
UGA CAPSULE

DEPARTMENT OF MICROBIOLOGY ALUMNI NEWSLETTER

New Large Microbiology Research Grants Focus on Plasmids, Life on the Edge, and on Biodefense



Anne Summers is the team leader of a new NSF-supported study on plasmids as agents of genetic transfer to create biodiversity important to agriculture and to ecology. Plasmids enable ongoing evolution of bacteria and other organisms via horizontal gene transfer, yet they are understudied. Anne notes “this is the first major grant awarded by any federal agency specifically for genomic studies of these ubiquitous mobile genetic elements”. The project addresses plasmids isolated directly from freshly-obtained and carefully-preserved bacteria and archaeobacteria, and the approach was made possible by development (in Annes lab) of rapid and inexpensive methods for purifying DNA from isolated large plasmids. The project will use plasmids obtained from a wide variety of sources, thus the project involves other Microbiology faculty including Tim Hoover, Jan Mrázek, Joy Peterson, Barny Whitman, and Juergen Wiegel. Some (UGA) labs within other departments will also participate.



Juergen Wiegel obtained strong external support to study bacteria that live on the very edge of conditions suitable for life—termed the extremophiles. Some of these bacteria cope with multiple high stress conditions of salt, alkali, and temperature. How these novel organisms survive or even generate maintenance energy under such conditions is a mystery, and is being addressed by the Wiegel lab. The work is supported by the Air Force Office of Scientific Research. Juergen also received an NSF grant to study *Natronanaerobium alkaliphilum* a member of the anaerobic halo-alkalithermophiles. The novel bacterium was isolated by Noha Mesbah, a graduate student studying in the Wiegel lab. The anticipated new bioenergetic principles underlying survival in such extreme conditions are of keen interest to diversity and to harsh environment survival.



Mark Schell was awarded two, three year contracts to study *Burkholderia/Ralstonia* from biodefense perspectives. These are multi-investigator projects of immediate concern to US defense and biosecurity.

One project focuses on environmental regulation of virulence gene expression of the dangerous human pathogens *Burkholderia mallei* and *B. pseudomallei*, funded by the Department of Defense. Only a handful of labs worldwide are approved to carry out *Burkholderia* research. The other contract focuses on development of rapid and sensitive detection methods for *Ralstonia solanacearum* strains that are a threat to U.S. agriculture. Mark was also awarded an NIH grant to begin to study secreted *Burkholderia* virulence factors.

In another defense-related project, The Army Research Office recently awarded Eric Stabb a grant on inhibitors of bacterial communication (quorum sensing) processes. If bacterial communication can be disrupted, many detrimental processes ranging from biofouling to human diseases could be thwarted.



2007 Faculty Awards and Recognitions



Tim Hoover was honored at a Faculty Recognition Banquet for receiving the 2007 Outstanding Undergraduate Academic Advisor Award. This award is for exemplary dedication in assisting undergraduate students with course advising, career decisions, and general guidance. Only one such award is given annually. Tim also received an Undergraduate Research Mentoring Award for his commitment to involve and support undergraduate students in research projects.



Jan Mrázek received the Oak Ridge Association of Universities Ralph Powe Junior Faculty Award. The award is designed to enrich research and professional growth of young faculty. Jan will use the award money for software development to facilitate interpreting the wealth of new prokaryotic genome information becoming available. A long term goal is to create a comprehensive database of

functional DNA motifs for researchers. Jan was also given a matching amount for his research from the Vice for Research Office at UGA. These awards were presented by Associate Vice President for Research Regina A. Smith during the Microbiology Department graduation ceremony on May 11.



Anna Karls and Joy Doran Peterson will serve as ASM Division Officers. Anna will Chair the Genetics and Molecular Biology Division this year, and Joy (as current Chair-elect) will Chair the Fermentation and Biotechnology Division in 2008.

Juergen Wiegel (together with Mark Farmer of the Cell Biology Department) received a teaching award for their Freshman seminar course on the Origins of Life. This was one of only three courses selected for recognition (university-wide) of the more than 100 freshman seminar courses taught.

Three Microbiology Professors Elected Fellows of AAAS

The American Association for the Advancement of Science elected Larry Shimkets, Barny Whitman, and Juergen Wiegel as Fellows, an honor based on meritorious efforts to advance their



scientific discipline. Fellows are elected based on a sustained record of achievement, and two of these Microbiology professors began their academic careers as Assistant Professors at UGA, while one (Juergen) began here as an Associate Professor. Larry was recognized for his broad contributions to bacterial physiology, and particularly for deciphering regulation and development processes of myxobacteria. Barny was honored for his distinct contributions to both methane-producing bacteria and to bacterial systematics and classifications, and Juergen for his distinguished contributions to ecology and biotechnology, especially for discoveries of unique bacteria and their (also unique) metabolism. Although these professors are internationally-acclaimed for their basic work on these bacteria and associated metabolic processes, the on-going work in all three professors labs has profound implications for advancing commercial applications based on bacterial metabolism; timely fields such as bioremediation, antibiotic and fuels production, and biofilm

prevention are some of the areas impacted.

A Symposium to Honor Professor Ljungdahl



Early in March scientists from around the world gathered at UGA to discuss alternative fuels production focusing on the key roles of anaerobes, and to honor the career of Professor Lars J. Ljungdahl of the Biochemistry and Molecular Biology Department. Lars recently celebrated his 80th birthday, and had worked at UGA for more than 40 years; he had an adjunct appointment in Microbiology and was an undaunted champion of microbiology research at UGA. His sterling career was noted and prominently recognized in sessions ranging from cellulose degradation to fuel conversion mechanisms. Still, the symposium was focused on the state of the art of the science, as Lars requested. The two-day conference consisted of 23 plenary talks and a poster session, and finally a gala banquet with many of Lars' collaborators and associates honoring him. The conference "Incredible Anaerobes: From Physiology to Genomics to Fuels" was organized by Profs. J. Wiegel, M.W. Adams, and R. Maier. A book on this topic based on the sessions will be published by the Annals of the New York Academy of Sciences.

Student Awards in the Past Year

Emily Henriksen received a Graduate School Excellence in Teaching Award.

The Excellence in Teaching Award is given to no more than five recipients

annually from among approximately 600 graduate student assistants. This is Emily's second teaching award, as she previously received an Outstanding Teaching Assistant Award.

Todd Smith received an Outstanding Teaching Assistant Award for his many contributions and dedication as a Microbiology teaching assistant.

Chandra Carpenter received an Outstanding Teaching Assistant Award for her excellent work as a Biology teaching assistant. Also, Chandra is one of 15 outstanding TA's (university-wide) selected this year to participate in the TA mentor program.

Pamela Bonner was recently honored at the Annual Research Awards Banquet for receiving the Graduate Student Excellence in Research Award this year. She was selected as the sole student in the Life Sciences to receive this award, due to her outstanding accomplishments (seven publications from her thesis work, for example) on signal transduction/development processes in *Myxococcus xanthus*. She received many other awards during her time at UGA and is now pursuing postdoctoral work at Indiana University.

Erinn Howard received the inaugural Dr. William "Jack" and Jane Payne Fellowship in Microbiology. This award acknowledged Erinn's contributions to research, teaching and service to the scientific community. Erinn's accomplishments include being first author on a Science paper in 2006, doing an excellent job as a TA in Marine Sciences and Biology laboratories and as an undergraduate research mentor. Erinn serves as an assistant editor for

the magazine of the Association for Women in Science (AWIS), she has served as a GSA representative, and she serves as a volunteer for Recording for the Blind and Dyslexic.

Stephanie Bose received the 2006 Dr. Joy Porter Williams Fellowship in Microbiology, which included a monetary prize. Stephanie has an outstanding record as a teacher. She received recognition for her teaching portfolio, and she previously received an Outstanding TA Award. This semester she has been teaching at the Gwinnett University Center. Her research has resulted in numerous publications, and she helped with the Georgia Science and Engineering Fair, and volunteered to help with the CURO (undergraduate research) program.

Also, congratulations to:

Brian Higgins and Chandra Carpenter in Anna Karl's lab for their receipt of the Outstanding Paper Award from the UGA Chapter of Sigma Xi. Their winning paper was: Brian P. Higgins, Chandra D. Carpenter, and Anna C. Karls. Chromosomal context directs high-frequency precise excision of IS492 in *Pseudoalteromonas atlantica*. 2007. PNAS **104**:1901-1906.

Chandra Carpenter and Noha Mesbah. These two Microbiology graduate students received Dissertation Completion Awards from the Graduate School for 2007-2008. These highly competitive completion awards provide support for the students final year of dissertation research.

Make a Gift to the Department

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 Humphries, 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 Humphries 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: Pat Bates, The University of Georgia, Department of Microbiology, 527 Biological Sciences Building, Athens, GA 30602-2605.

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