Grant Proposals in Arlington, VA, held November 30 to December 3, 2009. He also was an Invited Participant, at the NSF Biology REU Site Program Directors Workshop, held March 17 through March 20, 2010.

Dr. Tom Bultman, gave two oral presentations and a poster presentation on his research at the International Symposium on Fungal Endophytes of Grasses in Lexington, Kentucky in June of 2010.

Lori Hertel and Dr. Kathy Winnett-Murray traveled to Halifax, Nova Scotia to present a major workshop at the Association for Biology Laboratory Education's Annual Meeting. It was held at Dalhousie University. They presented a version of the "Exploring Animal Eyes Lab" from Biology 260, which was recently developed as a "wet lab" to accompany the physics-based BioOptics lab. For the last day of the conference, Lori and Kathy experience "tidal bole rafting" on a river emptying into the Bay of Fundy, which is unlike anything else you've ever experienced.

Dr. Greg Murray and two of his summer research students, Ingrid Slette and Anne Short, worked in Costa Rica for two weeks in July to continue collecting data on long-term trends in forest dynamics at the Monteverde Cloud Forest reserve.

In September (2009), Dr. Greg Fraley was invited to give a seminar regarding his puberty research at Wayne State University.

In June, Dr. Greg Fraley was invited to chair a Special Symposium at the Endocrine Society Annual meeting in San Diego, CA.

In July, Dr. Greg Fraley was invited to give an oral presentation regarding his duck research at the Joint Annual Meeting of the Agricultural Science Societies.

In August, Dr. Greg Fraley was invited to present his duck research at the Maple Leaf Farms, Inc. Annual Duck Research Conference.

## What Have Current Biology Students Been Up To?

**Julia Becker ('11)** was one of 58 students chosen nationwide to present her and Dr. Fraley's research to congress at the "Posters on the Hill" conference. In Washington, D.C. Julia was further selected to give a special presentation to US Representative, Dr. Vern Ehlers.

**Hilary Bultman ('12)** went to Costa Rica for a month long class in Tropical Biology through the Organization of Tropical Studies and Duke University. She visited four field stations throughout Costa Rica's diverse environment (from the cloud forest to the rainforest to the paramo and even the dry (seasonal) forest). She spent most of her time in the field learning about the different habitats and performed three field experiments while meeting an assortment of biologists along the way.

**Erin Hildebrandt ('12)** was a Plant Genomics Intern at the University of Missouri-Columbia. The lab that she was in worked on the signal pathway responsible for the phototropic response (growth towards or away from light) in plants. One project she did was screening mutant *Arabidopsis thaliana* seedlings. The other project she worked on was making plasmids containing a sequence for photI that would have a single amino acid mutation. These plasmids will be used to make *A. thaliana* plants with a specific mutations for a study about the way plants regulate the photI protein.

**Angelica Willis ('12)** presented at the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers conference in March of 2010 in Atlanta, GA.

**Courtney Long ('12)** participated in research in the state of Montana.

**Michael Parrish ('12)** did research at the Field Neuroscience Institute in Saginaw, on bone marrow stem cells to help find cures for Alzheimer and other diseases. Channel 5 WNEM had a video clip which highlighted Michael working at the Institute. Click into the link for more information. <http://www.wnem.com/news/24754155/detail.html>



Julia Becker ('11) at the "Poster on the Hill" in Washington DC



Summer research students in GES and Biology enjoyed a collect trip abroad "The Laurentian" as guests of NOAA's Great Lakes Environmental

## Current Biology Students, continued

**Jonathan Oldham ('11)** did public health/nutrition related mission work in Honduras this summer through the Christian Reformed World Relief Committee's program called HARVEST.

**Jeffrey Sweers ('12)** job-shadowed a physician working in Haiti this past summer.

**Zach Mobley ('11)** spent the summer doing research in Wildlife Ecology at the University of Wisconsin (Madison, WI).

**Jonathan Brooks ('11)** had the opportunity to do an internship at the National Oceanic and Atmospheric Administration's (NOAA) lab at the Great Lakes Environmental Research Lab. During his time there, he assisted researchers, including Dr. Gary Fahnenstiel, with sampling, helped to develop protocols for the use of new instruments, and conducted an independent project to determine the best technique for chlorophyll extraction. He not only learned about the Great Lakes and working in a research environment, but also got to meet a lot of great people who were really passionate about what they did.

**Caitlin Roth ('12)** is currently studying abroad in Perth, Australia at Murdoch University.



Dr. Hledin and her research group



Dr. Putzke with his research students



Biology and Geology students and faculty enjoy a trip through Buckner's cave as a part of the twice annual caving trips

# News from Hope Alumni

**Maggie Mohr ('09)** presented her and Dr. Fraley's research at the Society for Neuroscience conference in Washington D.C. and is in a Ph.D. program in Behavioral Neuroendocrinology at Michigan State University.

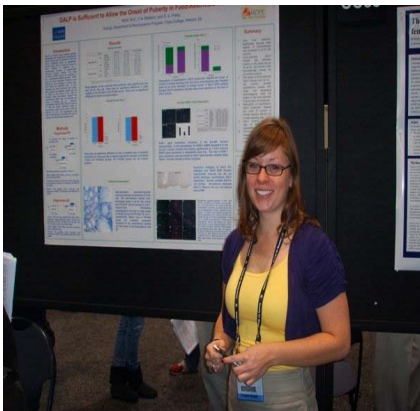
**Alexa Jansma, ('08)** is beginning her third year at Ross University School of Veterinary Medicine.

**Molly Lien ('07)** is in her 4<sup>th</sup> year at Michigan State University of Veterinary Medicine and is leading the raptor rehabilitation club.

**Kelley Hutchins ('07)** recently completed medical school was named DO of the year of her graduating class.

**Jacqelyn Randolet ('08)** is currently in a PhD program at Purdue University.

**Lauren Brierley ('08)** is finishing up her Master's project on bird behavior at Purdue University.



Maggie Mohr ('09) at the Society for Neuroscience Conference in Washington D.C.



Lauren Brierley working on her bird project at Purdue



6 Molly Lien ('07) and friend



Alexa Jansma, ('08) now enrolled at veterinary school

## News from Hope Alumni, continued

**Alex Taylor ('08)** will begin a Ph.D. program in Neuroscience at Pennsylvania State University and will be working in the lab of Dr. Paul Bartell, a Hope alumni.

**Marlie Johnson ('08)** is in her fourth year of veterinary school at Washington State University.

**Becky Kolak ('07)** is in AmeriCorps and working at the Pemaquid Watershed Association. She directed summer camps for 6-8 year olds and 9-12 year olds.

**Amanda Ferguson ('10)** is in a year long research assistantship position at the NOAA Great Lakes Research Lab in Muskegon, MI this past summer.

**Heather Bair Brake ('97)** is at the Center for Disease Control in Atlanta, Georgia and is soliciting interns for CDC. Grace Osborne worked at CDC as an intern this past summer.

**Brian Eisinger ('08)** is starting graduate school in the Zoology Department at the University of Wisconsin-Madison. He will be working on the neurobiology of aggression in mice.

**Chelsea Schrottenboer ('09)** is currently teaching conversational English in Japan.

**Jon Dean ('08)** is beginning a DVM-PhD dual degree at the University of Minnesota, College of Veterinary Medicine.

**Shirley Bradley ('10)** highlighted the significance of her research experience at the College through her article "My Passion for Research" which is featured in the September 2010 edition of "Enzymatic," the newsletter of the Undergraduate Affiliates Network of the American Society for Biochemistry and Molecular Biology. She reflects on her four years working in the laboratory of Dr. Maria Burnatowska-Hledin. The September 2010 newsletter featuring Bradley's article is available at <http://www.asbmb.org/CareersAndEducation.aspx?id=1706>.

**Brian Puls ('10)** has secured a Science teaching position at a middle school in Mebane, North Carolina.



Chelsea Schrottenboer with her students in Japan

Marlie Johnson enjoys the view while mountain climbing in the Pacific Northwest



## NSF Predoctoral Fellowships Awarded to Biology Alumni

Two recent Biology graduates, Jamin Dryer and David Gonthier, were both awarded prestigious National Science Foundation Fellowships to pursue graduate studies. In this newsletter we are featuring Jamin Dryer and his work. We'll give an update on Mr. Gonthier's work in a later newsletter.

Hello!

Two years after graduating in 2006 I decided to join the lab of Claudio Gratton in the Entomology Department at University of Wisconsin-Madison. I am working on a fantastic project that combines cross-ecosystem subsidies and pulsed resources, with my study system a lake in northeastern Iceland called Mývatn. Literally "Midge Lake" in Icelandic, this body of water is home to billions of aquatic insects that emerge synchronously and swarm over the shoreline to mate in June and August. Together with a postdoc I am examining the impact that this massive flux of biomass has on the terrestrial ecosystem through experiments and descriptive sampling efforts. We also work at a number of lakes in the region that are "midge" or "non-midge" lakes which provide us with a bit more scenery and travel. Last summer two undergrad field assistants rounded out the "Team Midge" foursome, and this year we have expanded to five including an REU during the 2009 summer field season which will last from May to August. I encourage anyone who is interested to follow our blog "Smidge of Midge" during the upcoming field season ([www.uwmyvant.blogspot.com](http://www.uwmyvant.blogspot.com)).

Beyond the science Mývatn is an amazing place midges or no midges. The area is known for its volcanic activity and there are hot springs, steaming mud-pots, fumaroles, and active volcanoes within just a few kilometers. The lake is also notable for the abundant bird life, specifically waterfowl. Located at nearly 66 degrees north latitude means too that for most of the summer we do not experience darkness of any appreciable kind; once in a while it is annoying but most of the time it is just plain beautiful. We live and work in an old parsonage turned field station, where we interact daily with other researchers from around Iceland and the rest of Europe, some of whom have already become dear friends.

Life in Madison is great, and I love being at a major university in a vibrant city. Nevertheless I miss friends and family in Holland and at Hope, and now know first hand what a difference my education in the Biology Department has made for me as a person and as a scientist. Thanks to everyone in the Department for everything you've ever done for me, and I hope to see you all next time I am in town.

Unz síðar! (Until Later!)

Jamin

David Hoekman (postdoc that Jamin works with), Jamin Dreyer, Jackie Entringer (field assistant from UW-Madison). They are standing in a swarm of midges, mostly *Tanytarsus gracilentus*, and had been trying to collect them in sweep nets for use in one of their experiments. Date: 29 July, 2008.



**Hope College Department of Biology Seminar Schedule ~ Fall 2010**  
**A. Paul Schaap Science Center 1019, Friday, 3:00 P.M. \*\* unless otherwise noted\*\***

- September 3                    **Biology Faculty – Meet the Faculty and Department Picnic at ODC**
- September 10\*\*                **Dr. Linda Randall**, University of Missouri  
Joint seminar with Chemistry and Biology Departments  
“Exploring the dynamic cycle of protein export in *Escherichia coli*”  
**\*\*Note change in time and location: 4:00 p.m. Winants Auditorium, Graves Hall\*\***
- September 17                 **Dr. Dennis Babel**, Mycology Consultants Laboratory  
“Human Mycotic Infection, or Why Do These Fungi Want to Replace Us?”
- September 24                 **Dr. Cindy Miranti**, Van Andel Institute  
“Role of Integrins and Cell Adhesion in Controlling Normal and Prostate Cancer Cell Survival”
- Oct. 1                            **Biology students discuss their off-campus research experiences**
- Oct. 8                            **Dr. Scott Swinton**, Michigan State University  
“Cultivating Agricultural Landscapes – and Farmers – for Ecosystem Services”  
(Part of Critical Issues Symposium, and jointly sponsored by the Departments of Biology, Geology and Environmental Sciences and Economics and Business Administration)
- Oct. 15                          **Fall Recess – No Seminar**
- Oct. 22\*\*                        **Dr. Sheila Tobias**, Gentile Interdisciplinary Lectureship  
“Teachers’ Authority vs. Teacher Accountability: Must we Choose?”  
**\*\*Note change in time and location: 3:30 p.m. Maas Auditorium\*\***
- Oct. 29                          **Dr. Brian Yurk**, Hope College  
“Insect Population in a Warming Climate: **How** Will Development Time and Population Dynamics Changes as Temperatures Rise?”
- Nov. 5                            **Dr. Michael Henshaw**, Grand Valley State University  
“Population Genetic Structure of a Broadly Distributed Social Wasp: Investigating the Roles of Selection, Drift and Historical Contingency with Microsatellite Data”
- Nov. 10\*\*                        **Dr. Rebecca Humphries**, Director, Michigan Department of Natural Resources and Environment.  
“Climate Change in Michigan”  
(Co-sponsored by the Holland Area League of Women Voters, the Departments of Biology, Geology and Environmental Sciences, Physical Plant, and the Environmental Studies Program)  
**\*\*Note change in date, time and location: Wednesday, Nov. 10<sup>th</sup>, 7:00 p.m., Winants Auditorium, Graves Hall\*\***
- Nov. 12                          **Dr. Lars Brudvig**, Michigan State University  
“The Value of Landscape Corridors for Plant Biodiversity”
- Nov. 19\*\*                        **Dr. George Crabtree**, Argonne National Laboratory  
“The Sustainable Energy Challenge”  
(part of the series on Energy and Environment, and co-sponsored by the Departments of Physics and Biology)  
**\*\*Note change in location: Winants Auditorium, Graves Hall\*\***
- Nov. 26                          **Thanksgiving Break – No Seminar**
- Dec. 3                            **Dr. Gary Fahnenstiel**, Great Lakes Environmental Research Laboratory (NOAA)  
“Lake Michigan Under Siege: Dreissenid Mussels Flexing Their Muscles”
- Dec. 10                          **Dr. Virginia McDonough**, Hope College, Biology Department  
“What Are You Eating? Uptake and Structural Recognition of Dietary Lipids by Cells”
- Dec. 17                          **Christmas Break – No Seminar**