
UGA CAPSULE

DEPARTMENT OF MICROBIOLOGY ALUMNI NEWSLETTER

Dan Colley to direct \$18.7 million grant to combat schistosomiasis



Microbiologist and Immunologist Dan Colley has researched the tropical disease schistosomiasis for almost 40 years; now he will use all his experience to direct the third largest grant in the history of UGA to thwart this debilitating and sometimes deadly disease. The parasitic disease affects over 200 million people around the world and is caused by several species of flatworms of the genus *Schistosoma*. The disease is most common in Africa and to a lesser extent in Asia and South America. The worms damage internal organs and impair physical and cognitive development in children. The grant was awarded from the Bill and Melinda Gates Foundation as part of their Global Health initiative. The award is designed to explore the best

ways to identify, control, and perhaps eliminate the disease. The research is broad-based and designed to not only answer strategic questions concerning the ways to most efficiently control schistosomiasis, but to ensure future control programs focus on efficiency, efficacy, and sustainability. The work is expected to provide critical tools to permit control of the disease in low and middle income countries in Africa, the Middle East and the Americas. In a UGA press release, President Michael Adams said "This grant significantly bolsters the University of Georgia's growing strength in public health and medical research".

Dr. Colley is a Professor of Microbiology and the Director of the UGA's Center for Tropical and Emerging Global Diseases. He has a long record of international scientific leadership experience and accomplishments. He will oversee the Gates Award schistosomiasis project management team at the UGA Center. Dr. Colley said "While controlling schistosomiasis is a World Health Organization global priority, most endemic countries still lack adequate control programs, and the sustainability of existing programs is tenuous". The multi-disciplinary consortium of scientists will include partners from around the world, who will individually subcontract with the University of Georgia. They will involve federal, state, and private institutions, labs, and field sites in North America, South America, Europe and Africa. Dr. Colley recently delivered a keynote lecture on campus describing the research plan. His lecture was part of the popular "Voice from the Vanguard" lecture series that focuses on progress in combating timely and world-wide diseases. Dr. Colley has received many awards, one of the most recent being the Brazilian Presidential Medal for Scientific Merit, Brazil's highest scientific award. He has also recently been selected to serve as one of 25 U.S. health experts for Research! America's Society for Global Health Research. This is a national advocacy group to promote greater investment in research that disproportionately affects the world's poorest nations.

New faculty pursuing and publishing high-impact studies

Assistant Professor Jan Mrázek, Associate Professor Joy Doran-Peterson and Associate Professor Eric Stabb continue to excel in their emerging research. The three are performing and publishing noteworthy studies on comparative analyses of microbial genomes, on biomass conversion processes, and on mechanisms underlying natural bacterial-animal interactions, respectively.



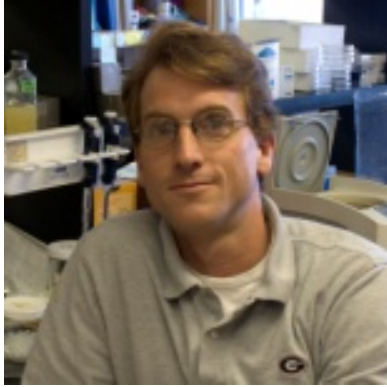
Jan Mrázek's work is founded on the premise that genomes contain biologically significant information that extends well beyond that encoded in the genes themselves. He published a manuscript (November 2008) in the *Journal of Molecular Evolution* describing new roles of simple sequence repeats within DNA. These difficult to identify sequences are stretches of repeating DNA units that can only be uncovered by bioinformatic approaches. Intriguingly, Jan has uncovered different types of repeating units that are correlated to that organisms physiological niche. The work has implications both in the phenomena of phase variations in bacteria as well as antigenic variation of pathogens. For example, the work is

expected to help explain the curious genome reduction that pathogens undergo in adapting to an obligate pathogenic lifestyle. Much of Jan's work involves development of new computational methods (i.e. algorithm and software development) to analyze genomes. Another recent manuscript of Jan's (in *Bioinformatics*, April 2008) describes a novel approach to rapidly identify important areas within DNA sequences dispersed in bacterial genomes. Identifying these motifs will allow researchers an easier way to predict physiological functions within the myriad of DNA sequences that are becoming available.



Joy Doran-Peterson directs a very active group of students, and she is also Director of the Biofuels, Biopower and Biomaterials Initiative at UGA. Her lab has been studying microbial liquid fuels production from a variety of biomass substrates. The extremely timely research areas involving optimization/conversion of agricultural and forestry residues into more tractable substrates (i.e. sugars) and then improving the fermentation processes using these sugars as substrates for fuel production are among current efforts in her lab. A recent breakthrough in her lab involves improved technology featuring a rapid, yet mild and acid-free treatment procedure that increases the amount of simple sugars released from plant-

derived waste by at least 10-fold. Such sugars can then be converted to ethanol for example, by microbial enzymes or whole cells. UGARF technology manager Gennaro Gama says the new technology has unique commercial application for the biomass industry, especially for the producers of sugarcane, corn switchgrass and other woody biomass crops. The technology is licensed by the UGA Research Foundation, and a recent review of some of Joy's work is in the *Annals of the New York Acad Sci.* 2008 March.



Eric Stabb conducts basic research on model systems to uncover how beneficial bacteria interact with their hosts. Such research will permit an understanding of human microbiota, the evolution of animal-bacterial systems, and the response of host cells (such as immune responses) to partners and invaders. The current system under study in Eric's lab involves the light organ symbiosis between the bacterium *Vibrio fischeri* and the Hawaiian squid. A recent key manuscript in the *Journal of Bacteriology* (February 2009) by graduate student Dawn Adin and others (from Eric's lab) describes the mechanism by which the bacterium releases cell wall molecules (peptidoglycan products) into the host, such that profound host cell changes (morphogenesis) occurs. In this way the host recognizes the beneficial bacterium. It was known that cell wall components from pathogens can cause developmental changes of host cells, but the new work aids our understanding of host cell-bacterial interactions in a beneficial system (i.e. symbiosis). The high degree of specificity of the squid/*Vibrio* association may also be explained at the level of the cell wall molecule (peptidoglycan monomers) release into the host. The impact of the work is such that a special "commentary article" was published as a companion to the work in *J. Bacteriology* to highlight the findings.

Non-academic career options explored by Microbiology graduate students



On May 2, 2008, a 2002 alumnus from Dr. Whitman's lab, Kamyar Farahi, volunteered to return to Athens and give an informal career seminar to current graduate students exploring alternative options to an academic career path. With a pizza slice in one hand and a pointer in the other, Dr. Farahi discussed life working in industry. Although Dr. Farahi works for Johnson & Johnson's Centocor Ortho Biotech, an Immunology/Oncology focused Biotech Company, he gave excellent perspective as to the benefits and drawbacks in large versus small companies and academia versus industry, as well as on the various positions available within the biotech and pharmaceutical fields (e.g. Medical Affairs, Research and

Developmental, Business, Regulatory).

The first half of the talk covered standards and processes in the work setting, how to present science discoveries, and paths to career progression. Under this open discussion environment, several students requested more detail on securing a job outside academia that included turning a CV into a resume, tips on applying and obtaining an interview in this competitive market, as well as recommendations on honing ones interviewing skills. It is a concern that graduate students oftentimes receive only an "academic jobs perspective", as that is the area known by their mentors. Importantly, Kamyar spoke candidly, with both poise and humor, to the delight and benefit of the attendees; the success of this exchange has prompted graduate students to seek out similar speakers to come to Athens (any volunteers?) for the next year that can broaden the scope of post-graduate career paths.

UGA and CDC Microbiologists collaborate to address human infectious disease threats

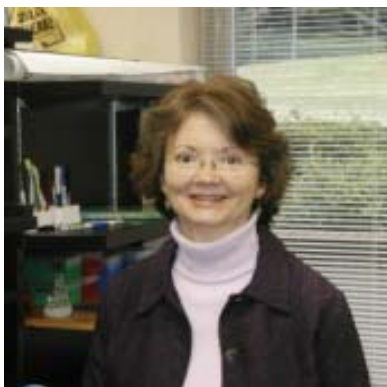


The University of Georgia and the Centers for Disease Control and Prevention are beginning a new collaboration focusing on understanding and controlling microbe-based threats to human health. The complementary strengths of the two institutions are viewed as a prime opportunity to both collaborate as well as to make basic and applied science advancements. Scientists from the two institutions will conduct joint studies on rabies, malaria, tick-borne diseases, avian influenza and measles. In a recent UGA News Release, Duncan Krause, Director of the UGA Faculty of Infectious Diseases said “In a growing trend nationally, infectious disease research is encompassing human, animal and ecosystem health collectively in order to better control the growing threat of emerging diseases. This initiative with CDC will serve in particular to promote research and graduate training at the interface of public health, veterinary medicine, and ecology.” Twenty-one UGA-CDC proposals competed recently for research funding (per grant) of \$50,000 per year for two years. The review process was administered by Dr. Krause and awards were made to projects demonstrating the greatest scientific merit, potential to enhance UGA-CDC collaborative interactions and that showed promise for future funding support.

Faculty awards and recognitions



Wendy Dustman received the “Outstanding Undergraduate Academic Advisor Award” from the Vice-President for Instruction. The award announcement noted the high impact Wendy has on students even after their graduation. She encourages student involvement in microbiology outside of the departmental Microbiology course work. For example, it was noted that she helped establish a UGA student chapter of the American Society for Microbiology.



Anna Karls was awarded a Sandy Beaver teaching award that acknowledges outstanding teaching within the Franklin College. She also was awarded a new NIH grant to work on prophage-associated virulence factors in pathogenic *Neisseria* species.



Juergen Wiegel received the prestigious Bergeys Award for achievement in Bacteriology; this award is given to one internationally recognized microbiologist annually. He also became a Distinguished Research Professor at UGA, one of the highest honors exemplifying sustained research achievements at the university.



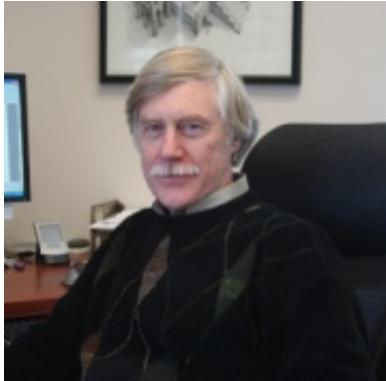
Tim Hoover received a new NIH award to study flagellar gene regulation in *Helicobacter pylori*. Also, previously (in 2007) he had received an Outstanding Undergraduate Advisor Award. Nevertheless, he finds time to seek out a few trout on the Chatooga River.



Duncan Krause was elected an Alternate Councilor for ASM Division G, and his large NIH award on *Mycoplasma pneumoniae* gliding motility was competitively renewed for five more years.



The Department of Microbiology received an Embracing Diversity Award from the Office of Institutional Diversity. Eric Stabb accepted the award at a fall 2008 ceremony.



Harry Dailey and the Biomedical and Health Sciences Institute received a CURO departmental excellence in undergraduate research mentoring award.

Student awards and recognitions

Noha Mesbah of the Wiegel lab received several competitive awards and honors. She received the Dr. William “Jack” and Jane Payne Fellowship in Microbiology. This departmental award recognizes excellence in research, teaching and service. Also for her research accomplishments, she received the Robert Anderson Memorial Award from the Vice President for Research Office (the award is sponsored by the University of Georgia Research Foundation). Noha’s remarkable success in her research is exemplified by three peer-reviewed publications (two first authorships), an invited talk at an international meeting, and three peer-reviewed book chapters. She was awarded a Dissertation Completion Award from the Graduate School for her final year at UGA and she successfully applied for a Sigma Xi Grant-in-Aid of Research and a 2-year National Science Foundation grant to conduct her research. Noha also served as an MGSA officer.

Adrienne Cottrell received the 2008 Graduate School Diversity Award. This award recognizes the outstanding efforts of graduate students to achieve and sustain diversity and inclusion within the university community.

Congratulations are in order for **Alecia Septer**, who received a three-year National Defense Science and Engineering Graduate (NDSEG) Fellowship. The NDSEG Fellowship is sponsored and funded by the Department of Defense (DoD) through their various research wings. Alecia’s application was chosen for support by the Army Research Office (ARO). The American Society for Engineering Education (ASEE) administers the NDSEG Fellowship.

Chris Reisch is one of only 16 graduate students chosen to participate in the international summer course “Microbial Oceanography: Genomes to Biomes,” which is sponsored by the Agouron Institute and is based at the University of Hawaii. The course will explore the dynamic and fundamental role marine microbes play in shaping ocean ecology and global biogeochemistry.

Caran Cagle was awarded a Graduate School Teaching Seminar Assistantship for Fall 2008.

Sarah Craven and **Charles Rosenberg** were selected to participate in the 2008 Graduate School Emerging Leaders Program.

Poonam R. Patel, an undergraduate student conducting research in Dr. Ellen Neidle's lab received an Undergraduate Research Fellowship from the American Society for Microbiology. As part of the award, she will be presenting her research at the General ASM meeting in Philadelphia this May. Poonam is a joint Microbiology and Biochemistry major.

Pat Bates, Administrative Associate in Microbiology, received a 2008 Staff Excellence Award from the Franklin College. Only a few such awards are given annually, and Dean Garnett Stokes acknowledged Pat's outstanding devotion to departmental service in an awards ceremony in May. This award caps 30 years of dedicated service to UGA by Pat, who is retiring on February 27, 2009.

Teaching award 2008

In 2008 **Caran Cagle** received the Outstanding TA Award.

Travel awards 2008

Kate Brandon, Caran Cagle, Alecia Septer, Noha Mesbah and **Megan Patch** received ASM travel grants to attend the 2008 General Meeting in Boston.

Jason Cloward, How-Yi Chang, and **Sue Hennigan** (all in the Krause lab) received travel awards to attend the 17th Congress of the International Organization for Mycoplasmaology this past summer in Tianjin, China.

Noha Mesbah, Elizabeth Burgess and **Sarah Craven** received travel awards from the Graduate School to attend the ASM meeting in June.

Donors are welcome to give to the Microbiology Department Fund. Such funds will be used to support all aspects of our department at the University of Georgia.

Contributions can be made by check payable to The Arch Foundation and sent directly to: Nancy Perkins, The University of Georgia, Department of Microbiology, 527 Biological Sciences Building, Athens, GA 30602-2605.

For more information on other opportunities for giving to the department please contact Nancy Perkins nancydh@uga.edu or 706-542-2677.

If you have newsworthy or updated contact information please do so on the form provided and mail to: Nancy Perkins, The University of Georgia, Department of Microbiology, 527 Biological Sciences Building, Athens, GA 30602-2605.

Receive the Capsule Newsletter

Please provide the following information to receive the CAPSULE NEWSLETTER.

Name: _____

Address: _____

Phone: _____

Email address: _____

Please provide updated information for Alumni status.

How would you like to receive the CAPSULE NEWSLETTER?

_____ Email

_____ Mail

_____ Online