



DEPARTMENT OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH SCIENCES

# ENVIRONMENTAL HEALTH

## News

SCHOOL OF PUBLIC HEALTH AND COMMUNITY MEDICINE ■ UNIVERSITY OF WASHINGTON ■ SPRING-SUMMER 2006

## TOXICOLOGY IN ACTION

*Our department's Toxicology program involves research ranging from basic to applied sciences. The following two stories about graduate student research explain some of the ways toxicological studies inform us about human health. The remainder of this issue summarizes the highlights of our 2005-2006 school year, including degrees, awards, and presentations at spring conferences.*



### A BASIS FOR COUNSELING

A small snip of hair rarely changes anyone's life. But for Ami Tsuchiya, it revealed a level of mercury in her body so surprising that it spurred her toward a new course of study.

While pursuing her master of public health degree in nutrition at the University of Washington in 2002, Tsuchiya took part in an environmental health class project focused on mercury exposure through fish consumption. Separately, she had an opportunity to have her hair tested.

"That project was really intriguing because, having a nutrition background, I thought fish was really good for you," she said. "And then I saw my mercury level. So I thought maybe I should really study this."

She entered the master's program in Toxicology and, this summer, will wrap up a study of mercury exposure among local Japanese women. For her thesis, Tsuchiya recruited Japanese women of childbearing age through a Kirkland clinic, run by nurse practitioner-midwife Sachiko Oshio. Tsuchiya estimated their methylmercury exposure based on reported fish con-

sumption habits, mercury analysis of fish purchased locally, and biological samples of hair, blood, and toenails.

Professor Thomas Burbacher, Tsuchiya's advisor, introduced her to Washington State Department of Health (DOH) toxicologist Koenraad Mariën, who has a grant to study the topic. Tsuchiya's thesis work is part of a larger DOH study led by Mariën.

"The objective of this study is to determine if certain individuals or sub-populations within the Japanese and Korean communities may be overexposed to methylmercury obtained through the consumption of finfish and shellfish from Puget Sound as well as from other sources," Mariën said.

A 2003 study led by Clinical Assistant Professor Ruth Sechena revealed that Asian American and Pacific Islanders (AAPI) in King County consume, on average, more seafood than the general population. While the study included only small sample sizes, it raised the concern that AAPI seafood consumption practices may put this population at greater risk of mercury exposure.

*—continued on page 2*

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Because the methylated form of mercury can move from the blood into the growing hair shaft, Tsuchiya's hair tests can indicate the level of methylmercury in the body. High body burdens of methylmercury have been associated with debilitating diseases of the nervous system. If pregnant women are exposed to too much methylmercury, it can result in birth defects in their children.

## STUDY INTERVIEWS

At the Kirkland clinic, Tsuchiya visits with each participant three times during the study period. During the first visit, she asks them about their fish consumption habits using fish models she brought back from Japan to identify portion size and species (see photos on page 1). Next, she weighs participants and asks for their pregnancy status.

"Then I cut their hair, about the width of a pencil, from the nape of the neck," Tsuchiya said. "I wrap it in paper and send it to the lab." The nurse-midwife may also draw blood. After participants complete a self-administered food frequency questionnaire, Tsuchiya counsels them about their fish intake with the aid of a brochure published by DOH.

"I explain which fish are low in mercury, and which fish are high in mercury, especially shark, tile fish, tuna steak, king mackerel, and swordfish." Half of the brochure is dedicated to advice about canned tuna consumption. "But for our population, canned tuna isn't the problem...at the end

of the study, we hope to make culturally appropriate brochures." At the second visit, Tsuchiya reviews the women's mercury test results. At the third visit, she follows up and collects more samples, and counsels the women.

Tsuchiya told one of her participants: "Your results show you are eating fish, which is good. You're at a [mercury] level where birth defects are not seen. Just keep doing what you're doing." She emphasized that fish is a low-fat, protein-rich food that belongs in a healthy, well-balanced diet. As with the other interviews, she offers to set up an appointment with Mariën if there are questions she can't answer or with a healthcare practitioner if results indicate high mercury exposure.

## FAMILY OF RESEARCHERS

At this year's Student Research Day, Graduate Program Coordinator Matt Keifer introduced Tsuchiya. Keifer noted that he first met her a decade ago when she visited the campus with her late grandfather, Dr. Kenzaburo Tsuchiya, a prominent Japanese researcher who investigated the link between a painful bone-weakening disease known as itai-itai (literally "ouch-ouch") and cadmium contamination. "It's an honor to have his granddaughter at our school and presenting today," Keifer said (see page 6).

Mariën said Tsuchiya has been an ideal researcher for his study. "We are fortunate to have her working with us," he said. "Her bilingual skills, her knowledge of the Asian communities, as well as her master's degree in nutrition, have been of immense benefit during this endeavor."

Tsuchiya has enjoyed meeting so many people and offering them advice. "I want to do nutritional counseling and I think I'm most effective one-on-one," she said.

—Alison Scherer

## FURTHER READING

DOH: Fish Facts for Healthy Nutrition:

<http://www.doh.wa.gov/fish/default.htm>

Sechena R, Nakano C, et al. 1999. Asian and Pacific Islander seafood consumption study. Available from <http://www.epa.gov/r10earth/offices/oea/risk/a&pi.pdf>

Mariën K, Patrick GM. 2001. Exposure analysis of five fish-consuming populations for overexposure to methylmercury. *J Expo Anal Environ Epidemiol* 11(3):193-206



Alison Scherer

*Ami Tsuchiya takes a hair sample from a study participant for mercury analysis.*

## EXPLAINING HEALTH EFFECTS

In a specially designed research laboratory near campus, mice inhale carefully diluted and aged diesel exhaust intended to mimic urban air pollution. If you've ever spent time waiting for the bus in the U-District, you might know how these mice feel.

Epidemiological research shows that when ambient particulate air pollution levels rise, so do instances of cardiovascular effects and death. Diesel exhaust, the largest contributor to urban ambient air pollution, plays center stage in a University of Washington study of cardiovascular effects. The results might shed light on ways to minimize human health effects in the future.

"It would be nice to figure out why there are cardiovascular changes involved with increases in particulate matter, because at that point we could potentially stop them," said researcher Lisa Corey. Corey, who received her master's degree in Toxicology here, is two years into the Toxicology PhD program. She began participating in this research project autumn quarter.

The mice, which lack a gene known as Apolipoprotein E, are used as a model of cardiovascular disease because they form advanced atherosclerotic plaques similar to those of humans, she said. Apolipoprotein E is a carrier for cholesterol in the blood, said Professor Dan Luchtel, Corey's advisor. "If you don't have the ApoE molecule, cholesterol builds up in blood vessel walls, leading to atherosclerosis," he said. In the human population, there are three versions of this gene, and genotype is associated with a variety of health effects.

During study experiments, the so-called ApoE<sup>-/-</sup> mice are exposed to exhaust at the lab for as short as one day to as long as eight weeks. Exposure levels range from filtered air to 400 µg/m<sup>3</sup>, which Luchtel describes as "like standing right behind a bus tailpipe. That's a hefty dose." He said ambient exposures to humans are generally 2 to 15 µg/m<sup>3</sup>.

"We're trying to understand the pathophysiological mechanism of response," Luchtel said. To do so, the study aims to measure several endpoints, including pathological changes in plaque formation and plaque stability, and markers of inflammation in the blood and lungs.

"It's likely that there is a complex mechanism from exposure to adverse effects that involves inflammation, which we will measure in various ways," Corey said.

### *Lisa Corey in the lab*



Alison Scherer

"When (particulate matter) enters the lungs, it activates cells that call upon other inflammatory cells by secreting cytokines. We can measure changes in cell counts and cytokine levels."

She said that small airborne particles might be able to enter the bloodstream from the lungs and migrate elsewhere in the body. "There are also studies in animals suggesting that the smallest particles can be taken up by olfactory nerves and go from the nose directly to the brain," she said.

Using surgically implanted radio transmitters, Corey also measures heart rate changes among mice exposed continuously for eight weeks to diesel exhaust. Although researchers are not clear why particulate air pollution affects heart rate, direct damage to the lungs or action on nerves to the brain might be responsible. "Decreases in (heart rate variability) are considered adverse because it means that your heart cannot adjust or adapt to the changes that you throw at it," Corey said. "For example, you would collapse and faint if you had to run up a flight of stairs if your heart rate didn't increase to get more oxygen to your brain and muscles." Preliminary results show the mice experience decreased heart rate variability with increasing duration of exposure.

—Alison Scherer

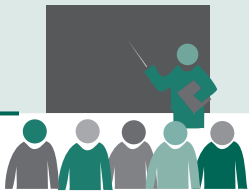
### FURTHER READING

OSHA health and safety topic: Diesel exhaust

<http://www.osha.gov/SLTC/dieselexhaust/index.html>

American Lung Association of Washington newsletter story on diesel bus emissions

[http://www.alaw.org/pdfs/breathing\\_newsletters/2003\\_march\\_17/diesel\\_paper\\_2003.pdf](http://www.alaw.org/pdfs/breathing_newsletters/2003_march_17/diesel_paper_2003.pdf)



# CONFERENCE PRESENTATIONS

*Departmental presenters in bold green type*

## International Society of Exposure Analysis

*Oct 30–Nov 3, Tucson*

**Kissel JC, Norman AM, Smith JA, Shirai JH**, Bunge AL. Dermal absorption of aqueous VOCs: Comparison of three skin models

**Shirai JH, Shoaf MB, Kedan G, Kissel JC**. Surface-area weighted dermal sediment loads following activities in tide flats

**Smith JA, Kissel JC, Shirai JH**, Morgan MK, Sheldon LS, Croghan CW. Analysis of concordance of probabilistic aggregate exposure predictions with observed biomonitoring results: An example using CTEPP data

**Spalt EW, Kissel JC, Shirai JH**. Comparing concentration normalized average fluxes from soil to Potts-Guy water permeability coefficients

## Society of Toxicology

*March 5–9, San Diego*

**Xiaozhong Yu**, an acting assistant professor in the Institute of Risk Assessment and Risk Communication, was awarded a Colgate-Palmolive Grant for Alternative Research to fund a proposed *in vitro* study on male reproductive toxicity. Five grants were awarded nationally. The department hosted a reception for friends and alumni at the Marriott Hotel and Marina.

**Botta D, McConnachie LA**, Fernandez C, **Vliet PA, White CC, Kavanagh TJ**. A model system to assess the role of modulated glutamate-cysteine ligase in toxicant induced oxidative stress

**Cole TB**, Pettan-Brewer C, Forbes A, Proll S, Furlong J, **Costa LG**, Furlong CE. Modulation of low-level organophosphate toxicity by human PON1, as assessed by microarray analysis

**Fay KA, Simpson CD, Dills RL, Paulsen MH, Kavanagh TJ**. Acidic extracts of wood smoke particulate matter cause caspase independent apoptosis in mouse RAW and MLE cells

Flowers L, Barton HA, **Faustman EM**, Moore MM. Carcinogenic mode of action and US EPA's 2005 Cancer Guidelines

**Gallagher EP**, Shao J, **Money Penny C, Eckert M**, Stapleton P, **Bammler T, Beyer R, Farin F**. Mixed lineage leukemia gene rearrangements in human hematopoietic stem cells exposed to etoposide and chlorpyrifos

**Gilbert SG**. The Precautionary Principle: Implication and applications

**Giordano G, Afsharinejad Z, Kavanagh T, Costa L**. Reactive oxygen species mediate the neurotoxicity induced by organophosphorus insecticides in mouse cerebellar granule cells

**Giordano G, White CC, Kavanagh TJ, Costa LG**. Low concentration of domoic acid (DA) induces mitochondrially mediated apoptotic death in mouse cerebellar granule cells

**Gribble EJ, Yu X, Hong S, Faustman EM**. A role for p53 in mouse midbrain neural precursor cell (NPC) cell cycle arrest and premature neuronal differentiation following methylmercury exposure

**Griffith WC, DeFrank NM, Gohlke JM, Gribble EJ, Faustman EM**. Systems biology models for integration of diverse studies of

the developing neocortex after exposure to low dose radiation from external and internal sources

**Gross-Steinmeyer K, Zhu C, Stapleton PL, Tracy JH, Bammler TK, Strom SC, Thummel KE, Eaton DL**. Down-regulation of CYP3A4 in human primary hepatocytes and human Is180 colorectal carcinoma cells by sulforaphane

**McConnachie L, Mohar I, Kavanagh TJ**. Gender differences in acetaminophen-induced hepatotoxicity in wild-type and GCLM-null mice

**Moore N, Guizzetti M**, Gallis B, Shaffer S, Goodlett DR, **Costa LG**. Use of proteomic approaches for the identification of changes in astrocyte secretion following ethanol exposure

Parent R, **Eaton DL**, Goldstein BD. Toxicology in the courtroom: Establishing causation

**Peck EC, McConnachie LA, Beyer RP, Bammler TK, Baker C, Ceballos D, Vliet PA, Stewart JA, Luchtel DL, Kaufman JD, Kavanagh TJ**. Differential gene expression in GCLM-null and wild-type mice exposed to diesel exhaust

**Robinson JF, Yu X, Gribble EJ, Hong S, Kim E, Sidhu JS, Faustman EM**. Examination of arsenic-induced alterations in cell cycle progression and global gene expression in p53 transgenic mouse embryonic fibroblasts

**Trute M, LaVire H, Janssen P, Gallagher E**. Characterization of hepatic and olfactory glutathione S-transferases of coho salmon (*Oncorhynchus kisutch*)

**VanDeMark KL, Guizzetti M, Giordano G, Costa LG**. Effect of ethanol on carbachol-induced neurite outgrowth in prenatal hippocampal neurons

Vitalone A, Catalani A, Chiodi V, Cinque C, Fattori V, Giacomi A, Matteucci P, Zuena A, **Costa LG**. Behavioral effects of perinatal exposure to PCB126 and methyl mercury, alone and in association

**White CC, Dabrowski CM, Fernandez C, Botta D, Beyer R, Bammler TC, Kavanagh TJ**. Differential gene expression in hepatocyte subpopulations sorted from acetaminophen-treated mice

**Xia Z, Choi W, Klintworth H**, Hsuan S, Kruse S, Palmiter R. Molecular mechanisms underlying dopaminergic cell death

**Yu X, Griffith WC**, Hanspers K, Robinson J, **Faustman EM**. Functional interpretation of dose and time-dependent microarray data: Quantitative integration of GO ontology analysis for toxicology and risk assessment

## American Industrial Hygiene Conference & Expo

*May 13–18, Chicago*

**Mike Morgan**, editor in chief, and **Noah Seixas**, review board member, attended the board meeting of the *Journal of Occupational and Environmental Hygiene*. **Rick Neitzel** was formally presented the 3M award at an awards dinner, and also received the Noise Committee's outstanding lecture award. The department hosted an alumni reception.



**Ballew C, Galvin K, Tchung M, Fenske R.** Determination of organophosphate pesticide exposure opportunity in cherry orchard workers

**Camp J, Winnemuller L, Russell S, Johnson P.** Eight ways to assess a lifting tool

**Croteau G, Camp J, Yost M, Martin D, Heald A.** Evaluation of exposure and health care worker response to nebulized administration of tgAAVCF to patients with cystic fibrosis

**Croteau G, Camp J, Yost M, Nguyen F, Nguyen B.** Silica dust exposures in Vietnamese refractory brick plants

**Galvin K, Fenske R, Negrete M, Powers K, Lu C.** Commute vehicle and workplace factors as predictors of pesticide take home residues for agricultural workers

**Galvin K, Fenske R, Tchung M, Servin F, Lewis K, Borges O.** Fluorescent tracer as an enhancement to hands-on pesticide safety training for pesticide handlers

**Tchung M, Galvin K, Ballew C, Fenske R.** Portable work boot storage for agricultural workers

## **WSU Sustainable Agriculture Symposium** *May 18–20, Tri-cities*

**Fenske R.** Technological innovation, worker safety, and sustainable agriculture

**Osses-Henriquez CE.** Smart ladder and existing ladder add-ons

**Ceballos D.** Pesticide exposure opportunity for tree fruit thinners

**Rainey M.** Using fluorescent tracers to aid knowledge gain and behavioral intent in pesticide safety training

**Postma J.** Consensus as a decision-making model in *El Proyecto Bienestar*

**Yost M.** Modeling children's exposures to methamidophos: Consideration of meteorological conditions in assessing deposition and volatilization of pesticides

## **American Thoracic Society** *May 19–24, San Diego*

**Carlsten C, Kaufman JD, Trenga CA, Curtiss H, Peretz A, Aulet M, Stewart JA, Larson TV, Sullivan JH.** Blood coagulation markers in healthy subjects exposed to diesel exhaust

**Corey LM, Baker C, Lucht DL.** Cardiovascular effects in ApoE<sup>-/-</sup> mice following inhalational exposure to diesel exhaust

**Jansen K, Allen RW, Koenig JQ, Mar TF, Larson TV, Lippmann M.** Association between exhaled NO and daily personal exposure to ambient PM<sub>2.5</sub> in adult subjects with respiratory disease

**Koenig JQ, Mar TF, Jansen K, Stapleton P, Farin F, Larson TV.** GST status and associations between PM<sub>2.5</sub> and FeNO in children with asthma

**Mar TF, Koenig JQ, Schreuder AB, Larson TV, Lumley T, Covert DS.** Wintertime emergency department visits for asthma in children: Associations with airborne concentrations of fine particle mass, total fine particle carbon and ultrafine number count

**Peck EC, Trenga CA, Beyer RP, Bammler TK, Srinouanprachanh S, Sullivan JH, Farin FM, Kaufman JD.** Gene expression in peripheral blood mononuclear cells from healthy human volunteers exposed to diesel exhaust

**Peretz A, Sands FN, Sullivan JH, Trenga CA, Leotta DF, Gill EA, Stewart JA, Kaufman JD.** Brachial artery response in humans exposed to diesel exhaust

Sullivan JH, **Peretz A, Carlsten C, Moody MM, Trenga CA, Jansen KA, Kaufman JD, Stewart JA, Bammler TK, Hallstrand TS.** Genomic analysis of the effects of diesel exhaust particles on asthmatic airways

Sullivan JH, **Trenga CA, Peretz A, Carlsten C, Farin FM, Curtiss HM, Stewart JA, Aulet MR, Larson TV, Wilkerson JH, Kaufman JD.** Effect of controlled diesel exhaust exposures on levels of inflammatory cytokines and markers of endothelial activation in healthy adults

## **American Society for Microbiology** *May 21–15, Orlando*

Lee J-K, Freeman R, Cangelosi G, **Shin G-A.** Inactivation of *Mycobacterium avium* complex (MAC) by ultraviolet irradiation

**McLaughlin LA, Levy K, Beck NK, Smith JA, Eisenberg JN, Meschke JS.** Laboratory efficacy compared to household effectiveness of chlorine use in rural coastal Ecuador

## **Air & Waste Management Association** *June 20–23, New Orleans*

Ireson R, Ondov J, Zielinska B, Weaver C, Engine, Easter M, **Davey M, Hesterberg T, Lawson D, Liu L-JS.** Explicit quantification of in-cabin concentrations of school bus exhaust and crankcase emissions using intentional tracers

**Vedal S.** Mortality and short term exposure to particulate matter: Size of effect estimates

**Webber W, Davey M, Larson T, Liu L, Hesterberg T, Ireson R, Easter M, Lapin C, Zielinska B, Lawson D.** Comparing three approaches of estimating bus self-pollution—a pilot study

**Wu C.** Innovative optical remote sensing techniques: Particulate matter

**Wu C.** Optical remote sensing for natural and anthropogenic emissions

Zielinska B, Campbell D, McDaniel M, Ireson R, Weaver C, **Davey M, Liu L-JS, Lawson D, Hesterberg T.** Chemical characterization of diesel crankcase and tailpipe PM emissions, including a quantitative deuterated tracer for lubricating oil

# STUDENT RESEARCH DAY, MAY 25, 2006

*In a seminar session, one second-year master's student from each of the academic programs was selected to present an oral summary of his or her thesis research. The remainder of the graduating master's students and selected PhD students presented posters of their work. Thesis abstracts are online at <http://depts.washington.edu/envhlth/news/researchday06.html>. Faculty preceptors are listed in parentheses.*

## PATHWAYS OF EXPOSURE

**Joseph A. Smith III, MS, Environmental Health**

*(John Kissel)*

A recent study by the Environmental Protection Agency left lingering questions. The EPA measured children's exposure to pollutants at homes and daycare centers in North Carolina and Ohio. Exposure to the organophosphorous pesticide chlorpyrifos was detected by testing for the urinary biomarker 3,5,6-trichloro-2-pyridinol (TCPy). The EPA study found that children excreted more TCPy than could be explained by inhalation, soil ingestion, and foods. Smith's study constructed a probabilistic exposure model to see if exposure pathways such as dermal absorption, dust ingestion, or hand-to-mouth transfer might explain these missing sources. When the analysis is complete, it could be useful to parents and policy makers.

## TRAINING METHODS COMPARED

**Maggie Trabeau, MS, Industrial Hygiene** *(Noah Seixas)*

The construction industry often uses a "train-the-trainer" approach to teach workers about noise induced hearing loss, but the effectiveness of this method hasn't been adequately evaluated. Trabeau's study compares the effectiveness of a "train-the-trainer" approach with an expert trainer using the same materials. Results showed that training increased workers' knowledge about noise exposures, improved their attitudes about hearing protection devices (HPDs), increased self-reported intent to wear HPDs, and increased use of HPDs. She did not find the effectiveness of the hearing conservation program to be dependent on the training method.

## MERCURY EXPOSURE & FISH

**Ami Tsuchiya, MS, Toxicology** *(Thomas Burbacher)*

Methylmercury can pose risks to the developing nervous system, which has led to fish advisories for women of child-bearing age, infants, and children, especially in communities that eat a high amount of fish. This study examines exposures among women of childbearing age and of Japanese descent

who reside in the greater Seattle area. According to the preliminary analysis of 66 women tested, about half were above the reference dose for seafood consumption. The percentage of women who were above EPA's reference dose blood level for mercury was three times higher than a previous National Health and Nutrition Examination Survey. At the end of the study, Tsuchiya, a registered dietician, plans to develop culturally appropriate recommendations for diet and health education for this population (see story, page 1).

## BIOTERRORISM RESPONSE

**Alfredo T. Fernandez, Jr., MPH, Environmental and Occupational Health** *(William Daniell)*

This study examines the attitudes, opinions, and knowledge of emergency personnel in King County, using a tabletop exercise and a scenario involving activation of a biodetection system at a postal distribution center. A tabletop exercise is a scenario-driven evolution where representatives of the various first responder and support organizations would respond to information introduced over time. After the exercise, participants questioned existing communication plans and showed increased understanding of the roles and responsibilities of different agencies. Participants reported significant gains in knowledge about bioterrorism events, response, and planning.

## AIR POLLUTION & HEART DISEASE

**Spencer Olsen, MPH, Occupational and Environmental Medicine** *(Joel Kaufman)*

This epidemiologic study looked at the association of ambient air pollution, cardiovascular disease, and mortality in a large cohort of older US veterans. Dr. Olsen hypothesized that those with diabetes or chronic obstructive pulmonary disease would be more susceptible to the cardiovascular effects of air pollution. He analyzed data on more than 30,000 veterans from a Veterans Affairs database. Although he didn't find associations between community air pollution and mortality with this data, he thinks further study can inform policy decision making regarding chronic exposure to ambient air pollution among susceptible populations.

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## STUDENT POSTER SESSION

### *Environmental Health, MS*

**Laura McLaughlin** (*John Scott Meschke*) Chlorine and UV-disinfection as drinking water treatment options for rural areas of less developed countries

**Michael Paulsen** (*Christopher Simpson*) Development of an assay for 1-nitropyrene metabolites as biomarkers of exposure to diesel exhaust

**Yolanda Sanchez** (*Matthew Keifer*) Temporal patterns of asthma hospitalizations in the Yakima valley community of Washington

**John Shultz** (*John Scott Meschke*) Pathogen prevalence and antibiotic resistance in ready-to-eat food products

**Whitney Webber** (*L-J Sally Liu*) How much on-bus air pollution comes from the bus itself? A pilot study of diesel school buses

### *Industrial Hygiene, MS*

**James (Chris) Ballew** (*Richard Fenske*) A simple intervention to aid in the reduction of organophosphate pesticides from take-home pathways

**Elizabeth Gray** (*Michael Morgan*) Exposure assessment and exhaled breath analysis of solvent-exposed workers

**Peter Lang** (*Michael Morgan*) Glove permeation: Comparing an empiric and predictive method

**Amy Sly** (*John Scott Meschke*) Collection of *B. subtilis* using an aerodynamic lens concentrator and polyurethane foam

**Jason Woodruff** (*Noah Seixas*) Validation of task-based noise exposure predictions in the construction trades

### *Safety and Ergonomics, MS*

**Cheng (Robin) Han** (*Peter Johnson*) The development of testing software to measure and characterize differences in computer mouse use proficiency: Comparison of children and adults

### *Toxicology, MS*

**Mary Trute** (*Evan Gallagher*) Characterization of hepatic and olfactory glutathione S-transferases of coho salmon (*Oncorhynchus kisutch*)

### *Environmental and Occupational Health, MPH*

**Elizabeth Hom** (*Matthew Keifer*) Analysis of environmental and occupational health concerns in key informant interviews with community advisory board (CAB) members of *El Proyecto Bienestar*



*Graduate students Chris Ballew and Alison Scherer discuss Ballew's research on pesticide exposures in cherry orchards.*

**Sinang Lee** (*Richard Fenske*) Translation of the fluorescent tracer technique from a research dermal exposure method to a pesticide safety educational tool

**McKinley (Mac) Rainey** (*Richard Fenske*) Evaluating training improvement and assessment tools in hands-on pesticide handler training

**Phayong Thepaksorn** (*Matthew Keifer*) Occupational injuries in Thailand

### *Occupational and Environmental Medicine, MPH*

**Jason Allen** (*Joel Kaufman*) Oxidative stress and antioxidant status in controlled human diesel exhaust exposure: A randomized, blinded, cross-over experiment

**Chris Carlsten** (*Joel Kaufman*) Cell markers, cytokines, and immune parameters in cement mason apprentices

**Hieu Hoang** (*Matthew Keifer*) Will power: Is personal motivation associated with retention in the Army?

**Son Phan** (*Matthew Keifer*) A study of silicosis risk in Vietnamese refractory brick workers

**Dung Tri Phung** (*Matthew Keifer*) The patterns of at-work injuries in Vietnamese communities

**Troy Ross** (*William Daniell*) Hazards to hearing and threshold shifts: The results of deployment to a combat environment

**Satish Subramaniam** (*Harvey Checkoway*) Baseline characteristics and predictors of occurrence of mesothelioma among asbestos-exposed men in the beta-carotene and retinol efficacy trial

### *Environmental and Occupational Hygiene, PhD*

**Ming-Yi Tsai** (*Michael Yost*) Modeling deposition from an aerial spray application





# 2005-2006 DEGREES & AWARDS



Charles Treser

*l to r: New PhDs Doug Johns, Parveen Bhatti, and Xun Zhang*

## Summer 2005

Lynn Bekris, PhD  
Amber Govert, MS  
Yi-Nien Lin, MS  
Karen Takatani, MS  
Betsy Walter, MS

## Autumn 2005

Janet Blackstone, MS  
Elizabeth Gribble, PhD  
Douglas Johns, PhD  
Helen The-hui Mu, BS  
Elizabeth Spalt, MS

## Winter 2006

Samir Kelada, PhD

## Spring 2006

Jessica Ang, BS  
James (Chris) Ballew, MS  
Parveen Bhatti, PhD  
Evan John Francis Brestar, BS  
Christopher Carlsten, MPH  
Amandeep Chawla, BS  
Heidi Curtiss, MPH/MPA  
Alfredo Fernandez, Jr., MPH  
Elizabeth Gray, MS  
Cheng (Robin) Han, MS  
Hieu V. Hoang, MPH  
Elizabeth Hom, MPH  
Christine Hayun Kim, BS  
Sinang H. Lee, MPH  
Laura McLaughlin, MS  
Gabrielle Morris, MPH

Son Hong Phan, MPH  
Dung Tri Phung, MPH  
McKinley (Mac) Rainey, MPH  
Troy Ross, MPH  
Brianna Sheppard, BS  
John Shultz, MS  
Sathish Subramaniam, MPH  
Sean Sweeney, BS  
Phayong Thepaksorn, MPH  
Maggie Trabeau, MS  
Mary Trute, MS  
Whitney Webber, MS  
Terral Wilson, BS  
Jason Woodruff, MS  
Jihae Yi, BS  
Jennifer Young, MS

## COMMENCEMENT SPEAKER

Robert Duff, director of the Office of Environmental Health Assessments at the Washington State Department of Health, was our department's commencement speaker this year. Duff (MS in Toxicology, 1993) told this year's graduating class, "The time is past, or maybe has never been, when practicing good science is all that is asked of us. We are here for something more. We are here because we *value* our health and our environment. In the end, we are here for the future." And, "I can tell you with no uncertainty that there is a crushing need for you."



Kathy Hall

*l to r: Jay Smith, Rob Duff, John Kissel at DEOHS commencement reception*



Courtesy of C. Treser

*Chuck Treser (2<sup>nd</sup> from left) at the commencement ceremony with bachelor degree recipients (l to r) Eric Coker, Brianna Sheppard, Jihae Yi, Christine Hayun Kim, Evan Brestar, Amandeep Chawla, and Jessica Ang*







*clockwise from bottom left: Marcy Harrington, Chris Carlsten, Sean Sweeney, Janice Camp*

## ANNUAL CEREMONIES

*At the annual School of Public Health and Community Medicine graduation ceremony on June 9, our students, staff, and faculty were the recipients of several awards.*

**Joseph (Jay) Smith III**, a graduate student in Environmental Health, won the School of Public Health's Gilbert S. Omenn Award for Academic Excellence for master's students. **Eric Coker** and **Sean Sweeney** were named outstanding undergraduate students and **Christopher Carlsten** the department's outstanding graduate student.

**Marcy Harrington**, manager of the Pacific Northwest Agricultural Safety and Health Center won the department's distinguished staff award this year. The other nominees were **Maureen Cornell Endres**, **Russell Dills**, **Gayathri Kishore**, **Azure Skye**, **Portia Vleit**, and **Jianbo Yu**.

*At the DEOHS graduation, later that day...*

**Janice Camp** was named the faculty mentor of the year by the department's graduate students. **Bill Daniell** was also recognized for his mentoring.

Professor **Dave Eaton** delivered the school's Distinguished Faculty Lecture this spring, "Genes and cancer-causing chemicals: Understanding why humans are not just big rodents."

Assistant Professor **John Scott Meschke** was awarded an EPA Star Grant.

Professor **Mike Morgan** is serving on the Royalty Research Fund Review Committee, the first faculty member in our department to do so.

Associate Professor Emeritus **Jack Hatlen** was honored in March as a trailblazer by the Western Region National Association of Medical Minority Educators. Earlier this year, the faculty helped Hatlen celebrate his 80th birthday. The department has established the Jack Hatlen Scholarship for environmental health undergraduates.

Senior Lecturer **Chuck Treser** was elected a Diplomate in the American Academy of Sanitarians. He is the second member of our faculty to be so honored. Hatlen is also a diplomate. Treser gave three talks at the World Congress on Environmental Health in Dublin, Ireland, in June.

PhD student **Rick Neitzel** won a \$5000 scholarship from 3M.

Lecturer **Rick Gleason** was appointed to the executive board of the Evergreen Safety Council. Gleason provided a teleconference for the National American Industrial Hygiene Association on July 11. He also spoke about technology use at the Western Region Universities Consortium Trainers' Exchange June 12-13 in Seattle. Gleason also gave three talks this spring: at the Labor & Industries' DOSH Conference in Ocean Shores in May; at the Region X Voluntary Protection annual meeting in Spokane on May 25; and in June at the American Society of Safety Engineers.

Associate Professor **Joel Kaufman** presented the NIEHS Epidemiology seminar at Research Triangle Park, NC, April 17. His topic was "Investigating air pollution effects on cardiovascular disease risk." He also gave two talks at an EPA meeting, Update on Particulate Matter Health Effects Research, one on "Effect of diesel exhaust particulate exposures on endothelial function" and the other on "A new prospective cohort study of air pollution and cardiovascular disease." At the 10th

*—continued on page 10*



International Inhalation Symposium, Kaufman spoke about “Cardiovascular disease and air pollutants: Evaluating and improving epidemiological data implicating traffic exposure” in Hannover, Germany in early June.

**Robert Rogers**, MD, FACP (BS, 1977), was elected president of The Chicago Medical School National Alumni Association for 2006–2008. An attending physician at Cedars Sinai Medical Center, Dr. Rogers is an active member of a number of associations and is on the editorial advisory board of *Southern California Physician*.

Associate Professor **L-J Sally Liu** and graduate students **Whitney Webber** and **Michael Compher** presented a talk “Assessing children’s exposures

to diesel exhaust from commuting by diesel school buses before and after diesel engine retrofit” at the Health Effects Institute in San Francisco in April.

Research Scientist **Mark Davey** and Associate Professor **L-J Sally Liu** presented their research on “Chemical characterization of diesel crankcase and tailpipe PM emissions” with their fellow researchers at the South Coast Air Quality Management District Conference in Los Angeles in late April.

**Kathy Hall**, communication director, presented a talk on “Academic poster presentations: How to get noticed” at the International Communication Association meeting in Dresden, Germany, in June.

On May 8, the **Center for Ecogenetics and Environmental Health** cosponsored a Science Day with the National Institute for Environmental Health Sciences. The center’s external science advisory board met in conjunction with the seminar. Center researchers presented 35 posters and collected 68 abstracts for research done during the past year, many in collaboration with the UW Center for Child Environment Health Risks Research, Toxicogenomics Research Consortium, Superfund Basic Research Program, Comparative Mouse Genomics Center, Oceans and Human Health, Environmental and Molecular Epidemiology Training Grant, Environmental Pathology/ Toxicology Training Program, and MESA Air Pollution Study. Dr. David Schwartz, director of the NIEHS, spoke on “Environmental Genomics and Human Health.”

*Four alumnae of the Environmental Health program, Alma Cardenas, Marley Shoaf, Cynn timer (Curl) Henderson, and Elizabeth Spalt, investigate a mine site in Colorado. All work for Integral Consulting.*



*Courtesy of John Kissel*



## CONTINUING EDUCATION

To confirm this schedule or find more information about these courses, call 206-543-1069 or visit the Continuing Education website at <http://depts.washington.edu/ehce>. Courses are in Seattle unless noted.

### PACIFIC NORTHWEST OSHA EDUCATION CENTER

Not for OSHA rules only! All classes offer training that meets Washington DOSH, OR-OSHA, and Alaska state standards, as appropriate.

- Aug 1-3** OSHA 2250: Principles of Ergonomics
- Aug 7-10** OSHA 500: Trainer Course in Standards for the Construction Industry
- Aug 7-10** OSHA 501: Trainer Course in Standards for General Industry (*Portland*)
- Aug 8-10** OSHA 3095: Electrical Standards (*Anchorage*)
- Aug 14-17** OSHA 6000: Collateral Duty for Other Federal Agencies (*Portland*)
- Aug 22-24** OSHA 3110: Fall Arrest Systems (*Portland*)
- Aug 28-31** OSHA 521: OSHA Guide to Industrial Hygiene
- Aug 29-31** OSHA 2264: Permit-Required Confined Space Entry (*Boise*)
- Sep 5-7** Supervisory Safety and Health Duties
- Sep 5-8** OSHA 2015: Hazardous Materials (*Portland*)
- Sep 11-14** OSHA 501: Trainer Course in Standards for General Industry
- Sep 12-14** OSHA 2225: Respiratory Protection (*Portland*)
- Sep 18-20** OSHA 503: Update for General Industry Outreach Trainers
- Sep 18-21** OSHA 511: Standards for General Industry (*Portland*)
- Sep 20-22** OSHA 502: Update for Construction Industry Outreach Trainers
- Sep 25-28** OSHA 5600/NIEHS 322: Disaster Site Worker Train-the-Trainer
- Oct 2-5** OSHA 510: OSHA Standards for the Construction Industry (*Portland*)
- Oct 2-5** OSHA 6000: Collateral Duty for Other Federal Agencies
- Oct 9-12** OSHA 521: OSHA Guide to Industrial Hygiene (*Portland*)
- Oct 10-12** OSHA 3010: Excavation, Trenching, and Soil Mechanics
- Oct 17-19** OSHA 3110: Fall Arrest Systems (*Boise*)
- Oct 17-20** OSHA 501: Trainer Course in Standards for General Industry (*Richland*)

- Oct 23-26** OSHA 500: Trainer Course in Standards for the Construction Industry (*Portland*)
- Oct 24-26** OSHA 2264: Permit-Required Confined Space Entry
- Oct 30-Nov 2** OSHA 2045: Machinery and Machine Guarding Standards
- Nov 6-9** OSHA 510: OSHA Standards for the Construction Industry (*Richland*)
- Nov 7-9** OSHA 3095: Electrical Standards (*Portland*)
- Nov 13-16** OSHA 511: Standards for General Industry
- Nov 14-17** OSHA 521: OSHA Guide to Industrial Hygiene (*Anchorage*)
- Dec 4-6** OSHA 502: Update for Construction Industry Outreach Trainers (*Portland*)
- Dec 5-7** OSHA 3110: Fall Arrest Systems
- Dec 6-8** OSHA 503: Update for General Industry Outreach Trainers (*Portland*)

### NORTHWEST CENTER FOR OCCUPATIONAL HEALTH & SAFETY

- Sep 13-14** 12th Conference on Occupational Hazards to Health Care Workers: Narrowing the Knowledge and Action Gaps
- Sep 26** Managing Stress in First Responders (*Spokane*)\*
- Oct 5** Puget Sound Occupational and Environmental Medicine Grand Rounds
- Oct 10-12** Hazardous Materials Incidents: Improving Interagency Response (*Richland*)
- Oct 25** Occupational Health Practitioners and a Global Flu Pandemic (*Wenatchee*)\*\*
- Nov 9** Puget Sound Occupational and Environmental Medicine Grand Rounds
- Dec 5** A Small Dose of Toxicology: How Chemicals Affect Your Health (*Portland*)
- Dec 6** A Larger Dose of Toxicology: How Chemicals Affect Your Health (*Portland*)

\* in conjunction with the Governor's Industrial Safety and Health Conference, Sep 27-28

\*\* in conjunction with the Northwest Occupational Health Conference, Oct 25-27




## BIENNIAL REPORT

The department's 2003-2005 biennial report focuses on "Assessing, Managing, and Communicating Risks."

In the report, you will read about a new predictive tool that can identify the injured workers who are at risk of chronic disability and about a win-win solution to a neighborhood noise problem that also reduces risks to workers. You will learn how technology can be applied to identify farm workers whose risk of pesticide-related symptoms may be higher than average and to reduce the risk of water-borne illness.

You will learn how a new interdisciplinary center is working to uncover some of the mysteries in the human-ocean relationship. And you will learn how departmental research is helping inform decision making about lead in the drinking water in the Seattle Public Schools.

For a print copy, e-mail [ehadmin@u.washington.edu](mailto:ehadmin@u.washington.edu) or call 206-543-6991. For the online version, go to the department's home page, <http://depts.washington.edu/evoblth>, and click on the second tab, "biennial report." 



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