Jacqueline Barkoski: Exploring Associations Between Horse Care Pesticides and Autism

Horse owners do not mind getting their hands dirty. Take grooming, for instance. Brushing the horse’s coat and spraying it with fly repellent are part of the routine. Sometimes, horse owners apply the pesticide by hand, first spraying it on their own skin before wiping it on the animal. Soon, however, we will know if caring for a horse has unintentional consequences thanks to research by Jacqueline Barkoski and her colleagues from UC Davis.

Barkoski, a doctoral student in the UC Davis Graduate Group in Epidemiology, and her academic supervisor, Irva Hertz-Picciotto, are investigating the health effects of pesticides like fly repellent, particularly pyrethroid and pyrethrin-based products, which are widely used in the horse industry. These products have been linked to neurotoxicological effects in human and animal studies. They question whether a woman’s exposure to these pesticides during the first trimester of pregnancy may be related to developmental outcomes of the child, including autism.

COEH faculty Irva Hertz-Picciotto is the principal investigator and director of the UC Davis Center for Childhood Autism Risks from Genetics and the Environment, or CHARGE. Launched in 2003, CHARGE is the first comprehensive study of environmental causes and risk factors for autism and developmental delay.
The Global Burden of Disease Study, published in the December 2012 issue of the Lancet, reports household air pollution as the single most important risk factor in many poor regions and the most important environmental risk factor globally.

The study led by the Institute for Health Metrics and Evaluation at Washington University produced new estimates measuring the impact of hundreds of diseases, injuries, and risk factors in 21 regions worldwide.

The five-year collaborative project encompassed more than 450 researchers from 150 countries. The study Household Air Pollution Working Group included COEH faculty Kirk R. Smith, John Balmes, and Michael Bates from the Division of Environmental Health Sciences in the School of Public Health along with several students, including Heather Adair, Zoe Chafe, Seth Smith, Jeffrey Roth, Ray Lui, and Jimmy Tran.

The study was funded by the Bill & Melinda Gates Foundation and the California Center for Environmental Health along with the Environmental Protection Agency and the Shell Foundation.

Not only has the total population of California grown from 23 million to 38 million people, the economic characteristics of the population have changed dramatically, with the percentage of people in poverty declining from 19.5% in 2000 to 11.5% in 2010. We are a more diverse state today than we ever have been.

The Global Burden of Disease for Household Air Pollution is 4 Million Premature Deaths Annually, Study Finds

There is evidence to show the periodontal effect is a critical window of exposure and is very correlated with autism,” says Barkoski. “Specifically, in the first trimester when the neural tube is forming, it is believed that exposures during this time can have an impact on the neurodevelopmental system of the child. It contributes to the rational for looking at mothers who use pyrethroid and pyrethrin-based products while they are pregnant.

The horse industry is a $4.1 billion dollar business in California, reports Barkoski. There are roughly 50,000 horse owners in the state and the majority of them are women.

Coincidentally, a couple of years ago, some parents contacted the CHARGE study to ask researchers, “I and my friend’s horse recently needed to have surgery. Can you tell me why our children have autism – do you think there is anything going on?”

There are so many chance events, and you can’t assume just from their question that something related to their occupation must be causing autism,” says Barkoski. “But pyrethroid and pyrethrin-based products are used in a variety of horse care products, including coat conditioners and sun screens. They’re used on the horse to kill lice, ticks, and black flies, as well as sprays, wipes, and concentrates. And no one has looked at what exposures humans are receiving as well as animals.”

Barkoski first developed a pilot survey and interviewed horse owners in Davis, California, to learn about the industry, and to find out how and when the products are used. Using her pilot, she plans to distribute the survey to a study population of 36,000 women. She is also tracking pyrethrin exposures during pregnancy to determine their influence on autism and other neurodevelopmental disorders.巴斯金斯基博士的研究小组发现，环境中的影响因素是儿童自闭症的一个重要原因。自闭症的发病率在过去的35年中已经上升了近50%，巴斯金斯基博士说。

巴斯金斯基的研究小组把注意力集中在儿童自闭症的环境因素上。环境因素包括空气污染、水污染和土壤污染。巴斯金斯基的团队发现，这些因素在过去的35年中对儿童自闭症的影响越来越大。

巴斯金斯基的研究小组发现，空气污染是儿童自闭症的一个重要风险因素。空气污染可以导致呼吸道疾病，从而影响儿童的神经系统发育。

巴斯金斯基的研究小组发现，水污染也是儿童自闭症的一个重要风险因素。水污染可以导致水质变差，从而影响儿童的神经系统发育。

巴斯金斯基的研究小组发现，土壤污染也是儿童自闭症的一个重要风险因素。土壤污染可以导致土壤中的重金属进入人体，从而影响儿童的神经系统发育。

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LOHP a Catalyst for Change in the Wake of Richmond Refinery Fire

An interim April 2013 investigation report by the U.S. Chemical Safety Board (CSB) of a catastrophic explosion at the Chevron refinery in Richmond on August 6, 2012, and the conclusion that the catastrophe that enveloped 19 crews at the refinery and caused over 15,000 area residents to seek medical care for symptoms related to smoke from the fire’s combustion products, was largely due to a management culture at Chevron that ignored preventive maintenance and safety problems. This finding was corroborated in a separate report prepared by the Labor Occupational Health Program (LOHP) for California Governor Jerry Brown’s Interagency Taskforce on Occupational Safety and Health, which recommended that health, safety, and environmental performance remain tangential—not central—concerns of the refinery industry.

The Richmond refinery has used an increasing amount of crude oil feedstock since 1985, the CSB reported. Yet “maintenance and safety problems identified by refinery workers are often not corrected for months or years,” reports Wilson, who doubts whether and to what extent the refineries are tracking and acting on leading, lagging, and near-miss performance indicators, which the Collaborative along with a series of LOHP facilitated meetings designed to give voice to the health and safety concerns of refinery workers and the community.

The recommendations summarized by Wilson stem from his work with the Collaborative along with a series of LOHP facilitated meetings designed to give voice to the health and safety concerns of refinery workers and the community.

“The Listening panels” in Southern and Northern California were commissioned by the Governor’s Interagency Task Force on Refinery Safety and conducted by LOHP. Charlotte Chang, LOHP project director, helped convene the first meeting in Southern California on March 13 where twenty-five steelworkers and community members met with the Governor’s team.

“The fire has had a marked decline in industrial accidents in the EU and other countries where it has been adopted. Funding for the summary report by LOHP was provided by the California Department of Industrial Relations.

Related story links:

The Collaborative found common findings with Wilson, who wrote “to draw attention to the state’s permissive regulatory setting and between the unions and community groups over various issues in the refinery,” reports Chang. It turned out that LOHP’s reputation was the critical element in bringing the parties to the table, says Chang. “We had good experiences with the USW over the years and they remember that,” says Chang. “It was essential to the dynamics of the negotiations.”

Chang is keeping her eye on the issues that are important to making the partnerships work. “My role is in helping to bring the partnership together and make it successful” by ensuring that things are transparent and that we establish a trusting environment.

Chang’s background is in evaluating and facilitating multi-stakeholder partnerships that have coalesced around worker health and safety. The main questions Chang asks now are: “How do we affect enduring change, what are the best practices, what other models exist and can we establish a trusting environment.”

As Wilson points out, “Refinery accidents are common in California. There were 41 separate incidents between the August 6 fire and January 2013, and most of those events caused unexpected releases of toxic substances and potentially endangered workers and the public. I think there is inattention in this industry in process safety.”

Wilson concurs with the conclusions of the April CSB report. He calls on the U.S. to switch the responsibility for demonstrating safety to the managers of hazardous industries, following the approach adopted in the European Union in the wake of a massive industrial release of dioxins in Seveso, Italy, in 1976. Since then, the EU has instigated new rules requiring refineries to demonstrate adherence to rigorous health, safety, and environmental standards as a condition of operating their plants. LOHP noted in its presentation that the process was begun by safety experts who serve as government auditors. “This ‘Safety Case’ approach has

Street Level Health Project, a grassroots non-profit organization in the City of Oakland’s Fruitvale neighborhood, offers free medical screening to urban immigrants, with a focus on health insurance. Known as the “International Clinic,” it serves people from over 26 countries, its staff connects underserved community members with localized government services for healthcare, food, housing, and more.

Now, in an innovative partnership with UCSF’s Street Level Health Project is offering occupational medicine consultations to injured workers who depend on the free clinic for care. Immigrant day laborers with chronic low back pain and house cleaners with work-related respiratory problems are receiving treatment from Manejch Berenji, MD, a Clinical Fellow from the Division of Occupational and Environmental Medicine (OEM) in the UCSF School of Medicine.

“This is a population that has fallen through the cracks,” says Berenji. “They don’t have access to the traditional medical services after an occupational injury. Unfortunately, these workers can go without medical care for a long period of time.”

The services offered by Berenji and two additional occupational medicine residents, Scott Petersen, MD, and Lan Nguyen, MD, and UCSF faculty, also made possible through a grant from the Health Resources and Services Administration, or HRSA.

The goal of the grant, now in its third year, is to increase clinical experience with underserved populations within UCSF’s OEM program.

“I think it’s a great training opportunity for our residents and nursing students,” says Robert Harrison, the associate residency director of OEM trainees and also good for the workers by providing access to UCSF care and advanced level residents,” adds Harrison.

Bay Area immigrants are frequently employed in construction, food preparation, cleaning, and transportation. Their exposure to work-related health hazards is higher than average, yet they are less likely to have health insurance.

“These are migrant workers and often their employer doesn’t have established healthcare,” explains Berenji. “If something happens to them on the worksite, they have nowhere to go.”

In Alameda County, where Street Level Health Project is located, 18 percent of adults are without insurance for all or part of the year, according to the 2011 California Health Interview Survey.

“When a low wage worker is out of work for a day or more, it has a ripple effect on their families,” notes Noellyn Robleto, Street...
Underserved Workers Gain Access to UCSF OEM Specialists

Level’s Wellness and Prevention Coordinator. "Our main goal is to ensure we are providing the right services so they can stay healthy."

On a recent clinic visit, Berenji got to know more about her patients by stepping in to serve lunch to the community. "It’s amazing what they’ve been through," she says. "They are making it day by day."

With Street Level Health Project, they have somewhere to go and people they can trust in their native language. It’s a valuable community resource.

Harrison says the collaboration is a pilot to assess the needs at 20 different clinics. Currently, Street Level Health Project is building a worker-driven leadership network to spread the word about the occupational medicine services now available.

Through the HRSA grant, Fellows and faculty from UCSF provide access to occupational health that is acutely underserved. "This is why I went into medicine," says Berenji. "I believe, especially with this population, we are making a difference."


Reaching Oakland Day Workers to Promote Occupational Safety

The Oakland Workers Collective, launched in 2012 by Street Level Health Project, does more than refer day laborers to health and safety classes. It helps find underequipped workers to an underserved community with the help of volunteers like Jeremy Verango, a master’s student in the UCSF School of Nursing.

"At Street Level, we always focus on health, but we see health as more than the doctor-patient relationship. We see it encompassing injury prevention," says UC Berkeley alumna Gabriela Galicia, BA ’09, the Leadership and Empowerment Program Manager for Street Level.

Jeremy helped Galicia put together the curriculum for the health and safety classes. Classes have covered body mapping and workplace hazard assessment. They have also focused on pain awareness, ergonomic risks and respiratory symptoms related to chemical exposures. In March, the subject was construction safety.

Tuesday evenings from five-thirty to seven, Verango leads occupational safety classes for up to twenty day laborers who work in a wide range of jobs—from construction, painting, and landscaping to moving and hauling.

"It’s important that these workers find community and support with our Collective and feel empowered that they are receiving the necessary training and preparation for the work they are doing," says Verango. "With the Collective, day workers have a voice, and they know their rights are being advocated for and protected."

Classes not only focus on occupational safety, but how workers can establish a good relationship with their employer, including how to respond in the event they are mistreated or not paid on time. "Quite honestly, health and safety can get pushed to the side when a worker’s first priority is to have a job and make some money," notes Verango.

"This is a community that is vulnerable on many levels," says Jeremy Verango. "Many of the workers are undocumented and constantly at risk for different types of discrimination and deportation."

and the collective's work with the Oakland Workers Collective.

The Collective trains workers to record as much information as they can about their day-to-day work. "In the event that they do get hurt," adds Verango, "it reminds them about the health care services available at Street Level." Verango also encourages day workers to use personal protective equipment. Street Level provides limited safety gear such as hard hats, goggles, and ear plugs, according to Galicia.

In addition to his work with the Collective, Verango is a registered nurse during clinic hours at Street Level. "My voluntourism develops my comfort with a diverse clinical setting and strengthens my awareness of the needs of the community in Oakland," notes Verango.

"It’s been great to have Jeremy here," says Galicia. "He’s allowed us to connect with UCSF to bring more expertise to the Collective. "We don’t have the resources to do everything ourselves." We can feel we can teach those experts how to work with our population."

Scientists from UC Berkeley are the first to demonstrate how apps installed on smart phones can substantially improve pollution exposure estimates used in environmental and public health studies.

The paper by Edmund Soto and Michelle Phillips, published in 2012 by the California Air Resources Board, describes the use of Street Level Health Project’s CalFit app to assess the need for continued clinics. Currently, Street Level Health Project’s Street Level app has been downloaded by 2,000 individuals in the Bay Area.

"This is a huge innovation in exposure science that is going to allow us to assess more accurately the health effects of air pollution and other environmental exposures," notes Jerrett.

“This is just the beginning,” says Soto. "The CalFit app was designed to be flexible so that it can be used in a variety of environmental health studies. CalFit is currently being used in research on greenspace exposure, physical activity, diet, and stress.”

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Smartphones Add New Dimension to Exposure Studies

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Read the journal article: http://www.ncbi.nlm.nih.gov/pubmed/23416743
California Governor Jerry Brown delighted the upbeat crowd at a reception celebrating COEH’s 35th anniversary on May 10, 2013. The special honor of the governor’s visit capped the highly successful Lela Moris COEH Symposium held at the Brower Center in downtown Berkeley.

Director John Balmes, MD, introduced Brown to guests, thanking the governor “for signing the legislation that started way to go, of course, but California is in

Photo: Berkeley Event Photographer Genevieve Shiffrar

California Governor Jerry Brown

the Cutting Edge

The annual symposium brought together leaders from the fields of occupational and environmental health, green chemistry, and public policy. Participants learned about the history and scope of COEH from founding director and UC Berkeley professor Emeritus Robert Spear, and Dr. Marc Schenker, the director of COEH at UC Davis, as well as Julia Faucett, professor emerita of Occupational and Environmental Health Nursing at UCSF.

Schenker drew attention to the challenges facing unempowered immigrant workers in the United States, citing the example of 17-year-old grape harvester Maria Isabel Vasquez Jimenez from Stockton, California, who died on May 16, 2008, from heat exhaustion while pregnant. Schenker says “Going forward, we need to think about these employees.”

Faucett traced the history of ergonomic research at COEH, noting how thousands have been trained in ergonomics through COEH and the Labor Occupational Health Program (LOHP).

Major contributions to the ergonomics field include the overhead drill press developed by a research team led by David Rempel, professor of Medicine in the UCSF Division of Occupational and Environmental Medicine and director of the joint Berkeley and UCSF Ergonomics Program. Studies of the tool shows it significantly reduces worker fatigue and back pain.

Also, it turns out an ergonomic wine tub for hand-harvesting grapes developed by the Agricultural Ergonomics Research Center at UC Davis reduced worker’s back and knee pain so effectively that they negotiated with their managers to keep the tub after the study — signaling a successful intervention.

Dynamic discussions during the second panel explored ways that COEH has not only fulfilled its mandate, but remains “on the cutting edge of a changing world,” addressing issues of green chemistry, health disparities, and scientific advances in our abilities to measure all the exposures of an individual in a lifetime and how those exposures relate to health.

Presenters included Martin Mulvihill, executive director of the Berkeley Center for Green Chemistry, Rachel Schenker, the executive director of the Berkeley Center for Green Chemistry, and Dr. Richard Jackson, director of the Center for Green Chemistry, Health Disparities, and Scientific Advances in Our Abilities to Measure All the Exposures of an Individual in a Lifetime and How Those Exposures Relate to Health.

Panel moderator Robin Baker, director of zip for COEH and the Center for Construction Research and Training, engaged leaders of government and influential thinkers from academia and business, including Dr. Gina Solomon, deputy secretary for Science and Health at the California Environmental Protection Agency, Kirk Smith, professor of Global Environmental Health at UC Berkeley, Amy Coombe, chief of Policy and Legislation for the California Department of Industrial Relations, Charlotte Brody, the vice president for Health Initiatives at BlueGreen Alliance, who calls herself a downstream user of COEH research, and Jodi Freyman, a management member of the California Occupational Safety and Health Appeals Board.

The intersection of the oldest and newest environmental risk factors — indoor and outdoor air pollution and climate change — was underscored by Smith. “We began using cook fires 8 million years ago,” he noted, and 40 percent of the world’s population still relies on solid fuels for cooking and heating.

Household air pollution is now the single most important risk factor in many poor regions and the most important environmental risk factor globally, according to the Global Burden of Disease Report published in the December 2012 issue of the Lancet.

On global warming, Smith discussed the occupational impacts of a nine degree shift in temperature during the 21st century, as projected by the Intergovernmental Panel on Climate Change (IPCC). “The assault of this change will be steep,” Smith says, “leaving significant parts of the planet where you can’t work outside.”

Freyman shared insight on how to build bridges between public health and corporate leaders. She told participants she believes businesses will not fully address

 Guido Rosati Teaching Fellows Fund Announced

Robert Spear announced the establishment of the new Guido Rosati Teaching Fellows Fund. Rosati started studying at the UC Berkeley campus at age 17, noted Spear. He then studied industrial hygiene while in military service during WWII, and later became involved in the industrial hygiene program at UC Berkeley. He also served as president of the Northern California Section of the American Industrial Hygiene Association from 1971-72.

“I consider him a model of professional contributions to our programs,” said Spear, who plans to expand the fund, established by Rosati’s family, in collaboration with of the School of Public Health. The fund will support outstanding professionals from the community to participate in teaching and mentoring COEH students.

The Rosati Family with Robert Spear (inside)

continued to page 10

Fellows Fund Announced

Richard Jackson

The Rosati Family with Robert Spear (inside)
Governor Jerry Brown Helps Celebrate 35th Anniversary of COEH

Whorton Award Recognizes New Voices in Environmental Health Research

Elizabeth J. Carlton received the 2013 COEH Donald Whorton Writing Award. Dr. Whorton, “who advocated for sound science and good writing,” according to Spear, was the founding director of the LOHP at UC Berkeley and an elected member of the Institute of Medicine of the National Academies. Carlton’s paper, “Repeated Schistosoma japonicum infection following treatment in two cohorts: evidence for host susceptibility to helminthiasis?” appeared in the March 7, 2013 issue of PLoS Negl Trop Dis.

Carisa Harris-Adamson received honorable mention for her paper that also won first place in the PREMUS best paper competition. “Workplace and individual factors in wrist tendinosis among blue-collar workers – the San Francisco study,” published in 2011 in the Scandinavian Journal of Work, Environment and Health. Held every three years, PREMUS is an international conference on the prevention of work related musculoskeletal disorders.

PhD in Control Engineering in 1968 from Cambridge University in England. In 1969, UC Berkeley convinced Spear to return as a post-doctoral fellow. Soon, they recruited him as an assistant professor of Environmental Health Sciences. He became an associate professor in 1975 and a full professor in 1981. Spear served as associate dean of the School of Public Health from 1988-91 and of the College of Engineering from 1994-96. He also served as the acting dean of the School of Public Health in 2007.

The late M. Donald Whorton

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COEH then and now

Donald Whorton was an internationally recognized occupational health physician and workplace epidemiologist, with long ties to COEH. He was the founding director of the COEH’s Labor Occupational Health Program (LOHP) at UC Berkeley. Whorton’s groundbreaking work establishing the link between male sterility and exposure to the pesticide dibromochloropropane (DBCP) led the Environmental Protection Agency to ban the substance. Dr. Whorton was board certified in occupational and internal medicine, an elected member of the National Academy of Science Institute of Medicine, and a fellow of the American College of Epidemiology and the American College of Occupational & Environmental Medicine. Donald continued his important work in occupational and environmental health until his untimely death from ALS (Lou Gehrig’s Disease) in 2008.

Profile: Robert Spear, Founding Director of COEH

It all started with a phone call back in 76. The medical director of Hooker Chemical Company rang Robert Spear because one of its subsidiaries in California had an occupational health problem.

“We need somebody who knows about pesticides and agricultural chemicals to go and look to see if there are any hazardous situations that might explain some of the rumors we’ve been hearing,” the director said. “I’ll do it,” Spear replied, “but I want to take a chemist with me, my colleague Steve Rappaport.”

The aftermath of that call is California history. The two young professors from UC Berkeley School of Public Health helped to discover the rumors were true — six out of seven men at the plant who were tested for fertility were sterile, and all of them worked with the pesticide dibromochloropropane, or DBCP.

“You can imagine what happened next,” said Spear.

Following the revelation of the DBCP tragedy, the State passed Assembly Bill 3414 in September 1979. That legislation mandated the University of California to establish occupational health teaching, research, and servicing in Northern and Southern California under the leadership of a chair from the California Department of Industrial Relations. Spear was appointed as the Center’s founding director in Northern California. It fell to Spear to put together a plan linking a nexus of occupational health programs at UC Berkeley, San Francisco, and Davis. Later, DBCP was banned from use in 1979 by the US Environmental Protection Agency.

As occupation hazards changed over the years, Spear and his colleagues led COEH to keep pace. “In 1977 we were right in the teeth of an environmental awakening in this country following the earlier enactment of the Clean Air Act, the Clean Water Act, the Occupational Safety and Health Act, the establishment of the Environmental Protection Agency — all at the federal level. Though occupational health research and practice solidified at the Center, Spear says the environmental side saw tremendous growth and became the largest source of funding.

Looking forward, Spear sees a great challenge because of the lack of political interest in occupational health and public confusion over the state of the environment. “That’s why a new set of tools to deal with the complexity of occupational and environmental exposures is so important,” he believes. As an example of these emerging tools, he interest has been in the application of exposure assessment methods to unusual problems. For example, some years ago Spear turned his attention to global health issues, specifically control and intervention strategies to reduce the prevalence of schistosomiasis, a major parasitic disease in China as well as in Africa and parts of South America. Much of his group’s work has been in Xichang County in southwestern Sichuan where he was made an Honorary Citizen of the county by the local government.

“My greatest satisfaction has been the achievements of my students,” says COEH founder Robert Spear.

Spear has received many honors for his contributions to the field, but he says that his greatest satisfaction has been the achievements of his students. “I always felt that you really were working with students that were a little smarter than you were and to help them move on,” says Spear.

It comes as no surprise, then, that UC Berkeley honored Spear with the Zak Sabry Mentorship Award at the School of Public Health’s commencement ceremony in May 2010. Spear also considers the Friendship Award from the State Council of the People’s Republic of China, the Jinding Award from the provincial government of Sichuan, China, the Berkeley Citation, and the Berkeley Faculty Service Award among his highest honors.

Spear, a professor emeritus in the Division of Environmental Health Sciences in the School of Public Health, is a Licensed Professional Engineer and an internationally recognized mathematical modeling expert in toxicological and infectious disease processes. He began his academic career at UC Berkeley, first receiving his BS degree in Engineering Science in 1962, then an MS in Mechanical Engineering in 1963. Spear obtained his PhD in Control Engineering in 1968 from Cambridge University in England. In 1969, UC Berkeley convinced Spear to return as a post-doctoral fellow. Soon, they recruited him as an assistant professor of Environmental Health Sciences. He became an associate professor in 1975 and a full professor in 1981. Spear served as associate dean of the School of Public Health from 1988-91 and of the College of Engineering from 1994-96. He also served as the acting dean of the School of Public Health in 2007.

Robert Spear

Robert Spear points to the work of COEH faculty Martyn Smith and Steve Rappaport. At their Genes and Environment Laboratory, they are developing a new generation of biomarkers and biosensors for environmental epidemiology.

Spear’s major research interest has been in the application of exposure assessment methods to unusual problems. For example, some years ago Spear turned his attention to global health issues, specifically control and intervention strategies to reduce the prevalence of schistosomiasis, a major parasitic disease in China as well as in Africa and parts of South America. Much of his group’s work has been in Xichang County in southwestern Sichuan where he was made an Honorary Citizen of the county by the local government.

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Spear has received many honors for his contributions to the field, but he says that his greatest satisfaction has been the achievements of his students. “I always felt that you really were working with students that were a little smarter than you were and to help them move on,” says Spear.

It comes as no surprise, then, that UC Berkeley honored Spear with the Zak Sabry Mentorship Award at the School of Public Health’s commencement ceremony in May 2010. Spear also considers the Friendship Award from the State Council of the People’s Republic of China, the Jinding Award from the provincial government of Sichuan, China, the Berkeley Citation, and the Berkeley Faculty Service Award among his highest honors.

Spear, a professor emeritus in the Division of Environmental Health Sciences in the School of Public Health, is a Licensed Professional Engineer and an internationally recognized mathematical modeling expert in toxicological and infectious disease processes. He began his academic career at UC Berkeley, first receiving his BS degree in Engineering Science in 1962, then an MS in Mechanical Engineering in 1963. Spear obtained his PhD in Control Engineering in 1968 from Cambridge University in England. In 1969, UC Berkeley convinced Spear to return as a post-doctoral fellow. Soon, they recruited him as an assistant professor of Environmental Health Sciences. He became an associate professor in 1975 and a full professor in 1981. Spear served as associate dean of the School of Public Health from 1988-91 and of the College of Engineering from 1994-96. He also served as the acting dean of the School of Public Health in 2007.

Robert Spear points to the work of COEH faculty Martyn Smith and Steve Rappaport. At their Genes and Environment Laboratory, they are developing a new generation of biomarkers and biosensors for environmental epidemiology.

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Sarah Daniels’ first course with The Berkeley Center for Green Chemistry (BCGC) was a “game changer” for her and her professors. “I was blown away” were her words. Daniels, a PhD student in the Environmental Health Sciences Program in the School of Public Health, thought the interdisciplinary approach of the introductory course was far different from her other classes at the university. “I found the community of BCGC was phenomenal and unique on campus,” said Daniels. “And, I wanted to push that further.”

She approached her instructors — Dr. Megan Schwarzman from COEHI and the School of Public Health and BCGC Executive Director Martin Mulvihill from the College of Chemistry — with an idea for a graduate seminar where students would act as consultants and partner with an outside organization to advance green chemistry solutions. Daniels worked with them on a proposal and “before you knew it, Marty and Meg had developed a course curriculum, Greener Solutions, for Fall ’12.”

The inaugural class partnered with Hewlett-Packard (HP) to investigate key sources of hazard posed by their products at the end of their lifecycle, when they become e-waste. Their project identified chemicals that are found in e-waste, mostly computers and laptops, and prioritized a list of chemicals to investigate further. They then assessed the potential threat of these chemicals to humans and the environment.

“Outdated computers are ending up overseas in Africa, India, and China illegally,” Daniels said, “where they are being disassembled in a non-traditional way, mostly subjected to burning or acid leaching, to obtain precious metals without releasing contaminants into the environment.”

An interdisciplinary group of six UC Berkeley students met for class sessions twice a week, working with Schwarzman and Mulvihill to scope the research project and determine deliverables. “While the students focused on the research question, we guided them through the inquiry process, teaching them skills they should be able to draw on in the future,” said Schwarzman. “Best of all was getting to spend several classes on writing skills — something that’s often only addressed peripherally in the sciences.”

“Marty and Meg did a great job to make this experience focused on building professional skills that are essential to consulting, such as conducting research thorough literature searches and finding creative ways to communicate and present new information,” noted Daniels.

The group consulted remotely with HP every two weeks, discussing early drafts of their work with their contact at HP, UC Berkeley alumnus Curtis Wray, MS’11, who suggested resources as the project developed.

“I enjoyed working with the students,” said Wray, a materials chemist with the Global Environmental Materials Team at HP. “Our collaboration with the University of California, Berkeley, made an important contribution to our materials program at HP. The students had diverse areas of expertise, which was crucial to tackling the problems we gave them. They were wonderful to work with — enthusiastic and professional.”

The project concluded with a 75 page report, “Identifying substances of concern during informal recycling of electronics,” which the students presented on campus, by webinar to HP, and at a poster session for an organization of businesses and NGOs. Although the semester is over, the students are preparing their report for publication and have been asked to present to HP’s global offices.


Sarah Daniels

Hertz-Picciotto Recognized for Outstanding Contributions to Science and Medicine

Ivra Hertz-Picciotto, professor of Epidemiology at UC Davis and chief of the Division of Environmental and Occupational Health in the Department of Public Health Sciences, received the 2013 UC Davis School of Medicine Research Award for her outstanding contributions to biomedical science and medicine through laboratory or clinical research.

Hertz-Picciotto is one of the world’s leading researchers into environmental exposures and perinatal and newborn health outcomes and on methodological issues in epidemiology. Her translational research has addressed the effects of lead, arsenic, mercury, pesticides, polychlorinated biphenyls, or PCBs, and air pollution on pregnancy outcomes and on early child development.

Quinlan Appointed to Occupational Safety and Health Standards Board

Patricia Quinlan’s appointment to the California Occupational Safety and Health Standards Board was announced by Governor Edmund G. Brown Jr. in February 2013.

Quinlan has been the deputy director of COEHI since 2011. She has held multiple positions at UCSF since 1987 including coordinator, industrial hygienist and clinical professor in the School of Nursing.

Quinlan is a member of the American Academy of Industrial Hygiene, American Industrial Hygiene Association, American Public Health Association, and American Conference of Government Industrial Hygienists. She received her Master of Public Health degree from UC Berkeley in 1982.

Baker Named to California State Compensation Fund Board


The seven-member Occupational Safety and Health Standards Board is the standard-setting agency within the Cal/OSHA program. Its mission is to promote, adopt and maintain reasonable and enforceable standards that will ensure a safe and healthful work place for California workers.

“Patty is a well-trained and highly experienced industrial hygienist who has taught workplace exposure assessment to a generation of occupational medicine physicians, occupational health nurse, and industrial hygiene trainees at both UCSF and UC Berkeley,” notes COEHI Director John Balmes.

“The Governor has made an outstanding choice in appointing Patty to the Board,” adds Balmes. “She understands the risks workers face on the job and will endeavor to reduce those risks, but in a pragmatic way that will not hurt the recovering California economy.”

Quinlan received her MD from the University of California, San Francisco, and her MPH from the University of California, Berkeley. She is currently a research scientist in the School of Public Health at UC Berkeley.
I have known and worked with Robin Baker for many years,” says John Balmes, director of COEH, co-founder of the Labor Occupational Health Program, COEH’s director of health. “She has worked on the compensation issues workers face as well as the need for prevention efforts to reduce workplace injuries and illness. She is a superb choice to join the Board of SCIF.”

Baker’s interests include the promotion of evidence-based best practices in health and safety, particularly in the construction industry and among immigrant and young workers. She is also a nationally recognized expert in participatory interventions designed to address occupational health disparities.

From 1981 to 2010, she was director at the UC Berkeley Labor Occupational Health Program. Previously, she was director at the Project on Health and Safety, from 1978 to 1981.

Baker is a member of the American Federation of Teachers and the American Public Health Association. She earned a Master of Public Health degree from UC Berkeley in 1977.

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Koshland Honored for Professional Achievement

Catherine P. Koshland, vice provost of Teaching, Learning, Academic Planning, and Facilities at UC Berkeley, received the Adel Sarofim Award for Outstanding Professional Achievement in Health Effects Engineering and Environmental Monitoring from the International Congress on Combustion By-products and their Health Impacts. The award was also presented to Donald Lucas, staff scientist in the Environmental Energy Technologies Division of the Lawrence Berkeley Laboratory. He is also appointed as a professor in the UC Berkeley School of Public Health.

Koshland’s research is at the intersection of energy, air pollution, and environmental health. Her work includes critical assessments of environmental policy, and social and environmental impacts that result from the implementation of new technologies or regulations. She is a professor of Environmental Health Sciences in the School of Public Health, and a professor in the Energy and Resources Group and is the Wood-Calvert Professor in Engineering. Koshland currently serves as associate director of the UC Berkeley Superfund Basic Research Program.

CHAMACOS is conducted by the Center for Environmental Research and Children’s Health (CERCH) at UC Berkeley. Approximately 600 pregnant women were enrolled in the study from 1999-2000. Researchers have followed the children from birth through age 12 to investigate the effects of pesticides and other environmental exposures on childhood development.

The Center’s findings receive widespread attention. For example, the San Francisco Chronicle reported on their paper that linked decreased IQ in children exposed to Vector-born Pollutants and exposure to attention deficits and the lowering of IQ in children. In December, researchers from CERCH received the “2012 Paper of the Year Award” from the journal, Environmental Health Perspectives, for their article linking exposure to organophosphate pesticides with adverse effects on cognitive development. And in March 2013, they were recognized by the California Department of Pesticide Regulation with its Innovator Award.

Less known is the Center’s success with community outreach, such as the forum in December. “We make it a fun event with food and engaging presentations so that our participants enjoy themselves while learning,” said Daniel S. Madrigal, the coordinator of Community Outreach for CHAMACOS.

The invitation-only event is timed to coincide with the end of the agricultural season so more participants from the farm working community can attend.
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).