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Full color newsletter:
[www.rochester.edu/
College/BIO/newsletter.html](http://www.rochester.edu/College/BIO/newsletter.html)

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The Open Reading Frame

University of Rochester
Department of Biology
Newsletter

Message from the Chair

On behalf of the Biology Department, I would like to congratulate our graduating seniors for successfully completing their studies at the University of Rochester. I would also like to acknowledge their parents, family and friends for the support they have given our graduates. We in the Biology Department have gained an appreciation of the capabilities and enthusiasm of these young people and are confident they will achieve success in their future careers.

The 117 students graduating this year represent a 16% increase from just two years ago. This trend will no doubt continue as our freshman and sophomore courses have undergone dramatic increases in enrollment over the past few years. This increased focus on Biology stems from the many issues relating to medicine and health, new business opportunities, environmental concerns and the many social/political problems facing our society today. The department looks forward to these exciting new times. We have hired many new faculty over the past few years. You can learn about two of these new faculty, Gloria Culver and Michael Welte, in this newsletter. You can also learn about all our faculty by going to our website (www.rochester.edu/College/BIO).

This department takes pride in the ability of our faculty to provide an interesting variety of courses for our students as well as to establish successful research programs. While total funding for science in the US has remained essentially flat over the past few years, funding in our Biology Department has increased from an average of \$3.6 million to over \$5.6 million a year. The Department remains ideally situated for further developments in the many fields of Biology. I hope the diverse interests of the Biology Department have served our graduating seniors well, and that the first hand view these students have obtained of what science is, and what science is not, has prepared them for the many challenges that lie ahead.

I would like to acknowledge the many seniors for their thoughtful and entertaining contributions to this newsletter, and to encourage all alumni to keep us informed of developments in their careers. I would like to thank Linn Sajdak for her many valuable contributions to the department and wish her well in her retirement. I would like to thank Tara and Justin Ramsey and Mary Fredendall for assembling this newsletter. Finally, thanks to Tip Benyajati, Marianne Arcoraci and Jenn Baylark for running the Undergraduate Program in Biology and Medicine and for organizing our graduation ceremony.



–Tom Eickbush

One Hundred and Seventeen Biology Majors Earn Degrees in 2008



The Department of Biology will be awarding one hundred and seventeen diplomas on Sunday, May 18th, 2008, at 2:30 p.m. in the Alumni and Advancement Center Auditorium. This year's graduating class is made-up of sixty-six women and fifty-one men. The Class of 2008 have satisfactorily completed the requirements for one of the four Biology Department tracks including: B.A. in Biology (BIO), B.S. in Biological Sciences: Cell and Developmental Biology (BCD); B.S. in Biological Sciences: Evolutionary Biology and Ecology (BEB), B.S. in Biological Sciences: Molecular Genetics (BMG).

Dr. Thomas Eickbush, Professor of Biology and Department Chair, will be the Master of Ceremonies by welcoming students and guests in addition to handing each student their diploma.

Student speakers are chosen by the faculty for excellence in academics, research, and for their service to the College. This year's student speakers are Daniel Goldstein, who will be introduced by Dr. Anthony Olek, and Kiana Frank, who will be introduced by Dr. Elaine Sia.

Dr. Elaine Sia and Dr. Cheeptip Benyajati will present the Janet Howell Clark Prize. This College-wide award is given each year to a senior woman who has shown promise in creative work in science and mastery of allied fields. This

year's recipients are: Kiana Frank (BMG) and Anjuli Cherukuri (BIO).

Dr. David Goldfarb will present The Donald R. Charles Memorial Prize. Given annually by the Biology Department to students who show great potential and have exhibited excellence in science, the 2008 Donald R. Charles Award will be received by Anjuli Cherukuri (BIO), Erin Fox (BEB), Kiana Frank (BMG), Daniel Goldstein (BIO), and Anthony Scott (BMG).

Dr. Cheeptip Benyajati will present the students who have earned degrees with Distinction in Research, Phi Beta Kappa, and Latin Honors. The ceremony will culminate in the awarding of diplomas. Personalized messages written by graduates will be announced as they receive their diplomas by: Dr. Anthony Olek, Dr. Cheeptip Benyajati, Dr. John Jaenike, and Dr. Elaine Sia.

A reception will be held immediately following the ceremony in the tent on the front lawn.

Graduating Class of the Undergraduate Program in Biology and Medicine (UPBM) 2008

Bachelor of Arts Biology (BA BIO):

Pradeep M. Ambrose
Sara E. Ancello
Jenna M. Anderson
Hossein M. Aziz
Zhe Bai^{MCL}
Asha A. Bhatt^{CL}
Erika M. Blair^{CL}
Patrick M. Brennan
Sarah B. Campeas^{CL}
Erin E. Casey
Anjuli R. Cherukuri^{ΦBK, MCL}

Yun J. Cho^{CL}
Robert M. Corey
John O. DiRaddo
Annabel S. Eom
Ashley H. A. Fan^{CL}
Jennifer L. Fichter^{ΦBK, MCL}
McKenzie J. Fisk
Nina E. Gadziala
Daniel J. Goldstein^{ΦBK, MCL}
Laurel A. Grabowitz^{ΦBK, CL}
Matthew G. Guerinot^{CL}
Ravi Gupta
Payam Hadian
Eric D. Hansen^{ΦBK, SCL}
Brian M. Hanson
Trilby A. Hillenbrand^{ΦBK, MCL}
Jessica Holbeck
Melina L. Hong^{CL}
Kang T. Hsu
Aditi P. Kadakia
Leah L. Kammerdiener^{MCL}
Thanos D. Kantarelis
Suzanne G. Kirsche^{ΦBK, SCL}
Mike G. Koskulics
Patrick Kuo
Kevin T. Lai
Alexander J. Langley
Kathryn L. Levy^{ΦBK, MCL}
Camille B. Madison
Joseph A. Mailman^{CL}
Anthony M. Mark
Carli O. Moochler
Yvonelle Moreau
Krystie L. Morrissey
Gordian U. Ndubizu
Patrick M. O'Brien^{MCL}
Katherine A. Olson^{CL}
Ashanti D. O'Steen
Cristopher D. Palomino
Salvador E. Pena^{CL}
Brian C. Poon^{CL}
Daniel Quintana
Nicole B. Rall
Melissa L. Ratliff
Brian T. Seeley^{CL}

Mansi J. Shah
 Jeewon Shin
 Kimberly N. Snyder
 Annalynn M. Surace
 Samantha P. Valvo
 Adam J. Weis^{CL}
 Tiffany C. Wixom
 Steven M. Yates
 Pokmang D. Yu

**Bachelor of Science
 Biochemistry (BS BBC):**

Shawn M. Conlon^{CL}
 Victoria J. Dimarco^{CL}
 Lauren Z. Hageman^{ΦBK, MCL}
 Kyle P. Hanretty
 Moriah G. Heller^{ΦBK, MCL}
 Brittany L. Kmush^{CL}
 Matthew A. Mavissakalian^{★★, CL}
 Christopher D. Mcfarland^{ΦBK, MCL}
 Anthony J. Molisani
 David A. Nissan^{ΦBK, SCL}
 John R. Serafini^{★★}
 Ogi Takahashi
 Phuong Ngoc Vi Tran^{★★}
 Sheng P. Xu

**Bachelor of Science
 Cell and Developmental
 Biology (BS BCD):**

Andrea M. Berry^{CL}
 Sean M. Czaja
 Megan E. Dommer
 Max R. Ehrmann
 Asha S. Francis
 Christopher M. Hancock
 Bilal Z. Iqbal^{CL}
 Shannon A. O'Brien^{ΦBK, SCL}
 Bridget N. Remming^{CL}
 Anna M. Sokolov
 Emily R. Strassner
 Chin Tang

**Bachelor of Science
 Evolutionary Biology
 and Ecology (BS BEB):**

Victoria Banchevsky
 Shane C. Campbell-Staton^{★★}

Stephanie R. Corretore
 Erin M. Fox^{★★}
 Courtney M. Higgins
 Scott B. Hughey^{★★}
 Rebecca S. Kaufman
 Jeremy B. Mann
 John A. Park
 Thomas J. Pasqualucci
 Naomi R. Salama
 Katherine D. Shaw^{CL}
 Vivian Wong
 Si Zhang

**Bachelor of Science
 Microbiology (BS BMB):**

Heather M. Brown
 Katrina E. Burns^{★★, CL}
 William A. Comrie^{CL}
 Karen M. Crow
 Aaron D. Figueroa
 Patrick M. Furbert
 Katharyn J. Gelinias
 Brad S. Goldberg
 Jacob A. Grantier
 Jason A. Greenman
 Christopher A. Hanai
 Jennifer L. Karatzas^{CL}
 Tessa M. Lawrence
 Benjamin S. Misemer^{CL}
 Drew A. Phillips
 Elizabeth M. Selleck^{ΦBK, MCL}
 Julianne N. Smith

**Bachelor of Science
 Molecular Genetics
 (BS BMG):**

Cynthia Arvizo
 Danielle A. Bombardier^{CL}
 Matthew J. Brown^{CL}
 Kristen L. Della Penna^{ΦBK, MCL}
 Rory T. Evenson-Phair
 Samantha J. Falk^{ΦBK, MCL}
 Kiana L. Frank^{ΦBK ★★, MCL}
 Amanda D. Gerard^{CL}
 Nicola M. Gerken
 Justin W. Gorski
 Amanda J. Grieco
 Naazneen R. Iqbal^{CL}
 Anna J. Klausner^{ΦBK, MCL}

Steven D. Klein^{CL}
 Ryan M. Klock^{★★}
 Shweta Krishnan^{★★, CL}
 Anita M. Kulangara
 Dev R. Master
 Kevin J. Murphy^{CL}
 Michael S. Roche
 Anthony J. Scott^{★★ ΦBK, MCL}
 Jessica A. Sorrentino
 Keith R. Syverson
 Yael Tarlovsky
 Lucy E. Wojcicki^{CL}
 Barbara C. Yang^{CL}

**Bachelor of Science
 Neuroscience (BS BNS):**

Jathin Bandari^{ΦBK, MCL}
 Julia Bosman^{ΦBK, SCL}
 Daniel A. Carr
 Leigh M. Carroll^{★★, ΦBK, MCL}
 Lauren E. Cassidy
 Francisco J. Corbalan
 Laura J. Czarniak
 Jonathan F. DeRight
 Sanjiv Gollakota
 Jessica L. Guidi^{ΦBK, SCL}
 Eva M. Knoth^{★★, CL}
 Hsuan Y. Lu
 Danchi D. Nguyen^{CL}
 Colin P. O'Banion
 David E. Packhem
 Joseph R. Panza
 Erin E. Phillips^{MCL}
 Kari M. Plewniak^{ΦBK, CL}
 Sadaf T. Rauf
 Nicole C. Toscano^{CL}
 Jenna A. Wankner
 Stacie R. Woods

ΦBK: Phi Beta Kappa
 ★ ★: Degree with Distinction in
 Research
 CL: Cum Laude
 MCL: Magna Cum Laude
 SCL: Summa Cum Laude

Research Emphasized as Major Component of Biological Science Education at UR

The Biology Department of the University of Rochester, together with the research departments of the School of Medicine and Dentistry located just a five-minute walk away, offers to its majors a diversity of opportunities for engaging in hands-on modern biomedical research.

Those opportunities are limited only by students' talents and by their persistence in searching for faculty doing research projects that match their interests. Every year Biology majors engage in laboratory research as volunteers, as student employees, for credit in IND 395, and in the summers as research fellows either at the UR or at other institutions as well as in paying jobs for biotechnology companies.

Independent Research

Several members of the Biology Department graduating class of 2008 have done one or more semesters of Independent Research for credit.

Those students, their faculty sponsors, department and number of semesters of research each are:

Cynthia Arvizo, BMG (2)

Faculty Sponsors: Dr. Shey-Shing Sheu, Dr. Elaine Sia
Department: Pharmacology and Physiology, Biology

Victoria Banchevsky, BEB (2)

Faculty Sponsor: Dr. James Fry
Department: Biology

Danielle Ashley Bombardier, BMG

Faculty Sponsor: Dr. Barbara Iglewski
Department: Microbiology and Immunology

Matthew Brown, BMG (2)

Faculty Sponsor: Dr. David Goldfarb
Department: Biology

Katrina Burns, BMB (2)

Faculty Sponsor: Dr. Michelle Dziejman
Department: Microbiology and Immunology M&D

Shane Campbell-Staton, BEB (2)

Faculty Sponsors: Dr. Richard Glor, Dr. Robert Minckley
Department: Biology

Leigh Carroll, BNS (2)

Faculty Sponsor: Dr. Charles Duffy
Department: Cognitive Behavioral Neurology

James Cassuto, CHM/BI

Faculty Sponsor: Dr. Martin Zand
Department: Medicine M&D Nephrology Unit

Anjuli Cherukuri, BIO (2)

Faculty Sponsor: Dr. Daven Presgraves
Department: Biology

Yun Jae Cho, BIO (3)

Faculty Sponsor: Dr. Baek Kim
Department: Microbiology and Immunology

William Comrie, BMB (2)

Faculty Sponsors: Dr. Mingtao Zeng, Dr. Minsoo Kim
Department: Microbiology and Immunology M&D

Francisco Corbalan, BNS

Faculty Sponsor: Dr. Suzanne Haber
Department: Pharmacology and Physiology

Stephanie Corretore, BEB

Faculty Sponsor: Dr. Richard Glor
Department: Biology

Victoria Dimarco, BBC (2)

Faculty Sponsor: Dr. Douglas Portman
Department: Center for Aging & Developmental Biology

Aaron Figueroa, BMB (2)

Faculty Sponsor: Dr. Stephanos Kyrkanides
Department: Department of Dentistry M&D

Erin Fox, BEB

Faculty Sponsor: Dr. Justin Ramsey
Department: Biology

Kiana Frank, BMG (3)

Faculty Sponsor: Dr. Robert Marquis
Department: Microbiology and Immunology

Sandra Garcia, BMB

Faculty Sponsor: Dr. Robert Rose
Department: Medicine M&D Infectious Disease Unit

Daniel Goldstein, BIO

Faculty Sponsor: Dr. Coeli Lopes
Department: Med M&D-AAB Cardiovascular Research Institute

Sanjiv Gollakota, BNS (2)

Faculty Sponsor: Dr. Anna Majewska
Department: Neurobiology and Anatomy M&D

Christopher Hanai, BMB

Faculty Sponsor: Dr. Martin Pavelka
Department: Microbiology and Immunology
M&D

Christopher Hancock, BCD

Faculty Sponsor: Dr. Henri Jasper
Department: Biology

Kyle Hanretty, BBC (2)

Faculty Sponsor: Dr. Bogdan Polevoda, Dr.
Fred Sherman
Department: Biochemistry and Biophysics

Moriah Heller, BBC

Faculty Sponsor: Dr. Joseph Wedekind
Department: Biochemistry and Biophysics

Kooghee Hong, BMB

Faculty Sponsor: Dr. Michelle Dziejman
Department: Microbiology and Immunology

Scott Hughey, BEB (3)

Faculty Sponsor: Dr. Baek Kim
Department: Microbiology and Immunology

John Humphrey, BCD

Faculty Sponsor: Dr. Robert Minckley
Department: Biology

Anna Klausner BMG (3)

Faculty Sponsor: Dr. Philip Davidson
Department: Pediatrics

Steven Klein, BMG (2)

Faculty Sponsor: Dr. John Werren
Department: Biology

Ryan Klock BMG/CHM (2)

Faculty Sponsor: Dr. Gloria Culver
Department: Biology

Brittany Kmush, BBC

Faculty Sponsor: Dr. Dirk Bohmann
Department: Department of Biomedical
Genetics

Shweta Krishnan BMG (3)

Faculty Sponsors: Dr. Elaine Sia, Dr. Vera
Gorbunova
Department: Biology

Patrick Kuo, BIO

Faculty Sponsor: Dr. Steven Goldman
Department: Neurology

Anita Kulungara, BMG (2)

Faculty Sponsor: Dr. Elaine Sia
Department: Biology

Hsuan Lu, BNS (3)

Faculty Sponsor: Dr. Shirley Joseph
Department: Neurosurgery

Jeremy Mann, BEB

Faculty Sponsor: Dr. Richard Glor
Department: Biology

Matthew Mavissakalian, BBC (2)

Faculty Sponsor: Dr. Harold Smith
Department: Biochemistry and Biophysics

Christopher McFarland, BBC/PHY

Faculty Sponsor: Dr. Mark Dumont
Department: Biochemistry and Biophysics

Benjamin Misemer, BMB

Faculty Sponsor: Dr. Stephen Dewhurst
Department: Microbiology and Immunology
M&D

Anthony Molisani, BBC

Faculty Sponsor: Dr. Mark Dumont
Department: Biochemistry and Biophysics

David Nissan BBC/HIS (2)

Faculty Sponsor: Dr. Bradley Nilsson
Department: Chemistry

David Packhem, BNS

Faculty Sponsor: Dr. Michael Weliky
Department: Brain and Cognitive Science

Christopher Palomino, BIO

Faculty Sponsor: Dr. Vera Gorbunova
Department: Biology

Joseph Panza, BNS

Faculty Sponsor: Dr. Kim Tieu
Department: Environmental Medicine

Thomas Pasqualucci, BEB

Faculty Sponsor: Dr. Robert Minckley
Department: Biology

Daniel Quintana, BIO

Faculty Sponsor: Dr. Allen Orr
Department: Biology

Nicole Rall, BIO

Faculty Sponsor: Dr. Wilfred Pigeon
Department: Psychiatry

Maria Sachenko, BNS

Faculty Sponsor: Dr. Shirley Joseph
Department: Neurosurgery

Naomi Salama, BEB

Faculty Sponsor: Dr. Jia Guo
Department: Pulmonary Critical Care Unit

Anthony Scott, BMG

Faculty Sponsor: Dr. Willis Li
Department: Biomedical Genetics

Elizabeth Selleck, BMB

Faculty Sponsor: Dr. Robert Rose
Department: Medicine M&D Infectious
Disease Unit

John Serafini, BBC/PHY

Faculty Sponsor: Dr. David Mathews
Department: Biochemistry and Biophysics

Julianne Smith, BMB

Faculty Sponsor: Dr. Laura Calvi
Department: Department of Medicine

Anna Sokolov, BCD (2)

Faculty Sponsor: Dr. Vera Gorbunova
Department: Biology

Phuong Ngoc Vi Tran, BBC

Faculty Sponsor: Dr. Patricia M. Hinkle
Department: Pharmacology and Physiology

Stefanie Trop, BMB/ MUS

Faculty Sponsor: Dr. Stephen Dewhurst
Department: Microbiology and Immunology
M&D

Sheng Xu, BBC

Faculty Sponsor: Dr. Xin Bi
Department: Biology

De Kiewiet Fellowship

The Undergraduate Program in Biology and Medicine (UPBM) has been awarding de Kiewiet Summer Research Fellowships since 1983 to UR students majoring in one of the UPBM tracks. Although the number of applicants is small compared to most summer programs, the competition is intense.

Students applying must already have a Faculty Sponsor and must submit a detailed research proposal. The summer fellows work fulltime in a lab for 10 weeks. Class of 2008 graduates who have been de Kiewiet fellows are:

Katrina E. Burns, BMB

Title: "*VSP-II Mobilization in Vibrio Cholerae*"
Faculty Sponsors: Dr. Michelle Dziejman, Dr. Mary Anne Courtney

Victoria J. DiMarco, BBC

Title: "*Analysis of DIS3 Activity in Saccharom- yces Cerevisiae*"
Faculty Sponsors: Dr. J. Scott Butler, Dr. Douglas Portman

Erin M. Fox, BS BEB

Title: "*Interspecific Hybridization Between Red and Silver Maples in Upstate NY*"
Faculty Sponsors: Dr. Justin Ramsey, Dr. John Jaenike

Laurel A. Grabowitz, BA BIO

Title: "*TNF-Mediated Regulation of Osteoclast Formation*"
Faculty Sponsors: Dr. Brendan Boyce, Dr. Lianping Xing, Dr. Zhenqiang Yao

Shweta Krishnan, BMG

Title: "Importance of Protein-protein Interactions for the Function of Mgm101p"
Faculty Sponsors: Dr. Elaine Sia, Leah Pogorzala

David A. Nissan, BBC/HIS

Title: "*Designing β -Sheets as Models to Study the Dynamics of Amyloid-B Aggregation*"
Faculty Sponsors: Dr. Bradley Nilsson, Xianfeng Gu, Timur Senguen

Erin E. Phillips, BNS

Title: "*Basal Ganglia Involvement in Avian Song Learning*"
Faculty Sponsors: Heather Bradstreet, Dr. David Holtzman, Dr. Kathy Nordeen, Dr. Ernie Nordeen

Anthony J. Scott, BMG

Title: "*Novel RNA Interference Components In Drosophila Melanogaster*"
Faculty Sponsors: Willis Li, Ph.D. and the Li Lab

Thirteen UPBM Graduates Earn Distinction in Research

The Undergraduate Program in Biology and Medicine (UPBM) provides majors in the B.S. or B.A. tracks the opportunity to graduate with distinction in research. Students must achieve a minimum GPA of 2.7 and must defend their written thesis at a meeting of their advisory committee. Most students seeking a degree with distinction have worked on a research project for a year or more and have achieved significant results. They then immerse themselves in the time-consuming process of writing the thesis. Those who successfully complete their research and then push on to write the required paper are rewarded with the phrase "Distinction in Research" added to their transcripts.

The thirteen members of the class of 2008 who have earned the honor of "Distinction in Research" are:

Katrina E. Burns, BMB

Title: "VSP-II Excision in *Vibrio cholerae* Seventh Pandemic Strains"
Faculty Sponsor: Dr. Michelle Dziejman

Shane C. Campbell-Staton, BEB

Title: "Molecular Analysis of Bottleneck Event and Geographic Origin of Captive U.S. *Pogona vitticeps* Population"
Faculty Sponsor: Dr. Richard Glor

Leigh M. Carroll, BNS

Title: "Navigational Decline in Healthy Aging."
Faculty Sponsor: Dr. Charles Duffy

Erin M. Fox, BEB

Title: "Natural Interspecific Hybridization Between Red and Silver Maple (*Acer rubrum* and *Acer saccharinum*) in Western New York"
Faculty Sponsor: Dr. Justin Ramsey

Kiana L. Frank, BMG

Title: "Antimicrobial Actions of Cu and Fe cations against *Streptococcus mutans* in Suspensions and Biofilms"
Faculty Sponsor: Dr. Robert Marquis

Scott B. Hughey, BEB

Title: "HIV Mutation Rate in Different Cellular dNTP Concentrations"
Faculty Sponsor: Dr. Baek Kim

Ryan M. Klock, BMG

Title: "Evaluation of Factors Involved in 30S Ribosome Subunit Biogenesis in *Escherichia coli*"
Faculty Sponsor: Dr. Gloria Culver

Eva M. Knoth, BNS

Title: "The Influence of Distraction on Spatial Localization with Age"
Faculty Sponsor: Dr. Gary Paige

Shweta Krishnan, BMG

Title: "Tumor Suppression In An Aging Rodent Via Contact Inhibition."
Faculty Sponsor: Dr. Vera Gorbunova

Matthew A. Mavissakalian, BBC

Title: "Induction of ApolipoproteinB mRNA Editing: Using a Novel Secretion and Transduction Mechanism"
Faculty Sponsor: Dr. Harold Smith

Anthony J. Scott, BMG

Title: "Identification of Genes Putatively Involved in RNA Interference in *Drosophila melanogaster*"
Faculty Sponsor: Dr. Willis Li

John R. Serafini, BBC

Title: "Molecular Dynamics of RNA Internal Loops"
Faculty Sponsor: Dr. David Mathews

Phuong N. Tran, BBC

Title: "Effect of Helix 8 on Phosphorylation of the Thyrotropin-releasing Hormone Receptor."
Faculty Sponsor: Dr. Patricia Hinkle

Life-Shaping Experiences and Future Plans

Jathin Bandari ('08 BNS)

Throughout high school I found my studies in biology mundane and consequently tedious. I felt as if I was being force-fed information and it was my duty to mindlessly regurgitate facts. I couldn't understand why anyone would waste time on such bland matters. It was not until college, when I was exposed to conceptual biology, that I found science intellectually stimulating.

My interest in science was not sparked until BIO110 during my freshman year. I was no longer drilling facts into my head, but rather reconstructing logic in novel contexts and ultimately appeasing my curiosity.



Regardless of whether or not I was being tested on it, if something did not make sense or seemed inconsistent with prior knowledge, I sought the answer until I understood it. I look back on those days and it is clear to me

what changed between my high school and college years – intellectual freedom. While in the former the curriculum was very constrained, the latter encouraged independent thinking.

The thrill of biology lies not in watching bacteria grow in Petri dishes, but rather in the consequent intellectual implications. This knowledge may be applied to a variety of contexts, ranging anywhere from medicine to our own personal philosophies. To quote Richard Dawkins, biology is a "consciousness raiser." So I would like to thank the professors at the University of Rochester for raising my consciousness – for opening my eyes and enabling me to view the world in a perspective that fervently admires the subtleties of nature.

Victoria DiMarco ('08 BBC)

I'm a senior biochemistry major with minors in religion and political science. As a DeKiewiet Scholar this past summer, I did my research with Dr. Scott Butler in the Microbiology & Immunology

Department. Over the course of the summer, I investigated the effects of the DIS3 protein on *S. cerevisiae* cell growth. The sequence of the *dis3* gene was cloned into *E. coli* and then transformed into *S. cerevisiae*. Later efforts had two goals: to introduce a site mutation via overlap PCR mutagenesis that eliminated a catalytic aspartate, and to delete the PIN domain, which is likely important for protein function. In the past, I have done research in Dr. Douglas Portman's lab, working on sexual dimorphism in *C. elegans*.

My interest in science was first piqued by my grandfather, who was a professor at RIT. While my mother had already trained me to enjoy reading, my grandfather's influence caused many of those books to be science books. As college approached, I spent my summers reading books about physics and biology. While my love of literature almost caused me to go into journalism, I ended up coming to the University of Rochester as a biology major, knowing that I wanted to go to medical school eventually.

My basic biology classes didn't turn me on, and it wasn't until I took genetics with Dr. Hinkle that I really became invested in my major. My other classes all seemed like background information for genetics, which was the only course



relevant to my goals. Genetics was the first class to offer real-world applications and the first class in which I was able to see how the subject could be used to understand and alleviate disease. I began in research soon after, and continued on that route for more than two years, before moving to work in a doctor's office during my senior year.

As a second semester senior, I'm now in the process of applying to medical schools, one of which is the University of Rochester Medical School, where I've spent most of my time for past few years. I plan to eventually specialize in neurosurgery. I'm very excited to finally have the time and financial ability to be completing my EMT training at Perinton Ambulance this semester so that I can gain more immediate medical experience before entering medical school.

Erin Fox ('08 BEB)



I'm a senior in the EEB track, although I'm more interested in the ecology aspect of things than the evolutionary biology. I actually started out as an English major, and then switched to Environmental Science because I love being outside and I figured I couldn't go wrong there. I finally switched over to EEB my sophomore year and started working in the Ramsey lab that summer. I've had a lot of great opportunities in the biology department here, including working on my own research project last summer under a De Kiewiet Fellowship, as well doing fieldwork in the Pacific Northwest two summers ago, which was incredible. I'm currently working on an honors thesis based on my De Kiewiet research, which focused on interspecific hybridization in maples. In the next year, I'll be applying to grad schools, probably for conservation science or plant systematics.

Kiana Frank ('08 BMG)

I'd like to enlighten you to the secret life of a research scientist. The life that no one can imagine a girl in gloves and a lab coat possesses, but a life that keeps her sane after a day of counting plates of Strep. Mutans in Dr. Robert Marquis lab and the nitty gritty memorization of all the proteins and more involved with translation. So here goes, not only am I a scientist and molecular genetics student by day, but I moonlight as the D'Motions Hip hop dancing president by night.

I love to dance. And, well, as you may have assumed, prior to my U of R days, this scientist dork had no rhythm. So, freshmen year I joined a little hip hop dance group called D'Motions. I worked hard and enjoyed it immensely and finally the rhythm clicked. With D'Motions I found an outlet that I had just as much passion for as my science. I absolutely love dancing, I can't keep still when I hear music, and I just feel it in me and I have to move. I put my heart and soul into this group and it has played a very important role in my college career at Rochester.

As a junior I was elected to be the president of the group. I demanded professionalism and hard work from my members. I definitely challenged them, pushed them and encouraged them to strive for a new level. My motto was to work hard and to have fun. We became a group for those who loved dancing, those who just wanted to learn and those who wanted to have fun and shake it. I am so proud of the dedication and the hard work put in by all my members. For me the best part was watching the newer members, timid and shy like I was at the first practice, just blossom before my very eyes throughout the year.



Here I am, proof that scientists not only can have a life outside of the lab but some dancing skills as well.

Daniel Goldstein ('08 BA BIO)

I came to the University of Rochester with the aspiration of pursuing science and medicine, and with the intention of advancing my skills as a classical pianist at the Eastman School of Music. UR provided the unique opportunity to merge my love of science with my talent for music. After taking biology courses, I took a Music Therapy course at Eastman. I had always heard that there was a close connection with music and the healing sciences. I confirmed this idea while participating in clinical research at Strong Memorial Hospital on the effects of music in the recovery process.

After my sophomore year, I spent my summer doing research in the cardiac electrophysiology department at MetroHealth Hospital in Cleveland, OH. Selected as a researcher in the prestigious Chester Summer Scholar Program, I performed experiments that generated data, demonstrating that T-wave alternans are a significant predictor for cardiac arrhythmias and sudden death, the leading cause of death to date. With the success of my summer research and with the guidance of several biology professors, I sought out a research assistant's position at Strong Memorial Hospital to delve deeper into cardiac electrophysiology. Under the guidance of Dr. Lopes, I

did research testing mutants of the KCNQ1 potassium channel subunit, which has been linked to Long QT syndrome, another sudden death disease specifically affecting adolescents. By doing research, I was better able to appreciate the power and complexity of the sciences.



Some of my fondest memories as a biology student were not found sitting amongst the rows of lecture hall desks, feverishly writing notes, but rather standing in the front of a classroom, guiding

freshmen students through Dr. Olek's BIO110 course. I started as a Teaching Assistant for BIO110 my sophomore year and rose through the ranks to become the head TA my senior year. As a TA, I learned that a true understanding of material does not come from taking tests, but rather conveying that material clearly and understandably to others. Seeing many of my former students become some of Dr. Olek's best TA's makes me proud because I know I have been successful as a student and teacher. As I depart from Rochester to become a medical student at SUNY Upstate Medical University in Syracuse, I know that I will never forget the friends, professors, and special relationships that I have gained here at UR.

Laurel Grabowitz ('08 BA BIO)

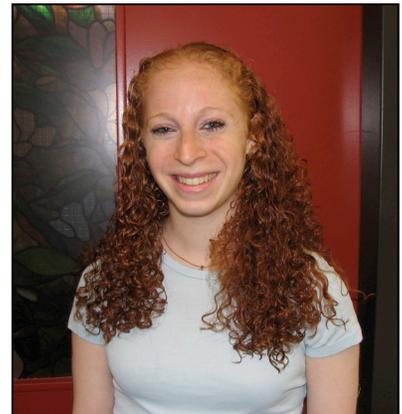
I developed my interest in science and medicine while training as a gymnast in high school. You're probably thinking, "What do backhand springs and the balance beam have to do with being a doctor?" All the flipping I did made me interested in injuries and rehabilitation, thus directing me towards orthopedics. As I began my studies at the University of Rochester, my interest in the other complexities of biology and chemistry developed.

After making the decision to try my hand at research, I looked to Strong Memorial Hospital to focus on an area of interest. Since I had been working on a review paper about bone pathology and related genes in my Molecular Biology class, I contacted Dr.

Brendan Boyce, M.D., who is an anatomical and surgical pathologist in the Surgical Pathology Department. His research in bone pathology, specifically osteoclast regulation and function, caught my attention, and after a few meetings, we created a proposal for my summer project for the DeKiewiet Fellowship.

My project for the summer explored the role of the cytokine Tumor Necrosis Factor (TNF) in the development and regulation of osteoclasts, which function in bone resorption. Specifically, my project focused on how TNF works to stimulate osteoclast activity from osteoclast precursors in the absence of RANK-L, another cytokine known to be essential for osteoclast formation. From previous data in the lab, this regulation seems to be mediated via $\text{NF}\kappa\text{B2}$. In vitro, I cultured mouse spleen cells in osteoclast culture medium under various conditions and assessed the osteoclast development under varying concentrations of cytokines. For in vivo experiments, I injected TNF into the calvaria of $\text{NF}\kappa\text{B2}^{-/-}$ mice and tested for osteoclast formation. While no precise conclusions could be drawn from my experiments, my results, in conjunction with data from Dr. Boyce's lab, do show evidence that TNF induces negative regulators in RANK-L induced osteoclast formation. Dr. Boyce's lab continues to test how $\text{NF}\kappa\text{B2}$ mediates TNF inhibition of this pathway.

This research experience was both challenging and rewarding. I developed more biochemical research skills in one summer than a first-year graduate student gains in one year. This experience taught me to think and read critically, how to understand and critique scientific papers, and how to work as a team. I learned to be patient and diligent, and I now recognize the enormous effort that is put into every field of research.



Even though my plans are still geared toward the medical route, my experience as a DeKiewiet Summer Fellow helped me to greatly appreciate the work that goes into research. I may even consider attending a research-based medical school in order to participate in more research in the future. I feel it is extremely

important for anyone who wants to become a doctor to have some hands-on research experience in order to truly appreciate the new discoveries in science that make modern medicine possible.

Eric Hansen ('08 BA BIO)

The sciences have always been my favorite course of study. In high school, I enjoyed learning about the rational models we have for understanding how the world works. Thus, it was a natural choice to pursue a biology major at Rochester.



Yet upon arriving on campus, I was blown away by my first biology course, Bio 110 with Dr. Olek. In the first week of class, I was confused by the fact that I could not find everything we talked about in class in our textbook so that I could memorize it for the test. When I approached him about it after class, he challenged my entire belief system about learning that I held throughout high school. He asked me to avoid memorizing unnecessary details from a book, but rather to study by discovering my own applications for the models we talked about in class. He also asked me to challenge everything I read to see if it fit the available data. It was initially hard for me to accept that a textbook could be wrong, but it was an important turning point in my academic career.

From the fall of my freshman year on, I began to ask questions not only about how the world worked, but also about if our current models were correct. Through laboratories in genetics, anatomy, and physiology, I learned the importance and difficulty of obtaining precise, accurate data to analyze. The lessons I learned in Bio 110 about how to learn also carried over to my other fields of study, history and philosophy.

Perhaps the most important time I spent as an undergraduate was as a participant and then a leader in workshops. As a participant, I learned the value of group study in an environment where you are comfortable asking questions and challenging your peers. As a leader of Organic Chemistry workshops and Biochemistry workshops, I realized that one really only understands a concept fully when one is prepared to teach it. I also was afforded the opportunity as workshop leader to work with amazing students and watch them grow from a basic understanding of biology and chemistry to a complex knowledge of the organic and biological chemistry subjects we were studying.

My undergraduate experience was greatly enhanced by the conscientious, caring professors in the biology department, who always had their office doors open and made it easy to develop strong relationships with them. As I embark on my journey across Elmwood Avenue to the University of Rochester School of Medicine next year, I hope to continue to progress as a passionate scientist as I pursue a career in cardiology.

Moriah Heller ('08 BBC)

I have loved biology ever since my high school science teacher posed the question, "What makes something alive?" As I thought about it, I realized that I could not think of the one defining factor that made a rock just a rock and made a cell a living thing. After all, they are both made of the same "stuff," right? From that point on, I basically made it



my educational mission to figure out the answer to that question

I didn't always know I wanted to be a biologist. I took it as an omen in middle school during my first dissection that my frog was the only one out of the entire class's to have cancer, and out of the owl

pellets we dissected for rodent skeletons, I was the only person to wind up with an apparently anorexic owl. I figured these were signs to stay away from biology, as fate was trying to tell me it just wasn't where I belonged. Luckily, I gave biology a second shot in high school once I was posed that infamous question that still to this day sometimes stumps me.

I entered U of R as a biology major on the pre-med track, the same path as approximately 98.7% of my freshman class. As I watched myself somehow manage to get through general chemistry, what I considered to be "The Hardest Class Ever," and then through organic chemistry and biochemistry, both of which I separately considered to be "The Hardest Class Ever," I realized that I might be able to actually pull this bio thing off. I switched my major to biochemistry, and that summer did a research internship at Joslin Diabetes Center in Boston. I fell in love with research and decided I wanted to be a researcher rather than a doctor. The next fall I was asked to join Joseph Wedekind's lab at U of R to do undergraduate research. Ever since, I have been studying the Hairpin Ribozyme as a model for RNA enzymes with the Wedekind lab. Specifically, I have been performing the organic synthesis of modified nucleotides for incorporation into the hairpin's active site in order to probe its structure and mechanism. This work has led to one publication, and may even produce more by graduation.

Not only are the undergraduate research opportunities at the U of R unlike those at most other universities, a dual function of U of R's small size and outstanding caliber of scientific research, but the faculty are absolutely unique in their level of student involvement. I truly believe that if it were not for my mentors, advisors, and some long crying sessions during professor's office hours, I would not be where I am today.

U of R was a huge factor in my success, and I am grateful for the path that led me here. I am graduating this May magna cum laude with my BS in biochemistry, and have accepted a Ph.D. position at Sloan Kettering Cancer Center to pursue my degree in cancer biology. Maybe, in fact, my frog WAS a sign....

Courtney Higgins ('08 BEB)

During high school I went on two short field trips to Central America that focused on diversity and conservation efforts in the region. It was those field trips that initially sparked my interest in ecology and

evolution. Throughout my first two years as an undergraduate at the U of R, I always yearned for field-based courses. During most of the academic year in Rochester, the weather is not conducive for field studies so during the spring semester of my junior year I went to Costa Rica with the Organization for Tropical Studies. After a semester in the field, I realized that long-term fieldwork was not something that I enjoyed as much as I thought I would. Upon



my return to Rochester this past summer, I wanted to give lab work a try in order to broaden my research experience. Professors Ramsey and Glor welcomed me to their labs where I have found a nice place for myself in the world of research. Though my undergraduate studies were completed in December of 2007, I continue to work with Professor Glor on a project involved in georeferencing and niche modeling *Anolis* species in the Greater Antilles.

Leah Kammerdiener ('08 BA BIO)

When I entered the U of R four years ago, I could hardly have imagined that part of my education would be taught sitting stranded in the middle of sacred Aboriginal land in the Outback. Who could have guessed that my biology degree would be earned in part by studying the koala or the kookaburra? Not only did I finish my degree requirements in Australia, I took what I learned and applied it to my activities while studying abroad.

Australia is an extremely large country with a wide variety of ecosystems and some of the most distinctive animals on Earth. I found myself in this unique environment during the fall of my senior year. The fantastic experiences that I had on the other side of the world occurred in unique "classrooms" (Kangaroo Island, the Outback, and the Great Barrier Reef), and taught me some of the best life lessons (self-sufficiency, the importance of conserving such

intriguing ecosystems, and how to run away from a charging bull seal). Studying in Australia added an element of real life and meaning to my degree. What I took away from the experience was a set of great



friends, a broadened perspective, and a genuine curiosity to explore new places.

Australia also gave me the opportunity to apply what I had learned here at the University of Rochester. I took Dr. Dietsche's lectures on human anatomy and mammalian physiology and superimposed them with what my Australian zoology professors taught about kangaroos. The Professors Ramsey's lectures on flagship species were born out in the popularity of the cuddly (but not so friendly) koala. My four-year immersion in biology helped me to fully appreciate the time and experiences I had abroad.

Anita Kulangara ('08 BMG)

I've been interested in biology, medicine, and solving problems for as long as I can remember. For this, I blame my family. Thanks to my older brothers, I joined my high school's Science Olympiad team and Science Research Program and ended up loving science. I was introduced to genetics on the Science Olympiad team where I learned and then coached fellow students about genes, epidemiology, and cell biology. My science research program provided me with the wonderful opportunity of conducting cancer research where I developed a novel diagnostic technique to diagnose lymphoid malignancies, such as leukemia and Non-Hodgkin's lymphoma (NHL). Part of this method involved amplifying Immunoglobulin Heavy Chain Gene Rearrangements using Real-Time PCR. The results I found from this first project lead to a second study that I co-authored during my junior year at the University of Rochester (UR). In this continuing project, a direct clonal link was established between HIV-related disorders and NHL. I was flabbergasted by the fact that such an

effortless technique carried so much weight on people's lives. I was so glad to think that I could have a huge impact in the medical world. Working on independent research in high school introduced me to another aspect of the medical scene where I could help patients through laboratory research.

When I entered the UR, I wanted to major in molecular genetics and take pre-medical courses while gaining more research experience. I'll never forget Dr. Dietsche's outrageous lectures in Anatomy and Physiology from my sophomore year and the stories he would tell me about the U.S. Navy. I'm going to miss having a professor like Dr. Goldfarb who can manage to relate such things as the movement of kinesin proteins to scenes from *The Matrix*. I cannot begin to explain how grateful I am to have shared in the lessons and friendships while working with mitochondrial DNA and yeast in Dr. Sia's Molecular Genetics lab during my junior year. Dr. Sia and her graduate students made their windowless lab the happiest place on campus. I am going to miss walking around and seeing those familiar faces on the third floor of Hutchinson Hall. Studying at the University of Rochester has given me confidence to step into the real world because of the lessons I learned from my amazing teachers and mentors. Best of luck to the Class of 2008! It's been a great four years!



Patrick Kuo ('08 BA BIO)

I always held an inquisitive passion for biology – wondering how living things could grow and what was going on inside. What gravitated me towards pursuing biology in college came from my pre-collegiate experiences at Brown and Harvard Universities. There, I was impressed to discover how biology maintained homeostasis and affected disease and aging. Thus, when I came to Rochester, I vowed to join a lab so I can critically understand biological concepts at work behind aging. That was when I met one of the best professors ever, Dr. David Goldfarb, who positively influenced and helped me tremendously. For one, he allowed me to conduct

some replicative lifespan aging studies on *S. cerevisiae*. Through a novel lifespan assay, I ran many experiments and charted growth curves that could compare differential rates in dividing daughter cells. Through initial division and replication from mother cells, and then the daughter cells' senescence, the generation growth could be controlled by media factors, as well as understood through application of oxidative stress. Now David wasn't just a mentor who taught me to analyze science critically, but he was also like a best pal. Unassuming and mellow, David was a trusted advisor from whom I could get downright candor and practicality on a whole buffet of issues. I owe him my greatest gratitude for all his well-serving advice that looked out for my best interests. When I made a painful decision to join a clinical lab to broaden my horizons, much to my surprise, David was wholly supportive knowing my thirst to get out and experience other groundbreaking studies.



At this neurological gene therapy research "powerhouse," my studies focused on the identification of novel molecular signaling pathways in human oligodendrocyte progenitor cells (OPCs). Perturbation of these critical pathways may lead to development of new therapies directed toward

repair in demyelinating diseases, such as Multiple Sclerosis. Through an independent research project, I successfully engineered and cloned several lentiviral plasmids that served as over/under-expression vectors directed against cell-surface based markers that could genetically regulate OPC development. Amongst other achievements, I subcloned mouse proteins into a lentiviral cassette to develop novel, cell-surface based magnetic selection of human neural progenitor cells.

All of this could not have been so successfully achieved had I not embraced the persevering spirit of that fortune to see the light at the end of the day. It was that spirit that carried me well beyond the language of science and lab work, and thrust me into college and community service. I had the humbling

privilege to serve as the sole undergraduate representative to The Faculty Council of The College of Arts, Sciences, & Engineering, advancing the academic interests of the 4500+ student body. Outside the college bubble, I've undertaken outreach service efforts to raise eye health awareness and elementary education. All of this could not be possible without the unwavering love and care from my parents and brother, and the support and understanding from my friends, staff advisors, and professors, such as Dr. Olek, and Drs. Ramsey.

As we know from Ecclesiastes that "to everything there is a season, and a time to every purpose..." thus this season and purpose embraces the next chapter of my life. In the fall, I will be matriculating at the Temple University School of Podiatric Medicine in Philadelphia where I will earn my Doctor of Podiatric Medicine degree. One day, I hope to specialize in orthopedics medicine and podiatric surgery.

Daniel Quintana ('08 BA BIO)

I am a senior at the University of Rochester majoring in Ecology and Evolutionary Biology. I am also a Senior Representative for the Society of Undergraduate Biology Students (SUBS) and a Brother of Sigma Beta Rho Fraternity, Incorporated. After graduation, I plan on taking a year off doing research at the Eastman Dental Center and then attending dental school to become an orthodontist.



It always seems to throw people off when I tell them I'm studying Evolutionary Biology but my long-term goal is to go to dental school. This is because my interest in Evolutionary Biology was first sparked by my high school Biology teacher. That interest grew more as I began taking courses in Biology at the University of Rochester. However, I also grew interested in research when I took a Genetics

laboratory course my sophomore year and concurrently worked as a technical assistant in Dr. Rita Miller's laboratory. I have worked for the past two and a half years in Dr. Miller's laboratory of yeast cell biology and molecular genetics. There I have learned to prepare DNA mini preps, bacteria transformations, and yeast transformations as well as prepare media using sterile techniques from the very talented graduated students, Nida Meednu and Sonia D'Silva.

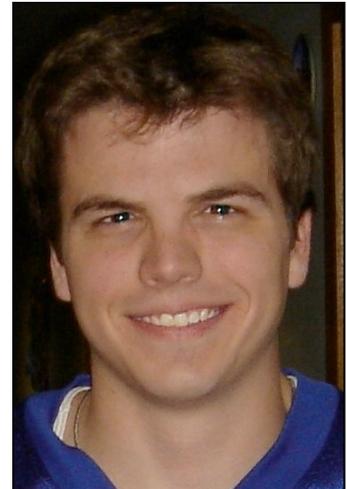
From there I branched out to do research in something that was more along my interests. My junior year I conducted research in Dr. Allen Orr's laboratory of evolutionary genetics. My project was on the genetics of hybrid sterility and meiotic drive in *Drosophila*. Working on this project alongside Nitin Phadnis, my supervising graduate student, was an exciting learning experience. Thanks to his help, as well as Dr. Orr's, Sonia's, and Dr. Miller's, I received an internship to conduct research last summer with Dr. Eric Nagy at the University of Virginia Mountain Lake Biological Station. Dr. Nagy's work explores the evolutionary dynamics of natural hybrid plant populations. My project was on the environmental variation and the distribution of genetic variation across a hybrid zone in the wood fern *Dryopteris*. By measuring environmental variables I found a significant difference in environmental variation that correlated with the genetic variation that occurs along transects of this population of wood ferns. This summer was an amazing experience in that I was able to do field research and my lab consisted of the great outdoors. However, I could not have done it without the help of Dr. Orr, Dr. Miller, Sonia, and Nitin.

I would like to thank Jeremy Rabinowitz, my TA for Biology 111 Lab and Genetics Lab, who initially got me interested in research; Dr. Rita Miller for employing me in her lab and for her recommendations; Sonia and Nida for all their advice, interesting topics of conversation, and good lunch food (especially dessert); Dr. Elaine Sia and the entire Sia laboratory for adopting me as one of their own; Dr. Allen Orr for giving me the opportunity to work in his lab, for his advice, and his great recommendations; Nitin for allowing me to work with him and teaching me the skills to be a master fly pusher; and last but not least, my family and friends here at the university. It has been a great four years and it's sad to see it come to an end. However, thank you to everyone in Biology Department and all my professors because I have learned so much and I am forever grateful.

Anthony Scott ('08 BMG)

Admittedly, I came to UR set on applying to medical school. Having done well in the pre-med classes, becoming a biology major was pretty much an easy and logical decision to make. However, once I got the nod to become a BIO202 (Molecular Biology) TA, wrote an article defending the relevancy and importance of my scientific education in the campus newspaper and enjoyed my independent research project, my biology degree became more than a prelude to medical school and an experience unto itself. The abilities to break down experimental evidence and think critically about data, learned from lab meetings and in upper level biology classes (such as BIO202, BIO215 (Molecular Biology of Cell Signaling), BIO222 (Biology of Aging) and BIO210 (Cell Biology)), are crucial transferable skills that served as the cornerstone of my undergraduate education.

Accordingly, since nature seems like a game of blackjack to me, I am proud to say my training in science has taught me how to count cards (however, my chosen vocation as a researcher means that my reward will be more figurative than financial).



This past summer, I was fortunate enough to be a part of the deKiewiet Summer Research Fellowship. My project centered on the RNA interference (RNAi) pathway in *Drosophila melanogaster* (fruit flies). RNAi is a mechanism by which double-stranded RNA can silence genes, conserved in organisms in some form from fission yeast to humans and has many scientific and therapeutic purposes. As RNAi was only discovered a few years ago in fruit flies, my goal was to find new components of the pathway. After having completed a genome-wide screen the previous summer, I narrowed down the search to specific regions of the genome, selecting genes within the regions for further review. Using genetic means, such as P-element mutagenesis, I assessed two candidate gene's suitability for additional testing.

Throughout my undergraduate years, the faculty and staff of the Undergraduate Program in Biology and Medicine and the Department of Biomedical Genetics helped me immensely. Most important of which was

Professor Willis Li who gave me a great job when I first came to Rochester and encouraged my research pursuits throughout the four years I worked with him. I also really appreciate my lab mates, who frequently helped me with laboratory techniques and made me feel like a full-time lab member. Back on the River Campus, Professors Benyajati (for whom I served as a TA) and Sia (my major advisor) gave me important advice and aid as a student in their department.

Also at UR, I've been a writer and two-time editor at the Campus Times, member of the community service group Alpha Phi Omega and a two-time Freshman Fellow. Additionally, I'm a huge Buffalo sports fan and stay in shape by running every so often. I'll be heading off to an MD/PhD program next year (location to be determined at a later time, but I can tell you it will be in a blue-collar city on Lake Erie), most likely completing a PhD in Genetics and being trained either in Internal Medicine or Pathology.

Elizabeth Selleck ('08 BMB)



I have always had a curiosity about how the human body worked. At a young age I was convinced that mice controlled my body, as they were the only things small enough to fit inside and move around. While that notion has been cleared up and I realize that ATP is responsible for most things (thanks Professor Olek!), I still have a great interest in how the body interacts with its surroundings. I am particularly interested in when these interactions end in disease and have been able to study these as a Microbiology and Immunology major and hope to continue to study microbial pathogenesis as a career.

I have had the opportunity to work with Professors David Lambert and Robert Rose in two very different areas of biology, development and virology respectively. I thank them both for the opportunity to learn basic research skills and develop a scientific curiosity; as well as their dedication to allowing undergraduate students do real research and not just making them wash dishes. I also had the opportunity to work as a TA for Bio 110 and Chem 203. These experiences made me realize that I really enjoy teaching science and the pleasure of helping students understand ideas that I once struggled with will hopefully be a part of my career. A large part of my Rochester experience has been rowing for the Rochester Crew team. Despite the lack of sleep that 6:15 a.m. practices have provided, I have met some of the hardest working and most entertaining people I have ever known. To work hard as a team and see success as a team has been a priceless part of my college career. I also had the amazing chance to study abroad in Christchurch, New Zealand. I made some great friends there who changed how I view the world around me, and learned that despite the miles that separate us, the world is a small place that needs to be taken care of.

I am thankful that the University of Rochester has given me the opportunity to study my scientific interests as well as pursue other areas of the liberal arts, including women's studies and music. I know of no place else where as an undergraduate I could have my own research project in a top-tier research setting while still taking classes taught by actual professors in such diverse areas. As a result I am able to confidently enter the biomedical research world knowing that my education here has prepared me for what's ahead not only in the lab but also in the world as a whole. Next year I hope to be doing research at the NIH in their post-baccalaureate research training program and then to continue to a PhD program in Microbiology. Graduating from the U of R is an honor and a privilege and I thank everyone who has been a part of my undergraduate career here.

Hellos and Goodbyes

Two department veterans retire



Louise Vanni joined the Biology Department on February 2, 1981 as an Accounting Bookkeeper II and quickly moved up the ranks to become the department administrator. Louise was involved in many activities at the University. She was the department representative

for the University's United Way Committee and she was a participant in the National Conference on Undergraduate Research (NCUR). Louise was also a valued member of the River Campus Administrators Group, which was organized to help administrators keep informed on policies, and for support with common issues. Louise's name was synonymous with Biology. She was the department resource person and social coordinator. In 1994 she received the University's Distinguished Employee Award for outstanding service. Louise took it upon herself to become the department's historian. She began compiling books of research articles by emeritus professors and became the recipient of old photographs and items that had historical value in Biology. History was her true love. She was a social studies teacher before she started her family. Louise has two sons, Chris and Doug. Chris is married and working in the banking industry in New York City. Doug is single and working at his uncle's insurance company in Michigan. He also does modeling gigs on the side.

Anyone who knows Louise knows she loves to travel. Her travels have included Egypt, Florence, and Spain. When she retired at the end of December 2007, we sent her off with funds for an airline ticket. On April 12th she embarked on a European cruise along the Danube River encompassing medieval towns in Hungary, Germany, Austria, Serbia and Romania. I am sure we will continue to receive news from Louise about her travel adventures. Biology was her second family. We wish Louise a happy retirement and will often wonder "Where in the world is Louise Vanni today?"

Barbara Yunker retired in October 2007 after 5 years of service to the Department of Biology. She had started out as Department Secretary and due to her quick thinking and bright personality, was promoted to Administrative Assistant with responsibility for running the front office and providing the Chair with secretarial assistance. Barb is known for providing that "bit of sunshine" which was often needed on cloudier days and while we know she is enjoying her own sunshine on her frequent visits to Florida, she is missed!



Brenna Holik, Department Coordinator



I was born and raised in El Paso, Texas with the tumbleweeds, the prickly pears, and the roadrunners. In 1986, I moved with my family to Albany, New York and never stopped missing the Texas sunsets or how the air there smells like mesquite after it rains. In Albany, I was introduced to real pizza and the candor and sharp wit that New Yorkers are known for. Though I still have family in both El Paso and San Antonio, my heart truly lies in New York. I suppose I am an oxymoron of sorts—I am a Texan New Yorker! In 1996, I decided to stay in the Northeast and moved to Rochester to pursue a bachelor's degree at SUNY Geneseo. While attending, I interned at the Albany Institute of History and Art, and the Oxford Gallery in Rochester. It took me five years, but I graduated from Geneseo in 2001 with a BA in Art History. After college, I parlayed my part time job into a successful retail management career. I spent seven years as a Manager and Trainer at Bed Bath and Beyond.

This past October, I began working in the Biology Department at the University of Rochester. Everyday I am more and more impressed with both the faculty and the students. As the oldest of four, three of whom are presently in college, I both empathize with and respect the students I work with everyday. As someone who originally thought to major in archaeology, I find this department fascinating with its often-evolutionary slant on biology.

In my spare time, my passion is Ballroom Dancing. Growing up with a mother who teaches ballroom has instilled in me its great value and beauty, and you will always hear me encouraging people to try it! I

am a published poet, a gardener, a cook, and I have just refinished my first antique. In summary, I feel truly blessed to be working with such an extraordinary group of people and I look forward to making this department my home.

Kristin Fien, Accounting Bookkeeper



Kristin Fien joined the Biology Business Office as an Accounting/Bookkeeper in January 2008. She is a graduate of St. Bonaventure University with a BBA in Accounting. She worked briefly as an Accounting Clerk at First Federal Savings and Loan in Rochester before starting

a family. She and her husband, Paul, have three children. In between being a full-time mom she has held part-time positions at the Lutheran Church of the Incarnate Word, Cheveau Designs in Pittsford and the McQuaid Jesuit High School Bookstore as well as volunteering at her kids' schools, church, and coaching softball.

Jenn Baylark, UPBM Course Coordinator



We would like to extend a warm welcome to Jenn Baylark who is our new UPBM Course Coordinator. Jenn comes to us from a Rochester law firm and has become a valuable member of our undergraduate team with her bright smile, sharp mind and warm

personality.

Courtney Higgins, Department Secretary

The Biology Department would like to extend a special thanks to Courtney Higgins (BEB, '08). Courtney was gracious enough to serve as department secretary temporarily during the Spring Semester. We benefited greatly from Courtney's exceptional organizational talent and were grateful for her witty sense of humor. Thank you, Courtney!

Alumni Update

Joseph Hatem (BA Biology 2007) conducted undergraduate research in Henri Jasper's lab for one summer and an independent study in pathology clinical research. Joe is currently a first-year student at UR medical school.

David T. Yeung (BS Cellular & Developmental Biology 2002) spent five years at the U.S. Army

Medical Research Institute of Chemical Defense (USAMRICD) at the Aberdeen Proving Ground in Maryland as a postgraduate researcher the first year and as a University of Maryland School of Medicine (2007 Ph.D. Medical Pharmacology & Experimental Therapeutics) student the last four years. At USAMRICD, his research focused on the metabolism of chemical warfare nerve agents, such as sulfur mustard, tabun (GA), sarin (GB), soman (GD), VX, and Russian-VX (VR) by human enzymes. The goal of the research was to generate a genetic variant of the human paraoxonase-1 (HuPON1) enzyme with a 10-fold enhancement in enzymatic activity towards these deadly chemicals, so that this mutant enzyme can be used as a prophylaxis against a 5xLD50 organophosphorus intoxication insult. In July 2007, David started a new position as a Program Specialist with the National Institute of Neurological Disorders and Strokes at the NIH to assist in the administration of the Countermeasures Against Chemical Threats (CounterACT) Initiative. The goal of the program is to facilitate the development of post-exposure therapeutics against chemicals that can be employed in a chemical terrorism event and/or national emergency (e.g. chemical warfare agents, cyanide, chlorine, bromine, sulfur mustard, etc.). More information can be found at: http://www.ninds.nih.gov/funding/research/counterterrorism/counterACT_home.htm

Faculty Hellos and Goodbyes

Linn Sajdak

My time at the University of Rochester is the last step in a long and varied career. There are those that would tell you that I am restless. I have been a nurse, a tissue culture technician, a middle school teacher, a preschool teacher, an adult educator of weaving and knitting, a knit wear designer and production manager and finally a university-level Lecturer. Perhaps this is a very strange string of activities. However, the common thread in all of these things is that I am now and always have been a teacher.



You should have seen the skepticism in the eyes of the admission's counselor at the University of Wisconsin – Milwaukee when I told him I wanted to enter the PhD program in evolution. He looked me straight in

the eye and said in a tone of voice that one would use to a child, "You know, of course, that you will have to take chemistry and math." I was 40 years old and had never taken a degree in biology so maybe he was right to think I was crazy.

Now it might be true that my retirement account could be larger if I had just kept being one of the other things that I had done, but I could not quiet the little voice that said, "I need to know more." My joy in life comes from learning and sharing knowledge. I want others to feel that excitement that comes when they suddenly understand and think, "Isn't that cool!"

So, in January 1996, having graduated with my PhD in December at the ripe old age of 50, I came to the University of Rochester to work with freshmen in the Biology Department. During my time here I have taught a non-majors' course called "Biology and the Environment" in which we discussed environmental issues. I am pleased to say that the pool of intelligent and dedicated students who are excited to take on environmental issues from the legal and policy point of view is large.

I taught Introductory Biology to hundreds of students every spring semester. When I came in 1996, there were no labs connected to this course. One of my first efforts was to write the lab manual and launch this course. I am also involved with the Genetics courses. With help from Dr. Tony Olek and Bev Mihalenko, we put together an introductory lab course in genetics, another new course for our undergrads. In addition, I spend the first weeks of summer with a hard-working group of students that want to take Genetics in summer school.

The best part of this job has been the opportunity to work with the best students in the country as students and as teaching assistants in the courses that I teach. Our University of Rochester students are some of the most dedicated, responsible and enthusiastic people you will ever meet. I have been privileged to know them and I want to thank them for 12 stimulating years in which I learned as much or more than I taught.

Gloria Culver

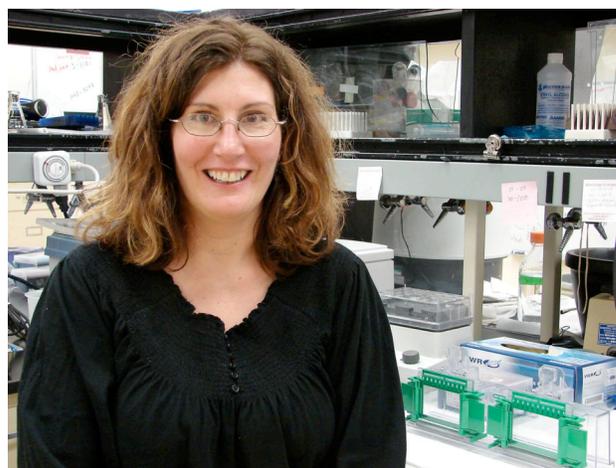
By Elaine Sia

Gloria Culver, an Associate Professor, joined the Biology Department in January of 2007. Gloria is a biochemist whose work is focused on the assembly of a complex molecular machine, the ribosome. The

small ribosomal subunit of *E. coli* consists of a 16S RNA and the 21 protein subunits that associate with this RNA molecule. The Culver laboratory is particularly interested in understanding how the association of ribosomal proteins with the RNA promotes structural changes in the particle as it assembles into the mature ribosome. Members of the lab are also working to understand how protein factors, that are not integral parts of the ribosome, act to promote its assembly.

Gloria is a native of northwestern New York, she grew up just outside of Ithaca. She stayed close to home for her undergraduate education, obtaining her bachelor's degree in 1988 from Ithaca College. While there she began her career in scientific research in the laboratory of Vicki Cameron studying mutations in mitochondrial genes in yeast that affect the activity of the electron transport chain. Gloria remembers fondly her time at Ithaca College, in part because it was a small college where it was possible to know all of the faculty in the department.

She was encouraged to present her work at a regional meeting of yeast researchers where she met Fred Sherman, Eric Phizicky, and Terry Platt, all faculty members in the Department of Biochemistry in the University of Rochester Medical Center. This meeting inspired Gloria to apply for admission to the graduate program in the Department of Biochemistry. While there, she performed her thesis work in the lab of Eric Phizicky. In his lab, she worked to identify an interesting product of tRNA splicing.



Gloria moved to the University of California Santa Cruz to the laboratory of Harry Noller in 1995 to perform her post-doctoral work. She and her colleagues in Noller's laboratory were working to understand the architecture of the ribosomal RNA in

the small ribosomal subunit. She employed biochemical approaches, including hydroxyl radical probing, to study the structure in the years before the crystal structure was available. In fact, she recalls that she and the other post-doctoral researchers in Noller's laboratory lived in fear that the solution of the crystal structure of ribosomes would make their work obsolete. As a result of this work, she realized that similar approaches could be used to understand the dynamic process of subunit assembly.

In 1999 Gloria joined the Department of Biochemistry, Biophysics and Molecular Biology at Iowa State University, where she quickly established a productive research group. In 2004 Gloria was promoted to Associate Professor with tenure at Iowa State.

Fortunately for the Biology Department, Gloria decided to move to Rochester in 2007. Five graduate students; Deepika Calidas, Keith Connolly, Nathan Napper, Zhili Xu, and Joy Roy Chaudhuri, made the move with her, and have made a welcome addition to the scientific community here.

In addition to her important contributions to research, Gloria is making her mark in undergraduate education at the University. This spring semester, she has taken on the important task of teaching the very large undergraduate biochemistry course.

During her years in graduate school, Gloria met her future husband, Joe Anderson, who was a graduate student in the Chemistry Department at the time. Joe had come to Rochester (1990), from Wabash College in Indiana, to study organometallic chemistry with Rich Eisenberg. After earning his PhD, Joe wanted to study more biological or biophysical questions, so he went on to perform his post-doctoral research with Glenn Millhauser in the Chemistry Department at UC Santa Cruz studying Electron Paramagnetic Resonance Spectroscopy.

Throughout his time in research, Joe had maintained an interest in computers, and during his post-doctoral years, he began to think he would like to turn this hobby into his career. As a result, when he and Gloria moved to Iowa State, Joe began working as a computer consultant, also at Iowa State. Joe now employs his skills in this area in the Biology Department, in his position as Senior Information Analyst. Gloria and Joe have a daughter, Lillian, 4. Welcome, Gloria, Joe and Lillian.

Michael Welte

By David Goldfarb



The Biology Department welcomes the developmental cell biologist Michael Welte ("Veltae") to our faculty ranks. Michael's group studies how organelles move about the cell on microtubule tracks. Using the dance-like movements of lipid droplets in developing *Drosophila* embryos as a model system, Michael has discovered components of a multi-subunit apparatus whose components are involved in other important trafficking processes. Michael's work produces visually striking images and movies, some of which can be found on his lab website.

The youngest of three boys, Michael grew up in the town of Spaichingen in southwest Germany near the Black Forest. Like many mid-sized European towns Spaichingen is surrounded by beautiful farmlands and low hills, and is known for its light industry, including the famous 200 year-old Sauter Piano factory. Upon arriving in Rochester, Michael discovered that Spätzle noodles made in Spaichingen are available at Wegman's. Coincidentally, "Spätzle" is also the name of a maternal effect gene required for the dorsal-ventral pattern of the *Drosophila* embryo.

Michael's father Anton was the town's only veterinarian. His mother Rosemarie assisted in the business as an accountant and helped with small-animal surgery. He remembers accompanying his father to watch him deliver calves in chilly barns, and the like, but these experiences were not what ignited his interest in biology. He particularly disliked the irregular hours of a vet. He does remember being impressed by Watson's "The Double Helix", but as a boy Michael was more interested in astronomy and physics. Long before he switched to microscopes, Michael spent many happy nights at

home peering at planets and stars through his telescope. Bicycling is one lasting habit that has carried over from Spaichingen to Rochester.

At Eberhard-Karls-Universität in Tübingen Michael pursued a double degree in biology and mathematics. Double degrees are unusual in the German system, but he successfully passed his 2nd year exams and earned "Vordiplom" degrees in both fields. After his 3rd year he took his first trip to the U.S. for an international exchange program at the University of Washington, Seattle, where he worked on immunoglobulin genes with Ursula Storb. Later, Michael was encouraged by Storb to apply to graduate school at the University of Chicago, where she had recently moved. Because a German undergraduate degree is approximately the equivalent of our Masters degree, Michael was eligible for American graduate schools before he had completed his full undergraduate diploma. So off he went.

Growing up in the safe environment of Spaichingen, where children are allowed to wander freely, was not necessarily the best preparation for the mean streets of Chicago. Ever the wanderer, Michael found himself one night in the wrong part of town. A would-be mugger appeared out of the darkness and demanded, "Give me all your money!" Not understanding the fellow's words, Michael guessed he was being offered drugs, so he replied, "No thank you, I am not interested." The agitated thief raised his voice and spelled-out, "M-O-N-E-Y!" Still not understanding, Michael stood his ground and looked befuddled. Defeated, the thief retreated back into the darkness and Michael sought out much needed advise on where not to go.

As a Ph.D. student with Susan Lindquist, whose is famous for her classic work on the heat-shock response, he finally began working with Drosophila. Michael then moved to Princeton University in 1994 for a postdoc with Eric Wieschaus. The Wieschaus lab held regular joint group meetings with Trudi Schupbach's group, who is Eric's wife. Wieschaus won his Nobel Prize while Michael was in the lab. Michael reports that Wieschaus was not overtaken by all the attention, and he remained engaged in the day-to-day activities of his lab, "pushing flies" almost daily. Here Michael developed his lipid droplet model system for studying vesicle movement. In a key study, using a novel squashed-mount embryo preparation and optical tweezers, they measured the forces generated during bi-directional lipid droplet movements. In this study, Michael also implicated the novel protein Klar in the tight coupling between

motors of opposite polarity. He took this system to his first independent position at Brandeis University where he worked until his move to Rochester in 2007.

Scientists often treasure those rare "Aha" moments, and Michael is no different. Lipid droplets move in a tightly orchestrated fashion, first into the interior of the embryo and then back to the periphery. The tight temporal control of retrograde and anterograde lipid droplet movements, which can be observed in real time, is what makes this model system so attractive. Dissecting the individual steps of a complex cellular process such as this can be achieved through the identification of mutants that arrest at discrete intermediates. After years of mapping the halo mutation, which inhibits anterograde transport and causes a striking opaque zone to appear at the periphery of the embryo, Michael's lab finally identified halo molecularly. To confirm they had really found halo, they prepared mRNA for the identified gene in vitro and injected it into halo mutant embryos, hoping this would cure the motion defect. Within less than 20 min, lipid droplets near the injection site moved inwards, creating spectacular "hybrid" embryos, opaque on one end and transparent at the other. Overwhelmed with excitement, Michael ran through the building showing the images to whoever would listen.

Michael is now established in a beautiful hillside home near Highland Avenue with his husband Eric Rubinstein, two dogs, three cats and an ever-changing number of goldfish. Michael and Eric met in Boston where Eric had a high profile position in the State Public Health Department. Eric, who recently earned a law degree, now works as the Director of Regulatory Support at the Clinical and Translational Science Institute (CTSI) at Strong Hospital. Michael will begin teaching Advanced Cell Biology 220/420 in the Fall. When you have an opportunity, ask Michael about the time Eric Wieschaus sang him a song as preparation for a job interview, an event that – over the years – lead to obsession with the Broadway musical "Wonderful town", the urge to take signing lessons and an impromptu trio at Michael's wedding featuring Michael, Eric Wieschaus, and the voice teacher Pam Wolfe.

Achievements and Milestones

Terry Platt became the faculty Co-Director of the Center for Workshop Education in the College, serving with the other Co-Director, Dean Vicki Roth of Learning Assistance Services. The Center was officially established on 31 March 2008 at a joint luncheon involving the College and the UR Medical Center. The Center's goal is to encourage, coordinate and facilitate existing Workshop programs at the U of R, as well as to work with interested faculty who wish to develop Workshops for their own courses.

Daven Presgraves was awarded the 2008 Balfour Prize from the Genetics Society of the United Kingdom, which is given annually to mark the contributions to genetics by an outstanding young investigator. He will deliver the Balfour Lecture at the society's annual meeting at the University of Bath in September. Daven also received a Radcliffe Fellowship to spend a 2008-2009 sabbatical year at the Radcliffe Institute for Advanced Study at Harvard University. He is also the invited seminar speaker for the symposium "Genetics and Molecular Biology of Speciation" at the 2008 Society for Molecular Biology and Evolution meetings in Barcelona.

Hiram Lyon was presented with the Silver Beaver Award this May by the local council of the Boy Scouts of America.

Molly Gildea spends a lot of time doing whatever daughter Tuolumne wants, which is mostly walking outside or sitting on the porch swing eating yogurt and graham crackers. Tuolumne really likes turtles and wants to visit Rich Glor's house to meet Clarence, a real live tortoise. Although her verbal skills are minimal, Tuolumne signs effectively for specific foods and animals. Tuolumne likes kisses, especially from other small children (e.g., Dave Lambert's sons, Wendell and Charlie).

Molly is involved with a variety of community building efforts. Perhaps most significantly, Molly is coordinating a new farmer's market to be held at the corner of Oxford and Monroe on Wednesday evenings this summer from 4:30 to 7:30. The market is scheduled to include a bakery, a biscotti maker, and pasta seller, a winery, and at least one real-life farmer, as well as live music and some children's activities—please contact Molly if you know of additional vendors that may be interested in participating.

Stan Hattman welcomed grandchild number five, Korben Mitchell Suskin, born on 10 February 2008. Stan's daughter, Ursula Hope, husband Todd and son Gavriel Winter are all doing well.

On 28 March 2008, Stan played jembe in the drum ensemble for the annual Afro-Expressions performance, *The Making of a Queen*, at the U of R. He also performed with the Nat Turner Drum Circle at the Memorial Art Gallery's Kwanzaa celebration in December.

On the Biology Department front, the Hattman research lab no longer exists-- it has been stripped and readied for renovations.

Lidza Kalifa received a scholarship to attend the Keystone Symposia "DNA Replication and Recombination" and present a poster entitled *Localization and Participation of the FEN1 Homolog Rad27p in the Mitochondrial Compartment of Saccharomyces cerevisiae*. She also received a four-year pre-doctoral fellowship (NIH Ruth L. Kirschstein National Research Service Award).

Jack Werren traveled to India in April 2007 to give a series of workshops on symbiotic microorganisms and to develop collaborative research projects. On this month-long trip, he also saw elephants and heard a tiger in the wild! Over the summer, the Werren lab ran a workshop for high school teachers, introducing them to a lab exercise series that integrates biodiversity, molecular biology and bioinformatics. Jack's recent Science paper—which shows widespread gene transfers from bacteria to animal genomes—was recognized by *Discover Magazine* as one of the top 100 science stories of 2007.

Many folks in the Werren lab have had recent milestones. **Deodoro Oliveira** accepted a postdoctoral position with Alfredo Ruiz at the Universidad Autónoma de Barcelona. **Marie-Jeanne Perrot-Minnot-Cezilly** gave birth to a beautiful baby girl, *Raphaelle*, on 23 August 2007. **Jon Giebel** entered graduate school at University of Michigan, **Crystal Allen** began work at a biotech company in North Carolina, **Dan Reed** moved to Boston for work in neurobiology lab, and **Jorge Azpura** is at the Smithsonian Tropical Research Institute in Panama studying insect symbionts—Jorge will be returning to Rochester as a first year graduate student in fall 2008.

Nitin Phadnis won a travel award for a meeting entitled "Evolution of Sex & Recombination: Theory & Practice" to be held at the University of Iowa.

Jody Bowen LaRose, technical associate in the Gorovsky Lab, and **Molly Saweikis**, technician in the Presgraves lab, share a passion for dogs and accomplishments in AKC (American Kennel Club) dog sport competition. Molly and her black Labrador retriever, Zorro, have recently earned their AKC Rally Advanced title. Last fall, Jody and her Shetland sheepdog, Sunshine, completed their Excellent titles in Rally, Standard Agility, and Jumpers With Weaves.

Rally is a sport where the dog and handler walk a course with signs directing a particular action at each station. Because the handler has to correctly interpret and instruct her dog to perform the required tasks, this is a great test of interspecific teamwork and communication. Agility involves courses of ~20 obstacles that include jumps, tires, A-frames, and weave poles. Luckily for Jody and Molly, only the dog has to actually navigate the course—the handler runs beside the dog and provides direction. Molly, Zorro, Jody and Sunshine can often be found at DOTCORN, a local obedience club that offers excellent training opportunities for the family pet as well as the canine athlete.

Dave Lambert welcomes a new baby. Samuel Wheeler Lambert was born on 22 August 2007 and has taken well to life in Rochester. His brothers Wendell (now five years old and soon headed for kindergarten) and Charles (mostly just headed for trouble at the moment) are delighted.



Rob Unckless and his wife, Heather Fiore, announced the birth of their son, Miles Fiore Unckless, born 1 September 2007. Miles weighed 9 lbs. 8 oz. at birth and was 22 inches long.

[Howard Bryant Flyer]