

environmental health sciences connection

Newsletter of the Department of Environmental Health Sciences at the Johns Hopkins Bloomberg School of Public Health

FROM THE CHAIR



Dr. John D. Groopman

The beginning of the academic year is always a good time to reflect upon the accomplishments of the Department and look forward to the future. We have built a remarkable physical facility that has the finest research laboratories and core services found in any school of public health in the world. This allows us to attract the highest caliber students and young faculty to help address the problems of environmental health across the globe. Even in these difficult economic times, our faculty and students continue to obtain the research funding support that allows us to remain at the forefront of our field. In the following, I would like to briefly highlight some of the achievements of our faculty over this last academic year, and recognize that this is just a subset of the many accomplishments by the Department.

Dr. Lynn Goldman, Professor of Environmental Health Sciences,

was awarded additional funding to expand recruitment for the National Children's Study Center to Montgomery County, in addition to the original recruitment area of Baltimore County. Lynn is the principal investigator of the Center, the goal of which is to enroll 100,000 children in order to monitor environmental exposures and health outcomes from birth through age 21.

Dr. Shyam Biswal, Associate Professor of Environmental Health Sciences, has contributed landmark research this year in the area of lung disease. His studies have shown that the effects of tobacco smoke leading to emphysema can be mitigated, and in some instances reversed, by sulforaphane exposure, a constituent found in broccoli. Shyam's findings have been translated into clinical trials by Dr. Thomas Kensler's group in China. These efforts offer new opportunities for prevention and intervention in high risk populations that are exposed to a diverse array of environmental toxins and toxicants.

Dr. Ana Navas-Acien, Assistant Professor of Environmental Health Sciences, is a new recruit to the Department. Ana's research involves characterizing the exposure and health risk from toxic metals such as lead, cadmium and arsenic. In this regard, Ana's research is a direct descendent of Anna Baetjer's work in our Department.

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I hope these little vignettes of success, and those to follow in this newsletter, give you a feeling of the broad-based excitement and accomplishments being made by our faculty and students.

CENTER IN URBAN ENVIRONMENTAL HEALTH NEWS

Community Outreach and Education Core (COEC) Focus

COEC team members hit the road for the American Lung Association's "Breathe DC" Metro Walk

Team Environmental Health (The BRIICK Layers) had 27 walkers and raised almost \$2,000. The team placed seventh in its class! Team captain Dr. Michael Trush raised \$500 and will be featured in the Winner's Circle, while Barbara Bates-Hopkins, Norma Kanarek, and Pat Tracey raised \$350 each. Team Environmental Health would like to acknowledge those that walked with us, and those individuals that so generously supported us with their donations. Next year's Breathe DC walk will be held in May, 2010, and look forward to even greater participation and support!

COEC continues successful Day at the Market program The Day at the Market is an educational and outreach event currently held for four hours (10am-2pm) on the last Wednesday of every month at the Northeast Market, 2101 East Monument Street, in East Baltimore. It is a joint endeavor between the Environmental Justice Partnership and the COEC pilot program. This informal event engages residents, disseminates materials and information pertaining to environmental health issues, obtains feedback from the community, and promotes interactions between residents and researchers in a setting where residents are at ease, in familiar surroundings, and easy to reach.

The program also provides a great opportunity to recruit research participants. Participation at one event resulted in Dr. Ben Apelberg (JHBSPH, Department of Epidemiology) obtaining 60 saliva samples for his studies on exposures to environmental agents.

COEC works with Greater Baltimore Asthma Alliance (GBAA) The mission of GBAA is to reduce the burden of asthma in Baltimore City and is composed of members from many organizations, including the Baltimore City Health Department, doctors from the JHU School of Medicine, and students from JHSPH and the University of Maryland School of Nursing. GBAA has developed three working committees to advance its mission: Healthy Homes and Communities, Schools, and Providers. COEC staff serve as members of these committees and have contributed and participated in a variety of GBAA community activities. In 2009, these activities included a "Family Feud"-style game based on asthma questions held at the GBAA All-Star Game at the Lake Clifton Campus School, on March 20, 2009 and another game at the Fallstaff Middle School on May 14, 2009. Such events and games increase the community's knowledge base about asthma, asthma triggers, and the relationship between the environment and this disease.

COEC participates in the Breathe Easy Asthma Summit On June 30, 2009, the Coalition to End Childhood Lead Poisoning conducted this summit as part of its Healthy Home project. COEC discussed its activities, and explained the resources available to the community in understanding the relationship between the environment and asthma.

COEC joins forces with Southwest Cares Project The Southwest Cares project is an EPA-funded project focused on the environment and health in communities that suffer from some of the worst health statistics in Baltimore City. On April 20, 2009, the Southwest Cares project held a kick-off meeting at the Diggs-Johnson Middle School that was attended by nearly 100 residents. Dr. Trush made a presentation on "What is Environmental Health?" and COEC continues to participate in the planning activities and the community interactions of Southwest Cares.

2009 Delta Omega Scientific Poster Winners

The Delta Omega Scientific Poster Competition is an annual event to give students the opportunity to display their research and receive recognition for their work. Two PhD students from the Department of Environmental Health Sciences won first and second place in the Basic/Lab Science category.

The first place winner in the Basic/Lab Science category was PhD candidate **Christopher Harvey** - "Nrf2 - A novel target to improve host antibacterial defenses in high risk populations."

The second place winner in this category was PhD candidate **Talia Chalew** - "Development of Assay to Assess Environmental Impacts of Engineered Nanoparticles on Chesapeake Bay Oysters."



April Neal receives her award with faculty mentor, Dr. Tomas Guilarte

Student Award Winners



Chris Harvey presenting at the 2009 EHS Research Retreat

International Neurotoxicology Conference Poster Winner

April Neal, a recent PhD graduate in Environmental Health Sciences, with a sub-specialty in neurotoxicology, was awarded second place in the prestigious poster competition at the 2008 International Neurotoxicology Conference. April completed her PhD in May 2009; her research topic was "Disruption of Developing Glutamatergic Synapses by Pb²⁺."

The American Industrial Hygiene Conference & Exposition Poster Winner

Ashish Jachak, an Environmental Health Engineering PhD student, presented a poster titled "Metal Oxide Nanoparticles are Efficiently Trapped by Human Mucus" at the American Industrial Hygiene Conference & Exposition (AIHce) held in Toronto, Ontario, Canada From May 30th - June 4th.

Awards:

1. Best of Session - Student Poster Session
2. First Place - Conference Poster
3. Best Student Poster by The Nanotechnology Working Group - American Industrial Hygiene Association (AIHA) Committee
4. Best Student Poster by The Engineering Committee - AIHA Committee

This project is a multidisciplinary research effort in collaboration with EHE Professor and Mentor Dr. Patrick Breysse; Dr. Justin Hanes, Professor, Whiting School of Engineering; and Dr. Sam Lai, Assistant Professor, Whiting School of Engineering.



Ashish Jachak, PhD Candidate

Women in EHS

New NIEHS Training Program Director: Valeria Culotta

In 2008, after 17 years (1991-2008) as director of our T32 Training Program in Environmental Health Sciences, James Yager decided to step aside. Valeria Culotta was selected as the new training program director effective October 1, 2008. Val was described as "one of the most outstanding members of our departmental and training program faculty" at the time of her appointment. She is currently Director of the Division of Toxicology, a position Jim also held from 1989 – 2000. She has an outstanding record of scientific achievement, including being awarded a merit award for her GM-funded project on "Genetic Determinants Of Oxygen Toxicity" in 2005, and she has been a recipient of funding from the NIEHS since 1997.

Maryland's Top 100 Women: Lynn Goldman

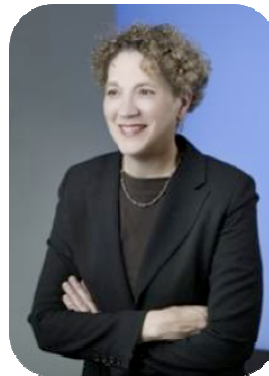
The Daily Record has selected Lynn Goldman, MD, MPH, as one of Maryland's Top 100 Women of 2009. Maryland's Top 100 Women recognizes high-achieving women who are making an impact through their leadership, community service and mentoring. Lynn is a pediatrician and professor in the Division of Occupational and Environmental Health. She is principal investigator for the Johns Hopkins University Center for the National Children's Study and co-principal investigator of the National Study Center for Preparedness and Critical Event Response (PACER).

2009 National Women's History Month Honoree: Ellen Silbergeld

The National Women's History Project champions the accomplishments of American Women and leads the drive to write women back into history. Every year in March, the NWHP coordinates observances of National Women's History Month throughout the country. The NWHP originated this widely recognized celebration and sets the annual theme, produces educational materials, and chooses particular women to honor nationally for their work. Women's History Month programs, community events, plays, essay contests, and related projects often have wide-ranging effects. This year's theme, *Women Taking the Lead to Save Our Planet*, encourages the recognition of the important work of women in the on-going "green movement." Women were acknowledged in communities and states throughout the country. The 2009 Honorees include scientists, engineers, business leaders, writers, filmmakers, conservationists, teachers, community organizers, religious or workplace leaders or others whose lives show exceptional vision and leadership to save our planet. <http://www.nwhp.org>



Dr. Valeria Culotta



Dr. Lynn Goldman



Dr. Ellen Silbergeld



Thomas Hartung and CAAT: Re-thinking Animal Testing

This March, Thomas Hartung became the second director of the Center for Alternatives to Animal Testing (CAAT), succeeding founding director Alan Goldberg. Taking the helm of a center with such a potentially provocative mission—one that manages to upset elements on both sides of the animal testing landscape—is a difficult job, and Hartung is taking it on by going on the offensive, particularly in terms of reevaluating animal testing and its efficacy. To do that, he's positioning CAAT to take some bold steps, and turn the center into a nexus for evolving theories and practices of testing.

In an interview with *Johns Hopkins Public Health* magazine editor Brian Simpson, Hartung noted recent developments that may help change the basics of animal testing on a global level. "The OECD, the Organization for Economic Collaboration and Development, has a program where agreements for individual tests to be applied are done," he explained, "and after this agreement, every member country has to accept the other's test. The big advantage is that this has almost abolished duplicate testing. And in the end, science is global. Science does not know borders."

Hartung also cited a 2007 National Academy of Sciences vision document ("Toxicity Testing for the 21st Century") that may change some of the basis for testing procedures in way that improves both animal welfare and scientific results. "This is having repercussions at the moment worldwide," he said of the publication, "because this vision put forward the concept of moving away from animal testing to a human cell-based toxicology. This was really a fire for dry wood. Toxicology was waiting for something like this—not changing small patches, but really rethinking toxicology."

Hartung continued: "I aim at this moment to develop [CAAT] further, to be an intellectual center for the paradigm shift in toxicology, a think tank. You need a quite substantial change, and this requires an out-of-the-box thinking."

Proposed Engineered Nanoparticle Superfund Research and Training (ENSRT) Center

A multidisciplinary team of investigators was recently assembled, to include both biomedical and non-biomedical projects, to address health and environmental concerns that may arise from direct, indirect, or accidental releases of ENPs into the environment in response to the national Institute for Environmental Health Sciences Superfund Basic Research Program announcement.

The Superfund Research Program (SRP) is a network of university grants that are designed to seek solutions to the complex health and environmental issues associated with the nation's hazardous waste sites. The research conducted by the SRP is a coordinated effort with the Environmental Protection Agency (EPA). The SRP is federally funded and administered by the National Institute of Environmental Health Sciences.

Today, the Program supports peer-reviewed research in 14 university programs encompassing 89 collaborating institutions. These programs conduct interdisciplinary, multi-project research focused on one central theme. Primary focus of most programs is environmental exposures encountered at the hazardous waste sites. <http://www.niehs.nih.gov/research/supported/srp/>

Dr. Patrick Breyse, principal investigator in the latest JHU submission, decided to take a unique approach and focus his proposal on emerging contaminants of concern.

The mission of the proposed Engineered Nanoparticle Superfund Research and Training Center (ENSRT) is to provide scientific basis for assessing and managing future health and environmental impacts resulting from the introduction of nanomaterials into the environment.

The ENSRT Center will consist of a team of researchers with expertise in the following disciplines: environmental, chemical, and biomedical engineering; biophysics; material science; environmental and analytical

chemistry; environmental sciences, and toxicology. Two of the projects are considered non-biomedical and five are considered biomedical.

PROJECT 1

Effects of Environmental Exposure on the Properties of Engineered Nanoparticles

Howard Fairbrother, Professor in the Department of Chemistry

PROJECT 2

Transport and Fate of Engineered Nanoparticles in Saturated Porous Media and Their Impacts on Microbial Community

Edward Bouwer, Co-PI & Professor in the Department of Geography & Environmental Engineering

PROJECT 3

Engineered Nanoparticles and the Human Mucus Barrier

Justin Hanes, Professor in the Department of Chemical and Biomolecular Engineering

PROJECT 4

Nanoparticle Uptake in Living Cells

Peter Searson, Professor in the Department of Materials Sciences and Engineering

PROJECT 5

Neurotoxicological and Intracellular Effects of Nanoparticles

Tomas Guilarte, Professor in the Department of Environmental Health Sciences

PROJECT 6

Nrf2-Dependent Environmental Stress Response as a Modifier of Nanoparticles Induced Innate Immune Dysfunction and Pulmonary Injury

Shyam Biswal, Associate Professor in the Department of Environmental Health Sciences

PROJECT 7

Molecular Biomarkers of Nanoparticle Exposure

Ellen Silbergeld, Professor in the Department of Environmental Health Sciences

Chesapeake Health Report

Bad Water 2009: The Impact on Health in the Chesapeake Bay Region



On July 7, 2009, the Chesapeake Bay Foundation released “Bad Water 2009: The Impact on Human Health in the Chesapeake Bay Region.” The report links pollution to human health risks and calls on the federal Environmental Protection Agency to act now to reduce that pollution and the potential threats to human health.

Thaddeus Graczyk, PhD, Associate Professor in Environmental Health Sciences and member of the Center for Water and Health, is highlighted in the report:

“[Dr. Graczyk] believes current water testing procedures miss the true prevalence of pathogens like *Cryptosporidium* because local health departments do not test for *Cryptosporidium* or other protozoans. Illnesses caused by *Cryptosporidium* are not typically fatal, but can be for people with weakened immune systems because of cancer, AIDS, or other diseases. Moreover, water-quality tests at public beaches are typically performed during the week, when fewer people are likely to be at the beach or in the water, and sediments laden with pathogens are not being stirred up. The protozoan pathogens often come from sewage, pet, farm animals, or wildlife feces that are washed by rain or are directly deposited into waterways. Sampling that Dr. Graczyk performed in 2006 at a beach at the Gunpowder Falls State Park on the Gunpowder River (a Bay tributary) found *Cryptosporidium* at levels that could cause infection, in 32 percent of 60 samples, including 70 percent of weekend samples and none of the weekday samples. He tested both during the week and on weekends and found the beaches were open on days when the levels of *Cryptosporidium* were high enough to make people sick because the health department did not test for the pathogen. Another problem, Dr. Graczyk has concluded, is that the bacterial sampling of swimming areas now performed by local health departments uses tests that take two days or longer to show results. So by the time health officials know there is a problem and want people out of the water, it is too late. Officials at the Maryland Department of the Environment disagree with Dr. Graczyk’s study and conclusions, and say current testing procedures and beaches are effective in protecting the public.”



The full report can be found at <http://www.cbf.org>

Department Receives Funding to Study Public Health Systems Preparedness

In fall 2008, Dr. Jonathan Links, professor, EHS Deputy Chair, and PI/director of the Johns Hopkins Center for Public Health Preparedness was awarded a five-year, \$7.6 million grant from the Centers for Disease Control and Prevention (CDC) to research disaster preparedness and response. This grant was made possible through CDC's establishment of Preparedness and Emergency Response Research Centers (PERRC) at seven universities nation wide. The purpose of the PERRC is to conduct research that will evaluate the structure, capabilities, and performance of public health systems for preparedness and emergency response activities.

The Johns Hopkins PERRC is uniquely focused on mental and behavioral aspects of public health systems research in preparedness and emergency response. The Center's goals are to build capacity, competency, and coordination of public health systems to prepare for, respond to, and recover from the adverse mental and behavioral health effects of emergencies.

The Johns Hopkins PERRC projects focus primarily on the "public mental health system" as it relates to preparedness through four critical components of a public health system – public health infrastructure, communities, media, and the legal and ethical environment.

FOUR PROJECTS FOR PERRC

Project 1:

Applying the Extended Parallel Process Model (EPPM) to Willingness-to-Respond in the Public Health System

Project 2:

Fostering Coordinated Mental Health Preparedness Planning

Project 3:

Role of the Media in Resistance

Project 4:

Legal and Ethical Assessment Concerning Mental and Behavioral Preparedness

NIH Form UPDATE

xTrain now accepts trainee appointments to T15, T32, T34, T35, T90, TL1, and TU2 research training grants and scholar appointments to K12 and KL2 institutional career development awards from all institutions registered with the eRA Commons. It can be utilized now; there are no further registrations or special steps required.

Environmental Health Nursing: Evolving and Expanding

Public health researchers and practitioners have made solid progress in getting communities and public sector agencies to understand the crucial role of environmental health and its impact on individuals, neighborhoods, and populations. This success has led to an increase in demand for nurses with specialized training and education in the field, and a recent article in a special Baltimore *Sun* section on education highlighted the Environmental Nursing and the Occupational and Environmental Health Nursing (OEHN) Program at the Education and Research Center for Occupational Safety and Health (ERC), one of 16 multidisciplinary university centers for safety and health in the nation.

In an interview for the article, Jacqueline Agnew, RN, MPH, Ph.D., a professor in the department of environmental health sciences and director of the ERC, discussed how environmental nursing is now considered the overarching field that encompasses many other subspecialties of nursing. She also explained that the OEHN Program (which is run by Sheila Fitzgerald, Ph.D., RN-C), focuses on an interdisciplinary program that mixes community-based nursing, public health, and varied elements from across the environmental health spectrum. "Environmental health nursing is the big umbrella that occupational health nursing falls under," she said to *The Sun*. "We prepare all levels of nurses to practice the sciences related to protecting communities – or populations – in the environment that are exposed to the multitude of hazards. The lines are blurred between occupational and environmental health. Populations differ, but because we deal with the same exposures and the same health effects, we are often dealing with the same client."

The OEHN program offers both MPH and MSN/MPH degrees, as well as a PhD or DrPH track; the curriculum for either path is rigorous and covers a variety of public health and nursing classes, along with specific work in epidemiology and toxicology.

One challenge, Agnew added, is keeping up with the fluid and expanding needs of the agencies and companies looking to hire the program's graduates. "The large demand is coming on the public sector side," Agnew said. "It is very hard to get a handle on because employers are so varied."



Dr. Jacqueline Agnew

Division of Environmental Health Engineering Contributions to the Grantham Prize for Environmental Journalism Winners

Dr. Patrick Breyse and faculty within the Division of Environmental Engineering assisted authors Blake Morrison and Brad Heath in their *USA Today* series "The Smokestack Effect: Toxic Air and America's Schools." Morrison and Heath were recently informed that they will receive the 2009 Grantham Prize for Excellence in Reporting on the Environment. Grantham Prize jurors described the series as taking "science-based journalism to a new level."

The reporting team worked with Dr. Breyse and Dr. Amir Sapkota at the University of Maryland (EHS graduate 2005) to pool government data on industrial polluters near 127,800 schools in an effort to identify potential toxic hot spots. The series of articles examined the impact of industrial pollution outside the nation's schools. The *USA Today* analysis indicated that thousands of schools are within a half-mile of major industrial plants that emit potentially dangerous chemicals. Many of those locations are elementary or pre-kindergarten schools. The research was integrated into an online, interactive database, allowing community members to look up specific schools and get an estimate of how the air quality at their school compares to other areas.

SPECIAL REPORT

The Smokestack Effect

Toxic Air and America's Schools

USA TODAY used an EPA model to track the path of industrial pollution and mapped the locations of almost 128,000 schools to determine the levels of toxic chemicals outside. The potential problems that emerged were widespread, insidious and largely unaddressed.

Photo by Garrett Hubbard, USA TODAY

Find your school * required

School Name City/County * Select a State

The methodologies and limitations for the difficult assessment of toxic exposure were carefully described in the series' companion Web site, and a list of frequently asked questions was added to help readers understand how to interpret and act upon the findings. Since publication of the series, the Environmental Protection Agency has announced a program to investigate the impact of hazardous air pollutants on the nation's schools.

Summer Internship Program 2009

This year, the Department of Environmental Health Sciences hosted 13 summer interns (of 30 total within the School). The majority were supported by two grants from the National Institute of Environmental Health Sciences: the Short-term Research Training in Environmental Health Sciences for Underrepresented Students, and Connecting Students to Environmental Health Researchers.

Summer interns receive research training and participate in weekly "Introduction to Public and Environmental Health" seminars, as well as an "Environmental Health Sciences" journal club. At the end of the summer program, the students presented a poster of their research project in Feinstone Hall.



NEW EHS STUDENTS

Andrew Azman

PhD, Environmental Health Engineering

A native of Baltimore, Andrew Azman is returning to Charm City to begin his work in the Environmental Health Engineering Program. Andrew's career interests have involved water health and hygiene since his studies at the University of Colorado, Boulder, where he showed that heavy metals from mine run-off were contaminating the local water supply. He also founded CU Biodiesel, which successfully advocated the use of biofuels at both the university and the city of Boulder. In 2004, he travelled to San Leon, Peru as Program Manager for an Engineers Without Borders potable water project; two years later, he became Water and Sanitation Program Manager in Gulu, northern Uganda, for the NGO Action Contre La Faim (ACF), where he managed water and hygiene programs for people displaced by that nation's civil war. In 2008, he joined the United Nations Children's Emergency Fund (UNICEF) as a consultant, working in the southern region of Malawi. Most recently, he assisted another NGO, Baobab Health, in managing the design and installation of touch screen computers at HIV/AIDS clinics in Malawi.

Lalita Abhyankar

MHS, Environmental Health

A biochemistry and biology (molecular and cellular) major at the University of Arizona, Tucson, Lalita focuses on interdisciplinary and cross-expertise studies of environmental health. As a co-preceptor for a health sciences colloquium on South Asia, she developed a plan of study that took into account not only chemical and environmental health issues, but also cultural, religious, and social structures that could affect successful implementation of public health strategies. She has worked on insulin degrading enzyme (IDE) and its activity within liver cells at the Department of Veterans Affairs in Phoenix, Arizona, and her results indicated a

direct relationship between IDE activity and the activity of insulin receptor enzymes. A native of New York, she frequently travels to her parents' homeland of India, and returned this summer to participate in a service project dealing with child and maternal healthcare in rural and urban areas.

Patrick Baron

MHS, Occupational and Environmental Hygiene

Since graduating from Wesleyan University in 2006, Patrick has spent much of his time as a teacher and writer in Chicago, Illinois. His focus at the School of Public Health will be on nutrition and education about the health benefits of good food, an area in which he grew interested while working as a teacher of low-income, special needs children and their families in Chicago's public schools. The low standards that school systems like Chicago's have been forced to set for nutrition and exercise made Patrick determined to work to improve the situation by working with administrations to find innovative solutions. Since returning to his native Baltimore in 2008, he's worked with the Baltimore City school system's nutritionist and on the system's new Fresh Start Farm, a 33-acre property that will grow foods for the system's students. He's also been working at Maryland's oldest organic farm, Country Pleasures Farm.

Frances Belmonte

PhD, Toxicology

It was her research on the Atlantic tomcod fish for her master's thesis at New York University that brought her to the School of Public Health to focus on further toxicological studies. She studied two groups of tomcod; one from the Hudson River, which has long been a source of PCB contamination, and a second group from Long Island. The Hudson River group was constantly exposed to a variety of chemicals like PCB, PAH, and chromium, all harmful and all found in many of the nation's waterways. A Virginia native, Frances has long been interested

in environmental health issues, as well as wider scopes of health issues. Prior to attending NYU, the Virginia Polytechnic Institute (Virginia Tech) graduate worked on a variety of projects, including Duke University's Human Vaccine Institute, University of North Carolina's Kidney Center, and was an intern at Virginia Tech's Center for Molecular Medicine and Infectious Diseases.

Lev Bubis

MHS, Environmental Health

While an undergraduate at University of King's College in Halifax, Canada, Lev – who had previously focused on natural science during his education – enrolled in a one-year program designed to intensively teach a wide range of liberal arts, literature, law, history, and similar topics. That program proved pivotal in guiding his decision to enroll in SPH: His particular interest in an important Canadian Supreme Court ruling on private and public health care accessibility led him to explore a more policy-focused track in his education. Subsequently, he has spent the past two years volunteering at hospitals and assisting patients in Canadian hospitals. Lev has also been working with the Cochrane EPOC Group, contributing to the development of a database for the Canadian Agency for Drugs and Technologies in Health. A native of Ottawa (and a onetime snowboard instructor), Lev's ultimate goal is to become an MD.

Ann Carroll

DrPH, Environmental Health

Ann was born in Washington, D.C., and she developed an interest in health from listening to her parents – physicians and Irish immigrants – talk about their patients' concerns and health care trends they noticed in the area. Her own career has followed the continent-hopping precedent set by her parents. After spending seven years working with the U.S. Environmental Protection Agency, she relocated to Australia in 1996. There, she spent roughly five years, working at the New South Wales

Environmental Protection Authority (on projects that identified and treated lead poisoning cases in adults and children), as well as the NSW Health Department. In 2002, she rejoined the EPA, most recently serving as senior policy analyst for the EPA's Office of Brownfields and Land Revitalization. Her current work focuses on the improvement of interagency and inter-organizational cooperation in the remediation of Brownfields. She's an alumna of Virginia Tech and Boston University.

Joan Casey

PhD, Occupational and Environmental Health

Growing up in Oregon, Joan was entranced by the state's amazing natural beauty – but also concerned by man-made environmental damage, like oil-slicked beaches and clear-cut forests. A summer spent working for Duke University's Engineering World Health program in Managua, Nicaragua – repairing equipment for a hospital – also illustrated to her the consequences of poorly managed environmental regulation and public health. She saw the results of those policies in the areas poorly nourished citizens and precipitous levels of pollution, both industrial and ecological. Joan's graduate work at Columbia University included participating in development of an anaerobic digester, which can produce fuel from waste, and physiological studies of cardiovascular drugs. A graduate of Cornell University, Joan served as team captain for the school's indoor/outdoor track team. She ultimately hopes to help guide decisions that result in better environmental health for both developed and developing nations.

Jonathan Coulter

PhD, Toxicology

It was during his senior year at James Madison University that things clicked into place for Jonathan. A Human Histology course (and inspirational professor) helped him see the relationships between molecules, cells, organisms, and the environment. That led him to the lung cancer research that he performs today at Johns Hopkins, as a research technologist at

the School of Medicine's Department of Pathology and as part of Hopkins' Lung Cancer Specialized Programs of Research Excellence (SPORE) program. The Virginia native traveled from Harrisonburg (home of JMU) to Baltimore and a position in the laboratory of Dr. Edward Gabrielson, studying lung and breast cancer biology, treatment, and chemoprevention through both in vivo and in vitro methods. Most of his lab work has been into the causes of lung cancer, focusing on susceptibility, environmental factors, and prevention. His interest in cancer spans from test bench research to clinical evaluations to public health policy.

Stacey Grant

MHS (Part-Time/Internet-Based), Occupational and Environmental Hygiene

Like many of those accepted into the special MHS program, Stacey faces unique challenges that the flexibility of the part-time/Internet-based curriculum can help alleviate. She lives in Nelson, British Columbia, a "rural remote" area of BC that's a one-day drive from the nearest university. An occupational/environmental hygienist for the Interior Health Authority, she oversees workplace safety issues, as well as public health and community care needs for a large, rural swath of BC. She's done research in microbiology and microbial contamination at both the university and public agency levels, and recently has devoted the majority of her time to examining worker health and safety. She plans to use her degree to more effectively help install and effect workplace health changes.

James Grond

MHS (Part-Time/Internet-Based), Occupational and Environmental Hygiene

James' path to Bloomberg's MHS program has been a bit circuitous. Originally, he planned to become a large animal practice veterinarian, but, thanks to a contract awarded to the owners of the South Dakota research farm where he was working after college, James ended up going to work monitoring asbestos in federal buildings. This project, and his interest into work health

issues, led to a career in industrial and workplace hygiene and environmental remediation, which included projects like Alcatraz Island and the Presidio, both in San Francisco. In 1986, he relocated to the East Coast and helped run a series of environmental consulting firms; today, he is president of GCI Environmental Advisory. James is a Certified Industrial Hygienist and licensed asbestos investigator, and hold a variety of other environmental safety certificates.

Kevin Huang

MHS, Environmental Health

A native of Philadelphia who grew up in New Jersey, Kevin is enrolled in the BA/MHS concurrent program, and began taking classes at Bloomberg during his senior year at Homewood, including studies in environmental health and public health toxicology. He plans to focus on researching the role of environmental hazards in public health, a topic he first became interested in as an undergraduate studying public health and natural science. Kevin's summer work outside of Johns Hopkins is of interest as well: In 2004, as a summer intern research assistant in the Rutgers University Food Science department, he performed research into the antioxidants derived from varieties of tea, and which type of tea possessed the highest antioxidant activity (white and green, it turns out). In 2008, he was a summer research assistant at the Diabetes Center of the Children's Hospital of Philadelphia, where he helped analyze the relationship between Celiac disease and initial presentation of Type I diabetes.

Elizabeth Kasameyer

DrPH, Environmental Health

Elizabeth has taken a somewhat winding route to Baltimore, from her native Oregon to Wesleyan University in Connecticut, to Belize, back to Oregon, and finally to Baltimore, where's she's lived for the past three years. She's studied hedgehog biology, the mutational properties of iron radiation, and, as a Peace Corps environmental educator, helped Belize residents set up cottage industries while also guiding two

fish biodiversity studies on the New River Lagoon, near the Rio Bravo Conservation and Management Area (RBCMA). Her Peace Corps status brought her to the Johns Hopkins School of Nursing as a Peace Corps Fellow, and she's worked for a private hospital, state women and children's program, and most recently for the Baltimore Health Department's Healthy Homes Division, interning there while completing her MSN/MPH. Her work for the city involves the creation of an Integrated Pest Management pilot program in a city-owned property for the elderly and disabled.

Elaine Kazlauskas

MHS (Part-Time/Internet-Based), Occupational and Environmental Hygiene

With 15 years of experience in corporate and public health care, Elaine is now looking to focus on a specific goal: the creation of a holistic approach to the design of work places that includes not only work processes, but also the health and well-being of the people who work in those processes. She hopes to reduce worker stress through better-designed processes and improved workplace layouts, using experiences she's gathered while a senior process manager at The Children's Hospital of Philadelphia's Process Innovation Center. She's spent the past 18 months designing clinical work processes in conjunction with new facility construction for the hospital's delivery of radiation and proton therapy. native of Pennsylvania, Elaine is also an avid sailor, and a member of the crew of the 300-ton *Kalmar Nyckel*, Delaware's official tall ship.

Sandhya Kowdley

MHS (Part-Time/Internet-Based), Occupational and Environmental Hygiene

Sandhya is an intellectual property legal specialist, most recently with a Baltimore-based firm, and has bachelor's and master's degrees in law. Though she's worked with all manner of intellectual property issues, her current area of practice centers around vaccine and gene therapy rights and patents. This has allowed her

to rediscover and implement some of her undergraduate training in life sciences and environmental science. Her goal now is to study public policy and risk assessment with regard to airborne and infectious diseases brought about by environmental issues; as a child in India, poor air quality caused her respiratory ailments, and now as an adult she wants to focus on public health and areas such as large-scale initiatives to improve air quality.

Emmanuel Kyeremateng-Amoah

MHS, Occupational and Environmental Hygiene

As a physician in his native Ghana, Emmanuel has had first-hand experience with occupational health issues rarely seen in the U.S., problems by most measures of a more serious and more preventable nature. Poor, unsanitary, and unregulated working conditions in the country lead to respiratory problems, infections, serious trauma, and other difficult conditions that he hopes his work at Bloomberg will give him the tools to start improving. While attending the School of Medical Sciences at the Kwame Nkrumah University of Science and Technology in Ghana, Emmanuel was particularly active in organizing and leading his classmates (he was class president for two terms), and rallied them into action to provide care, support, and services to the region's underserved populations. Since 2005, Emmanuel has been a physician for the Ghanaian Health Service, most recently in Nkawkaw, a city of some 50,000 citizens; his work at Bloomberg will focus on investigating preventative measures occupational injuries and diseases.

Meghan Marshall

MHS, Environmental Health

Meghan is another participant in the BA/MHS combined program, and began taking classes at Bloomberg last year in preparation for her first full term at the school. In 2008, she was an intern at the New England Medical Center Large Animals Research Lab, helping prepare and monitor animals during tests of a variety of new medical and safety related products, from chest

protectors to abdominal wall patches. She performed a variety of duties, from prepping animals to monitoring them during anesthesia and inserting and removing tracking chips. She says her awareness of the environmental impact and changes going on around her—including the fading health of the ecological systems she enjoyed as a child—spurred her to take an active role in researching and helping to alleviate those changes. Meghan is a former multi-sport high school athlete, including field hockey (which she played at Homewood), lacrosse, and skiing.

Suzanne Martos

MHS, Environmental Health

Suzanne started at Cornell University as a biology major, but soon developed an interest in geological sciences, and broadened her study of science to include materials and energy in ecosystems. This led to her decision to begin linking humans to earth sciences, a course of study she has begun to pursue in her more recent work. In the meantime, she worked processing flora fossil specimens at Cornell, and performed independent research on extraterrestrial impact and crater geology at the Lamont-Doherty Earth Observatory of Columbia University. That research led the Arizona native to examine deep-ocean core samples for chemicals and minerals created during high pressure events. Though she enjoyed the lab and field work, she decided to further explore health and environmental issues, and has been working for ICF International, an environmental consulting firm, since 2007.

Kerri McGovern

MHS, Environmental Health

Though this is her first year since completing her undergraduate work in public health at Homewood, Kerri has already participated as a research assistant in two departments at Bloomberg. In 2007, she worked in the Department of Epidemiology on the long-running ALIVE program, studying diseases acquired by IV drug users. From 2006 to 2007, she served as a research assistant in the

Department of Health, Behavior, and Society in behavioral surveillance projects, and a community-based study on HIV prevention. More recently, she implemented two research studies at the North Shore University Hospital in Manhasset, NY: one on smoking cessation, and one on patient advocacy in the emergency room. The New York native was a member of the Johns Hopkins track team, and participated in the Public Health Student Forum at Homewood, in addition to several volunteer activities.

Nnenna Ofulue

MHS (Part-Time/Internet-Based), Occupational and Environmental Hygiene

A pharmacist who moved into industrial hygiene, Nnenna is a Nigerian native who has worked for that country's National Agency For Food And Drug Administration And Control (NAFDAC) as a pharmacist and a regulatory officer. During much of Nnenna's time at the NAFDAC, Nigeria was being flooded with fake and counterfeit products, and she was able to help as the agency put controls into place to stop that tide. She's currently working as an industrial hygienist for TOTAL, a large oil and gas exploration and production company. She hopes to use the knowledge and expertise she can draw on at Bloomberg to increase the safety of workers in Nigeria, and to bring successful ideas from American public health research and practice to her country.

Christopher Olson

MHS, Occupational and Environmental Hygiene

During his junior year at the University of Pittsburgh, Christopher—who had been working toward a career in physical therapy—had a moment of inspiration while working in an outpatient physical therapy clinic. He decided to focus more on the public health and epidemiological aspects of improving environmental health. This newfound interest in the links between health behaviors and disease led him to an internship at the Centers for Disease Control, where he analyzed data from the National Health Interview Survey about

family history and other associated risk factors. Christopher is a physical health and fitness expert who in 2006 completed a 130-mile bike trip with his father across Germany. He plans to combine principles of risk assessment with his knowledge of human health to improve safety in workplaces.

Arthur Russell

MHS (Part-Time/Internet-Based), Occupational and Environmental Hygiene

As manager of an EPA Superfund Technical Assessment and Response Team (START), Arthur brings to bear more than 15 years of experience in emergency management. His START team provides emergency hazardous materials response and consultation services to the EPA. His work has focused on the detection of hazardous chemicals, pathogens, and radioisotopes in field and laboratory settings, as well as counterterrorism training. He also spent three years at Sandia National Laboratories working on hazardous chemical and agent detection systems. Cancer is a particular concern at many Superfund sites, and the Connecticut native plans to focus on workplace health issues such as chronic exposure to carcinogens. He will be pursuing his MHS on a part-time/Internet basis while continuing to work in Buffalo, NY.

Rina Solanki

MHS, Environmental Health

Rina is a recent graduate of the University of South Florida, where she studied biomedical sciences. She interned for a marine survey and testing company this past year, and helped construct fiber optic sensors which measure oxygen, and received credit on a paper published on the company's work involving nanoporous film platforms for biophotonic sensors. Rina plans to use her studies into public health as a springboard for a career in medicine; she's particularly interested in the Population Environmental Health specialty track as it includes the study of global health, and effect of environments on populations and vice versa. A Florida native, Rina is also interested in infectious diseases and their prevention.

Megan Solomon

MHS, Environmental Health

Megan's career plan after Bloomberg is to head to medical school. Her desire to be a physician is a result of her interest in contributing to public health as a whole, as well as a more personal concern: the paltry health care conditions that some of her extended family members endure on Native American reservations (she's a member of the Oklahoma Choctaw tribe). After medical school, Megan's ultimate plans focus on bringing better health care to that underserved population, one with a history of high obesity and type 2 diabetes rate. She hopes to fund, open, and operate health clinics on reservations across the nation. A native of California, Megan served as a teaching assistant for Homewood's chemistry lab for her junior and senior years.

Sutyajeet Soneja

PhD, Environmental Health Engineering

While working on a senior design project at North Carolina State University that was created to protect sea turtle nests using remote monitors, Sutyajeet – who would earn dual BS engineering degrees (biomedical and biological engineering) – first became interested in environmental issues. Sutyajeet (a Minnesota native) has spent the past four years working at Hill's Pet Nutrition in Topeka, Kansas as an associate scientist bioengineer, developing ways to perform non-invasive research on animals. She's also worked on pet food formulas that can address some common ailments in companion animals, such as kidney and joint disease. At Bloomberg, she plans to use both lab and field research to focus her studies on airborne contaminants, their deleterious effects on public health, and their role in climate change.

Andrew Stewart

MHS, Environmental Health

A 2008 graduate of Dalhousie University (Halifax, Nova Scotia) with a degree in Neuroscience, Andrew is keenly interested in chemicals and substances in the environment and how they may specifically affect human health. Particularly, this includes how man-made materials can initiate natural and harmful biochemical processes, and how that may relate to autism etiology. His long-term goal is to become a physician. A Canadian native (Ottawa), Andrew was an avid rugby, football, and hockey player during his high school years; he's also volunteered at the Halifax Veteran's Hospital since 2005.

Dean Taiani

MHS (Part-Time/Internet-Based), Occupational and Environmental Hygiene

Dean has spent the past nine years working in industrial hygiene for three companies in the Pennsylvania and Maryland area. He graduated with a degree in safety science from Indiana University of Pennsylvania, and has worked on both the analysis of workplace safety measures for specific buildings and larger, more encompassing programs that evaluate hazards, health, and safety for government agencies. Dean currently works for a private engineering company that serves the United States Army's Aberdeen Proving Grounds. He is returning to Bloomberg to complete studies he began in 2003, and hopes to eventually open his own environmental consulting firm.

Joseph Varco

PhD, Toxicology

As a biology major (and engineering minor) at Lehigh University, Joseph worked with the molecular bases of diseases, concentrating on gap junction plaque deficiencies, which are responsible for a vast array of human diseases, ranging of cardiac ischemia to occulo-dento-digital dysplasia. Also at Lehigh, he designed a multifaceted algal surface cube (MASC) for a student entrepreneur competition; the device facilitates the anchoring and growth of macro algae, a vital food source in marine aquaria. During the summer of 2007,

he interned aboard the EPA vessel *O.S.V. Bold*, where he assisted in data collection and research of sea floor sediments and deposits. Born in New Jersey, Joseph's wide ranging interests include astronomy, aquaculture, and even fly fishing. He plans to focus on environmental health, exposure assessment, and related health risks.

Adam Waddell

MHS, Occupational and Environmental Hygiene

His summer job as an environmental health and safety intern, assisting industrial hygienists with air, noise, and chemical monitoring – as well as a full Eastern Cluster radiation inventory – for W.L. Gore and Associates, convinced Adam that environmental work was right for him. The interaction in the field with people and the elements, as well as the problem solving skills needed for the profession, were good fits for Adam, a Pennsylvania native and former Blue Jays football quarterback and record-setting decathlete. His current area of interest involves studying and helping to maintain healthy and safe working conditions.

Abigail Ward

MHS, Environmental Health

For the past six years, Abigail has worked in the marketing division of the land conservation efforts put forth by outdoor clothing and equipment manufacturer Orvis and its subsidiaries, first in Vermont and then in Colorado. She held a variety of jobs with Orvis, learning new skills from management to soliciting grant proposals and organization. An environmental studies major at Middlebury College, VT, with a focus in conservation biology, she plans to concentrate on utilizing her knowledge of the growing field of geography and geographic information systems (GIS) and incorporating it into public health epidemiology. By combining GIS with Spatial Analytics with research in physiology, toxicology, statistical analysis, and epidemiology, she hopes to be able to develop new strategies and practices to improve public health.

Sarah Wu

MHS (Part-Time/Internet-Based), Occupational and Environmental Hygiene

Sarah is working towards becoming a Certified Industrial Hygienist (CIH); her path to that goal has been a long and varied one. It's included working as a volunteer researcher during college at the CDC; Los Alamos National Laboratories' Carlsbad (New Mexico) office; and, currently, at the U.S. Department of Energy's Carlsbad office, working in the Department of Safety and Health. As a student at Carlsbad High School, Sarah (a native of Taiwan) worked to make sure that a renovation of the school's planetarium was performed in time for an approaching semester's classes to begin. She and her classmates researched planetarium materials and systems, and built support for the project in the school and community. The project was completed early and under budget, and seven sections of astronomy classes were added.

Rachel Zamoiski

PhD, Environmental Health Engineering

While on summer break, Rachel interned at a major Baltimore-area hospital's genetics department, and discovered that she was very interested in statistical analysis as a means by which researchers could discover trends and warning signs in numbers and patterns. She earned her MPH at Bloomberg, focusing on genetic epidemiology. Rachel cites the discovery by Dr. John Snow of a single water pump as a point source for cholera during the London cholera epidemic of 1854 as a defining moment for the potential for her work, particularly how simple observation and basic logic resulted in lives being saved. A native of Baltimore, Rachel has been living in New York City and working for a variety of medical and philanthropic organizations for the past two years.

About our publication

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