Issue 33

INTERFACE:
GENES AND THE ENVIRONMENT
CENTER FOR ENVIRONMENTAL GENETICS UNIVERSITY OF CINCINNATI Winter-Spring 2007

From the Director, Dr. Shuk-mei Ho

The mission of the Center for Environmental Genetics is to promote integrative research among basic and applied scientists, epidemiologists and clinicians to develop an understanding of the complex relationship between genetic predisposition factors and environmental exposures. The Center goal is to improve human health through clinical practice and public health initiatives that prevent illness and decrease mortality from diseases associated with environmental exposures. The CEG works with members to improve research design, increase access to state-of-the art technologies, and develop and apply appropriate biostatistical and bioinformatics analyses to data. The large CEG membership and NIEHS grant base is testimony to the enthusiasm for Environmental Health Sciences research throughout the University of Cincinnati and Cincinnati Children's Hospital and Medical Center. I look forward to working with the CEG members as we continue to improve on the excellent research at our facility.

CEG Year 15 Pilot Project Program Symposium October 31st, 2007

The Pilot Project Grant Program is one of the most important components of the CEG, to provide seed support for new initiatives in basic, translational, and clinical research that will shed light on the interaction between genes and the environment in which they operate. The Pilot Project Program Symposium will be held in the **Vontz Auditorium October 31st, 2007** from **10:00 am to 3:00 pm.** In addition to the PPP presenters, guest speaker **Joel N. Kline**, the Associate Director of The University of Iowa Environmental Health Sciences Research Center, will present **Eat Dirt: CpG DNA and Immunomodulation of Asthma.** This symposia is open to CEG members and the UC community.

Year 15 PPG Recipients:

- **Robert Smith, M.D.** *Clinical, environmental and genetic factors related to response and non-response to treatment of Type 2 diabetes patients with thiazolidinediones*
- **George D. Leikauf, Ph.D. Scott C. Wesselkamper, Ph.D., Michael T. Borchers, Ph.D., Jay W. Tichelaar, Ph.D., William D. Hardie, M.D., Mario Medvedovic, Ph.D.** *Genetic determinants of pulmonary function in mouse models of COPD*
- **Jagjit S. Yadav, Ph.D**. *Gene targets of trichothecene mycotoxins in indoor mold-induced lung toxicity*
- **Amy M. Rohs, M.D. James E. Lockey, M.D., Timothy P. Dalton, Ph.D., Ranjan Deka, Ph.D.** *Genetics of vermiculite-induced pleural thickening and fibrosing pleuritis*
- **Peter J. Stambrook, Ph.D.** *The CHEK2*1100delC polymorphism and susceptibility to breast cancer in childhood Hodgkin Disease survivors*
- **Ying Xia, Ph.D. George Leikauf, Ph.D.** *The role of MEK Kinase 1 in acute lung injury*
- **Jay W. Tichelaar, Ph.D.** *Ccl17-Ccr4 signaling in lung tumorigenesis*
- **Grace K. LeMasters, Ph.D. Gurjit K. Khurana Hershey, M.D./Ph.D., Jocelyn M. Biagini, M.S.** *CYP2A6 polymorphism and nicotine metabolism biomarkers in children exposed to environmental tobacco smoke*
- **Ana Luisa Kadekaro, M.D. Prashiela Manga, Ph.D.** *Effect of P gene and MC1R interaction on the UV response of human melanocytes*
- **Tiina Reponen, Ph.D. Sergey Grinshpun, Ph.D. Faye Grimsley, Ph.D., CIH** *Methodology for fungal fragments--A new exposure assessment tool for gene:mold interaction studies*
- **Erin Haynes, Dr.PH.,** *Community participatory research in a manganese exposed population.*

Researchers Identify New Markers for Prostate Cancer Risk

Shuk-mei Ho, Ph.D., is an expert in hormonal carcinogenesis and proteomics. The publication described in this article was cited among the NIEHS's 2006 Highlights In Environmental Health Sciences research.

Scientists have identified the first evidence of a direct link between chemical exposure while in the womb and prostate cancer development later in life. The research is reported in the June edition of the journal *Cancer Research* by Shuk-mei Ho, PhD, professor and chair of the University of Cincinnati's Environmental Health Department, and Gail Prins, PhD, professor of urology at the University of Illinois at Chicago.

In a laboratory study, Ho and Prins 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 prostate cancer in humans (prostatic intraepithelial neoplasia) than those who were not exposed.

These 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.

BPA is a chemical regularly used in the manufacture of plastics that can leach out when heated. It is one of many man-made chemicals known as "endocrine disruptors," which permanently alter the function of the endocrine system by mimicking the role of the body's natural hormones. Hormones are secreted through endocrine glands and dispersed to serve different functions throughout the body.

"Our research showed that early BPA exposure made the prostate more susceptible to precancerous lesions, which are brought on by the adult animal's exposure to elevated estradiol," says Ho, lead author of the report. "This is an important discovery, because BPA has been found in human maternal and fetal circulation. If it has such a long-lasting effect—by reprogramming how adult tissues respond many years later—then potential exposure sources during pregnancy need to be carefully scrutinized."

The CEG welcomes Dr. Gail Prins as a Center-sponsered speaker. She will present in Kehoe Auditorium at 10:00 a.m. on October 24th, 2007.

The researchers showed that early BPA exposure permanently changed methylation or "tagging" of specific stretches of DNA and the way certain genes are packaged within the nuclei of prostate cells.

"This phenomenon is known as epigenetic reprogramming," explains Ho. "The gene expression changes, but the DNA sequences and content do not."

They found that a specific altered gene—known as phosphodiesterase 4 (PDE4D4)—did not shut down through the natural aging process. Although the gene should normally phase out in adult life, when exposed to estradiol or BPA early in life the animals continued to produce it at high levels.

"It turns out that this specific gene plays an important role in regulating cellular function, so when it doesn't shut down as it should, it begins to promote prostate disease instead," says Ho. These findings are true for an animal model, the researchers stress, but application to human prostate disease needs further study.

"We need to understand the mechanism behind disease to inspire better lifestyle changes and smart manufacturing changes that will make a broader impact on human health," says Ho. "If we can develop strong biomarkers, we can manage and prevent diseases much earlier."

More than 1.6 million pounds of BPA, the molecular building block of polycarbonate plastics, are produced in the United States annually. The substance is regularly used in consumer products, such as baby bottles, water bottles, microwave ovenware and plastic eating utensils and in epoxy resins to coat medical food cans and dental sealants. It is also found in carbonless paper, compact discs, adhesives, flooring and electrical appliances.

Genetics Experts Investigate Causes of Harmful Metabolic Disorder

UC researchers have received more than $1.6 million from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) to study genetic causes of metabolic syndrome, a disorder that can lead to cardiovascular disease and diabetes.

“Metabolic syndrome has emerged as a public health problem of epidemic proportions in Western societies like the United States,” says Ranjan Deka, PhD, a UC Environmental Health professor who will lead the international study. “To combat this complex disease, we need to establish genetic biomarkers—but we also need to understand lifestyle patterns and make necessary changes.”

Metabolic syndrome is a combination of inherited risk factors, and, according to the American Heart Association, about 25 percent of Americans have it. Untreated, it can lead to life-threatening health problems such as coronary artery disease, stroke and type 2 diabetes. The study aims to identify and isolate the specific genes associated with metabolic syndrome so that scientists can identify at-risk populations.

“Metabolic syndrome is a complex disease that can’t be attributed to just one cause,” explains Deka. “Genes don’t act alone. They work in concert with the environment, so exposures as well as lifestyle choices and diet can contribute to it.”

Ranjan Deka, PhD, is a professor of environmental health who specializes in genetics.

Deka believes that genetic dispositions may be coming together with changed lifestyle—one of unhealthy food intake, little exercise and an overall sedentary lifestyle—to cause metabolic syndrome. Primary risk factors for the condition include central obesity (around and in the abdomen), high blood pressure, glucose intolerance and blood-fat disorders that promote plaque buildup in the artery walls. Deka and his team will attempt to establish a genetic basis for metabolic syndrome by identifying chromosomal regions associated with it. They will collect data from a genetically isolated population of about 80 large families living in the islands of Croatia. Because these islanders are a traditionally isolated society, Deka says, the people have a very homogeneous genome. This eliminates many of the confounding effects of a diverse population and is more conducive to research designed to isolate specific genetic causes of a disease. Croatians also have many risk factors for metabolic syndrome—including obesity and high blood pressure—that cannot be explained by poor diet or lifestyle choices.

“This is unusual,” explains Deka, “because this population eats a traditional Mediterranean diet, which is thought to be very healthful. We believe these risk factors may be primarily linked to genetics, not lifestyle and environmental exposures.”

Deka and his team will collect blood samples, environmental data (such as diet and lifestyle), family medical history and other demographic information from about 1,200 individuals from the Croatian islands. They will perform DNA analysis on each person to identify genetic markers that may be linked to metabolic disease.

“By understanding what genetic mutations exist and where they are within the body’s genetic makeup, we can identify correlations between genetic abnormalities and specific diseases,” Deka says. “When we can do that, we’ll have a better understanding of how to treat the underlying causes of complex diseases.”

Study collaborators include UC’s Ranajit Chakraborty, PhD, Pavao Rudan, PhD, of the Institute for Anthropological Research in Croatia, and researchers from the University of Pittsburgh and Cincinnati Children’s Hospital Medical Center.

Fernald Database, Biospecimens Now Available for Research

Jenny Buckholz, Fernald Medical Monitoring program manager (left), says diligent follow-up was largely responsible for the program's success.

Gathering information for studies of human disease is a slow process—it normally takes several years to get enough usable data to draw significant conclusions. Now a team of epidemiologists and biostatisticians from UC's Department of Environmental Health have a gold mine of ready-to-use data—and they are willing to share it with other researchers. Scientists at UC and other institutions can apply for access to 17 years' worth of medical information, including biospecimens, on 9,500 people enrolled in the Fernald Medical Monitoring Program (FMMP). Susan Pinney, PhD, Professor of Environmental Health and epidemiologist for the FMMP, says the database has grown so comprehensive that her team is looking for more researchers to use it.

"We've been studying and tracking this population for almost 17 years now, and the population has matured to a point where we have enough cases of disease to provide sufficient power for analysis," explains Pinney.

"We've been studying and tracking this population for almost 17 years now, and the population has matured to a point where we have enough cases of disease to provide sufficient power for analysis," explains Pinney.

Biospecimens, collected at the beginning of the program, can be used for studies of predictive markers for disease.

"Now that we know exactly who was exposed and who was not," she adds, "what we have left is a large pool of data and biological samples from a healthy, unexposed population that is ready to be used for research."

The FMMP was established in 1990 as the result of a $73 million class-action lawsuit against National Lead of Ohio and the U.S. Department of Energy on behalf of people living near the National Lead of Ohio's Feed Materials Production Center in Fernald. An earlier federal investigation revealed that the plant was emitting dangerous levels of uranium dust and gases into the surrounding communities. Since then, UC scientists have been monitoring health effects on this population through comprehensive medical exams every two to three years. The data coding is very specific. For example, Pinney can tell a prospective researcher exactly how many people had congestion in their lungs or a rotated heart during their chest X-ray.

Because the FMMP exposure assessment area covered a five-mile radius, there is also a large segment of the population that was truly unexposed to the uranium and radon being emitted from the plant, explains Pinney. That leaves data from more than 60 percent of the study population-some 6,000 people-for other researchers to use in health effects studies where the confounding effect of uranium exposure might have been a concern.

"The value of the database is greatly enhanced by the level of information coding. It's easily searchable and cross-linked with our repository of 100,000 biospecimens," adds Pinney.

Any credentialed researcher can apply for access to the database, and data analysis projects can be done under the auspices of the FMMP, without secondary approval from the Internal Review Board (IRB). Once their projects are approved, researchers are given unidentified data files based on the specific scope of their project. Projects involving biospecimens such as tissue, blood or urine, however, must receive separate IRB approval. There is currently no fee for access to the database; however, researchers requesting biospecimens must provide help to pull samples.

For more information on the FMMP database and biospecimens, visit www.genmed.uc.edu/fmmp.

Jarek Meller Receives Ohio Cyberinfrastructure Award

UC's Jarek Meller, PhD, was honored May 1 at the 2007 Advanced Technology Summit sponsored by the Ohio Supercomputer Center.

An associate professor of Environmental Health who also works with the Cincinnati Children's Research Foundation, Meller received an AT Summit award at the ceremony in Columbus for his experimental and applications research (modeling simulation and visualization) in the development of the SABLE project. The project and related initiatives have resulted in learning-based methods for genome annotation, analysis and prediction that have been made available to researchers around the world through the OSCnet fiber-optic network.

The Advanced Technology Summit was established to link industry, academic and government professionals in developing a vision for the use of emerging technologies to benefit Ohio and its citizens. The Ohio Supercomputer Center provides the state with a sophisticated public cyberinfrastructure, including high-performance computers, data storage systems, research support and advanced networking, as well as the expertise to integrate these elements to promote collaboration.

Jack Meller, PhD, (center), received the Advanced Technology Summit award at the 2007 Advanced Technology Summit sponsored by the Ohio Supercomputer Center.

UC Environmental Health Scientists Receive Distinguished Honors

Three professors in the University of Cincinnati (UC) Department of Environmental Health were recently honored for their contributions to science—locally, nationally and internationally.

Ranajit Chakraborty, PhD, professor and director of UC's Center for Genome Information, was selected for honorary fellowship in the Indian Academy of Sciences. The organization—which plans scientific meetings and publishes 11 scientific journals—grants honorary fellowship to no more than three distinguished scientists annually.

James Lockey, MD, professor of occupational, environmental and pulmonary medicine, was appointed by President George W. Bush to serve on the Centers for Disease Control and Prevention's radiation and worker health advisory board through August 2009. In this role, Dr. Lockey will have direct input into the government's policies and procedures that ensure the safety and well-being of radiation workers throughout the United States.

Grace LeMasters, PhD, professor of epidemiology, has become the first female scientist ever to receive the Professional Accomplishment in Academia Scientists Award from the Cincinnati Engineers and Scientists Association. She was selected for her contributions to science as an independent researcher, industry advisor and mentor for environmental health students.

"These recent awards represent UC's commitment to improving the health and well-being of workers in Greater Cincinnati—and in the nation," said Shuk-Mei Ho, chair of the department of environmental health. "Through innovative research and strong leadership, we'll continue to be stewards for environmental health and safety change and improvement in the future."

Founded in 1930, UC's Environmental Health Department has 48 full-time faculty in four divisions and houses the College of Medicine's largest graduate program, which has about 150 master's and doctoral students.

Early Exposure to Indoor Fungus Molecules May Protect Infants Against Future Allergies

Maybe being a fussy housekeeper isn't such a good thing after all. Environmental health scientists at the University of Cincinnati (UC) say they have confirmed what other scientists have only suspected: early-life exposure to certain indoor fungal components (molecules) can help build stronger immune systems, and may protect against future allergies.

The UC team found that infants who were exposed to high levels of indoor fungal components—known as fungal glucans—were nearly three times less likely to wheeze compared with infants exposed to low levels. Fungal glucans are tiny molecules that scientists believe cause respiratory symptoms in adults. Crawling infants are often exposed to these molecules when they disturb dust on carpet or floors in their homes.

Tiina Reponen, PhD, Professor of Environmental Health, and student Yulia Iossifova examine air sampling equipment prior to collecting fungal spores.

Study lead author and environmental health scientist Yulia Iossifova says exposure to high levels of these molecules may also protect against allergy development in high-risk infants. "The immune system's protective effects only appear to occur when there are high levels of microbial exposure," she explains. "Cleaner environments do not have enough microbial components to trigger the immune system response."

The UC team reports their findings in the May 2007 edition of the scientific journal Allergy. This epidemiological study is the first to suggest that early-life exposure to high levels of indoor fungal glucans can have a positive impact on the human immune system. "Fungi are a diverse group of microorganisms, so species differ in their glucan content and allergenic proteins. Some fungi also contain mycotoxins that can contribute to disease," adds Tiina Reponen, PhD, professor of environmental health and corresponding author of the study. "Exposure to indoor molds during infancy may be associated with respiratory symptoms, such as persistent coughing and wheezing."

The UC-led team analyzed the effects of microbial exposures to both fungal glucans and endotoxins (natural compounds secreted from disease-causing agents like bacteria) in 574 infants, enrolled in the Cincinnati Childhood Allergy and Air Pollution Study (CCAAPS), who were identified as being at greater risk for future allergies because at least one parent had known allergies.

The CCAAPS, funded by the National Institute of Environmental Health Sciences, is a five-year study at UC examining the effects of environmental particulates on childhood respiratory health and allergy development. UC researchers collected dust samples from each infant's primary activity room and analyzed them for indoor allergens, fungal glucans and bacterial endotoxins. They also gathered information about the home, including the presence of any visible mold and water damage. Environmental and food allergy development was monitored through annual skin prick tests.

Scientists say early-life exposure to common microbial components—like bacterial endotoxins and fungal glucans—can stimulate the body's immune system to produce infection- and allergy-fighting substances. Because of this, Iossifova says, people should avoid overusing antibacterial sprays and soaps to clean their bodies and homes. "Certain microbes can have helpful affects in the body," she explains, "but antibacterial disinfectants can't discriminate between helpful and harmful microbes—they destroy them all.

"This eliminates the natural competition among bacteria and fungi, so the surviving microbes are often the infectious ones that can develop resistance to drugs designed to eliminate them." Iossifova says further research is needed to determine how early microbial exposures affect the development of certain allergic conditions—including asthma, dermatitis and hay fever—later in life.

Collaborators in this study include UC colleagues David Bernstein, MD, Linda Levin, PhD, Hapinder Kalra, MD, Paloma Campo, MD, James Lockey, MD, Manuel Villareal, MD, and Grace LeMasters, PhD, principal investigator of CCAAPS. Gurjit Hershey, MD, of Cincinnati Children's Hospital Medical Center also contributed to the study.

Firefighters Face Increased Risk for Certain Cancers

University of Cincinnati (UC) environmental health researchers have determined that firefighters are significantly more likely to develop four different types of cancer than workers in other fields. Their findings suggest that the protective equipment firefighters have used in the past didn't do a good job in protecting them against cancer-causing agents they encounter in their profession, the researchers say.

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

The researchers found, for example, that firefighters are twice as likely to develop testicular cancer and have significantly higher rates of non-Hodgkin's lymphoma and prostate cancer than non-firefighters. The researchers also confirmed previous findings that firefighters are at greater risk for multiple myeloma.

Grace LeMasters, PhD, Ash Genaidy, PhD, and James Lockey, MD, report these findings in the November edition of the *Journal of Occupational and Environmental Medicine*. The UC-led research is the largest comprehensive study to date investigating cancer risk associated with working as a firefighter.

"There's a critical and immediate need for additional protective equipment to help firefighters avoid inhalation and skin exposures to known and suspected occupational carcinogens."

"We believe there's a direct correlation between the chemical exposures firefighters experience on the job and their increased risk for cancer," says LeMasters, professor of epidemiology and biostatistics at UC.

Firefighters are exposed to many compounds designated as carcinogens by the International Agency for Research on Cancer (IARC)—including benzene, diesel engine exhaust, chloroform, soot, styrene and formaldehyde, LeMasters explains. These substances can be inhaled or absorbed through the skin and occur both at the scene of a fire and in the firehouse, where idling diesel fire trucks produce diesel exhaust.

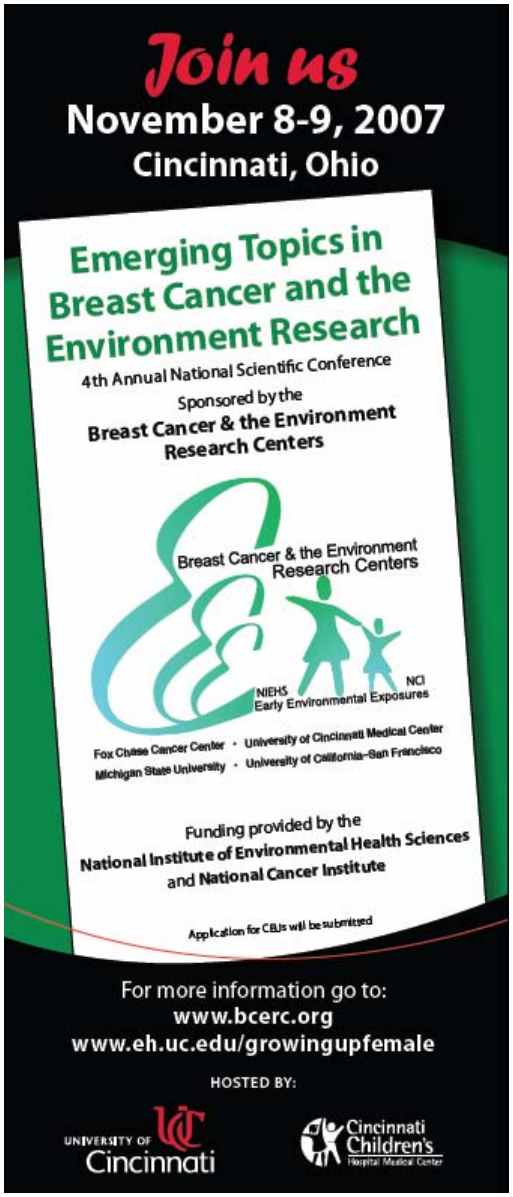
"Firefighters work in an inherently dangerous occupation on a daily basis," LeMasters adds. "As public servants, they need—and deserve—additional protective measures that will ensure they aren't at an increased cancer risk."

The UC-led team analyzed information on 110,000 firefighters, most of them full-time, white male workers, from 32 previously published scientific studies to determine the comprehensive health effects and correlating cancer risks of their profession. Risk for 20 different cancers was classified into three categories—probable, possible or not likely—patterned after the IARC's risk-assessment model. UC epidemiologists found that half the studied cancers—including testicular, prostate, skin, brain, rectum, stomach and colon cancer, non-Hodgkin's lymphoma, multiple myeloma and malignant melanoma—were associated with firefighting to varying levels of increased risk.

"There's a critical and immediate need for additional protective equipment to help firefighters avoid inhalation and skin exposures to known and suspected occupational carcinogens," says Lockey, Professor of Environmental Health and Pulmonary Medicine at UC. "In addition, firefighters should meticulously wash their entire body to remove soot and other residues from fires to avoid skin exposure."

The research was supported in part by a grant from the Ohio Bureau of Workers Compensation. Study collaborators include UC's Paul Succop, PhD, James Deddens, PhD and Kari Dunning, PhD, as well as Tarek Sobeih, MD, PhD, of Cairo University, and Heriberto Barriera-Viruet, PhD, of the Interamerican University of Puerto Rico.

The Cincinnati Breast Cancer & the Environment Research Center Hosts Local and National Conferences



The Breast Cancer & the Environment Research Centers (BCERC) consist of research scientists, clinicians and breast cancer survivors/advocates collaboratively studying how *early environmental exposures* impact pubertal maturation, development of the mammary gland and breast cancer. The Centers are focused on early exposures since early puberty is a known risk factor for breast cancer in women. The centers are located at the University of Cincinnati; Fox Chase Cancer Center in Philadelphia, PA; University of California-San Francisco; and Michigan State University in E. Lansing. The Centers consist of two research projects and a Community Outreach and Translation Core (COTC).

Laboratory studies are being conducted to better understand the development of the mammary gland and how/when select environmental agents impact breast development and breast cancer. Epidemiologic studies of young girls are being conducted to learn how environmental, genetic and/or psychosocial factors affect when a girl starts puberty.

Breast cancer advocates collaborate with Center researchers and clinicians in the interpretation of the study results before educating the public and policy makers about the research findings.

The Cincinnati BCERC is a joint effort between researchers from the University of Cincinnati College of Medicine and Cincinnati Children's Hospital Medical Center, and local breast cancer survivors and their advocacy, support and service organizations. The Cincinnati BCERC COTC hosts an annual educational forum called **Looking Upstream for Environmental Links to Breast Cancer**. Past keynote speakers have been Drs. Sandra Steingraber, John Peterson Myers and Marcia Herman-Giddens. The programs include updates on the BCERC research projects as well as related presentations. Video copies of the presentations from the past three years are available on-line at

http://eh.uc.edu/growingupfemale/events.asp

The Cincinnati BCERC will host the 4th annual national scientific conference of the Breast Cancer and the Environment Research Centers on November 8-9, 2007 at the Westin Hotel in Cincinnati. More information about the conference, including registration instructions and the Call for Abstracts, is available on-line at **http://www.bcerc.org/2007mtg/index.htm**

The Cincinnati Breast Cancer & the Environment Research Center is funded by the National Institute of Environmental Health Sciences and the National Cancer Institute (Grant No: U01 ES/CA 012770).

Community Cancer Education Seminar Available on the Internet

Presentations by CEG Director Shuk-mei Ho, Deputy Director Daniel W. Nebert, and Integrative Health Sciences Core Leader Susan Pinney are available to the public for viewing at http://eh.uc.edu/Cancer_Education.asp. Each year the UC Barrett Cancer Center sponsors **Community Cancer Education Day: Knowledge for Life Conference**. Each year the CEG COEC and the Department of Environmental Health participate in this event. In 2006, the COEC worked with Drs. Ho, Nebert and Pinney to produce these videos which address gene-environment interactions, using prostate and lung cancers as examples. DEH Information Technology Director Jim Krabacher developed the videos; COEC Leader M. Kathryn Brown coordinated the creation of the videos and the educational displays for the one-day event.

CEG 2007 Pilot Project Program Grant Awardees

The CEG congratulates the recipients of Year 16 Pilot Project Program grants. Funding for the Pilot Project Program for Year 16 was generously supplied by the Dean of the College of Medicine.

Genetic susceptibility to PCB-induced developmental neurotoxicity
Charles V. Vorhees
In collaboration with Daniel W. Nebert, Michael T. Williams, and Christine P. Curran

Interaction between COMT genotype and nicotine exposure on neurocognition in young adults
Krista Medina
In collaboration with Judith Strong, James C. Eliassen, and Paula K. Shear

Immunogenetics of chronic obstructive pulmonary disease susceptibility
Scott Wesselkamper
In collaboration with Ranjan Deka and Mario Medvedovic

Epigenetic dysregulation of airway epithelial cell gene expression in the pathogenesis of smoking-induced COPD
Dennis W. McGraw
In collaboration with Shuk-mei Ho

Pilot Project Grants provide seed support for new initiatives in basic, translational, and clinical research. CEG Pilot Project Grants have returned 18 research dollars in new grant money for every one dollar supplied by the CEG and the College of Medicine.

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

Borchers Selected for National Fellow Program

Michael Borchers, PhD, assistant professor of Environmental Health at UC, has been selected to participate in a new fellowship program aimed at increasing the public's awareness and understanding of environmental health science.

The year-long Science Communication Fellows program, sponsored by the nonprofit organization Environmental Health Sciences (EHS), is the first of its kind and will allow participants to gain experience bridging the gap between science and journalism, while also helping the lay public understand the importance of studying the environment and its effects on human health.

Borchers is one of 10 scientists from across the United States chosen to help EHS identify important new research findings about the environment and health for "translation" into easy-to-understand language useful to reporters and the public.

Dr. Shuk-mei Ho serves as a member of the Environmental Health Sciences Advisory Committee, where she helped to develop this program and continues to monitor its progress.

Borchers is currently researching air pollution and varying exposure levels that may trigger immune system responses that cause or worsen respiratory diseases, including asthma, cystic fibrosis and chronic pulmonary disease. he five-year, basic science study is funded by a National Institute of Environmental Health Sciences Outstanding New Environmental Scientist Award, given to Borchers in 2006.

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Interface is supported by NIH grant # ES06096 from the National Institute of Environmental Health Sciences, and is published by the Center for Environmental Genetics, Shuk-mei Ho, PhD, Director.

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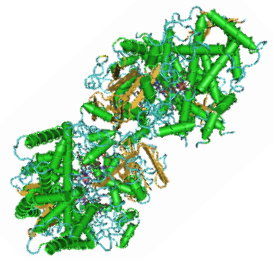
The Center for Environmental Genetics would like to thank the University of Cincinnati Academic Health Center Public Relations & Communications for news releases and photographs included in this issue of Interface. Contributors include Amanda Harper and David Bracey.

Web-Cytes

Cinteny: Server for Synteny Identification and Analysis of Genome Rearrangement
The Cinteny server can be used for finding regions syntenic across multiple genomes and measuring the extent of genome rearrangement using reversal distance as a measure. You may create a project and upload your own data or work with pre-loaded data by selecting the genomes. The CINTENY server was developed by A. U. Sinha and J. Meller, and can be accessed at **http://cinteny.cchmc.org/.**

Reproductive Physiology Modules
The UC College of Medicine has 64 award-winning modules, based on lectures by Andy LaBarera, available for viewing online at **http://aitl.uc.edu/itc/reprophys/**



Cn3D If you would like to manipulate a picture of your protein of interest, NCBI's Cn3D might be just the program for you. Cn3D is a helper application for your web browser that allows you to view 3-dimensional structures from NCBI's Entrez retrieval service. Cn3D simultaneously displays structure, sequence, and alignment, and has powerful annotation and alignment editing features. You can rotate the image of your predicted protein structure, alter the background, and produce figures as illustrated on this page.
http://www.ncbi.nlm.nih.gov/Structure/CN3D/cn3d.shtml

Reel Science
Chemical & Engineering News established Reel Science to encourage critical thinking about the way science is presented in film. The site includes reviews of new theatrical releases evaluated with a scientific audience in mind and recommendations of older films that have been influential or controversial within the science fiction genre. **http://pubs.acs.org/cen/reelscience/**