Issue 34

# INTERFACE: GENES AND THE ENVIRONMENT

CENTER FOR ENVIRONMENTAL GENETICS UNIVERSITY OF CINCINNATI Summer-Fall 2007

## From the Director, Dr. Shuk-mei Ho

It is an exciting time to be a research scientist at the University of Cincinnati! The 2007 Research Report states that research dollars coming in to UC and its affiliates hit an all-time high of $333.5 million. Affiliates included in UC's research-dollar total are Cincinnati Children's Hospital Medical Center, Cincinnati Department of Veterans Affairs Medical Center, Shriners Hospital for Children, Cincinnati, and clinical trials at UC Physicians. The majority of UC's research funding comes from the National Institutes of Health (NIH).

The Center for Environmental Genetics Year 17 Pilot Project Grant application process has begun (please see page 6 and our website for more details). Proposals will be accepted until March 10, 2008, either in hard copy to Kettering Lab room 112, or electronically to the CEG Program Coordinator at koprasej@uc.edu. Please note that investigators need to contact Dr. Susan Pinney, Director of the Integrative Health Sciences Core, if their proposals include human subjects.

The Pilot Project Program will support Outreach activities as well as classical laboratory and clinical research. If you are a UC faculty member with a desire to participate in Outreach activities that focus on gene-environment interactions, please stop by the CEG office at 112 Kettering Lab to discuss your ideas.

**All publications and presentations resulting from CEG support must acknowledge NIEHS P30 ES06096 The Center for Environmental Genetics**

## Learning Exchange for Genetic & Environmental Disease Solutions (LEGENDS) is now available online

LEGENDS is a program to inform the public about genetic and environmental factors in disease, and to discuss the social implications of genetic research and genetic testing. The LEGENDS curriculum includes material from environmental health, toxicology, epidemiology, and human genetics. The information on environmental and genetic interactions in disease is presented as case studies—examples include sunlight and skin cancer, air pollution and asthma, and blood tissue-related toxicity resulting from benzene exposure. In addition, the project addresses important public policy issues regarding the ethical, legal, and social implications of genetic research and genetic testing. The curriculum includes brief lectures and discussions based on thematic modules and a set of interactive exercises to be conducted in small groups.

Originally developed by Eula Bingham and the CEG as an Outreach mechanism, the manual has been posted on the Internet as a resource for other organizations working to further genetics education.

The manual is available for downloading from the website: http://eh.uc.edu/ceg/coep.asp

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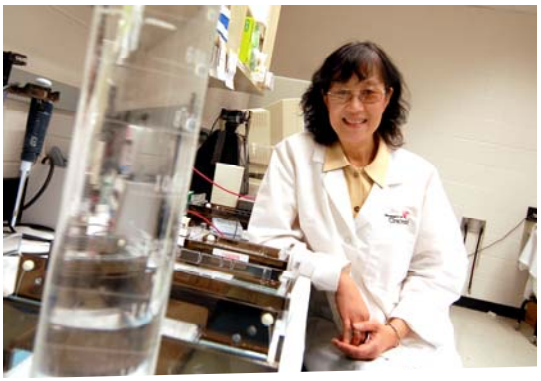
# UC Environmental Health Chair Recognized Nationally for Urologic Research Excellence



**Dr. Shuk-mei Ho, Director of the Center for Environmental Genetics, received the Women in Urology Award for Excellence in Urological Research**

Shuk-mei Ho, PhD, Professor and Chair of the University of Cincinnati's (UC) Environmental Health Department, recently became the second person to receive the Women in Urology Award for Excellence in Urologic Research. The award is presented jointly by the Society of Women in Urology and the Society of Basic Urologic Research. Ho, who was unanimously chosen as the 2007 recipient, accepted the award at the annual meeting of the Society of Women in Urology in Anaheim, California.

"Although urology is a male-dominated field, women have been performing outstanding urological research for decades—and Shuk-mei is right at the very front of those efforts," said David Stern, MD, Dean of UC's College of Medicine. "This national recognition is overdue and very well deserved."

The award was established in 2006 to honor leading female scientists with a distinguished record of producing top-notch urologic research and for significant contributions to the field of urology.

"Having your work recognized by your scientific peers is the highest honor an investigator can receive," said Ho. "I am proud to accept this award on behalf of all the fabulous women leaders in the field of urology and in science."

An expert in hormonal carcinogenesis, Ho focuses on the significance of hormones and endocrine disruptors in the development of breast, ovary, endometrial and prostate tumors. In the June 2006 edition of Cancer Research, she reported the first evidence of a direct link between chemical exposure while in the womb and prostate cancer development later in life.

In this laboratory study, Ho and her University of Illinois collaborator, Gail Prins, PhD, found that animals exposed to low doses of the natural human estrogen estradiol, or the environmental estrogen bisphenol A (BPA), during fetal development were more likely to develop an early form of human prostate cancer (prostatic intraepithelial neoplasia) than those who were not exposed. Their findings suggest that exposure to environmental and natural estrogens during fetal development could affect the way prostate genes behave, leading to higher rates of prostate disease during aging.

Ho has also pioneered research investigating the involvement of estrogenic compounds as potential cause factors and therapeutics for prostate cancer and male infertility. In 2006, she reported the unique functions of new isoforms of estrogen receptor-beta in the Proceedings of the National Academy of Sciences that lay a foundation for the development of safer drugs treatments for these urological disorders.

## Recent publications from Shuk-mei Ho's research group:


- Tam NN, Szeto CY, Sartor MA, Medvedovic M, Ho SM. Gene expression profiling identifies lobe-specific and common disruptions of multiple gene networks in testosterone-supported, 17beta-estradiol- or diethylstilbestrol-induced prostate dysplasia in Noble rats. *Neoplasia.* 2008, **10**(1):20-40.
- Hess-Wilson JK, Webb SL, Daly HK, Leung YK, Boldison J, Comstock CE, Sartor MA, Ho SM, Knudsen KE. Unique bisphenol A transcriptome in prostate cancer: novel effects on ERbeta expression that correspond to androgen receptor mutation status. *Environ Health Perspect.* 2007, **115**(11):1646-53.
- Zhang X, Leung YK, Ho SM. AP-2 regulates the transcription of estrogen receptor (ER)-beta by acting through a methylation hotspot of the 0N promoter in prostate cancer cells. *Oncogene.* 2007, **26**(52):7346-54.
- Tam NN, Leav I, Ho SM. Sex hormones induce direct epithelial and inflammation-mediated oxidative/nitrosative stress that favors prostatic carcinogenesis in the noble rat. *Am J Pathol.* 2007, **171**(4):1334-41.
- Miller RL, Ho SM. Environmental Epigenetics and Asthma: Current Concepts and Call for Studies. Am J Respir Crit Care Med. 2008
- Tang WY, Ho SM. Epigenetic reprogramming and imprinting in origins of disease. *Rev Endocr Metab Disord.* 2007, **8**(2):173-82.
- Ho SM, Tang WY. Techniques used in studies of epigenome dysregulation due to aberrant DNA methylation: an emphasis on fetal-based adult diseases. *Reprod Toxicol.* 2007, **23**(3):267-82.
- Ho SM, Tang WY, Belmonte de Frausto J, Prins GS. Developmental exposure to estradiol and bisphenol A increases susceptibility to prostate carcinogenesis and epigenetically regulates phosphodiesterase type 4 variant 4. *Cancer Res.* 2006, **66**(11):5624-32.

# Hot Liquids Release Potentially Harmful Chemicals in Polycarbonate Plastic Bottles

When it comes to Bisphenol A (BPA) exposure from polycarbonate plastic bottles, it's not whether the container is new or old but the liquid's temperature that has the most impact on how much BPA is released, according to University of Cincinnati (UC) scientists. Scott Belcher, PhD, and his team found when the same new and used polycarbonate drinking bottles were exposed to boiling hot water, BPA, an environmental estrogen, was released 55 times more rapidly than before exposure to hot water.

"Previous studies have shown that if you repeatedly scrub, dishwash and boil polycarbonate baby bottles, they release BPA. That tells us that BPA can migrate from various polycarbonate plastics," explains Belcher, UC Associate Professor of pharmacology and cell biophysics and corresponding study author. "But we wanted to know if 'normal' use caused increased release from something that we all use, and to identify what was the most important factor that impacts release."

**Scott Belcher, PhD, tested polycarbonate plastic bottles for Bisphenol A. Higher levels of BPA were released once the bottles were briefly exposed to boiling water.**

"Inspired by questions from the climbing community, we went directly to tests based on how consumers use these plastic water bottles and showed that the only big difference in exposure levels revolved around liquid temperature: Bottles used for up to nine years released the same amount of BPA as new bottles."

The UC team reports its findings in the Jan. 30, 2008 issue of the journal Toxicology Letters. BPA is one of many man-made chemicals classified as endocrine disruptors, which alter the function of the endocrine system by mimicking the role of the body's natural hormones. Hormones are secreted through endocrine glands and serve different functions throughout the body. The chemical—which is widely used in products such as reusable water bottles, food can linings, water pipes and dental sealants—has been shown to affect reproduction and brain development in animal studies.

"There is a large body of scientific evidence demonstrating the harmful effects of very small amounts of BPA in laboratory and animal studies, but little clinical evidence related to humans," explains Belcher. "There is a very strong suspicion in the scientific community, however, that this chemical has harmful effects on humans."

Belcher's team analyzed used polycarbonate water bottles from a local climbing gym and purchased new bottles of the same brand from an outdoor retail supplier. All bottles were subjected to seven days of testing designed to simulate normal usage during backpacking, mountaineering and other outdoor adventure activities. The UC researchers found that the amount of BPA released from new and used polycarbonate drinking bottles was the same—both in quantity and speed of release—into cool or temperate water. However, drastically higher levels of BPA were released once the bottles were briefly exposed to boiling water.

"Compared to the rate of release from the same bottle, the speed of release was found to increase from 15 to 55 times faster," explains Belcher.

Prior to boiling water exposure, the rate of release from individual bottles ranged from 0.2 to 0.8 nanograms per hour. After exposure, rates increased to 8 to 32 nanograms per hour. Belcher stresses that it is still unclear what level of BPA is harmful to humans. He urges consumers to think about how cumulative environmental exposures might harm their health.

"BPA is just one of many estrogen-like chemicals people are exposed to, and scientists are still trying to figure out how these endocrine disruptors—including natural phyto-estrogens from soy which are often considered healthy—collectively impact human health," he says. "But a growing body of scientific evidence suggests it might be at the cost of your health."

UC graduate student Hoa Le and summer undergraduate research fellows Emily Carlson and Jason Chua also participated in this study, which was funded by a National Institute of Environmental Health Sciences grant.

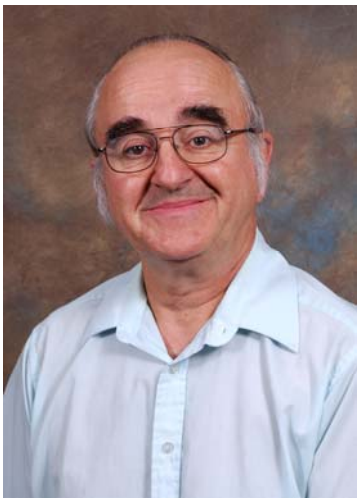
***Articles on page 2, 3, 4, and 8 were contributed by Amanda Harper as part of the University of Cincinnati Academic Health Center Public Relations & Communications, which also supplied photographs.***

# Study Shows Lead-Based Paint Problem Isn't Isolated to China

A multi-national team of environmental and occupational health researchers has found that consumer paints sold in Nigeria contain dangerously high levels of lead. Increased globalization and outsourcing of manufacturing has drastically increased the likelihood that products with unacceptably high levels of lead are being traded across borders—including between China and Africa as well as into regulated countries like the United States.

Researchers at the University of Cincinnati (UC) and University of Ibadan in Nigeria report these findings in an early Sept. 12 online edition of the journal Science of the Total Environment. Researchers believe the study—published in the December print issue of the journal—is the first report of new consumer paint lead levels in Africa.

"Nigeria's recent economic recovery may lead to increased activity in the building industry and Nigeria—like other African countries—is increasing trade with Asia, particularly in China," explains Eugenious Adebamowo, of the University of Ibadan and lead author of the study.



**Scott Clark, PhD, collaborated with scientists at the University of Ibadan, Nigeria, to measure lead levels in domestic paint.**

"It's important that international regulations be in place to supplement local efforts to ensure that paints have lower than recommended lead levels, with the ultimate goal of eventually eliminating all lead from paint," she adds.

For this study, researchers analyzed lead levels in five colors of paint, from each of five brands, marketed and sold in Ibadan, a city of more than 2 million people in southwestern Nigeria. Each paint sample was applied in a single layer to a wood block, left to dry and then removed and analyzed in UC laboratories for lead content. They found that 96 percent of the consumer paints available in Nigeria contained higher than the recommended levels of lead. Bright-colored paints—particularly yellow, red, and green contained the highest levels. Respectively, lead levels in yellow, red and green paint were ten, six and three times higher when compared with basic white paint

"The extent of domestic lead exposure, and its resulting health hazards has been understudied in developing countries, though its importance in cognitive dysfunction related to early exposure is well established in countries such as the United States," says Scott Clark, PhD, Professor of Environmental Health at UC and study collaborator.

Researchers compared the Nigerian paint samples with those sold in some Asian countries, using data obtained by Clark and his collaborators in previous studies. In the September 2006 issue of the journal Environmental Research, Clark reported that more than 75 percent of consumer paint tested from countries without lead-content controls-—including India, Malaysia and China—had levels exceeding U.S. regulations. Collectively, these countries represent more than 2.5 billion people. Although the median lead levels on Nigerian consumer-based paints did not substantially differ from those in Asian countries, nearly all still exceeded U.S. safety guidelines.

Sandy Roda, a study coauthor who oversaw sample analysis, stressed the international nature of the problem. She noted that one paint manufacturer in Nigeria sold high-lead paint in India, but offered a low-lead version in Singapore, a country that enforces a lead standard similar to the United States.

"It's very likely that many existing Nigerian homes contain dangerously high levels of lead, so it's absolutely critical from a health standpoint that immediate efforts be made to assess the presence of lead in homes," adds Clark.

Lead is a malleable metal previously used to improve the durability and color luster of paint applied in homes and on industrial structures such as bridges. Now scientifically linked to impaired intellectual and physical growth in children, lead is also found in some commonly imported consumer products, including candy, folk and traditional medications, ceramic dinner-

*(Continued on page 5)*

# Lead-Based Paint Problem (continued)

*(Continued from page 4)*

ware and metallic and wooden toys and trinkets. Researchers say exposure to environmental health hazards is a continuing concern in developing countries, where the United Nations has identified lead as a primary problem. "When it comes to public awareness of lead and its detrimental health effects, Nigeria and many other large, developing countries are 25 years behind," says Clement Adebamowo, corresponding author of the study. "Intervention programs could eliminate the risk for exposure and improve the overall health of the Nigerian people."

Training and research programs to increase public and professional awareness of lead exposure are being developed at the University of Ibadan in collaboration with other centers in Nigeria. Previous studies conducted by Jos University Teaching Hospital in Nigeria and several international collaborators have shown that 70 percent of children, aged 6 to 35 months, had elevated blood-lead levels and that flaking house paint was a primary determinant of this exposure.

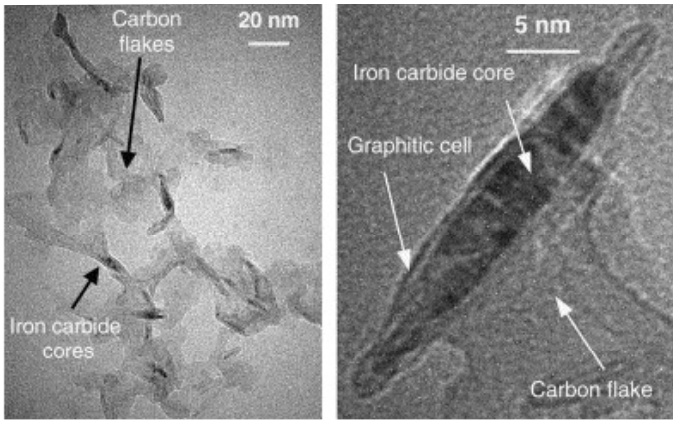
"Recent massive recalls of toys from China for lead-based paint content offer further evidence of the public health threat lead-based paint marketing in foreign countries can pose in the United States," adds Clark. "A consistent, global ban against lead-based paint is urgently needed to protect people not just in the United States—but around the world."

Additional collaborators in this study include Oluwole Agbede and Mynepalli Sridhar of the University of Ibadan.

# Recent Grant Submissions

The Center for Environmental Genetics has had the opportunity to work on several exciting grant submissions in 2007. The CEG has templates and grant-writing materials available to our investigators, including detailed resource information on available support cores. The Integrative Health Sciences Core offers consultation on clinical investigation design to CEG investigators.

Xiang Zhang, Winnie Tang, and Ying Chen used assistance from the CEG as each submitted a K99/R00—Pathway to Independence grant. NIH created this award mechanism to bridge the career transition from postdoctoral training to independent investigator.




**Iron containing "nano-cigars" produced by plasma synthesis at UC.**

CEG personnel joined with the College of Engineering to submit a proposal to develop a Center for the Environmental Implications of Nanotechnology. UC is already home to an Institute for Nanoscale Science and Technology and an NIH Nanomedicine Development Center, as well as an National Science Foundation supported undergraduate education grant in nanotechnology. It is the goal of the Center for Environmental Genetics and the College of Engineering to build research teams that are able to combine expertise to better understand the nature and properties of nanomaterials, and how the reduced scale of particles can alter interactions with biological organisms.

CEG Associate Director Dan Nebert submitted a T32 training grant to the National Institute of Environmental Health Sciences. This grant requests funds to support graduate students and postdoctoral fellows as they study gene-environment interactions. The Center for Clinical and Translation Science and Training (CCTST) assisted with the required tables.

Erin Haynes has used data resulting from CEG-funded pilot research to submit a Community-Based Participatory Research Grant: Marietta Community Actively Researching Exposure Study (Marietta CARES). This project, designed with the Neighbors for Clean Air community group, will examine biological indicators of manganese exposure in children, and compare neurodevelopmental measures with a control community in central Ohio.

# The Center for Environmental Genetics
# Pilot Project Grant Program

The Center for Environmental Genetics is currently accepting applications for Year 17 of the Pilot Project Grant Program. The CEG is a research and community outreach program funded by the National Institute for Environmental Health Sciences (NIEHS). Our overall mission is to study genetic and epigenetic differences that contribute to variation in response of different subjects to the same dose of environmental agents.

To achieve our mission, the CEG funds Pilot Project Grants to support synergistic, innovative, high-risk/high-reward research with a multidisciplinary foundation, with money from NIEHS, the College of Medicine Dean's Office, and the DEH.

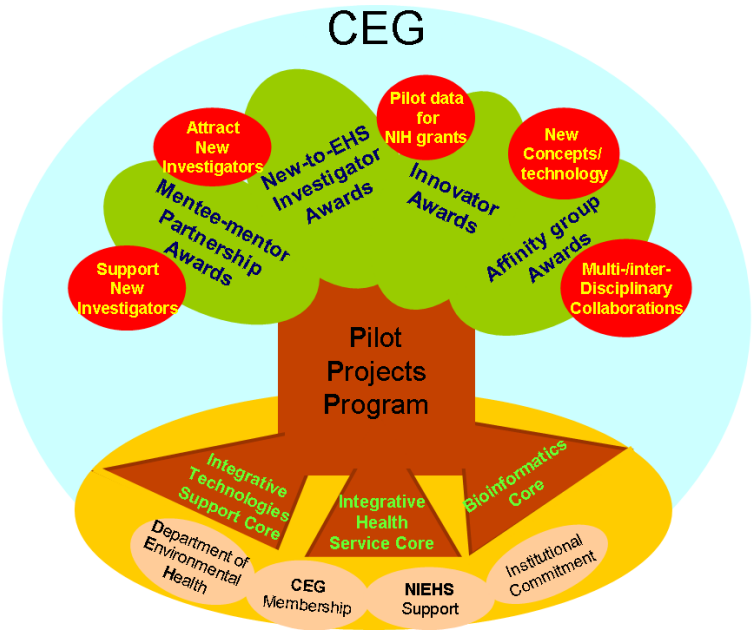
Funding Information: Applications must be received by 4:30 p.m. March 10, 2008. Pilot Projects using the Mentee-Mentor Partnership, the Innovator, and the New-to-EHS award mechanisms may request up to $30,000 for one year. Investigators applying for the Affinity Group Awards may request up to $50,000 for one year. The Principal Investigator must have an appointment at the rank of Research Scientist or higher. Postdoctoral Fellow, Graduate Assistants, and Research Assistants are not allowed to be Principal Investigators on these awards.

We anticipate that four to six projects will be funded. Funding and account numbers will be provided by April 1, 2008 and must be completely spent by March 31, 2009. Any unused funds at that time will be returned to the CEG.

Award Mechanisms: There will be four specific award mechanisms

1. **Mentee-Mentor Partnership Awards** for young investigators with a commitment to pursue environmental health sciences research, with an appropriate mentor(s) having supportive expertise included on the proposal.
2. **New-to-EHS Awards** for investigators at any level who have no prior experience in environmental sciences/medicine research, but are venturing into the field. They must identify an EHS scientist as a co-Investigator.
3. **Innovator Awards** for existing environmental health scientists who wish to develop research in a new direction, using a new technology/concept, or establishing new collaborations
4. **Affinity Group Awards** for multiple investigators from different disciplines submitting a highly integrated and novel transdisciplinary application.

Proposals will be given preference if they show a strong translational or clinical relevance and have a significant impact on some area of environmental health research related to gene–environment interaction. Requests to utilize CEG cores will also be preferred (please see our website for Core descriptions). Projects using human subjects must contact the Integrative Health Sciences Core for review prior to submission. Complete application details can be found at the website: http://www.eh.uc.edu/ceg/




Awardees will give an oral presentation of the results obtained during the PPP award period (tentatively scheduled for November 2009) at a Mini-Symposium of the PPP awardees, to which all CEG members, new PPP awardees, and other interested individuals will be invited. This Mini-Symposium provides the investigator an opportunity to present the approaches used and results obtained during the award period, and discuss future plans with regard to research, publications and grant proposals that might flow from this PPP support.

Manuscript publications, abstracts, presentations, and other activities resulting from your PPP project **must acknowledge CEG support.** The grant number to cite is**: NIH P30 ES06096**.

Electronic proposals may be submitted to Elizabeth Kopras at Koprasej@uc.edu, or a paper copy to the CEG office (Room 112, Kettering Lab; ML 0056) **by 4:30 p.m. March 10, 2008.**

# Center for Environmental Genetics: What Does Membership Entail?

A new University of Cincinnati faculty member recently asked the question, "How does membership in the CEG benefit UC faculty members? After all, I am invited to attend CEG-sponsored seminars, and I can submit proposals to the Pilot Project Grant Program without being a member."

While this is true, there is much more to the CEG than the seminar series and Pilot Project Grants. Focus group gatherings, faculty retreats, and other activities that foster integration and unity amongst members are continually under development. Participation in these activities has led to the development of several interdisciplinary research programs. In addition, CEG members have use of the Cores and facilities described below:

***Bioinformatics Core:*** CEG members have priority use of this core, under the direction of Dr. Mario Medvedovic, which assists investigators in converting the genomic and protein data into meaningful information through the use of appropriate statistical methods and computational tools.

***Integrative Health Sciences Core:*** CEG members receive assistance to develop expertise in the use of exposure biomarkers in human studies, including selection of biomarkers, collection, processing and storage, data interpretation, and communication of results. The IHS Core provides a panel of expert consultants as a resource to address design and methodological questions in studies of gene-environment interactions. The Core is in the process of developing informatics and biospecimen resources for research purposes.

***Integrative Technologies Support Core:*** Membership in the CEG entitles investigators to be eligible to apply for matching funds to use the research components that comprise the Integrative Technologies Support Core. In addition, ITS leaders will meet with CEG members to assist in experimental design using technologies that might be new to the EHS investigator.

***Career Development for Environmental Health Investigators:*** Members may nominate junior faculty to be supported as a Next-Generation Biomedical Investigator, where they are mentored by CEG investigators.

**Integrative Technologies Support Core:**

**Shuk-mei Ho—**Genomic and Microarray Laboratory

**Jerry Lingrel—**Transgenic and Knockout Mice

**Wallace Ip—**Microscopy

**Ranjan Deka—**Genotyping Facility

**Ken Greis—**Proteomics and Metabolomics Analyses

**Jing-Huei Lee—**High-Field Magnetic Resonance Imaging and Spectroscopy

**Alvaro Puga—**Flow Cytometry Facility

**Joseph Caruso—**Analytical Services and Mass Spectrometry of Large and Small Molecules as well as Heavy Metals

***Administrative Support:*** The Administrative Core assists CEG members with a variety of research issues including research compliance, funding, and building collaborations. Our experienced staff aids investigators with IACUC, IRB, Radiation Safety, and Laboratory Biosafety issues. Core members search through grant announcements from many sources, to find funding opportunities that match the expertise of our scientists, and can provide templates for grant applications.

The Center provides a framework through which UC, NIEHS and other EHS Centers meet national environmental health research needs, enhance research collaborations, and disseminate public health information. The CEG connects research efforts of our members with other organizations, including other research departments at UC, CCHMC, and community groups. The CEG promotes member science by maintaining ties with the UC Office of Public Relations and the NIEHS Communication Office.

# Follow-up to Interface Issue 33: LeMasters to Write IARC Monograph

Grace LeMasters, PhD, Professor of Epidemiology, has been invited by the International Agency for Research on Cancer (IARC) to serve on a working group that will develop Volume 98 of the IARC monograph on the evaluation of carcinogenic risks to humans, firefighting, painting and shift work. LeMasters spent a week in Lyon, France, in early October critiquing and summarizing the epidemiology section related to cancer in firefighters. The IARC, part of the World Health Organization, coordinates and conducts both epidemiological and laboratory research into the causes of cancer.

For more information, visit www.iarc.fr.


**Grace LeMasters, PhD, and James Lockey, MD, are studying the health effects of environmental particulates in firefighters.**

# UC Environmental Health Scientists Awarded $1.6 Million for Lead and Mold Exposure Research

The U.S. Department of Housing and Urban Development (HUD) has awarded about $1.6 million in research grants to University of Cincinnati (UC) environmental health scientists investigating lead and mold exposure in homes. Award recipients include bioaerosols expert Tiina Reponen, PhD, and environmental and occupational health and safety experts Scott Clark, PhD, and Bill Menrath, MS.

UC was one of just four institutions in Ohio to receive a portion of the $118 million awarded nationally by HUD. Grants were given to state and local communities, public health organizations and scientific research institutions for projects aimed at protecting children and families from dangerous lead-based paint and other home health and safety hazards. Reponen, Professor of Environmental Health, received more than $785,000 to conduct a comprehensive analysis of the health effects of total mold exposure in children starting from infancy to age 6. Her goal is to identify a method that can predict adverse health effects caused by residential mold exposure, most notably those related to asthma and allergic rhinitis.

"This study could have a significant affect on public health because it will improve our overall understanding of allergic disease related to mold in homes," says Reponen. "Our hope is that we can improve early prediction of allergic disease and establish cost-effective testing of mold in homes."

***CEG Pilot Project Grant to Tiina Reponen supported the development of a new exposure assessment tool to study gene:mold interactions.***

This research, which is being conducted as part of the Cincinnati Childhood Allergy and Air Pollution Study, will test two new mold evaluation concepts to determine the role of early- and late-childhood mold exposures in allergy development; how different microbes interact with environmental agents to cause allergy, and which methods are most sensitive in predicting the development of asthma and allergic rhinitis.

In conjunction with the National Center for Healthy Housing (NCHH), Clark, UC Professor of Environmental Health, is involved in two HUD grants totaling about $500,000 for studies related to lead-based paint exposure. The first project will supplement a previous research database of information on more than 1,000 housing units. This new funding will allow Clark and his team to learn more about the impact of soil lead treatment on interior and exterior home dust lead levels.

The second project will assess dust and soil lead levels and paint condition in homes with different window treatments. As a subcontractor to the NCHH, Clark will compare the results in homes where windows were replaced with levels in homes that have had other window treatment methods applied, such as paint stabilization, to determine which method is more effective at eradicating the problem long term. The study will include 200 houses where lead hazard control treatments were applied 13 years earlier.

Menrath received a $328,000 grant to improve the accuracy of a commercially available wipe method to test for settled dust on the floors, window sills and window troughs of homes. He believes this test, which was originally used to clean workers' hands, might help identify the presence of lead dust hazards following renovation, repair, painting and lead hazard reduction activities.

UC's Environmental Health Department is ranked fourth among National Institutes of Health-funded environmental health research programs. In total, the department holds approximately 147 grants and research contracts that total more than $24 million in direct funding annually.

## Comics

Long-time Interface readers noted the lack of humor in the new Interface design. Jorge Cham, a recent guest of the graduate students at the University of Cincinnati, has offered to fill the humor void.

Used by permission of "Piled Higher and Deeper" by Jorge Cham at www.phdcomics.com

# Department of Environmental Health Faculty Members Honored During Trips to India


**DEH Faculty Members in International Meetings in India, December 2007 – January 2008. From left to right: Drs. Bandana M. Chakraborty, Ranajit Chakraborty, and M. B. Rao**

Three faculty members of the Department of Environmental Health of the University of Cincinnati College of Medicine (Drs. Ranajit Chakraborty, M. B. Rao, and Bandana M. Chakraborty), all from the Division of Epidemiology and Biostatistics, returned from India after delivering a series of invited talks at several International Meetings.

At the University of Hyderabad's International Conference on Bioinformatics and Drug Discovery (BioConvene 2007, December 16-22, 2007) Dr. Ranajit Chakraborty conducted a special session on Bioinformatic Issues of DNA Forensics, Dr. M. B. Rao gave a workshop on use of R-packages in analyses of data related to Complex Disease studies, and Dr. Bandana M. Chakraborty gave an invited lecture on her findings from an inter-divisional collaborative project on lead toxicity effects on neuromotor function impairment (a pilot project of the NIEHS-funded project Center for Environmental Genetics). At the BioConvene2007 meeting, Dr. M. B. Rao and Dr. Ranajit Chakraborty also gave invited talks on analyses of high-dimensional data on genome-wide association (GWA) studies.

At the International Conference on Statistical Paradigms: Recent Advances and Reconciliations (ICSPRAR-2008), held at the Indian Statistical Institute, Kolkata (January 1-4, 2008), Dr. Ranajit Chakraborty's invited talk was on the subject of Bioinformatic paradox of occurrences of rare events in large databases; Dr. M. B. Rao spoke on alternative strategies of analyzing GWA data, and Dr. Bandana M. Chakraborty's lecture was on distinctions of different types of gene-environment interaction effects. All of these talks will be published in the proceedings of ICSPRAR-2008.

In addition, Dr. M. B. Rao gave invited lectures at the Sri Venkateswara University, Tirupati; and Vellore Institute of Technology, Vellore; and Dr. Ranajit Chakraborty lectured at Panjab University, Chandigarh, and at the Calcutta University, Kolkata.

This trip also brought several honors and awards to these faculty members:

- Dr. Ranajit Chakraborty was selected as the Foundation Day Visionary Lecture Series Orator of the Indian Statistical Institute during the commemoration of the Platinum Jubilee (75th Anniversary) of the Institute on December 17, 2007.
- Dr. Ranajit Chakraborty was selected as the S. S. Sarkar Memorial Lecturer of 2007 by the Indian Anthropological Society on December 28, 2007.
- Dr. Ranajit Chakraborty and Dr. M. B. Rao were inducted as Editorial Board Members of the International journal Sankhya-B, published by the Indian Statistical Institute, which is one of the top ten prestigious journals of Statistics in the world.

# Recent Publications from the Chakraborty Research Group


- Kaushal R, Pal P, Alwell K, Haverbusch M, Flaherty M, Moomaw C, Sekar P, Kissela B, Kleindorfer D, Chakraborty R, Broderick J, Deka R, Woo D. Association of ALOX5AP with ischemic stroke: a population-based case-control study. *Hum Genet.* 2007, **121**(5):601-7.
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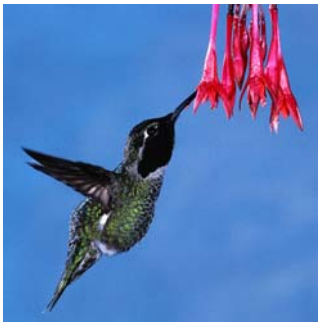
# Web-sites

***Evolution Weekend 2008*** http://www.butler.edu/clergyproject/rel_evolution_weekend_2008.htm

Michael Zimmerman, Dean of the College of Liberal Arts and Sciences at Butler University, has created a nationwide project to work with clergy in support of teaching evolution. Evolution Weekend is an opportunity for serious discussion and reflection on the relationship between religion and science, through sermons, discussion groups, meaningful conversations, and seminars. Resources for scientists and clergy are available on the website.



***Cornell Lab of Ornithology*** http://www.birds.cornell.edu/

You, too, can be an ornithologist, by joining the Cornell Lab of Ornithology. Members count birds, either at feeders or along vectors, to assist the scientists at Cornell to study biological diversity. Citizen scientist lab members receive a quarterly magazine and lab newsletter.

***Breast Cancer Genomics Informatics*** http://eh3.uc.edu/BreastCancer

CEG investigators led by Mario Medvedovic have developed a data portal for analyzing and interpreting new breast cancer genomics data which will be useful to the wider research community. The "Genomics Context" consists of a web-accessible comprehensive database of public cancer-related microarray data and results of analyses performed on these datasets. The focus on breast cancer, incorporation of animal and in-vitro model data, and uniqueness of the analytical tools distinguishes this project from other initiatives for organizing cancer genomics data.

***Do you have a favorite website that would be interesting to CEG members?***
***Recommend it to Elizabeth Kopras at koprasej@uc.edu.***