

# GENETICS *at georgia*

## Two Bishop fellows named



Stead

Brunilis Burgos-Rivera and Mark Stead were named the 2009 - 2010 Linton and June Bishop Graduate Fellows by the Graduate Affairs Committee.

Brunilis is a fourth-year student in Kelly Dawe's laboratory studying chromosome segregation in the plant *Arabidopsis*. Mark is a fifth-year student in Sidney Kushner's laboratory who employs modern genomic tools to

see *Bishop* page 6

## Robinson awarded Alton fellowship

The Graduate Affairs Committee awarded the 2009 Kirby and Jan Alton Graduate Fellowship to John Robinson. He is advised by John Wares and has been working on the ecological genetics of subdivided populations in *Daphnia*, a freshwater invertebrate commonly known as the "water flea."



Robinson

The Alton fellowship, funded by a generous continuing gift from Dr. Kirby and Jan Alton, provides full support for an outstanding fourth-year graduate student.

John anticipates graduating in May 2011. He plans to work in the field of conservation genetics, particularly of marine and aquatic organisms.

## Splice of life

### Study finds new relationship between gene duplication, alternative splicing in plants

By Terry Marie Hastings

University of Georgia scientists looking to understand the genetic mechanisms of plant defense and growth have found for the first time in plants an inverse relationship between gene duplication and alternative splicing. The finding has implications for diversity not only in plants, but also in animals, including humans.

The research was published in the December 22, 2009 *Proceedings of the National Academy of Sciences*.

"This inverse relationship previously has been reported in animals," said University of Georgia professor and senior author Chung-Jui Tsai. "And in animal genes, when there's a single copy, more often than not you see a higher degree of alternative splicing."

Alternative splicing is the molecular process that allows a single gene to produce many gene products or proteins with potentially different functions. It is thought to be an efficient mechanism

for the cell to rapidly create greater structural and functional diversity without evolving new genes.

Tsai is W. N. Haynes Professor and Georgia Research Alliance Eminent Scholar, Warnell School of Forestry and Natural Resources, and professor of genetics, Franklin College of Arts and Sciences, at UGA.

Tsai's team set out to investigate the role of a gene that encodes the enzyme isochorismate synthase (ICS), which has two distinct functions: synthesis of vitamin K for photosynthesis, the conversion of light to energy, and synthesis of salicylic acid, an aspirin-like compound found

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Billy Howard

Tsai



answer on page 4

**Guess Who?**

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Department of Genetics  
The University of Georgia, Athens  
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## editor's note



We are delighted to bring you the sixth annual *Genetics at Georgia* newsletter. We have once again had an exciting year here at UGA. As you will see in this year's newsletter, this has been a year of many outstanding accomplishments among our faculty and students.

As of the writing of this newsletter, we are finishing up recruitment of new junior faculty, a critical part of continuing to build our department from among the best and brightest out there. In addition to recruiting new junior faculty, we have also begun the process of searching for a new department head, a superb opportunity to recruit at the senior level. This is, indeed, an exciting period of growth in the Department of Genetics at UGA.

As you will read in the pages of this newsletter, both our undergraduates and graduate students continue to impress us with their accomplishments. We are especially keen to hear what you have been up to, both personally and professionally, whether you graduated just last year, or perhaps a few decades ago. Please send your news to Susan White ([whites@uga.edu](mailto:whites@uga.edu)). Your updates will appear in the following issue.

The success of each undergraduate and graduate cohort is greatly enhanced by opportunities to present their new results at national meetings, where they can interact with peers and leaders in the field. In this light, we ask that you consider a contribution to the Genetics Alumni Student Travel Fund, or choose from other funds that also help support the goals of the Department of Genetics. Your support at any level can truly benefit the students in our department. You can find more details on the pledge form on p. 7.

Daniel Promislow

Design: Christopher Ross, Susan White  
Photographers: Carmen Rodriguez,  
Darlene Strickland

## news | Graduate Program

Yet another productive and successful year for the genetics graduate students! Many of our students presented research at regional, national, and international conferences, and students at all levels continue to garner recognition for their research and teaching.

First, congratulations to our outstanding first-year students on their admission to the program. This year we admitted eight new students: Jennifer Olmstead, Paul Griffith, Kerin Bentley, Jared Lee, Matthew Volny, and Cheryl Pinzone. Sarah Sander and Rebecca Miller also joined the department from the newly minted Interdisciplinary Life Sciences program, which allows students to rotate between departments before choosing a home. Each new student is impressive both on paper and in person, and we are excited to have them join us as peers and colleagues. Two of our first-years, Sarah Sander and Kerin Bentley, were awarded



Sander

prestigious NSF Graduate Research Fellowships, which will provide them with stipend, research, and travel support over the course of three years. All first-years are now completing their rotations and settling into labs, many already beginning their own projects.

Though we have gained many new students, it is with bittersweet emotion that we watched senior students move on to bright new careers and futures. Tina Bell, Kate Small, Monica Poelchau, and Scott Small successfully defended their dissertations and have taken the next step in their careers. We bid a fond farewell to these students, and look forward to a new class joining us in Fall 2010. With that said, special thanks should be given to second-year student Louisa Carter and third-year student Cass Heighington who organized one of our most successful departmental recruitments.

Second-year students are gearing-up for qualifying exams, but continuing to prove their mettle in research. Emily Peeden presented her work at the Annual Meeting of the Society for Molecular Biology and Evolution in Iowa last June. Kristofer Mussar was given a Franklin Travel Award to present his work at the 21<sup>st</sup> International Conference on *Arabidopsis* Research in Yokohama, Japan. Kristofer Mussar and Louisa Carter were also named to the departmental NIH training grant. Congrats to Kristofer and Louisa!



Bentley



Mussar

Third- and fourth-year students are still performing at top levels. Eileen Roy presented her work at the International Conference of Genome Biology and Bioinformatics and published some of her work in the *International Review of Cell and Molecular Biology*. Mark Fisher was given a Franklin Travel Award and deserves special thanks for serving the Genetics Graduate Student Association as our representative to the UGA Graduate Student Association.



Roy

The senior students are setting the bar high for underclassmen. Continuing to prove her excellence in teaching, Eve Basenko not only had her teaching portfolio approved by the UGA Graduate School, but also was accepted into the Interdisciplinary Certificate in University Teaching program. Congrats to Eve! Brunie Burgos will be representing us abroad this summer with her American Society of Plant Biologists 2010 Travel Grant to attend their meeting in Montreal. She also received the ICAR-NAASC travel award to attend the 21<sup>st</sup> International Conference on *Arabidopsis* Research in Yokohama, Japan. Ginny Bain should also be recognized for her spectacular job of

see *Graduate* on page 8

## Researchers propose model for understanding chromosome disorders

By Philip Lee Williams

Parents of healthy newborns often remark on the miracle of life. The joining of egg and sperm to create such delightful creatures can seem dazzlingly beautiful if the chromosome information from each parent has been translated properly into the embryo and newborn.

The darker side is that when extra copies of chromosomes or fewer than the normal 46 (23 from each parent) are present, tragic birth defects can occur. Now, scientists at the University of Georgia have developed a model system for plants and animals that shows the loss of a key structural protein can lead to the premature separation of one DNA copy called a chromatid.

The new model shows for the first time that the loss of this protein can lead to aneuploidy—the name given to birth disorders caused by extra or too few chromosomes.

see *Model* on page 5

## news | Undergraduate Program

In 2009, 29 students graduated with degrees in genetics and 21 students matriculated to either medical (17), dental (2) or osteopathic (2) schools. A number of additional students from previous years have also now entered graduate degree programs. In May of 2009, we recognized our graduating seniors at a gala reception that was held in the Paul D. Coverdell Center for Biomedical and Health Sciences. At that time the Cynthia Kenyon Outstanding Undergraduate Award was presented to Sara Pope. The graduation reception has proven to be so popular that the department has decided to continue this event.

With changes in the university policy regarding the Academic Common Market there has been a drop in the

number of genetics major over the past several years. However, that decrease in enrollment seems to have abated and we currently have 96 majors. As the university moves closer to the start of its medical school in Athens, we expect to see increased demand for the genetics major.

We are pleased to report that Daniel Pique, a third-year student and LSAMP Research Scholar doing research with Kelly Dyer and Mary Bedell, has been awarded a summer fellowship from the Leadership Alliance Summer Research Early Identification Program. He is one of 15 undergraduates from across the country who will spend the summer in a pre-MD/PhD program at Rockefeller/Sloan-Kettering in New York City. Michael Bray, a third-year student working on his Honors thesis



Pique

see *Undergraduate* on page 7



## head's note

As a new department head, it is my great honor to update our colleagues and friends on some of the interesting events in 2009-2010 that have impacted UGA Genetics. With great assistance from Bob Ivarie, the previous head, and the hard work of several other faculty and staff in the department, I began to comprehend the complexities and issues associated with “Headhood” in the spring of 2009, before making my best stab at appearing to be in charge by summer. Despite a challenging environment at UGA, the department has managed to maintain its tradition of excellence and to set out in some new directions. In all of these efforts to continue our dedication to outstanding scholarship in research, teaching and service, the department has relied on contributions well beyond the call of duty from our faculty, staff and students. I should especially note the creativity and energy of my associate head, Nancy Manley, and the sage advice from former heads Wyatt Anderson, Bob Ivarie, Sidney Kushner and Rich Meagher.

As has been true for the last few years, UGA departments (including Genetics) received additional cuts in our support from the university and also were not permitted any raises. Through some careful budgeting and a surge in grant funding to genetics faculty (>\$3 million this year), we weathered these cuts without any layoffs or other loss of departmental staff, students or faculty. However, all faculty and most staff were required to take 6 furlough days this fiscal year, essentially a temporary cut in salary. Of course, the work did not somehow disappear during these furlough days (for instance, furlough days were not allowed to decrease our teaching), so we all ended up working just as much or more time for fewer dollars. The current recession

see *head's* on page 4

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## head's...from page 3

has caused widespread unemployment and budget cuts nationwide, and has especially impacted the budget for the state of Georgia, so it was not surprising that Genetics accepted the furloughs as part of our contribution to bringing UGA and Georgia back into fiscal health.

Genetics initiated a series of activities this year that we hope will dramatically enhance the quality with which we deliver our teaching, research and service missions. The most ambitious of these efforts is through an ad hoc curricular assessment committee, instigated by Nancy Manley and chaired by Michael McEachern. This committee, with full participation from all genetics faculty, will reassess and reconceive our entire curriculum for both undergraduate and graduate studies. The final outcome will be an updated and balanced curriculum, which guarantees that all of our graduating students will have state-of-the-art training in genetics that is unsurpassed by any institution worldwide. Genetics has also amplified its efforts to recruit students from under-represented groups, with the particular leadership of John Wares, and has helped design an improved Interdepartmental Life Sciences program.

The importance of the Department of Genetics was exemplified by UGA's decision allowing us to recruit several new faculty members over the next few years. One of these faculty members, Melissa Davis, has arrived and will greatly expand our research skills in biomedical genetics. Two additional searches are ongoing, including one for a new department head. I accepted the opportunity to be department head on the condition that this would be a one-year term, and this should be possible given the outstanding slate of applicants.

Our faculty, staff and students continue to shine, setting a great example for UGA and for generations of department members to come. I have been continually humbled by the excellent efforts and dedication of the department's staff, a group that I don't believe has its equal anywhere on campus. Our undergraduate majors continue to excel in the classroom, in their many services to UGA, and in the independent investigations that many conduct in our first-tier research labs. Our graduate students have made more than their share of dramatic research discoveries this year, and the Outstanding Teaching Assistant Award earned by Christina Zakas best exemplifies their teaching skills. The graduate students also played a key role in this year's incredibly successful recruitment of new students, our best ever, including the enrollment of our four top candidates, all with UGA Presidential or Graduate School Assistantship Awards. The faculty continues to turn out high impact science, with publications in such excellent journals as *Cell* and *Science*.

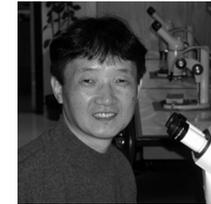
In short, the Department of Genetics has managed to set itself on an excellent trajectory in very difficult times. It has been a privilege to serve this crew of accomplished, creative and dedicated students, staff and faculty. Next year will be another challenge, but also an exciting opportunity to build on the excellence that has defined our department since its inception.

Jeff Bennetzen

Answer  
to Guess Who?...  
Jessica Kissinger

## bookBRIEF

Springer has recently published *The Handbook of Behavior Genetics*, edited by Yong-Kyu Kim, a research scientist in Wyatt Anderson's laboratory. Designed



for graduate students and scientists who are interested in studying human and animal behavior using quantitative and molecular genetic methods, each chapter begins with an overview of a subject by an internationally-known expert, who discusses its latest issues, advances, controversies, and emerging areas of importance.

## NIHGRANT

Nancy Manley and her colleagues have been awarded a two-year, \$2 million grant by the National Institutes of Health for studies on the thymus, the organ in humans that produces disease-fighting T-cells.



The grant is a collaborative program between UGA, the University of Texas M. D. Anderson Cancer Research Center, and the Center for Stem Cell Research at the University of Edinburgh in Scotland. Nancy Manley, a professor of genetics and chair of UGA's Interdepartmental Developmental Biology Group, is the principal investigator on the grant, which will support studies on molecular mechanisms regulating thymic epithelial cells during aging. Other principal investigators are Ellen Richie, professor of carcinogenesis (Texas) and Clare Blackburn, group leader (Edinburgh).

Source: Columns Vol. 37, No. 10,  
9/28/2009

## Model...from page 3

Disorders caused by errors in the proper transmission of chromosomes from each parent are uncommon but tragic nonetheless. Best known may be Down Syndrome, which is caused by an extra copy of chromosome 21. Many errors in chromosome transmission are so severe that miscarriages usually occur.

“As we know, human females have all the eggs they will ever have from the time of birth, and so as they age, the protein structures on chromosomes also age,” said Kelly Dawe, a geneticist and plant biologist at UGA. “If an egg is fertilized late in life, the final stages of chromosome separation may not occur properly. The goal of the work, which was done in maize, is to find out which parts of the chromosomes are most sensitive



Dawe

to failure. We now believe that proteins in a structure called the kinetochore are among the most sensitive to degradation or mutation. That may be a clue as to why older women have more problems with these kinds of chromosomal disorders when giving birth than younger women.”

The research was published in the journal *Nature Cell Biology*. Co-author on the paper is former University of Georgia graduate student Xuexian Li.

Irregularities in chromosome number are usually caused during a biological event called meiosis, in which the number of chromosomes per cell is halved and, in animals, results in the formation of gametes or sex cells. While the biology of meiosis has been known for more than a century, major questions remain about how all the constituent cell parts must coordinate to make the process successful.

see *Model* on page 7

**Collen Cotton** (BS '09) is a medical student at Washington University in the St. Louis School of Medicine.

Now a first-year medical student at the University of Alabama-Birmingham, **Samantha Eschborn** (BS '09) is keeping an open mind, but leans toward a surgical specialty.

A DO candidate at Lake Erie College of Osteopathic Medicine, **Joel Garrison** (BS '09) plans to specialize in internal medicine or family practice.

A student of the biomedical sciences program at the University of Miami Miller School of Medicine, **Ashley Green** (BS '09) is a PhD candidate in cancer biology.

**Julie Kim** (BS '09) is pursuing an MD degree at MCG in Augusta.

A DVM student of the College of Veterinary Medicine at Auburn University, **Martha Lane** (BS '09) eventually plans to open a clinic.

**Charles Lorentz** (BS '09) is pursuing an MD degree at Emory University's School of Medicine.

## alumni news

**Nithya Natrajan** (BS '09) is at Dartmouth Medical School in her first year of medical training.

**William Orr** (BS '09) is a first-year medical student at MCG in Augusta.

**Tulsi Patel** (BS '09) is now a doctoral candidate in development and genetics at Columbia University.

**Neil Pfister** (BS '09) is an MD/PhD candidate at Columbia University in the College of Physicians and Surgeons and the Graduate School of Arts & Sciences.

Finishing his second-year of medical school at Duke University, **Patrick Pilie** (BS '06) was awarded a Howard Hughes Research Training Fellowship for 2009-2010.

Currently a clinical trials coordinator at Metairie Oncologists in New Orleans, **Page Young** (BS '09) plans to pursue a masters degree in a field related to medicine.

Compiled by Susan White

Please send your news updated to  
Susan at [whites@uga.edu](mailto:whites@uga.edu)

## Genetics T-shirt revival

This year has been exciting for the Genetics Student Association, not only because of the many amazing seminars we've hosted, but also because we revived the genetics department T-shirt sale! Armed with Dave Hall's creative shirt design, as well as the enthusiasm and support from our club adviser, Daniel Promislow, we sold shirts to undergrads, grad students, faculty and staff, not to mention the shirts purchased as gifts for family members. As a club, it marked the highlight of our year to see how well received the shirts were to so many involved with this wonderful department. If you would like to hear more about the shirts, or would like to be notified next year of new shirt designs, please feel free to e-mail us at [UGAgenes@gmail.com](mailto:UGAgenes@gmail.com). We at the Genetics Student Association are grateful for your support and are excited for another year here at UGA!



Wei Wang and Pranav Kaushish

Left to right: Wei Wang, Pranav Kaushish, Sidd Dalal, Kaitlin McNally

## Splice...from page 1

naturally in most plants that is important for their resistance to diseases. In *Arabidopsis*, a tiny flowering annual plant that is widely used as a model organism, salicylic acid is derived primarily from ICS. The investigators wanted to know the role of the ICS gene in fast-growing and economically important *Populus* tree species.

The *PNAS* authors took their cues from *Arabidopsis*. In this tiny weed, there are two copies of the ICS gene, while there is only one copy of the gene in *Populus*.

When subjected to stresses, the tiny *Arabidopsis* plant did what was expected: It produced normal stress-fighting proteins, but from only one of the ICS duplicates. However, the single copy ICS gene in *Populus* spontaneously produced a mixture of the normal and alternative forms of gene product in equal proportions, and it did not respond to stresses.

Tsai said, "We asked, 'Does the ICS gene behave differently by chance? Or does it reflect something about how disease resistance is controlled in different kinds of plants?'"

Following the discovery of extensive alternative splicing in the *Populus* ICS gene, the researchers inserted the *Populus* ICS gene into an *Arabidopsis* mutant that lacked the stress-fighting ICS copy. The UGA-led research team found that the *Populus* ICS gene could not be correctly spliced at all in the foreign *Arabidopsis* host and could not restore the weed's ability to produce salicylic acid.

Tsai explained, "When the correctly spliced *Populus* ICS gene was inserted, it worked as expected in *Arabidopsis*. This suggested that some of the signal recognition for splicing is not in the weed any more."

Tsai's research found that in *Arabidopsis* one of the ICS genes has been recruited for defense. "When these species get attacked, it's important for them to respond quickly and massively using a dedicated ICS gene."

In contrast, Tsai said, woody perennial trees like *Populus*, which face environmental stress throughout their long lifetimes, have evolved other pathways to synthesize salicylic acid and other chemicals for "constitutive" defense—meaning these compounds are produced all the time—and the primary ICS gene function is photosynthesis.

Tsai concluded, "The gene duplication and alternative splicing of *Arabidopsis* and *Populus* reflect their distinct defense strategies."

But the major finding of the research—the relationship between gene copy number, gene sequence and how splicing may have contributed to gene evolution—is what Tsai finds most exciting.

"The finding that the *Populus* ICS gene cannot be properly spliced in *Arabidopsis* opens up new prospects in the quest for what makes a tree a tree," said Tsai. "The quest is certainly beyond differences in gene numbers, or individual gene functions, between trees and weeds." Tsai said she suspects that "subtle but fundamental differences in how genes are spliced between these species can have significant contributions as well."

Tsai's co-authors on the paper are Yinan Yuan, Michigan Technological University; Jeng-Der Chung, Taiwan Forestry Research Institute; Xueyan Fu and Sarah L. Booth, Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University; Priya Ranjan, formerly at MTU and now at Oak Ridge National Laboratory; and UGA scientists Virgil (Ed) Johnson and Scott Harding, also formerly at MTU.

The research was funded by the National Science Foundation.

Source: Columns, Feb. 1, 2010. Condensed and reprinted by permission

## Friends of Genetics

We proudly recognize alumni and friends who have supported our academic programs from March 21, 2009 to date. We are grateful for the generosity of all of our donors. If your name is listed incorrectly or is missing, please e-mail [whites@uga.edu](mailto:whites@uga.edu) so that we may properly acknowledge your generosity. To make a gift to the department, please refer to the gift form on page 7.

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DeEtte Walker  
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Somasekar Seshagiri  
Katherine R. Spindler  
James D. Vinson, Jr.

## Bishop...from page 1



Burgos

study RNA processing in *E. coli*.

The fellowship, an endowment established by a generous gift from Dr. Linton and Mrs. June Bishop, provides support for outstanding genetics graduate students each year.

Mark anticipates completing the PhD program in December 2010, and Brunilis in May 2011. Following graduation, they both intend to work as post-doctoral fellows, Mark in government or industry, and Brunilis in academia.

## Model...from page 5

During the two stages of meiosis, chromosomes are first separated by type, ensuring that only one of each gene is represented and then separated in half again in preparation for fertilization. The authors showed that the first stage is orchestrated in part by the kinetochore that attaches chromosomes to the rest of the cell. When they suppressed a kinetochore protein called MIS12, the chromosomes no longer separated by type and jumped to the second stage before completing the first. These failures closely mimic those seen in eggs from older women.

The cell division processes that Dawe and Li studied have implications for other diseases—such as cancer—as well. And yet a genuine payoff may come in the form of genetically improved lines of corn.

Dawe's work opens the possibility of a more positive outcome: the ability to engineer so-called "artificial chromosomes" with useful genes into corn varieties. Though that may be years off, it could offer a way to create lines that could resist drought, disease and insect pests without harming the environment.

Researchers are racing to design artificial chromosomes that behave like natural ones. With such an engineered chromosome, the positive traits researchers could give to corn plants would be almost limitless.

"You could really put genes in there at will, stacking traits that would make the plants able to withstand problems that now limit production greatly all over the world," said Dawe. "But to get from theory to practice, we will need a much clearer understanding of meiosis."

Unfortunately, most early generation artificial chromosomes have failed at meiosis in a nearly identical manner as plants with reduced MIS12. By manipulating MIS12 or other similar proteins, Dawe hopes to correct these defects.

Source: Columns, Sept. 28, 2009. Reprinted by permission.

## Undergraduate... from page 3

in Kelly Dyer's lab, has been awarded a CURO Summer Research Fellowship, and Kaitlin McNally, a fourth-year student, has been accepted into a summer research internship at the Boyce Thompson Institute for Plant Research at



Bray

Cornell University. Kaitlin also plans to study abroad at the University of Udine in Italy next spring to work with a professor who studies the grape genome.

We are sorry to note that our very capable undergraduate coordinator for the past two years, Jessica Kissinger, was forced to step down because of a large increase in other commitments.

Sidney R. Kushner

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## Laurels

**Kerin Bentley** and **Sarah Sander** were awarded NSF Graduate Research Fellowships.

**Michael Bray** was awarded a 2010 CURO Summer Research Fellowship.

**Brunilis Burgos** and **Mark Stead** were awarded the 2010 Linton & June Bishop Graduate Fellowship. **Burgos** also received an American Society of Plant Biologists 2010 Travel Grant and an ICAR-NAASC travel award.

**Mary Case** was awarded a B. O. Dodge Community Award by the Neurospora community.

**Kelly Dyer** was awarded the Ellison Medical Foundation 2009 New Scholar in Aging and the Oak Ridge Associated Universities 2009 Ralph E. Powe Junior Faculty Enhancement awards.

**Mark Fisher** and **Kristofer Mussar** received Franklin Travel Awards.

**Michael McEachern** earned promotion to professor.

**Kaitlin McNally** was awarded a 2010 Summer Research Internship at the Boyce Thompson Institute for Plant Research at Cornell University.

**Muktha Natrajan** was awarded the 2010 Morris K. Udall and Stewart L. Udall Foundation Scholarship and a 2009 Barry M. Goldwater Scholarship.

**Jenna Oberstaller** was awarded an Ellison Medical Foundation/Training Innovations in Parasitologic Studies Fellowship from the Center for Tropical and Emerging Global Diseases to study malaria diagnosis in Tanzania.

**Tulsi Patel** was awarded a 2009 American Dream Fellowship from the Merage Foundation.

**Daniel Pique** was awarded a 2010 Summer Fellowship from the Leadership Alliance Summer Research Early Identification Program.

**Sara Pope** received the 2009 Cynthia Kenyon Outstanding Undergraduate Award.

**John Robinson** was awarded the 2010 Kirby & Jan Alton Graduate Fellowship.

**Christina Zakas** received an Outstanding Teaching Assistant Award.

## Sara Pope receives Kenyon award

Sara Pope received the 2009 Cynthia Kenyon Outstanding Undergraduate Award. The Kenyon award, named in honor of a former undergraduate now on the faculty of the University of California, San Francisco, is given each year to an outstanding undergraduate student for exceptional performance in academics, research, and leadership.



Currently a medical student at Mercer, Sara investigated the relationship between genetic interactions for fitness and recombination in yeast in the lab of David Hall. She is co-author, along with D. Hall and M Agan, of the manuscript, "Fitness epistasis among six biosynthetic loci in the budding yeast *Saccharomyces cerevisiae*," which is in press at the *Journal of Heredity*.

## Graduate...from page 2

organizing this year's student seminar series while also juggling the responsibilities of student representative.

Lastly, special thanks go to the officers of the Genetics Graduate Student Association: Ginny Bain, Emily Peeden, Elizabeth Lucht, Kris Mussar, and Mark Fisher, who served as a voice for the student body. These students organized many of the activities and social events that we enjoy and served as liaisons to the Graduate School and faculty. During this year the GGSA was honored to host Dr. Bob Vrijenhoek and Dr. Chad Cowan as our student-invited speakers, and we look forward to our visits from next year's speakers, Dr. Dan Voytas and Drs. Peter and Rosemary Grant.



Peeden

Emily Peeden