

HIGHLIGHTS FROM THE BIOTECH CENTER

April-May 2009

Faculty Activities and Accomplishments

The Biotech Center proudly reports that member Lily Young was the recipient of the 2009 Waksman Award from the Theobald Smith Society, the NJ Branch of the American Society for Microbiology. The award is given in recognition of outstanding lifelong accomplishments in the field of microbiology. Dr. Young gave the Waksman Honorary Lecture on “Microbes, Methane, and Mud,” at the Society’s meeting held May 6 on the Cook Campus. At SEBS, Dr. Young has served as Associate Dean for Graduate Programs for the School (1999-2003), Chair of the Dept. Environmental Sciences (2001-2008), and is currently Dean of International Programs. Past activities include many advisory, oversight and program committees for NSF, EPA, NIEHS and the NAS/NRC. She and her colleagues have authored more than 100 articles and book chapters on biodegradation of environmental contaminants. Her research focuses on the role of environmental micro-organisms in anaerobic biodegradation of contaminant chemicals and mineral transformation.

At the request of USDA-APHIS-PPQ, Assistant Research Professor Rong Di has developed a Plant Biosecurity Certificate Program to train students with skills (including molecular technologies) needed in the U.S. plant quarantine system. On April 20, the SEBS Curriculum Committee formally approved the new Certificate Program. As part of that program, the Committee approved the new course that Dr. Di has developed and taught this spring: “Plant Biosecurity Issues and Technologies.” A second course was also approved, “Fundamentals of Pest Risk Analysis,” that will be taught by a USDA-APHIS-PPQ scientist at North Carolina State University every other fall and video-conferenced to Rutgers students with Dr. Di acting as the moderator. To receive the Certificate, students must complete 25 credits from a roster of 6 required courses and 6 electives. Three students (seniors) in Dr. Di’s first class have already completed the requirements and will receive a Plant Biosecurity Certificate.

USDA-APHIS-PPQ scientists participated in teaching the first semester of Dr. Di’s new course on “Plant Biosecurity Issues and Technologies” at SEBS this spring: Dr. Laurene Levy, Director and Plant Pathologist, and Dr. Mark Nakhla, Plant Pathologist from National Plant Germplasm and Biotechnology Laboratory (NPGBL)/Beltsville, MD, taught molecular detection of plant viruses. Dr. Clarissa Maroon-Lango, Lead Plant pathologist, Plant Germplasm Quarantine Program/ Beltsville, MD, taught immuno-detection techniques for plant pathogens. Dr. Terrence Walters, Identification Technology Program Coordinator/Fort Collins, CO, taught Lucid Matrix Keys for pest identification.

The Global Institute for Bio-Exploration (GIBEX), based at Rutgers, hosted Dr. David Gammon, Associate Professor of Organic Chemistry and Senior Associate of GIBEX-Africa at the University of Cape Town (UCT), South Africa, from April 27-29, 2009. Dr. Gammon is taking over as Chief Coordinator of GIBEX-Africa in January 2010 from the founding Chief Coordinator Prof. Kelly Chibale (also based at UCT). Dr. Gammon met with the GIBEX group

to discuss GIBEX activities in the U.S. and Africa. He toured Ilya Raskin's laboratory, where some of the STN innovations are being developed for transfer to GIBEX partners around the world. Dr. Gammon plans to expand GIBEX-Africa activities through collaborations with UCT faculty in the bio-conservation disciplines. This will open opportunities for exploring the biodiversity around Cape Town and beyond for biotherapeutic properties using the STN technology. He will also promote collaboration with strategically selected universities in Africa. On April 29, Dr. Gammon presented a seminar on "The evolution of natural products chemistry: Reflections on explorations of molecular diversity in South African plants and microbes."

Student Activities and Accomplishments

Graduate Assistant Amita Oka defended her Ph.D. thesis April 2. The title of her thesis is "Anaerobic benzene degradation in culture and hydrocarbon degradation in the subsurface environment." Amita works in the Biotech Center lab of her advisor Lily Young.

Graduate Assistant Laura Youngster in the Microbiology and Molecular Genetics Program defended her Ph.D. Thesis on May 4th. Her thesis is titled "Microbial degradation of the fuel oxygenate methyl tert-butyl ether (MTBE)." Max Häggblom is her advisor.

Lily Young, Max Haggblom, and Gerben Zylstra coordinated a symposium with a visiting graduate student group from the Department of Microbiology at Wageningen University in The Netherlands on May 20. The group of over 20 graduate students were visiting several universities on the east coast and chose Rutgers due to overlapping interests in microbiology. The full day event included a poster session by Rutgers graduate students and a joint symposium with speakers drawn from both universities.

Graduate students Aramis Villafane and Maryam Honarkhbash (Bini lab) presented posters at the meeting of the Theobald Smith Society on May 6, and also at the Joint Graduate Students Symposium (Rutgers-Wageningen) on April 20.

A delegation from the University of Sao Paulo (USP) in Brazil arrived in late April for the annual undergraduate student exchange visit between USP and Rutgers. Three undergraduate students, one faculty member, and a staff person spent four days at Rutgers April 22 to 25. The students presented posters at the Aresty Research Symposium and participated in Ag Field Day on the Cook College Campus. Their visit was coordinated by Lily Young and Gerben Zylstra.

Undergraduate Virian Serei defended her George H. Cook Honors Thesis April 21 and presented her research poster at the Aresty Undergraduate Research Symposium, the SEBS Research Symposium, and the American Society for Microbiology annual meeting in Philadelphia May 17 to 21. She won the Scientific Communication Award for her poster at the SEBS research symposium. Virian also won the Biotech Curriculum Award for Academic Excellence, and the Biotech Curriculum Award for Outstanding Service and Leadership. Virian is a graduating senior in Gerben Zylstra's laboratory.

Undergraduate Matthew Bruno (Young lab) completed his Cook Honors Thesis and made a poster presentation at the Aresty Undergraduate Research Symposium. At graduation, Matt also

received the Finstein Award for the Outstanding Student in Environmental Sciences, which includes a prize of \$500.

Nathalie Sanchez (Bagnell lab), a third year undergraduate Animal Sciences major, won first prize at the NJAES Science Communication Undergraduate Competition for her poster entitled “Factors in Milk are Important for Induction of Estrogen Receptor Alpha in the Neonatal Porcine Heart”.

Animal Science/ Biotechnology double major, Mike Strug (Bagnell lab), completed his GH Cook Honors Thesis, presented a talk at the Aresty Undergraduate Research Symposium and will present his research at the Annual Society for the Study of Reproduction Meetings in Pittsburgh from July 18-22. Mike was a top graduating senior in both of his majors receiving the Animal Sciences Endowed Award for Excellence in Academics and Research and the Biotechnology Curriculum Award for Academic Excellence.

Undergraduate students Jennifer McConnell (Microbiology) and Francis Ortega (Microbiology/Biotechnology) completed their Cook Honors Theses, and presented posters at the Aresty Research Symposium. They both work in Dr. Bagnell’s lab.

Also presenting posters at the Aresty Undergraduate Research Symposium were Puja Patel (Bini lab), Maria Montano (Tumer lab), and Shravan Dave (Young lab).

Grants and Fundraising Efforts

The Bill & Melinda Gates Foundation awarded Eric Lam a Grand Challenge Explorations Initiative grant of \$100,000 for his project "Transgenic tomato for delivery of RNAi therapeutics". This one year project is an exploratory grant to critically examine the feasibility of using transgenic tomatoes as an economical oral delivery route for RNAi therapeutics targeting important human viral pathogens. The award of this phase I proposal is required for eligibility to apply for a phase II project after 9 months from the Foundation. A press release about Dr. Lam’s award and two other Gates-supported projects (including Ilya Raskin’s project on malaria) can be found at: <http://news.rutgers.edu/medrel/research/gates-foundation-aid-20090430>.

Nilgun Tumer and her collaborator Barth Grant (Molecular Biology & Biochemistry) were recipients of an NIH ARRA award in May. Their research focuses on “C. elegans as a model for ricin intoxication.” The two-year project was funded at \$417,054.

Michael Lawton and Nilgun Tumer both received awards from USDA in April as part of the Wheat and Barley Scab Program. Dr. Lawton received \$48,200 for research on a rapid assay system for transgenes that confer resistance to Fusarium head blight. Dr. Tumer was awarded \$45,527 for a project entitled "A genome wide screen to identify novel genes for Fusarium head blight resistance." Both grants are renewals of projects that have been on-going for several years.

Elisabetta Bini was notified in April that her proposal to the NJ Water Resources Research Institute (NJWRRI) was funded at \$30,000. Her research will focus on antibiotic pollution of

aquatic habitats and impact on the development of environmental pools of resistance in natural microbial communities.

A 3-year project that Elisabetta Bini is conducting in collaboration with Costa Vetriani (PI) of the IMCS was recently funded by NSF at \$373,721. They will study the transcriptional response of the deep-sea vent epsilonproteobacterium *Caminibacter mediatlanticus* to changing environmental conditions.

Conferences, Seminars, and Other Events

A wide-ranging symposium was presented at SEBS May 27-28 on the “New Biology of Environment and Health.” Nine outstanding external speakers in the areas of health, environment, and energy spoke about how systems-wide analysis of biology is revolutionizing our ability to understand how these fields interact. Speakers included Rita Colwell (Canon US Life Sciences), Robert Strausberg (Craig Venter Institute), Ron Mazumder (Merck), Janet Jansson (Lawrence Berkeley National Lab), Colleen Cavanaugh (Harvard), Roger Beachy (Danforth Plant Science Center), Christoph Benning (Michigan State), Tom Jeffries (USDA Forest Products Lab), and Martin Keller (Oak Ridge National Lab). Program details can be found at: <http://biotech.rutgers.edu/envhealthsymposium/index.html>. The symposium was sponsored by contributions from Rutgers central administration, SEBS, the Biotech Center, the Department of Biochemistry and Microbiology, and the Waksman Institute. Members of the symposium coordinating committee were Max Häggblom, Eric Lam, Wendie Cohick, and Ilya Raskin.

The meeting of the American Society for Microbiology (ASM), held May 17-21 in Philadelphia, PA, was attended by many Biotech Center members and their lab groups. Faculty attending were Max Häggblom, Lily Young, Gerben Zylstra, and Elisabetta Bini. Dr. Bini gave an invited lecture May 18 on “Archaeal interactions with copper at extreme temperatures.” Presenting posters from the Young lab were Postdoc Abigail Porter and graduate students Amita Oka and Adam Mumford; presenting from the Zylstra lab were research assistant Hung-Kuang Chang, graduate student Elyse Rodgers-Vieira, and undergraduate Virian Serei. Members of the Häggblom lab also presented.

Professor Lily Young served on an NSF review panel for the Chemical Biological and Environmental Technologies program in the Engineering division. The panel met May 4-5 in Washington, D.C.

Michael Lawton and Eric Lam were invited speakers at the Brazilian Plant Molecular Genetics Symposium in early April. Dr. Lawton gave a talk on the application of the *Physcomitrella patens* system as a pipeline for testing plant genes and chemicals involved in fungal resistance. Dr. Lam gave a talk on deciphering the epigenetic regulator network in *Arabidopsis*. The meeting was held from March 31st to April 3rd and took place in Rio de Janeiro, Brazil.

Rutgers Day April 25 brought a good turnout from faculty, staff, and students. Postdoc Gili Joseph presented 3 demonstrations of GIBEX assays of plant extracts with potential pharmaceutical value. Graduate student Adam Mumford (Young lab) prepared and presented a summary poster of microbiology activities in the Biotech Center. Slavik Dushenkov, Associate

Director of GIBEX, greeted visitors in his costume from Uzbekistan and promoted international eco-tours through a new agency called IBEX. Additional posters were prepared by faculty and staff on various Biotech Center programs. Staffers Karen Yudin and Judy Snow coordinated Biotech Center participation and took part in the day's activities.