

Hope College Department of Biology Newsletter

Another Successful Summer!



The talented student research team – Summer 2005

The Biology Department had 29 students conducting full-time research this past summer. The students spent 10 weeks on campus working side-by-side with other students and their faculty advisors. While most students came from Hope College, we did have students from St. Thomas University in Miami, FL, Marygrove College in Detroit, the University of Rochester, Yale University, Columbia University, Colby College and the Autonomous University of Queretaro in Mexico. Students were paid \$3,400 stipends and the College paid half their housing costs.

Students worked on projects that included: water balance in rats, transcription in a human parasite, the biochemical functioning of nerve cells, spider community ecology, the molecular systematics of members of the pineapple family, lipid metabolism in yeasts, neuronal links between nutrition and reproduction, pollination biology of an invasive plant, defense in tropical pioneer plants against herbivores, and effects of fungal endophytes on plant resistance to drought and insects. Students not only conducted research, they also participated in weekly workshops on issues related to research, like hypothesis generation, ethical issues, and reading and writing the scientific literature. (see page 2)

Students also participated in weekly social events ranging from laser tag, bowling, hiking the dunes, and a day trip to Grand Rapids to visit the VanAndel Research Institute and the John Ball Park Zoo. Two weeks into the program students gave oral presentations of their proposed research and they gave final presentations of their findings at the end of the summer. Most students will be traveling to off-campus venues to present their work over the next several months.

Students in the program plan to become scientists, academicians, medical doctors, and high school teachers. Funding for the program came from grants from the National Science Foundation (the Research Experience for Undergraduates, the Collaborative Research at Undergraduate Institutions, and the Systematics programs), the Merck/AAAS Foundation, and the Howard Hughes Medical Institute.



Putt-putt golf was a relaxing break from work.



Plenty of smiles to go around.



Waiting for a chance at a hole-in-one.

We're already looking forward to next summer's program!



Faculty in the News

From the pages of the Holland Sentinel

Donald Cronkite Named College Teacher of the Year

HOLLAND - Dr. Donald Cronkite, professor of biology at Hope College, has been named the state's 2005 "College Teacher of the Year" by the Michigan Science Teachers Association (MSTA).

The Friday, March 4, awards ceremony during which he and winners in other categories were recognized carried added significance. This year's "High School Teacher of the Year" will be 1994 Hope graduate Angelique Biehl, who as a student was in two of his classes and now teaches at Portage Northern High School.

The awards were presented during the MSTA's 52nd annual conference, being held at the Detroit Marriott Renaissance Center. Known for his imaginative approach to his discipline, Cronkite was also invited to present a seminar on "The Role of the Zany in Teaching." In his own classroom, for example, he has had his students design costumes that illustrated the features that distinguished one of the phyla they studied, and has had them perform a square dance to demonstrate the principle of cell-division. For a biology "question and answer" column that he established for students seeking help, he adopted the egret image on the introductory text's cover as the mascot and had the bird present the answers in the first person.

It is not the first time that Cronkite, a member of the Hope faculty since 1978, has received major external recognition for teaching excellence. In 1995, he won the "Four-Year College Biology Teaching Award" presented by the National Association of Biology Teachers. In 1991, he was one of only 700 faculty members recognized nationally with a 1990-91 Sears-Roebuck Foundation Teaching Excellence and Campus Leadership Award. He has also received recognition from the campus community. In 1988, he was named a co-recipient of the college's Hope Outstanding Professor Educator (H.O.P.E.) Award by the senior class and served as Commencement speaker.

Cronkite is a specialist in genetics. His teaching interests include introductory biology, embryology, cell biology, genetics, the history of biology, evolutionary biology, and science and human values.

His publications include "A Problem-Based Guide to Basic Genetics," currently in its fourth edition. He is currently a member of a multidisciplinary committee formed by the National Council of Churches to lead the U.S. ecumenical community's work over the next two years on issues of human genetic technology. For several years, he was moderator of the Christian Action Commission of the Reformed Church in America, the college's parent denomination.

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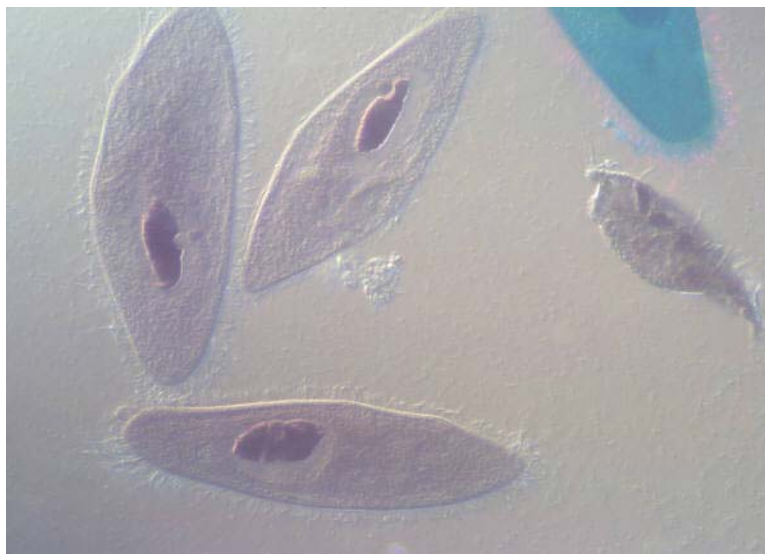
Cronkite was academic director for the Woodrow Wilson National Fellowship Foundation National Leadership Institutes for High School Biology Teachers from 1991 to 1997, and has been a science curriculum consultant to 21 different colleges. With help from the National Science Foundation, he has been involved in forming high school-college partnerships to enhance science education at the secondary level. He has been active on campus in presenting workshops for his colleagues concerning the appropriate use of technology in teaching.

He also directed pre-college outreach programs at Hope which were funded by the Howard Hughes Medical Institute, including a sixth/seventh-grade science recreation program, a seventh/eighth-grade science demonstrators program and a ninth/10th-grade research club.

Cronkite has also held visiting research appointments at the University of California-Santa Barbara, the University of Wisconsin-Madison, the University of Maryland, the Marine Biology Laboratory at Woods Hole and Tohoku University in Sendai, Japan. Prior to joining the Hope faculty, he taught at the University of Redlands in California.

He holds his bachelor's degree and his doctorate, both in zoology, from Indiana University at Bloomington.

The MSTA was founded in 1953, and works to promote the development and advancement of science education in Michigan. Membership is open to all who are interested in the advancement of science education in Michigan, and includes elementary, middle school, junior and senior high school teachers of science, college-level instructors and science education administrators, and suppliers of science books and apparatus.





Dr. Greg Fraley Joins the Biology Department

Dr. Gregory S. Fraley joined Hope's Biology Department in a tenure-track faculty position last Fall. He received a B.S. in Animal Science & Physiology from the University of Maryland at College Park where he continued on to obtain an M.S. in Avian Physiology & Neuroscience. Greg continued his graduate studies in Neuroscience at Washington State University College of Veterinary Medicine where he obtained a Ph.D. His postdoctoral studies involved stints at the Brain Research Institute at UCLA, Washington State University and finally at the University of Washington School of Medicine in Seattle, WA.

Greg's research attempts to understand how areas of the brain that control reproductive status are altered by metabolic wasting diseases such as diabetes, anorexia, bulimia, or cachexia. His graduate and postdoctoral work studied the neural mechanisms that control hunger/satiety and that control reproduction. It turns out that both of these very important physiological and behavioral systems are controlled by the same areas of the brain. Therefore, Greg's research efforts over the last few years have attempted to understand the neural mechanisms that regulate reproduction based upon hormonal signals that relay information regarding the body's nutritional or metabolic status.

As part of his research program here at Hope, Greg will continue to investigate diabetes-associated sexual dysfunction utilizing behavioral, histological and molecular biological techniques. Additionally, he will investigate novel models of *anorexia nervosa* to try and understand the neural basis of this devastating disease. Greg will teach general courses in Physiology for Biology majors and non-majors (Kinesiology & pre-nursing) as well as courses within the new Neuroscience Minor. Other teaching interests include gross anatomy and advanced topics in Neuroscience research.

Greg and his wife hail from opposite ends of the known universe. His wife, Susan, is from Seattle and Greg is a native Baltimorean. They met while Greg was doing his doctoral work at WSU-CVM, which was where Susan was finishing up her Veterinary doctoral studies. They have two dogs, Mabel and Maggie (Basset Hounds) and one cat, named Holly (Sphinx). Greg's favorite hobby is teaching martial arts (Tae Kwon Do) at the Dow Center and spending as much time with outdoor activities--biking, hiking, jogging, BBQ'ing, etc.--as possible; unfortunately, he finds Michigan much too flat for snowboarding.

Recent Faculty and Student Publications

Best, A.A., H.G. Morrison, A.G. McArthur, M.L. Sogin, G.J. Olsen. 2004. "Evolution of Transcription: Insights from the Genome of *Giardia lamblia*." *Genome Res.* 14:1537-1547.

Bultman, T.L., G. Bell*, and W. Martin*. 2004. "Reversal of Wound-induced Effects in a Grass are Mediated by a Fungal Endophyte." *Ecology* 85:679-685

Burnatowska-Hledin, M., J. Kossoris*, C. Van Dort*, D. Murrey*, J. Abbott*, C. Kan*, and C. Barney. 2004. "VACM-1 Expression in T47D Human Breast Cancer Cell Line." *Biochem Biophys. Res. Com.* 319: 817-825.

Cronkite, D.L., 2004. *Genetics Volume 2*. A joint project of Brooks/Cole Publishing and CNN. Dr. Cronkite produced a video of news stories about genetics and a study guide for it.

Cronkite, D.L. April, 2004. "Mouse Under Box in Kitchen." *Perspectives: A Journal of Reformed Thought*, pp. 5 and 19.

Cronkite, D.L. December, December 2004. "Instruments." *Perspectives: A Journal of Reformed Thought*. p. 3.

Eckerle K.P., Thompson C.F. 2005. "Addition of arthropod cocoons to house wren nests is correlated with delayed pairing." *Behavioral Ecology* 16: 1-7.

Givnish, T.J., K.C. Millam, **T.M. Evans**, J.C. Hall, J.C. Pires, P.E. Berry, K.J. Sytsma. 2004. "Ancient Vicariance or Recent Long-distance Dispersal? Inferences about Phylogeny and South American-African Disjunctions in Rapateaceae and Bromeliaceae based on *ndhF* Sequence data." *International Journal of Plant Science* 165 (4 Suppl.): S35-S54.

Fraley, G.S., S.E. Thomas-Smith, B. Acohido, D.K. Clifton, and R.A. Steiner. 2004. "Stimulation of Sexual Behavior in the Male Rat by Galanin-Like Peptide. In: *Hormones and Behavior* 46: 551-557.

Irwig, M.S., **G.S. Fraley**, J.T. Smith, B.V. Acohido, S.M. Popa, M.J. Cunningham, M.L. Gottsch, D.K. Clifton, R.A. Steiner. 2004. "Kisspeptin Activation of GnRH Neurons and Regulation of *KiSS-1* mRNA in the Male Rat." *Neuroendocrinology* 788:1-9.

McDonough, V.M., T.M. Roth*. 2004. "Growth Temperature Affects Accumulation of Exogenous Fatty Acids and Fatty Acid Composition in *Schizosaccharomyces pombe*. In: *Antonie van Leeuwenhoek*. 86: 34-354.

Murray, K.G., K. Winnett-Murray, and the Ecological Society of America. 2004. "The Effect of Eastern Hemlock (*Tsuga canadensis*) on the Establishment of Interspecific Seedlings . Teaching Issues and Experiments in Ecology. Volume 1. Experiments to Teach Ecology. <http://tiee.ecoed.net/vol/v1/experiments/hemlock/hemlock.htm>

M. Sulok*, N.A. Slade, and T.J. Doonan. 2004. "Effects of Supplemental Food on Movements of Cotton Rats (*Sigmodon hispidus*) in Northeastern Kansas." Journal of Mammalogy 85: 1102-1105.

Verburg, P., J.A. Arnone III, D. Obrist, D.E. Schorran, R.D. Evans, **D. Le Roux-Swarthout**, D.W. Johnson, Y. Luo, J.S. Coleman. 2004. "Net Ecosystem Carbon Exchange in Two Experimental Grassland Ecosystems." Global Change Biology 10: 498-508

Murray, K.G., **K. Winnett-Murray**, and the Ecological Society of America. 2004. "The Effect of Eastern Hemlock (*Tsuga Canadensis*) on the Establishment of Interspecific Seedlings . Teaching Issues and Experiments in Ecology. Volume 1. Experiments to Teach Ecology. <http://tiee.ecoed.net/vol/v1/experiments/hemlock/hemlock.htm>

Taylor, S.K., C.R. Arnold, A.T. Gerds, N.D. Ide, K.M. Law, D.L. Kling, M.G. Pridgeon, L.J. Simons, J.R. Vyvyan, **J.S. Yamaoka***, M-K. Liao, and T.E. Goyne. 2004. "Lactone Synthesis via Biotransformations of alpha-hydroxyamides. Tetrahedron: Asymmetry 15:3819-3821.

* - student

Alumni News

Don Kroodsma ('68) was featured in the March '05 edition of Audubon magazine. He had a new book coming out on bird song (*The Singing Life of Birds*), and Audubon did a lengthy piece on bird song and included a discussion on Kroodsma's body of work in this area.

Chris Lepczyk ('93), who is doing a post-doc at the University of Wisconsin-Madison, recently authored an editorial in the Wisconsin State Journal on feral cats. His dissertation work at Michigan State dealt in part with the ecological impacts of feral and free-ranging pet cats, and now he has become involved with this controversial issue in Madison.

R. Andrew Rodstrom ('99) has begun the Master's Program (Biology/Ecology) at Washington State University in Pullman, WA. Since graduating, Andrew has been assisting the teaching of the CIEE Tropical Ecology course in Costa Rica and spent the past year traveling, camping, and exploring the U.S.

Jackie Ryczek ('02) has been living and working in Florida since graduation, mostly doing part-time jobs in animal training, animal care, and education with Epcot Center (Living Seas exhibit). Jackie wrote that she finally got her "dream job" as a dolphin trainer at Discovery Cove at Epcot. It required a great deal of perseverance, certification, training, swim tests, various experience and all her accumulated work with her internship while at Hope (Kewalo Basin Marine Mammal Lab in Hawaii), as well the contacts she gained while working at Living Seas and Animal Kingdom (both at Epcot). For years, she never gave up. Now, she is elated.

Jonathan Atwell ('03) received an NSF Graduate Fellowship for his research entitled: "Endocrine mechanisms of behavior and reproduction in a unique seasonal strategist, the Phainopepla.", which will start this summer at California Audubon's Starr Ranch Sanctuary near Trabuco Canyon. (He is in his first year Ph.D. program at Indiana University in Bloomington). Jonathan also announced his engagement to Mandy (they have been together since Hope days) - they will be married in September.

Laurie Beth Nederveld ('03) was recently accepted to GVSU's Master's in Biology program to work on land/watershed management. Laurie Beth worked for the Annis Water Resources Institute and has most recently done additional watershed management work at Fishbeck and Thompson. She decided to pursue a master's degree so that she can be even more effective managing regional natural resources.

Lisa DeCamp ('04) secured an animal-care job at the vivarium at VanAndel Institute. She will be monitoring animals used in cancer research. She's very excited about it.

Emily Schmidt ('05) was awarded a scholarship to participate in the Enhancing Linkages between Mathematics and Ecology (ELME) program at Kellogg Biological Station, June 13 through July 29.

Mark Thomson ('05) is now employed as a research associate for MPI Research, Inc. of Mattawan, Michigan in the teratology (developmental toxicology) lab.

**Department of Biology Seminar Schedule
Fall 2005**

- September 2** Dr. Gregory Gemmen, University of California, San Diego
Optical Tweezers Measurements of DNA-Protein Interactions
- September 9** *Introduction to the Hope College Biology Faculty and Their Research.*
- September 16** Dr. Moses Lee, Dean of Natural Sciences, Hope College
Opportunities for Cancer Research: From the Control of Gene Expression to Anticancer Drug Design and Development.
- September 23** Dr. Andrew Wolfe, University of Chicago
Nutrition/Reproduction GnRH Regulation
- September 30** Drs. Andersen, Brown, Bultman, Sullivan, and Swarhout
Departments of Mathematics, Chemistry, and Biology, Hope College
Fungi, Alkaloids, and Differential Equations: Multidisciplinary Research at Hope College.
- October 7** Fall Break – No Seminar
- October 13** Jalaa' Abdelwahab, World Health Organization
Eradicating Polio in the Eastern Mediterranean Region **Muste Lecture**
- October 14** Dr. Marilyn Aardema, (Biological Chemistry) Proctor and Gamble
Future Challenges in Science: the Need for Interdisciplinary Teams
First Annual Gentile Lectureship
- October 21** Dr. Ross Overbeek, Argonne National Labs
Gene Discover Joint seminar with Computer Science
- October 28** Dr. Ken Keenstra, Michigan State University
Using Functional Genomics to Investigate the Biosynthesis of Plant Cell Walls
- November 4** Dr. Gaaron Smith, University of Montana
Analytical/Environmental Chemistry **Sigma Xi Speaker**
- November 11** Dr. Michael Katovich, University of Florida
Novel Approaches to Therapy in Hypertension
- November 18** Dr. Dean Welsh, Pfizer
Research in the Corporate World: Pharmaceutical Development at Pfizer Joint Seminar with Chemistry
- November 25** Thanksgiving Break
- December 2** Dr. Emilie Rissman, University of Virginia
Endocrine Control of Reproductive Behavior

