



PHOTO BY JOHN T. CONSOLI

UM Inks Formal Partnership with National Cancer Institute

Maryland researchers to collaborate with government disease experts

How do cancer cells migrate from one organ to another? Why do certain cells become malignant? And how can drug treatments identify new cancer growths?

These questions demand science that extends beyond traditional cell biology, and University of Maryland researchers with sought-after expertise in physics, math, computer science and engineering hope to provide answers through a new partnership with the National Cancer Institute, or NCI, part of the National Institutes of Health.

An agreement, to be signed at the university on May 19, will establish a **Collaborative Research and Graduate Partnership Program in Cancer Technology** between Maryland and the Center for Cancer Research at the NCI. The program, only the second of its kind affiliated with the NCI, will send Maryland graduate students to the NCI laboratories in Bethesda, Md., for training and will provide for professional and academic exchanges between university faculty and NCI researchers.



PHOTO BY PRAKASH PATEL

Maryland graduate students, such as those shown in top photo, will train with cell biologists and cancer experts at the National Cancer Institute. The university's sophisticated nanofabrication laboratories, shown above, will complement the cancer research facilities at the NCI.

"This partnership is a perfect fit with our strategic vision of working directly with federal experts to take on national priorities in science and public health," says **Mel Bernstein**, vice president for research at Maryland.

Maryland researchers expect to help the NCI do a quantitative analysis of the large amounts of raw data now available due to rapid-fire advances in genomics and cell imaging. These researchers include UM experts in statistical mechanics, chaos theory and nonlinear dynamics developing models that assist federal scientists as they look at healthy and cancerous cells.

"We can now see much more of what's going on, but we need the models in physics and math to understand *what* it is we are looking at," says **Wolfgang Losert**, an associate professor of physics at UM who will serve as director of the collaborative cancer technology program.

Losert, an expert in cell elasticity and cell migration, laid

the groundwork for the formal partnership, organizing a series of annual workshops starting in 2006 that encouraged Maryland researchers in physics, math and biology to meet and discuss the latest in cancer research.

The Division of Research also assisted by developing strong ties with the NCI leadership and inviting federal cancer experts to campus to collaborate with Maryland faculty.

"The NCI became aware of our strengths, particularly in physics, engineering and computational biology, and felt a formal partnership like this could open new doors of discovery," says **Ken Gertz**, associate vice president for research development.

Andrew Baden, professor and chair of physics at Maryland, and his team will continue their research in the relatively new field of biophysics, which uses concepts like complexity theory, chaos theory and single cell physics to identify how certain cells interact. One example, he says, might be investigating the elasticity of cells—how they "push" against other cells or bond together—to better understand how cancerous cells migrate from one part of the body to another.

Other collaborative efforts between Maryland faculty and the NCI researchers will involve genomics and gene sequencing; Maryland computational biologists will help the federal scientists pinpoint genetic markers that might predict why certain cells become malignant.

Steven Salzberg, director of the university's Center for Bioinformatics and Computational Biology, says his research group excels at analyzing the data from new sequencing technologies in use at the NCI.

"You need to do computational analysis to figure out which genes are turned on and which are turned off, and how much they are turned on," Salzberg explains. "These are very specialized algorithms that my group develops—very few places in the world do this kind of work."

Maryland faculty will also lend expertise in bioengineering and nanotechnology, using the university's sophisticated nanofabrication laboratories to expand knowledge in areas like targeted drug delivery and micro-photonics that can be used in cell imaging.

"We're developing a targeted means of drug delivery that brings drugs to kill cancer cells and delivers contrasting agents that can help identify any new cancer growths," says **William Bentley**, chair of the Fischell Department of Bioengineering.

Bentley echoes other Maryland researchers in saying that he welcomes the opportunity not only to interact with a world-class research facility like the NCI, but also to have an impact on cancer.

"Our bread and butter is research," he says. "But if you can get to a point where you can translate that research into a new treatment, then that is tremendous."

Seed Grant Winners Announced

The effect of smoking on women's health, new ways to study brain activity in animals and a novel drug delivery system to battle childhood epilepsy are all projects recently funded by a collaborative seed grant program between the **University of Maryland** and the **University of Maryland, Baltimore**.

Now in its third year, the program provides startup funds to cross-institutional teams in hopes of increasing the number of funding proposals submitted to the National Institutes of Health.

The goal is to encourage collaboration and develop proof of concepts that will position these teams for success.

From 53 proposals submitted, seven were chosen to split almost \$500,000 in seed funding. At College Park, proposals came from eight schools and colleges.

This year's funded proposals and PIs are:

Elbert Glover from UM and **Rebecca Brotman** from UMB are collecting data on the effects of cigarette smoking and its relationship to bacterial vaginosis.

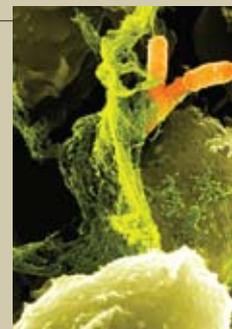


ISTOCK

Patrick Kanold from UM and **Joseph Kao** from UMB will study the brain circuitry of live animals using an inert molecule coupled with new imaging technology able to provide single-cell resolution.

John Fisher from UM and **Elizabeth Powell** from UMB will refine a bioengineered drug delivery system to transport hepatocytes, a cell from liver tissue that shows promise against pediatric epilepsy or autism.

Doron Levy from UM and **Jakub Simon**, M.D. from UMB are designing mathematical models that can assist in a vaccine for *Shigella* bacteria, which kills an estimated 4 million people annually.



Vincent Lee from UM and **Patrik Bavoil** from UMB are trying to decrease the incidence of antibiotic-resistance drugs by developing new approaches to target specific virulence factors produced by bacteria.

Jose Contreras-Vidal from UM and **Larry Forester** from UMB are assessing the cortical control of gait, how we move when walking, for people using artificial limbs.



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Ian White from UM and **Amy Fulton** from UMB are developing a micro total analysis system for selective nano culture mammospheres.

We introduce you to new faculty and research scientists in the Maryland research community.



Mega Subramaniam is an assistant professor of information studies. Her research centers on emerging trends in instructional design, computing and information science education and diversity and gender in computing education.



Susan Dwyer is an associate professor of philosophy. She investigates the intersection of law, public policy and moral philosophy in areas like abortion and pornography, and does other research in moral psychology and feminist theory.



David Godes is an associate professor of marketing. Having taught for 10 years at the Harvard Business School before coming to Maryland, Godes focuses on two areas: sales management and social networks/word-of-mouth communication in marketing.



Karoline Mortensen is an assistant professor of health services administration. Her research examines the interaction between health insurance and health-care utilization, particularly by Medicaid enrollees and the uninsured.



Alexander Williams is an assistant professor with a joint appointment in linguistics and philosophy. His research interests include verb semantics, the philosophy of language, the languages of China and categorical and tree-adjoint grammars.

Encouraging Prostate Cancer Awareness

A \$1.8 million project led by a School of Public Health associate professor will examine whether churches can help African American men get informed about prostate cancer screenings.

Led by **Cheryl Holt**, the four-year study funded by the American Cancer Society will include training churchgoers in Prince George's County, Md., as "community health advisers" who can offer their peers information on the disease, seek inspiring testimony from cancer survivors and provide resources for screening and treatment options. The goal is to encourage the men to talk to their doctors and decide whether to get screened.

"We know [African American men] are more likely to get the disease and they are more likely to die from it. What we don't know are the exact reasons why they are less likely to seek early screening than some other groups," says Holt.

Last year, there were 192,280 reported cases of prostate cancer, and 27,360 deaths, with African American men showing a mortal-



Cheryl Holt will develop and study the use of spiritually themed messages to promote cancer awareness.

ity rate twice as high as other racial or ethnic groups.

Holt, a social psychologist and an expert in health communication, says peer-based health education in a church setting is "culturally appropriate," as churches are already recognized as a social network for African American men.

FACULTY AWARDS & HONORS



JUAN CARLOS QUINTERO HERENCIA, professor and chair of the Department of Spanish and Portuguese, received a John Simon Guggenheim Memorial Foundation fellowship. A recognized poet and literary critic, Quintero Herencia will use the award to devote one year to examining how poetry and the act of listening are embedded in the texts of authors living in, or passing through, the Caribbean.

Maryland researchers named to National Academy of Sciences

Geology Professor **Roberta Rudnick** and **Neil Gehrels**, a NASA scientist who is an adjunct professor of astronomy, were recently elected members of the National Academy of Sciences, or NAS, considered one of the highest scientific honors given in the United States.

Rudnick and Gehrels will be inducted next April during the academy's 147th annual meeting in Washington, D.C. They join 19 other Maryland researchers in the NAS and bring to 49 the total number of faculty who are National Academies members.

Rudnick's research focuses on the origin and evolution of the continents, particularly the lower continental crust and the underlying mantle lithosphere.

Gehrels, who is chief of the Astroparticle Physics Laboratory at the NASA Goddard Space Flight Center, is an experimental physicist known for his work in gamma-ray astronomy.



Roberta Rudnick



Neil Gehrels

MARK THE DATE:

Third Annual Celebration of Scholarship and Research

Date: Tuesday, May 11

Time: 4 to 6 p.m.

Location: Atrium, Art-Sociology Building

Sponsored by the Office of the Vice President for Research and the Provost's Office, this annual event is a celebration of the scholarly and research accomplishments of the Maryland research community.

University of Maryland/National Cancer Institute Memorandum of Understanding Signing

Date: Wednesday, May 19

Time: 3 p.m.

Location: Lobby, Main Administration Building



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Produced by University Publications for the Division of Research
Mel Bernstein, vice president for research

Executive editor: Anne Geronimo
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