ASTHMATIC CHILDREN MORE VULNERABLE TO CHANGES IN AIR QUALITY

Children with asthma are more likely to wheeze as air pollution increases, even when concentrations are within National Ambient Air Quality standards, reports Jennifer Mann in a new study from UC Berkeley. And two subgroups of asthmatic children — those allergic to cats or fungal spores and young boys with mild, intermittent asthma — appear to be the most vulnerable to changes in air quality.

The study published in *Environmental Health Perspectives* also found that wheezing, a sign of asthma severity, was significantly associated with short-term exposures to nitrogen dioxide and PM10-2.5, which are inhalable, coarse air pollution particles composed of non-exhaust vehicle emissions such as tire rubber, brake fragments and dust. Coarse particles can have biological substances such as pollen, fungi and endotoxin on their surfaces.1,2

“Researchers have focused on the effects of particles in the fine fraction, which means 2.5 microns in diameter or smaller. But there have been fewer studies that have shown health effects of larger particles that are still respirable,” said lead author Jennifer Mann.

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LETTER FROM THE DIRECTOR

Letter from the Director

If that were not bad enough, President Obama’s proposed federal budget for FY2012 listed the 17 ERCs (as well as the eight Agricultural Occupational Safety and Health Centers) as “terminated” (i.e., no funds allocated). The Northern California ERC which I direct has been continuously funded by NIOSH since 1978 and has trained over 1200 students in occupational safety and health. Given the current federal deficit, we expected to see a reduction in funding, but not the complete elimination of a successful program.

The White House released a justification for the termination of the ERCs that contained erroneous information. The justification stated that the original goal of the program had been met, but the statutory goal of the ERCs is “to provide an adequate supply” of qualified occupational safety and health (OSH) professionals without a time limit. Currently, the 17 ERCs produce only about 40% of the government-projected need for OSH professionals. The White House indicated NIOSH has no means of tracking whether ERC-trained professionals actually end up in OSH jobs. In fact, NIOSH requires the ERCs to regularly provide information about graduates and most work in OSH. The justification also stated that ERCs were duplicative of OSHA’s training programs, although by mandate the ERCs train OSH professionals and OSHA trains workers. In addition, the justification suggested that because university institutional support was required by NIOSH for each ERC, the programs would survive the loss of federal funding, failing to take account of the fact that at least 60% of every ERC’s budget goes to support students. Finally, the justification suggested that state and private funds could make up for the loss of federal funds—not likely in light of the current economic downturn.

Needless to say, I have a different view of the role of the ERCs than the White House. These centers have a unique mission: to address OSH professional practice and research training in an inter-disciplinary environment that directly impacts safety and health practice in the workplace. They provide considerable value at a relatively modest cost ($25 million funds 17 centers annually). The ERCs (a) supply over 75% of the nation’s OSH professionals in specialty areas like occupational medicine and advanced injury prevention; (b) provide professional development training for OSH practitioners that support professional certification; (c) assist many small, medium and large-sized U.S. businesses; (d) develop major research innovations that prevent occupational injuries and diseases; (e) provide OSH expertise for the public and government leaders in ways that are not duplicative of any other U.S. government program; and (f) help to minimize worker’s compensation costs through dissemination of evidence-based OSH practices.

The consequences of the loss of ERC funding are great. Marked reductions would result in the number and quality of trained OSH professionals for employment in business, government, labor and education. The ability of OSH professionals to maintain professional certification would be reduced. The primary source of OSH training for businesses would be lost. I hope that Congress will see fit to restore funding for the ERCs and Agricultural OSH Centers. Otherwise, the backbone of the OSH professional educational infrastructure for our nation will be destroyed.

John R. Balmes

For many years the training programs of the Northern California Center for Occupational and Environmental Health (COEH) have enjoyed fiscal support from two sources, a large Education and Research Center (ERC) training grant from the National Institute for Occupational Safety and Health (NIOSH) and designated state funds through the University of California. The NIOSH funds provide tuition and stipend support for trainees in ergonomics, industrial hygiene, occupational epidemiology, occupational medicine and occupational health nursing. The state funds support the salaries of faculty educators and Center administrators. Now, the very existence of the training programs is at stake because both sources of support are threatened.

Over the last few years the University of California has absorbed huge cuts to its budgetary support from state funds. At COEH, our share has seen at least a 25% reduction in state support. We do not yet know how much we will be cut this year, but given Governor Brown’s plan to cut at least $500 million from the UC budget, it is likely that we will see another large decrease.
Low socio-economic status and a perceived imbalance between job effort and reward play a significant role in predicting recovery from work-related musculoskeletal injuries, according to a new study.

Researchers recruited over 650 hospital workers during 2002-04 to examine work-related musculoskeletal disorders (WRMSDs) of the trunk, neck, and upper and lower extremities. They assessed their recovery two years later to determine if the injuries had resolved and whether or not there were lingering impacts to work status or productivity.

“We documented the recovery trajectory and found that most injuries resolved in a two year time period,” said lead author Marion Gillen, deputy director of COEH and clinical professor in the UCSF School of Nursing. “We also found that people in the lowest economic strata had worse outcomes as a result of their injuries.”

The study was published in the October 2010 issue of Occupational Medicine (Lond) and funded by U.S. National Institutes of Health. COEH member Paul Blanc, professor of Medicine at UCSF, was senior author on the study. John Frank, who holds a Chair at the University of Edinburgh, was one of the co-authors.

Participants were from two hospital sites in San Francisco, California. Researchers recruited a diverse representation of hospital staff including nurses, clinicians, administrators, clerks and technicians. The cross-sectional, longitudinal study, which was facilitated through cooperation with hospital administrators and unionized labor, compared injured workers to a group of similarly employed, uninjured workers from the same sites.

After controlling for age, sex, race-ethnicity, income and education, recovery outcomes were poorest for those within the lowest 25% of socioeconomic status (SES) and for those who perceived a discrepancy between job effort and reward. “Along with poorer health outcomes, these groups also experienced work status changes or reduced work effectiveness,” reported Gillen. The research team identified that certain workers may be at risk of a double jeopardy — worse health and work status — following musculoskeletal injury at work.

“What is interesting is that these people had the highest level of occupation healthcare available following workplace injury,” said Gillen. “For example, they had access to occupational health services with direct clinical care and case management. Still, there is something that is not addressed related to SES status that contributes to disparities in recovery.”

The results were noteworthy, according to Gillen, because even though there was a difference in SES status among the study participants, they were all earning above minimum wage. The authors suggest WRMSDs may result in a worse long-term prognosis for workers with low SES status than is generally acknowledged.

The study highlights that creating work environments with appropriate rewards and less strain may contribute to better work effectiveness. Notes Gillen, “As occupational health professionals, we have to start looking at whether we need differentiated rehabilitation efforts and targeted return-to-work programs for people in different job classifications who face the double jeopardy following workplace injury.”

“As occupational health professionals, we have to start looking at whether we need differentiated rehabilitation efforts and targeted return-to-work programs for people in different job classifications who face the double jeopardy following workplace injury.”

Marion Gillen

Medical staff at Brooke Army Medical Center in San Antonio, Texas, lift a patient from one bed to another after surgery to move him to the recovery room. (U.S. Navy photo by Jhi L. Scott)
Toxicity Testing a Critical Tool for Breast Cancer Prevention

Breast cancer affects one out of every eight women in the United States, accounting for approximately 40,000 deaths in 2010. But with only about 10% of cases thought to be caused by inherited genes, scientists are increasingly focused on the role environmental factors play in disease development.

“Breast cancer is a leading cause of death among women in their prime years,” reports Sarah Janssen, assistant clinical professor in the UCSF Division of Occupational and Environmental Medicine and senior scientist at the Natural Resources Defense Council (NRDC). “A lot of money and research has been put into better detection and treatment, and as a result, women are living longer with their illness. However, we still don’t know what causes breast cancer, and we need more research focused on prevention.”

Though breast cancer is hypothesized to be associated with industrial chemical exposure and the use of consumer products, little is known about the toxicity of tens of thousands of chemicals commonly used in the United States. While research is ongoing to address this data gap, Schwarzman points to the need to act in the short-term. “The project asked how to use current test methods and make decisions with what we know now.”

For their investigation, Janssen and Schwarzman adopted the disease end-point approach developed by the National Academy of Sciences in their report, Toxicity Testing in 21st Century, which was co-authored by COEH faculty Gina Solomon, senior scientist for the NRDC and co-director of the OEM Residency program at UCSF.

It recommends scientists look upstream for early signs of disease, and where possible, use emerging laboratory tests capable of screening hundreds of chemicals in in vitro high-throughput assays. “Our project was a way to put some flesh on the bones of that report by focusing on a specific disease like breast cancer,” said Janssen.

To conduct the project, Schwarzman and Janssen convened a multidisciplinary expert panel representing the fields of cancer biology, toxicology, medicine, epidemiology, environmental justice, public health and public policy.

The panel first identified what scientists have already demonstrated to be early indicators of breast cancer development. Put simply by Janssen, “Before a tumor grows, what can predict that it will develop?” Examples included cell or tissue changes indicative of altered mammary gland development, and susceptibility factors such as obesity or early puberty.

The panel then developed a testing scheme, called the Hazard Identification Approach, to prioritize chemicals for testing and ultimately single-out chemicals that may raise the risk of breast cancer. They also identified gaps where assays have not yet been developed, and did a scientific review to pilot test the approach.

“Our goal was to pilot this approach through the lens of breast cancer, rather than developing a boutique toxicity testing scheme unique to a single disease. Ideally, the same approach can be applied to other disease end-points and ultimately combined to form a comprehensive approach to chemical testing,” said Schwarzman.

The project aims to dovetail with ongoing efforts to improve chemicals policy, including the regulatory process currently underway within California’s Department of Toxic Substances Control as part of the state’s Green Chemistry Initiative passed into law in 2008.

“The pendulum is swinging,” says Schwarzman. “A major motivator is the European chemicals regulation, REACH (Registration, Evaluation, Authorization and Restriction of Toxic Chemicals), which demonstrates that comprehensive chemicals policy reform can be done—the ship has sailed.”

Pathways to Breast Cancer: A Case Study for Innovation in Chemical Safety Evaluation, a recent report co-authored by Janssen and Megan Schwarzman, Pathways to Breast Cancer: A Case Study for Innovation in Chemical Safety Evaluation, has provided an important first step to untangling the link between breast cancer and chemical pollutants in the environment. Schwarzman is an associate director of the Berkeley Center for Green Chemistry and research scientist in the School of Public Health.

A recent report co-authored by Janssen, Megan Schwarzman, Pathways to Breast Cancer: A Case Study for Innovation in Chemical Safety Evaluation, has provided an important first step to untangling the link between breast cancer and chemical pollutants in the environment. Schwarzman is an associate director of the Berkeley Center for Green Chemistry and research scientist in the School of Public Health.

“Chemical producers must provide information, but what information? Our report was a way to answer that question for a disease that is a major public health issue affecting millions of women. If we did a better job of identifying chemicals upfront that were linked to the disease we could prevent a lot of pain and suffering.”

Sarah Janssen
Robin Baker Leads New r2p Initiative

After nearly 30 years as director of the Labor Occupational Health Program (LOHP) at UC Berkeley, Robin Baker has a new role as principal investigator of a 4-year project funded by CPWR: The Center for Construction Research and Training and the National Institute for Occupational Safety and Health (NIOSH).

Baker is a nationally recognized specialist in Research to Practice (r2p). R2p is a collaborative process between researchers and those who are able to apply new knowledge in the workplace to reduce injury and illness (workers, employers, policymakers and others). In her new position, she will use her significant experience to foster partnerships between the research community and the U.S. construction industry.

“Though construction remains one of the nation’s most hazardous industries, many evidence-based solutions already have been developed. Yet their adoption in the field continues to be all too rare, particularly on smaller work sites,” says Baker. “I am honored to have the opportunity to try to help close this gap.”

Post-doctoral fellow Charlotte Chang, DrPH ’10, joins Baker on the new project. Previously, Chang collaborated with LOHP and COEH faculty members Meredith Minkler and Niklas Krause on a study of Chinese restaurant workers.

Go online to read what occupational health leaders have to say about Robin Baker’s legacy at LOHP:
http://coeh.berkeley.edu/bridges/winter2010

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Ergonomics Program Announcements

Study of Carpal Tunnel Syndrome Receives $1.5 Million from NIOSH

The National Institute for Occupational Safety and Health (NIOSH) awarded principal investigator David Rempel $1.5 million over three years to conduct the largest known study of carpal tunnel syndrome (CTS), a major source of disability among workers. Caused by pressure on the median nerve that runs from the forearm into the hand, CTS accounts for the highest average number of days lost at work per case compared to all other major work-related injuries or illnesses.1

Rempel and colleagues, including Ellen Eisen, adjunct professor in the School of Public Health at UC Berkeley, will pool CTS data from seven other U.S. universities. The sample will include over 3,500 workers from diverse occupations. Researchers will then analyze information gathered from 2001-08 to determine the relationship between hand activity and CTS with the goal to reduce workplace injury and improve safety. The project will support graduate students at UC Berkeley and the seven participating research sites.

Rempel is a professor of Medicine in the UCSF Division of Occupational and Environmental Medicine and director of the Ergonomics Program at UC Berkeley, a joint program of UCSF and UC Berkeley.

National Academy of Sciences Appoints David Rempel to BOHSI

In November 2010, David Rempel was appointed by the National Academies of Sciences to its Board on Human-Systems Integration (BOHSI). BOHSI’s mandate is to identify critical issues in the design, test, evaluation, and use of new human-centered technologies. They also provide research advice in the areas of human factors engineering, physical ergonomics, training, occupational health and safety, health care, product design and macro-ergonomics.2

Rempel Receives ENR’s Award of Excellence for Developing Overhead Drilling Tool

David Rempel has been named one of the “Top 25 Newsmakers of 2010” by Engineering News Record (ENR) for his work in developing an overhead drilling tool, which reduces the stress on a construction worker’s shoulders, arms and hands by nearly 90%.3 ENR is the largest weekly circulation in the country on construction engineering. Read the story in the April 2010 edition.

Carisa Harris Wins First Prize at 2010 PREMUS Conference

Ergonomics PhD graduate Carisa Harris won first prize for Best Paper at the International Conference on Prevention of Work-Related Musculoskeletal Disorders (PREMUS 2010) held in Angers, France, this past summer.

Her paper reported preliminary findings on a prospective study of 450 workers from four industries to determine factors that predict wrist tendinosis, a common work-related upper extremity disorder. Harris joins the faculty at Samuel Merritt University in Oakland, California, where she will teach physical therapy and continue her research with David Rempel and Ellen Eisen.

Molly Follette Story Joins U.S. Food and Drug Administration

Congratulations to alumna Molly Story, PhD ’08, on her new career as a Human Factors and Accessible Medical Technology Specialist at the U.S. Food and Drug Administration (FDA).

In her role, she serves as a human factors resource for the Office of Device Evaluation (ODE) and the Center for Devices and Radiological Health (CDRH). She also works with internal committees on human factors at CDRH, accessibility of medical diagnostic equipment for patients with disabilities, and human factors issues related to use of medical devices in the home.

“I am excited to be working on the accessible equipment project since that was the focus of my UC Berkeley dissertation,” reports Story. “As a result of the Patient Protection and Affordable Care Act, known as the “health care reform act,” the U.S. Access Board will work with the FDA to write new standards for accessible medical diagnostic equipment. The standards will be based largely from the research we did at the UC Ergonomics Lab and at Marquette University, our collaborator on the grant.”

1 Stanford Hospitals and Clinic website
2 http://www7.nationalacademies.org/dbasse/About_BOHSI.html
Heat stress can be fatal to outdoor workers in California, especially in the summer when high temperatures are the norm. In 2010, the Labor Occupational Health Program (LOHP) led an innovative social marketing campaign to educate non-English speaking workers and their employers about the dangers of extreme heat.

The results were dramatic. Almost 90% of farmworkers surveyed were aware of the campaign, and many reported an increase in heat illness prevention behaviors including drinking water and resting in the shade, according to a report in December 2010 to the California Department of Industrial Relations (DIR). Approximately half of employers and over 80% of community groups surveyed were also aware of the campaign.

Suzanne Teran, coordinator of public programs at LOHP, led the collaboration with DIR, Cal/OSHA, Underground Advertising, UCLA-LOSH (Labor Occupational Safety and Health) and UC Davis’ Western Center for Agricultural Health and Safety. Funded by DIR, the campaign built on a successful pilot project conducted by LOHP in Mendota, California, in 2008.

Designed to reach underserved non-English-speaking workers in the hottest areas of the state, the campaign spanned “from the US-Mexico border in the south up to the Punjabi population in Yuba County,” said Teran.

The team began by framing their message. “How do you talk about the issue in a way that resonates with your target audience and ultimately leads to behavior changes by shifting attitudes?” asked Teran. Their main strategy was to position heat safety as simply part of the job: Water. Rest. Shade – the work can’t get done without them.

“In our analysis, we saw that productivity was a common goal for both workers and employers,” added Teran.

“We drew on this for the messaging to create positive associations with the needed prevention steps, for instance with the headlines ‘Stopping for water keeps you going,’ or ‘You’ll last longer after a little rest.’ These headlines were complemented by the powerful photography of confident workers doing what’s right for their health.”

With the help of seven focus groups from different worker populations – farming, construction and landscaping and others – they crafted easy-to-understand materials in five languages: Spanish, Mixteco, English, Punjabi and Hmong. A DVD with audio options in each of these languages was produced as a low-literacy educational tool for workers and employers. “We’ve heard from our evaluation with different community groups that the resources have been very useful for their community outreach efforts,” noted Teran.

Rolling out the campaign, “We strategically placed the message where workers and supervisors were in the right frame of mind to be thinking about heat and able to do something about it,” said Teran. Billboards were erected in both high traffic areas and rural roads near the fields. “We also used wall graphics, where you place ads in neighborhood check cashing stores and grocery outlets to reach workers with an approach that is local and targeted.”

Outdoor ads were placed on lunch trucks and in vans that carpool workers to the fields. Radio ads ran during their commute to and from work. Giveaways such as key chains with thermometers, bandanas and clipboards for crew leaders served as reminders of heat safety.

Community outreach and training was also central to the campaign. By summer’s end, the team trained over 150 people who in turn trained up to 8,000 workers. “It’s all about how you reinforce the message by bringing people in who can serve as a support to workers in their local community,” explained Teran.

The team leveraged multimedia tools to expand their reach. For instance, an online seminar for employers was held in June 2010 with 60 participants. They also created a multilingual website with educational materials, which attracted almost 9,500 visits between June and November 2010.

“In follow-up interviews after the campaign, both employers and worker advocates said that it would be great to run the campaign again next summer,” said Teran. “Funding is a major consideration, but we would enjoy the opportunity to continue dissemination.”

Campaign Website: http://99calor.org/english.html
See the complete Report on the campaign outcomes from the California Department of Industrial Relations: http://www.dir.ca.gov/dosh/HeatIllnessCampaign/HeatIllnessPreventionCampaignReport.pdf
Asthmatic Children and Air Quality (continued)

“There might be a relationship between the coarse particle findings and allergens that are contained in the coarse fraction of particles,” she notes. “Our research is supportive of previous studies that show fungal antigens make people more responsive to air pollution.”

Mann is a co-investigator with the Fresno Asthmatic Children’s Environment Study (FACES), an epidemiological investigation conducted by researchers at UC Berkeley and funded by the California Air Resources Board (ARB) and the National Institutes of Health (NIH). Starting in 2000, they enrolled approximately 300 asthmatic children from ages 6 to 11 years to examine the effects of air pollution on the health of their lungs.

FACES is led by Ira Tager, a professor of Epidemiology in the School of Public Health at UC Berkeley. Other co-investigators include Katharine Hammond, professor of Environmental Health Sciences (EHS) and John Balmes, director of COEH and professor of Medicine in the Division of Occupational and Environmental Medicine at UCSF and EHS at UC Berkeley.

Fresno has some of the highest levels of air pollution in the United States. During 2005-07, residents were exposed to annual average fine particulate matter concentrations that exceeded national standards by over 40%. The lifetime prevalence of asthma for children 5 to 17 years of age was almost 34% in 2005, nearly double the rate of 18% for the state of California.3

“The purpose of the study was to look at how the relationship of long-term exposures to air pollutants was associated with lung function growth and changes in asthma severity over time. But we were also interested in understanding how short-term changes in air pollution concentrations over the past few days to the past two weeks affected short-term changes in lung function and symptoms,” said Mann.

“We also hypothesized when FACES began that there would be certain subgroups of asthmatic children who would be especially responsive to air pollution, and indeed there were,” said Mann. “Our study will provide answers about vulnerable populations for the ARB’s next review of air quality standards.”

Co-authors on the article include Tager, Balmes, Hammond and Kathleen Mortimer, an adjunct professor of Epidemiology in the School of Public Health at UC Berkeley.

Air Pollution Modifies Immune Response

Ira Tager and colleagues recently published a separate study in the Journal of Allergy and Clinical Immunology that explains how air pollution impairs lung function by depressing regulatory T (Treg) cells, which are critically important in regulating immune responses involved in asthma.

They estimated children’s daily air pollution exposure to a group of chemicals called polycyclic aromatic hydrocarbons (PAHs), which are hypothesized to be one of the biologically plausible agents behind observed health effects. They compared these pollution levels to the function of regulatory T-cells in children with and without asthma living in Fresno, and a comparable group of children living in Palo Alto, California, where the air is cleaner.

“Living in a more polluted environment in Fresno was associated with much greater depression of regulatory T-cells and their function, and this depression was associated with immune responses that are enhanced with air pollution exposure,” said Tager. “The degree of suppression of these cells was associated with the severity of the asthma of these children and the decline in their lung function.”

The study presents strong evidence that impaired T-cell function is environmentally induced. Tager adds, “We were able to trace from the air pollution exposure, to the suppression of the function of a very important regulatory cell in the immune system, to phenotypic characteristics of the immune response to asthma, to phenotypic characteristics of the subjects themselves, and a specific alteration of the function of the gene that produces an important protein necessary for the function of Treg cells. As far as we know, we haven’t seen any studies that have made this complete picture.”

The authors note that T-cells may play a role in other autoimmune disorders, suggesting the implications of this study could extend beyond asthma.4 “T-cells are critically important to normal pregnancy,” says Tager. “Studying these cells might provide a unifying mechanism of how air pollution can both affect the risk of asthma and potentially other allergic diseases, and also have effects on birth outcomes.”

Kari Nadeau, an assistant professor in the Division of Immunology and

“T-cells are critically important to normal pregnancy,” says Tager. “Studying these cells might provide a unifying mechanism of how air pollution can both affect the risk of asthma and potentially other allergic diseases, and also have effects on birth outcomes.”

Ira Tager
Allergy at Stanford University, is lead author on the paper. COEH faculty Katharine Hammond and John Balmes are co-authors along with Tager.

**Center Awarded $1.5 Million from National Institutes of Health**

The new Center for Environmental Public Health led by principal investigator Ira Tager was awarded a $1.5 million, 3-year formative grant from NIH to corroborate their findings in a larger study with research partners at Stanford University.

“The grant will help us understand how air pollution and bioaerosols in the San Joaquin Valley, California, are related to asthma, regulatory T-cell function and adverse birth outcomes: small for gestational age, term low birth weight and structural birth defects,” reports Tager.

NIH awards these grants to develop the infrastructure needed for a full Children’s Health Center. UC Berkeley has two other Children’s Health Centers — one led Brenda Eskenazi and another led by Pat Buffler.

A new Children’s Environmental Health Center directed by Patricia Buffler was awarded $7.5 million for five years from the National Institutes of Environmental Health Sciences (NIEHS) and the U.S. Environmental Protection Agency.

The Center for Integrative Research on Childhood Leukemia and the Environment (CIRCLE) at UC Berkeley will encompass three research projects to examine the effects of in-utero and early life exposure to potentially carcinogenic chemicals present in homes, such as pesticides, tobacco smoke and polybrominated diphenyls, and their role in the development of childhood leukemia.

CIRCLE will include a Research Translation and Community Outreach Core to disseminate findings from each project. It will also support the career development of Libby Morimoto, a new junior faculty-level investigator.

Patricia Buffler is the Kenneth Howard Kaiser & Marjorie Witherspoon Kaiser Endowed Chair and Professor of Epidemiology in the School of Public Health at UC Berkeley and a faculty member of COEH.

**Martyn Smith Receives Children’s Health Advocate Award**

In October 2010, the Children’s Environmental Health Network (CEHN) honored Martyn Smith with the Children’s Health Advocate Award at its 5th annual reception held in Washington, DC.

Founded in 1992, CEHN is a national organization whose mission is to protect the fetus and the child from environmental health hazards and promote a healthy environment. In addition to Smith, recipients at the ceremony included U.S. Senator Frank R. Lautenberg, Dr. Sanjay Gupta from CNN and Marva King from the U.S. Environmental Protection Agency.

Smith is a professor of toxicology at the School of Public Health at UC Berkeley, director of the Genes and Environment Laboratory, and a principal investigator of the Superfund Research Program. His research interests include the causes of leukemia and lymphoma and the application of biological markers in toxicology and epidemiology.
Stephen Rappaport Receives the Jerome J. Wesolowski Award

The International Society of Exposure Science honored Stephen Rappaport with the Jerome J. Wesolowski Award at its 2010 conference in Seoul, South Korea. The award recognizes his outstanding contributions to the knowledge and practice of human exposure assessment.

Director of the Center for Exposure Biology and a lead investigator at the Genes and Environment Laboratory at UC Berkeley, Rappaport is a pioneer in the development and application of biomarkers of exposure to toxic chemicals. His research explores how humans metabolize toxins such as benzene and polycyclic aromatic hydrocarbons and quantifies individual variability in biomarker levels due to genetic, environmental and lifestyle factors.

Although Rappaport could not attend the Seoul conference to present his remarks, they have been published in the Society’s journal. In his commentary, Rappaport argues that the field of exposure science has an important opportunity to help determine the major causes of chronic disease, which we now know to be largely of ‘environmental’ rather than genetic origin. But to do so, he encourages exposure scientists to embrace the concept of the ‘exposome’ representing all exposures received by people during life from both external sources (air, water, diet) and internal sources (inflammation, lipid peroxidation, hormones, etc.).

Previous recipients of the Jerome J. Wesolowski award include COEH faculty Kirk Smith and Tom McKone from UC Berkeley.


John Balmes Honored with Rutherford T. Johnstone Award

John Balmes, director of COEH and professor of Medicine in the Division of Occupational and Environmental Medicine at UCSF, received the Rutherford T. Johnstone Award in September 2010 at the Western Occupational Health Conference in Newport Beach, California. Each year, the award is presented to a member or former member who has contributed significantly to occupational and environmental medicine.

Balmes was appointed in 2007 to the California Air Resources Board by former Governor Arnold Schwarzenegger. He is also director of the Human Exposure Laboratory (HEL), which has been studying the respiratory health effects of air pollutants for over two decades.

HEL scientists are currently studying the airway inflammatory and cardiovascular effects of ozone and second-hand tobacco smoke and seeking to identify genetic factors that influence susceptibility to air pollution.

With the Fresno Asthmatic Children’s Environment Study, Balmes and his colleagues are studying the effects of particulate matter, in combination with other ambient air pollutants and bioaerosols, on the natural history of asthma in children.

Balmes also collaborates on studies of the respiratory health effects of biomass smoke, hydrogen sulfide, and arsenic in drinking water (with Kirk Smith, Michael Bates, Allan Smith and Craig Steinmaus respectively). He studies the effects of environmental factors in adult asthma with Paul Blanc.

After accepting the award, Balmes presented the 2010 Rutherford T. Johnstone lecture.

View the presentation Dr. Balmes gave after the award presentation here: www.woema.org/files/Johnstone_award2010.pdf

Marc Schenker Recognized for Excellence in Scientific Writing

Marc Schenker received the Jean Spencer Felton Award for Excellence in Scientific Writing at the annual conference of the Western Occupational Medical Association in Newport Beach, CA, held in September 2010. The award presented by Paul Papanek, Chairman of the Board, is given annually to the author of a book, journal article or other written work important to the field of occupational health.

Schenker is a professor of Public Health and Medicine at UC Davis, and serves as director for the UC Davis Center for Occupational and Environmental Health, the Western Center for Agricultural Health and Safety, and the Migration and Health Research Center. His international research interests include environmental and occupational risk factors for respiratory disease and lung cancer, occupational reproductive hazards, agricultural health and safety, and migration and health.
Soo-Jeong Lee Joins the School of Nursing at USCF

In August 2010, Soo-Jeong Lee joined the UCSF School of Nursing faculty as an assistant professor with the Occupational and Environmental Health Nursing (OEHN) Program.

Lee’s interest in occupational health began while a nursing undergraduate at Seoul National University in Korea. She joined a student study club for occupational health, and soon she was in the field visiting nuclear power plants and coal mines to understand the health problems of workers. Successfully juggling her extracurricular interests with the demands of her studies, she graduated Magna Cum Laude with a Bachelors of Science in Nursing in 1993.

After graduation, Lee chose to focus on clinical nursing. She worked in the medical and intensive care units at Seoul National University Hospital. “As a young woman, the hospital setting was a place with drama – a place to save lives and cure people,” said Lee. “After entering nursing, I learned that hospitals are also a workplace that can affect the health and safety of workers.”

As a clinical nurse, she cared for many terminally ill patients. “This is where I learned the importance of prevention. It’s the reason I wanted to go back to school to study.” She earned her Industrial Hygienist Certification in Korea in 1994 and her MS in nursing in 1999. Then, motivated by her interest in occupational health, she set her sights on UCSF’s OEHN Program, where she completed her Adult Nurse Practitioner training and received her PhD in 2007.

Lee received no less than 16 scholarships and awards while a doctoral student, including the American Association of Occupational Health Nurses (AAOHN) Medique New Investigator Award for her dissertation. Her study of safe patient-handling practices among 400 critical care nurses was published in the September 2010 issue of the American Journal of Industrial Medicine.

Before joining UCSF, Lee worked for six months at the California Department of Public Health (CDPH) where she analyzed occupational health surveillance data before receiving a postdoctoral fellowship from the Centers for Disease Control and Prevention’s (CDC) Epidemic Intelligence Service, a training program for public health and applied epidemiology.

The CDC assigned her to the National Institute for Occupational Safety and Health (NIOSH) because of her interest in occupational health. “My major project was to analyze pesticide illness surveillance data and make recommendations for prevention,” said Lee. Her work resulted in the first multistate report on the magnitude and characteristics of acute antimicrobial pesticide illness among workers in healthcare facilities. First published in May 2010 in the CDC’s Morbidity and Mortality Weekly Report, it also appeared in the July 2010 issue of the Journal of the American Medical Association (JAMA).

Lee enjoyed her time at NIOSH and said it was a hard decision to leave, but the faculty position at UCSF was a natural fit and an excellent opportunity for her to pursue her goal of becoming a leading nurse researcher in the field of occupational health.

Building on previous collaborations, she is currently working on a CDC sponsored project with CDPH that will evaluate a reporting measure of influenza vaccinations among healthcare personnel. She is also developing a proposal to pursue intramural funding for an investigation into occupational exposures and safe work behaviors among cleaning workers in healthcare settings.

In the future, Lee hopes to offer a course in occupational health nursing and research methodology once she has established her research agenda. 📚
Center for Children's Environmental Health Manuscript Selected as Editor's Choice

An article by investigators from the Center for Children's Environmental Health published in the journal *Environmental and Molecular Mutagenesis* was selected as the Editor's Choice by the Environmental Mutagen Society. To honor its scientific contribution, the journal featured it on the front cover for March 2011.

“Effects of PON Polymorphisms and Haplotypes on Molecular Phenotype in Mexican-American Mothers and Children” was co-authored by Karen Huen, Lisa Barcellos, Kenneth Beckman, Sherri Rose, Brenda Eskenazi and Nina Holland. Researchers investigated how individual changes in the paraoxonase (PON) genes relate to variation of PON1 enzymatic activity. Since the PON1 enzyme can metabolize some neurotoxic organophosphate pesticides, these genetic variants may affect an individual’s susceptibility to pesticide exposure.

Huen and colleagues carried out a thorough analysis of PON genetic variation by sequencing the PON1 gene in 30 Mexican-American subjects. More than 90 PON genetic variants were identified, including 9 novel polymorphisms.

Researchers also assessed the functional significance of these genetic variants in over 700 Mexican-American mothers and children from the CHAMACOS birth cohort study from Salinas Valley, California. Such information is critical for identifying populations particularly vulnerable to organophosphate pesticide exposure. For instance, individuals with genetic polymorphisms known to code for lower PON1 enzymatic activity may be considered at increased risk of adverse health outcomes when exposed to organophosphate pesticides.

Allele frequencies of many of the genetic variants were noticeably different in the Mexican-American subjects compared to frequencies reported in Caucasian populations that may reflect potential ethnic differences in response to exposures.

The investigators also demonstrated that paraoxonase phenotypes are not static. The relative contribution of certain PON1 polymorphisms was higher in mothers than newborns, suggesting that the role of genetic variants on susceptibility to pesticide exposure changes with age.

Their research was supported by grants from the U.S. Environmental Protection Agency (R826886, R82670901) and the National Institute of Environmental Health Science (R01ES012503-03, PO1 ES009605).

LOHP Leads Workshop at OHS Conference in Asia

Robin Dewey and Laura Stock, program coordinators from the Labor Occupational Health Program (LOHP) at UC Berkeley, presented an electronics hazards workshop at the Asia Network for the Rights of Occupational Accident Victims (ANROAV) annual conference held in Bandung, Indonesia.

Attending the two-day workshop were more than 25 delegates from China, Hong Kong, Indonesia, Korea, the Philippines, Thailand and the United States.

Assisting Dewey and Stock were Ted Smith, co-founder of the International Campaign for Responsible Technology and Garrett Brown, a member of COEH’s Advisory Committee. Brown is a compliance safety and health officer for the California Division of Occupational Safety and Health and coordinator of the Maquiladora Health and Safety Support Network (MHSSN).

ANROAV is a coalition dedicated to occupational health and safety in Asia. It includes more than 20 trade unions, injured workers’ groups, and community and labor rights groups in 14 Asian countries with affiliated members in Europe and the United States. ANROAV was formed in 1997 after industrial disasters in Kader and Zhili, where over 250 workers were killed.

Participants at the event adopted a comprehensive declaration calling for improved working conditions in job sites across Asia.

http://www.anroav.org

Story adapted from “Border/Line Health & Safety” newsletter, MHSSN.
Prenatal Exposure to Organophosphate Pesticides May Play a Role in Children’s Attention Problems

Scientists at UC Berkeley have found that women exposed to organophosphate pesticides while pregnant are more likely to have children with attention problems at age five. In a separate study, they reveal that some children may be genetically more susceptible to organophosphates than others.

The two studies published in the October issue of Environmental Health Perspectives are part of a longitudinal investigation by the Center for the Health Assessment of Mothers and Children in Salinas (CHAMACOS) led by director Brenda Eskenazi, Maxwell Professor of Maternal and Child Health and Epidemiology in the School of Public Health and a member of COEH. The study enrolled over 600 predominantly Mexican-American pregnant women living in the Salinas Valley, an agricultural region in North Central California, starting in 1999.

Eskenazi and her research team have been working with families in the community for more than a decade to learn how pesticides and other environmental exposures affect the health of mothers and children.

Organophosphate (OP) pesticides are potent toxins widely used in agriculture to protect fruits and vegetables from insects and pests. “We know these chemicals are neurotoxins at very high doses,” said Eskenazi. “The question was whether we would find any associations when the exposures were considerably lower, but perhaps more constant, and whether some populations are more vulnerable than others.”

As a marker of prenatal OP exposure, researchers measured six dialkyl phosphate (DAP) metabolites in maternal urine twice during pregnancy. The DAPs represent 80% of the total OP pesticides used in the Salinas Valley. They found every 10-fold increase in maternal DAP concentration was associated with a five times greater odds of attention-deficit hyperactivity disorder (ADHD) assessment at age 5. The association was strongest among boys.

Eskenazi said the OP levels measured in pregnant women in Salinas Valley were somewhat higher than the general U.S. population of women of reproductive age, but not out of range. “If you look at the levels of metabolites of the women during pregnancy compared to women of reproductive age in the National Health and Nutrition Examination Survey of the U.S. population, there is a great deal of overlap in the distributions, which means that there are many people in the United States who have similar levels of pesticide metabolites.”

“We took a sample of urine and looked to see the metabolites in that urine, but those metabolites could come from eating or from exposure to the metabolites themselves in the environment,” reports Eskenazi. “We don’t know enough about it yet.” Nonetheless, she recommends washing fruits and vegetables and soaking berries and rinsing them several times, especially while pregnant.

A second study by Eskenazi and COEH co-authors Nina Holland, Karen Huen, Asa Bradman and Kim Harley suggests how one’s genotype may influence susceptibility to OPs.

“If you and I are exposed to the same level of a chemical,” questions Eskenazi, “but I have one genotype and you have another, am I more likely to have associations with adverse neurodevelopment than you are, given the same exposure?”

Scientists analyzed blood samples from over 350 children from the CHAMACOS study, and they found those with certain paraoxonase 1 (PON1) genotypes, which determine levels and efficiency of enzymes that break down the toxic metabolites of OPs, had more neurodevelopmental delays than those with other genotypes. PON1 measurements have been associated with diseases of the nervous system including Alzheimer’s, ischemic stroke and Parkinson’s, and with childhood autism, according to the authors.

“Our study was too small to say anything definitely,” said Eskenazi. “But a trend was suggestive that there may be an increased susceptibility.” To confirm their findings, the authors recommend a follow-up study that pools information from other research centers with similar data.

CHAMACOS Awarded $7.5 Million over 5 Years

The National Institute of Environmental Health Sciences and the U.S. Environmental Protection Agency recently granted CHAMACOS, led by principal investigator Eskenazi, $7.5 million over 5 years to study the children from the Salinas Valley into puberty.

The grant will help support graduate and post-doctoral students pursuing research into the health impacts of exposures to chemicals including agricultural pesticides, flame retardants and dichlorodiphenyltrichloroethane, or DDT.
COEH Shares Best Practices with OHS Delegation from China

In January, COEH hosted a delegation of senior occupational health and safety (OHS) officials visiting from the People’s Republic of China. The aim of the group was to learn more about the Center and about OHS best practices in California. During two days of presentations, delegates were offered a detailed glimpse into COEH projects across disciplines.

The visit kicked off at the Ergonomics Laboratory at UC Berkeley’s Richmond Field Station. Director David Rempel led a tour for more than a dozen delegates while disseminating information about the program’s research. Ergonomics PhD student Peiyi Ko acted as an interpreter for the non-English speaking guests.

Later, founding COEH Director and Professor Emeritus Robert Spear told delegates about his first trip to China in 1991. His research program, focused on schistosomiasis in Sichuan Province in southwestern China, is still active twenty years later.

Spear explained the origins of COEH and its interdisciplinary approach, where students come from a wide variety of academic programs. “It means we are unusual because of this lack of disciplinary cohesion,” he said, “but it also our strength because we bring a multidisciplinary approach to problems in public health.”

Along with Rempel, presenters included Julia Faucett, Professor Emeritus from the UCSF School of Nursing and James Meyers, Occupational and Environmental Health Specialist, Ergonomics Program Manager at Lawrence Berkeley Laboratory Ira Janowitz, Industrial Hygienist Jackie Chan from the San Francisco Department of Public Health, Health Educator Suzanne Teran from the Labor Occupational Health Program and Luoping Zhang, adjunct professor in the School of Public Health at UC Berkeley. “The message of these studies is an inspiration to us,” a delegate reported through a translator.

“We have a long tradition of working with colleagues in China, which we would like to continue,” said John Balmes, director of COEH, in his closing remarks before a reception in honor of the guests.

COEH extends special thanks to PhD student Peiyi Ko (Ergonomics) and to PhD students in Environmental Health Sciences at UC Berkeley Shuo Wang and Ruiling Liu for their invaluable help as interpreters.
COEH members are saddened by the loss of two long-time friends who were strong supporters of our efforts to improve occupational health and safety conditions for workers. John Talty passed away in January and Lela Morris in February 2011.

John’s distinguished service with the National Institute for Occupational Safety and Health (NIOSH) included 30 years in the U.S. Public Health Service Commissioned Corps (1960-1990). While serving in the Corps, John received three Medals of Honor: March of 1985 – Accommodation Medal; June 1987 – Outstanding Service Medal; and February 1991 – Meritorious Service Medal.

John served NIOSH two additional decades after his retirement from the Public Health Service working in the early 1990’s as a Supervisor General Engineer in the Education and Information Division, and later as a Scientific Program Officer in the Office of Extramural Programs. John was the NIOSH Program Officer for COEH. He continued to provide leadership, direction and guidance for a broad range of occupational safety and health disciplines including Industrial Hygiene, Occupational Medicine, Occupational Health Nursing, Occupational Safety and Occupational Health Psychology.

John was instrumental in helping ensure the quality of training provided by Education and Research Centers and Training Project Grants funded by NIOSH. He leaves a legacy of a multitude of students who have benefitted from his dedication to excellence in learning. “John was unstintingly generous, extremely patient, and consistently went out of his way to make sure that our reports were perfectly accurate assuring that the ERCs and NIOSH were represented in the best possible light,” said Marion Gillen, deputy director of COEH. “He will be sorely missed.”

COEH Renames Symposium in Honor of Lela Morris

Lela Morris joined COEH in 1982 as the Center’s first Director of Continuing Education. She was critical to the establishment of COEH and the development of the NIOSH’s Education and Research Center (ERC).

To honor Lela’s legacy, the directors of COEH have renamed one of its most important annual events in her honor. COEH’s Symposium will now be called the Lela Morris Annual COEH Symposium. This is a fitting tribute to Lela who was a shining example of how to bridge the gap between the campus and the community.

The Symposium brings together students, faculty, alumni, staff and community, across three UC campuses and across all academic disciplines involved in COEH. In past years, symposium topics have included a focus on air pollution, asthma, work organization, climate change, health policy, injury prevention, and most recently, problems facing immigrant and vulnerable workers. These are topics that were important to Lela. The event will also provide us with a lasting reminder of the values she imparted to our program, in particular, bridging our differences and coming together for a greater good.

Lela was a very important part of COEH, LOHP and the NIOSH-funded ERC. “Her astounding ability to encourage and cajole people to do the right thing was simply a miracle to be witnessed,” said Marion Gillen. “Her graciousness, infectious enthusiasm and thoughtful design laid the foundation for a program that has grown considerably and continued to thrive in the more than twenty years since her retirement. We are honored to call her one of our own, and will continue to honor her memory through our Lela Morris Annual COEH Symposium.”
The Northern California Center for Occupational and Environmental Health (COEH), a multidisciplinary program of the University of California at Berkeley, Davis, and San Francisco, promotes health and safety in workplaces and communities by:

- Educating health professionals in epidemiology, ergonomics, industrial hygiene, medicine, nursing, toxicology, and related fields to be leaders in occupational and environmental health.
- Developing new knowledge through an interdisciplinary research agenda focused on preventing illness and injury.
- Responding to the needs of people affected by hazards in their workplaces or communities, with special attention to vulnerable populations.

Through these activities COEH supports federal, state, and local agencies, health and safety professionals, industry, labor, and community-based organizations in their efforts to prevent occupational and environmental disease and injury.

COEH is an Education and Research Center (ERC) of the National Institute for Occupational Safety and Health (NIOSH).