



Your Health & The Environment

News from the University of Rochester Environmental Health Sciences Center

Spring 2007

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Environmental Medicine Integrated into University of Rochester's Medical School Curriculum

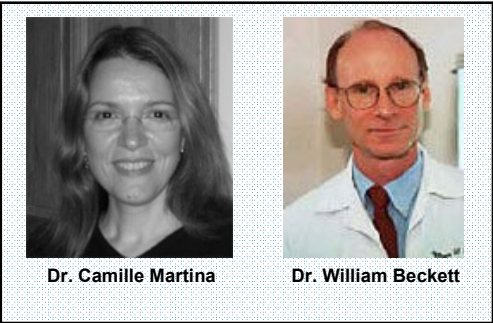
Last spring **Camille Martina, Ph.D.** and **William Beckett, M.D., MPH** were awarded an Environmental Health Sciences Center pilot grant to integrate environmental medicine curricula into the existing first and second year of University of Rochester's medical school curriculum.

This pilot project supports the Environmental Health Sciences Center's theme concerning "Environmental Agents as Modulators of Human Disease and Dysfunction," in that it "translates" the scientific knowledge of known environmental agents that can alter human bodily functions and systems, which can cause illness, to clinical education and practice. This pilot project also addresses and meets the goals of the NIEHS Strategic Plan 2006-2011, by creating an in-depth, comprehensive environmental medicine curriculum strand that informs and educates emerging health care professionals in a clinical-medical-educational context in which students learn of the causes, symptoms, diagnostic tools, medical interventions and treatments of illnesses caused by environmental agents.

The Institute of Medicine (IOM) suggested that, "as a minimum, all primary care physicians should be able to identify possible occupationally or environmentally induced conditions and make appropriate referrals for follow-up" (Institute of Medicine, 1988, p.63). Later, the Committee on Curriculum Development in Environmental Medicine (CCDEM) for the IOM again identified a need for integration of environmental health curriculum in medical schools.

Over the summer, Martina and Beckett met with School of Medicine and Dentistry first and second year course directors to discuss appropriate areas within their curriculum where environmental medicine could easily fit. The course directors supported the project goals (a) to improve medical professional competencies by increasing medical students' knowledge and awareness of their patients' exposure to environmental health risks at home and work and (b) to educate medical students in environmental medicine, so as to not misdiagnose nor overlook environmental illness in patients.

For further information or a link to the full article, please contact: Camille_Martina@urmc.rochester.edu



Dr. Camille Martina

Dr. William Beckett

Project Updates

Silica Toolbox Talks, Tools To Help You Prevent Overexposure To Silica

The Silica Toolbox Talks were developed through an alliance between the **University of Rochester's Finger Lakes Occupational Health Services** and the Occupational Safety and Health Administration's (OSHA) Buffalo and Syracuse Area Offices. The goal of the Silica Toolbox Talks is to equip contractors and their workers with tools to identify and address silica hazards at construction jobsites before these hazards adversely affect worker health.

The Silica Toolbox Talks will initially be used by contractors in the nine-county Finger Lakes region to deliver accurate health and safety information to their workers about how to prevent overexposure to silica, which can cause silicosis, a deadly lung disease. The Silica Toolbox Talks are a series of seven modules which can be delivered one at a time or all at once, depending on training needs.

For more information please contact:

University of Rochester; Finger Lakes Occupational Health Services

Telephone: (585) 274-4554 and ask for the Industrial Hygiene Department



Rats on a Road Trip: Effects of Exhaust on the Heart

In January, **Alison Elder, PhD** published a study in *Inhalation Toxicology* that connected exposure to fresh vehicle emissions that contained ultrafine particles to changes in rats' autonomic nervous systems. This research builds on a European study that found that people were more likely to have a heart attack within one hour of their morning commute via bus, car, or bicycle. Elder and her colleagues began their research with the hypothesis that rats would experience changes in heart rate that might provide clues as to why humans succumb to the effects of air pollution.

Aged, hypertensive rats rode on the New York State Thruway between Rochester and Buffalo in a mobile laboratory for six hours during this study. The rats traveled about 320 miles during the six hours and were exposed to emissions that are similar to what most motorists breathe on that same trip. During this trip, the researchers monitored the rats' blood pressure and heart rate.

The rats had a 10% decline in heart rate, which continued up to 14 hours after the road trip. There was also a 70% decrease in the vagosympathetic balance which is a measure of how the autonomic nervous system responds to change. These findings support research that is aimed at understanding why vehicle emissions, including ultrafine particles, can cause both respiratory and cardiovascular health problems.

For a copy of the article please contact Alison_Elder@urmc.rochester.edu

“The fact that exposure to air pollution can change the heart rate, independent of other factors, is a cause for concern. Air pollution is either having a direct effect on the heart in rats or is altering something within the circulatory system.”

- Alison Elder, PhD



Truck/mobile laboratory that was used in this study

Selected EHSC Faculty Publications

Ambient particulate matter directs nonclassic dendritic cell activation and a mixed TH1/TH2-like cytokine response by native CD4+ cells, [Journal of Allergy Clinical Immunology, Volume 119, No. 2, February 2007, Pages 488-497.](#)

Williams MA, Porter M, Horton M, Guo J, Roman J, Williams D, Breyse P, **Georas SN**

“Clinical implications: Inhaled APM can act directly on DCs as a danger signal to direct a proallergic pattern of innate immune activation.”

Semen quality of fertile US males in relation to their mother’s beef consumption during pregnancy Human Reproduction, [Human Reproductive Advance Access published online on March 28, 2007.](#)

Swan SH, Liu F, Oeverstreet JW, Brazil C, Skakkebaek NE

“The average sperm concentration of the men in our study went down as their mother’s beef intake went up. But this needs to be followed carefully before we can draw any conclusions.” -Shanna Swan, PhD

Concentrations of Urinary Phthalate Metabolites are Associated with Increased Waist Circumference and Insulin Resistance in Adult U.S. Males, [Environmental Health Perspectives, March 2007.](#)

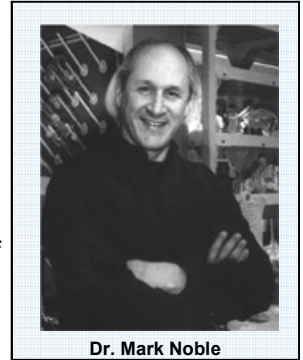
Stahlhut RW, van Wijngaarden E, Dye TD, **Cook S,** Swan SH

“Conclusions: In this national cross section of U.S. men, concentrations of several prevalent phthalate metabolites showed statistically significant correlations with abdominal obesity and insulin resistance.”

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** EHSC faculty, if you would like your publications to be featured in future newsletters, please send publication information to Kate_Kuholski@URMC.rochester.edu **

Toxicants Disrupt Critical Cell Function

Mark Noble, PhD, Zaibo Li, PhD, Tiefi Dong, PhD, and Chris Proschel, PhD are authors of a study that was published in February in the leading open-access scientific journal, [PLoS Biology](#). The work in this study establishes several new scientific principles. According to Noble, "We have discovered a previously unrecognized regulatory pathway on which chemically diverse toxicants converge to disrupt normal cell function, providing the foundation for a broadly relevant new principle in toxicology."



Dr. Mark Noble

Their research is the first to identify a common molecular mechanism that integrates the effects of environmentally relevant levels of such toxicants as methylmercury and lead with signaling pathways vital to normal cell division, differentiation and survival. Moreover, these studies also integrate the fields of toxicology and stem cell research, demonstrating that the dividing cells that give rise to the critical cell types of the brain and spinal cord are particularly vulnerable to the effects of toxicant exposure.

In this study, glial and progenitors cells (advanced-stage stem cells critical to functions of the central nervous system), were exposed to low levels of lead, mercury, and paraquat (a widely used herbicide). All of these substance shared the property of causing the accelerated degradation of receptors on the cell surface that initiate the signaling events that support cell division and survival. In this way, exposure to the toxicants turned off the signals activated by specific sets of these receptors. This caused cells to shut down and stop dividing. According to Noble, "If this disruption occurs during critical developmental periods, like fetal growth or early childhood, it can have significant impact. Development is a cumulative process and the effects of even small changes in the progenitor cell division and differentiation over multiple generations could have a substantial effect on an organism."

These findings will help support future research to understand how toxicant exposures contributes to health problems and diseases. The study will also help researchers develop a new method for the efficient new chemicals to reveal potential toxicity. This is a matter of great concern, as there are many tens of thousands of chemicals that are released into the environment but for which the toxicological potential is unknown.

[Chemically Diverse Toxicants Converge on Fyn and c-Cbl to Disrupt Precursor Cell Function](#) Li Z, Dong T, Proschel C, Noble M *PLoS Biology* Vol. 5, No. 2, e35 doi:10.1371/journal.pbio.0050035

Welcome to the Department of Environmental Medicine

Marc Adrian Williams, PhD is an Assistant Professor of Medicine and Environmental Medicine joined the department in September 2006 from The Johns Hopkins University School of Medicine Center for Allergy and Clinical Immunology. Dr. Williams is collaborating with **Dr. Steve Georas**, Chief of Pulmonary /Critical Care Unit, who also has a secondary appointment in Environmental Medicine.



Dr. Marc A. Williams

Dr. Williams' research explores how the external environment interacts with cells of the innate immune system. He has a long-standing interest in the cellular and molecular immunology of peripheral blood monocytes, peripheral and lung dendritic cells as well as tissue macrophages in fundamental and clinical immunology. Dr. Williams is particularly interested in how environmental exposures can adversely affect the appropriate responses of innate immunity, compromise protective immunity and exacerbate pulmonary diseases like asthma and chronic obstructive pulmonary disease (COPD). Work from his laboratory, including his post-docs Dr. Smruti Killeddar and Dr. Steve Bauer, has identified immunological defects in dendritic cell function attributable to cell exposure to ambient environmental and diesel exhaust particulates. He has identified that particulate matter adversely affects the functional activation of dendritic cells – the most pivotal of all antigen-presenting cells. Should pulmonary dendritic cells not function properly or interact with T cells appropriately, this may compromise protective immunity against important bacterial or viral lung infections which may likely exacerbate asthmatic conditions. Dr. Williams serves as associate editor of the international print journal *Stem Cells and Development* and is currently a member of the editorial board of the open access journal *Biomarker Insights* and former associate editor of *Discovery Medicine* Journal.

Community Outreach & Education Core

Rochester's [Healthy Home](#), a partnership between the Environmental Health Sciences Center, the SouthWest Area Neighborhood Association (SWAN), and the Rochester Fatherhood Resource Initiative, has successfully completed its first year in operation. With initial funding from a \$15,000 pilot grant from the EHSC, the Healthy Home has had over 600 visitors since it opened in June 2006.

Plans for this summer includes hosting a one year anniversary celebration and working with youth/adult teams from neighborhood block groups so they can give tours of the Healthy Home to their neighbors. These youth/adult teams as will help provide tours to roughly 300 students from SWAN's summer camps and use educational materials developed by two students from the University of Rochester's interprofessional MS, [Leadership in Health Care Systems Program](#). This program prepares future leaders as change agents with strong visionary leadership to improve population health and health care quality. The most valuable learning experiences involve field placements in the Rochester community, like the Healthy Home. Students interact with community leaders and learn first hand about health promotion, community preparedness, and community health. Graduates of the program are making a difference locally working in health care, public health, managed care, and education.

The Life Sciences Learning Center Scientist Instructor Program

In 2006, the Life Sciences Learning Center began accepting graduate students and post-doctoral fellows into 4 month, paid teaching internships. Scientist-Instructors taught classes at the LSLC and created a case study for high school students that focused on some aspect of their own research. This year's Scientist-Instructors include Shoshana Katzman (Microbiology and Immunology/Lab of Dr. Deborah Fowell), Seasson Phillips (Biochemistry/Lab of Dr. David Pearce), Erik Sampson (Orthopedics/Lab of Dr. Regis O'Keefe), Ramil Sapinoro (Microbiology and Immunology/Lab of Dr. Steven Dewhurst), and Peter Vitiello (Environmental Medicine/Lab of Dr. Michael O'Reilly). Classes coming to the LSLC have remarked on the benefits of having instructors who can discuss science as a career as well as the positive aspects of meeting "real scientists."



Ramil Sapinoro

The work of the LSLC Scientist Instructors has not been limited to the University of Rochester Medical Center. Ramil Sapinoro was asked to present his case study on AIDS vaccine development at a National Association of Biology Teachers (NABT) Northeastern Regional Workshop, "Vaccines: Pox to Pandemics," held on April 14th at the Sanofi Pasteur campus in Swiftwater, PA. Ramil's case study was well received by participating teachers and he has been invited to continue his involvement with the NABT through presenting his workshop at national conferences, as well as participating in the NABT's 4-year college/university section.

Other News

In February, **Dr. Bernard Weiss** and **Dr. Katrina Korfmacher** participated in the National Council for Science and the Environment's 7th National Conference on Science, Policy and the Environment which focused on [Integrating Environment and Human Health](#).

Dr. Bernard Weiss was recently funded for a National Institutes of Environmental Health Studies (NIEHS) for a project entitled **Developmental Neurotoxicity of Phthalate Esters**.

Dr. Shanna Swan recently started a reproductive epidemiology club. Please contact Shanna_Swan@urmc.rochester.edu for more information or to join.

Community Forums

Tom Farley's: "Healthscaping: Improving our lives by fixing our everyday world"

Tom Farley, MD, MPH, Chairman of the Department of Community Health at Tulane University in New Orleans and co-author of *Prescription for a Healthy Nation*, visited the University of Rochester in March and gave presentations on "**Healthscaping: Improving our lives by fixing our everyday world**" as part of a lecture series co-sponsored by the Pediatric Links with the Community, the Environmental Health Sciences Center, the Center for Community Health of the University of Rochester, and the Rochester Regional Community Design Center and Sector 4 Community Development Corporation.

"The main killers of our era are chronic diseases, like heart disease and cancer, and injuries, such as those caused by cars and guns," says Farley. "Medical care is just not very good at curing these problems."

He suggests taxing junk food, banning indoor smoking, building safe parks for walking and getting more healthy food choices into grocery stores. According to Dr. Farley, "In America we spend nearly twice as much for health care as any other nation. So why are we among the sickest people in the industrialized world? Something is wrong about the way we are approaching health in the United States. We don't need another health care reform plan, we need a new way to think about health."

**PRESCRIPTION
for a
HEALTHY NATION**
*A New Approach to Improving Our Lives
by Fixing Our Everyday World*



**TOM FARLEY, M.D.
and
DEBORAH A. COHEN, M.D.**

Sandra Steingraber Speaks on Chemicals and the Environment

Sandra Steingraber, PhD spoke on March 27 at the University of Rochester to an audience of community members, professors and students about how chemical pollutants have contaminated our way of life. She asserts that government regulations on chemicals such as DDT are not sufficient for public health because they do not protect the very young and very old people in our population.

Steingraber has written several books including "Living Downstream: An Ecologist looks at Cancer and the Environment" and "Having Faith: An Ecologist's Journey to Motherhood," in which she takes a highly personal approach to the impact of her surroundings on her health.

Her talk was co-sponsored by the Environmental Health Sciences Center and the Sustainability Roundtable. The Sustainability Roundtable is a group of faculty and students working to promote sustainability at the University of Rochester.

-Article excerpted from Kashika Sahay's piece in the *Campus News Times*. [Click here for a full link to the article.](#)



University –Community Partnerships: Members of the Rochester-based Breast Cancer Coalition with University of Rochester staff and guest Sandra Steingraber

*Lila Bluestone, Phyllis Connelly, Katrina Korfmacher,
Sandra Steingraber, Pat Foucht*