

# Your Health

News from the  
University of Rochester  
Environmental Health  
Sciences Center

Spring 2011



# The Environment

## Education in the Environmental Health Sciences Center

Formerly the Community Outreach and Education Core, our outreach program has a new name: the Community Outreach and Engagement Core. This name change underscores NIEHS's commitment to promoting two-way communication between researchers and communities.

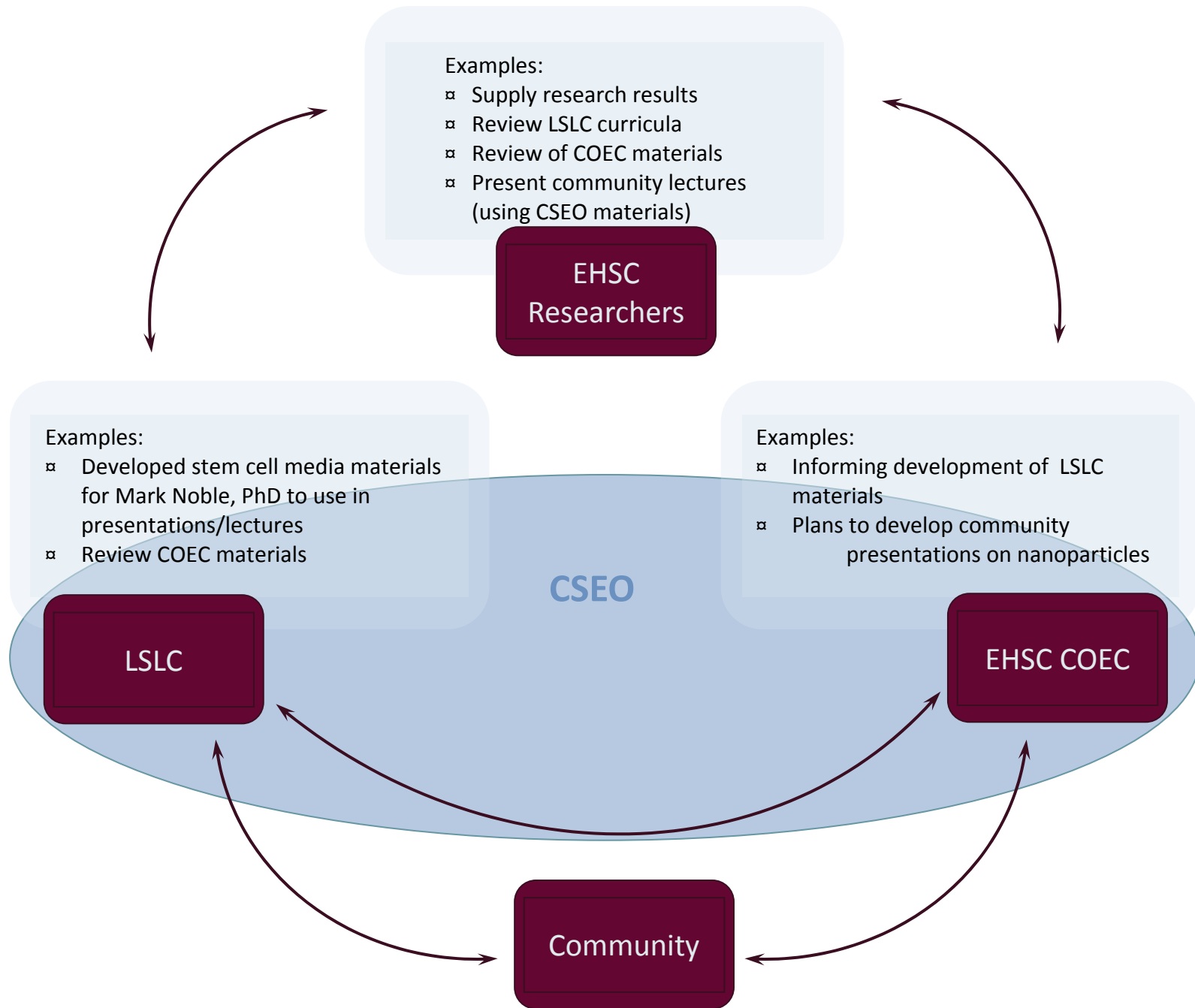
Removing "education" from our name does not mean that education is no longer important. In fact, education remains central to what we do: we educate children, community members, health care professionals, health interest groups, government agencies, researchers, and many others about the findings, uncertainties, and implications of environmental health research. We thought this would be a good time to step back and reflect on how the many aspects of education at the EHSC complement each other.



This issue focuses on the educational programs in which COEC staff are involved. The EHSC is housed in the Department of Environmental Medicine, which is also home to the Center for Science Education and Outreach (CSEO) and the Life Sciences Learning Center (LSLC). CSEO staff develop curricula related to a wide range of life science topics including environmental health. Some of these lessons are informed by the interests and experiences of the COEC in the local community (lead, healthy homes, etc.). Conversely, the COEC staff may adapt these materials to use with community audiences. The teaching and communications skills of CSEO staff are also utilized in a graduate course taught by COEC director Dina Markowitz, PhD (see page 7). These relationships between EHSC researchers, the COEC, the LSLC and the community are depicted on page 2.

Education is and will continue to be a crucial part of engaging the public in a wide range of environmental health topics. We in the COEC are fortunate to have the educational expertise and resources of the CSEO and LSLC and expect to continue to build on these connections.





The Life Sciences Learning Center (LSLC, part of the Center for Science Education and Outreach, CSEO) and Community Outreach and Engagement Core (COEC, part of the Environmental Health Sciences Center, EHSC) have related but separate goals and functions. The LSLC largely focuses on K-12 education related to a wide range of biological science issues, while the COEC primarily engages policymakers, community organizations and others in issues specifically related to environmental health. Topics for educational programs may arise from recent research, current environmental health issues, teachers' interests or community concerns.

The centers work closely together with researchers to produce quality outreach materials based on accurate and timely information. The centers also facilitate community-researcher interactions to help bring significant research results to the community. The following examples (pages 3-6) demonstrate the diversity of our education programs and how they complement each other.

## COEC Staff Conduct Workshops in Healthy Homes Concepts

Monroe County Department of Public Health subcontracted the COEC through a HUD Lead Hazard Control grant to provide healthy homes information by conducting trainings throughout the county. The training gives participants an overview of how to reduce home health hazards such as lead, asthma triggers, pests and indoor air quality issues.

Trainings are based on a PowerPoint presentation lasting about one hour, and are accompanied by hands-on activities. The COEC focuses on training staff of organizations that reach a large number of low-income residents with their services each year. The idea is to spread information into existing outreach networks to support awareness throughout the community. COEC staff also worked with local environmental education organizations to train housing professionals. These individuals reach a large number of renters and homeowners each year and have a unique perspective for locating and addressing hazards in a home.

So far, COEC staff have used this training as a basis for helping WIC, Neighborworks Rochester, Promotores de Salud, the Rochester Childcare Council and many other organizations integrate healthy homes information into their ongoing programs. By training staff at these organizations, we aim to create ongoing healthy homes education opportunities for Rochester's communities.

## EHSC Brings Science Activities to Retirement Home

Shaw-Ree Chen, PhD, Assistant Director of the LSLC, began work with Pittsford Highlands when EHSC researcher Ed Puzas, PhD expressed interest in understanding the concerns that potential research subjects may have about participating in an experimental treatment trial. In order to



explore older citizens' concerns about participating in research, Dr. Chen initially planned to conduct focus groups at retirement homes, but had difficulty finding a home that was comfortable hosting the groups. This barrier was overcome at Pittsford Highlands, when she suggested doing a "fun science" activity with the residents prior to the focus groups. After conducting a "medical mystery" activity that residents solved using simulated lab tests and gel electrophoresis, residents felt comfortable enrolling in the focus groups. In fact, Dr. Chen was asked to return for more hands-on demonstrations, and continues to visit every other month with volunteer scientists and staff members. These visits connect the EHSC with the retirement-age community, introduce residents to interesting developments in science, and promote an engaged sense of community among residents and scientists.



Jerrold Heindel, PhD, Scientific Program Administrator, National Institute of Environmental Health Sciences, *Developmental and Environmental Origins of Obesity*



Jorge Chavarro, MD, ScD, Department of Nutrition, Harvard School of Public Health, *Diet and Fertility for Women 101*



Dana Dolinoy, PhD, Department of Environmental Health Sciences, University of Michigan, *Simple Dietary Changes Can Protect Against the harmful Effects of Environmental Toxicants on the Developing Fetus*



Chris Hartman, Founder, Head Water Foods, Inc., *Case Study: Eat Healthy, Eat Fresh, Eat Local*



Janet Raloff, Senior Editor,, Science News, *Challenges of Translating Environmental Health Research*

## Researching Women’s Environmental Health

The COEC utilizes a wide range of strategies to reach the community with environmental health information. One of the most significant challenges of developing environmental health education messages, however, is that emerging research is often uncertain, making it difficult to deliver clear, concise suggestions for appropriate action. For example, new information regarding chemicals in food can be overwhelming for some community members because there is so much new information and so many uncertainties. Therefore, recommendations tend to be precautionary, rather than based on a well-understood negative health effect.

The annual Researching Women’s Environmental Health (RWEH) workshop hosted by the Center for Reproductive Epidemiology (CRE) brings scientists and community members together to discuss these emerging health concerns. COEC staff and other members of the Center for Science Education and Outreach partner with the Center for Reproductive Epidemiology (CRE) to help deliver these health messages, and to evaluate the effectiveness of the information (i.e., does this information encourage action?).

In 2010, the event coordinators gathered five dynamic and influential speakers in the field of environmental health and nutrition to present their work to an audience that included other researchers, doctors and members of the Rochester community (topics at left). The goal was not only to inform the public about emerging fields of environmental health research, but also to inform the scientific field about how their research is processed and understood by the public. To this end, afternoon discussion sessions with participants generated insights into how scientific research is interpreted and used by community members, the media and policy makers. Discussions captured community concerns about the issues, what information participants would like to have, what they thought could be done about the issues, as well as barriers and potential solutions to action. The sessions also explored the responsibilities of individuals, researchers, doctors, the media, and policy makers regarding environmental exposures.

Participants’ responses during the discussion groups suggest that people are overwhelmed by too much information. The breadth of topics surrounding environmental chemicals and the myriad ways of reducing exposures can be overwhelming and cause individuals to make no changes at all. A more effective option might be to find the commonalities among these recommendations, and generate simplified advice that applies to a number of health concerns. For example, doing one thing such as consuming fresh, organic vegetables, can decrease exposure to pesticides, obesogens and endocrine disruptors, and improve nutrition to help fight obesity. For a more detailed report on discussion group results, please contact Dr. Shaw-Ree Chen: [shawree\\_chen@urmc.rochester.edu](mailto:shawree_chen@urmc.rochester.edu).

## COEC Organizes Ongoing Talks at Eastman Kodak

One of the top employers in Rochester, Kodak maintains research and manufacturing facilities in Kodak Park, near the City of Rochester-Greece Border on Lake Ave and Ridge Road. Being a major producer of chemicals involved in photographic development, the company has had a longstanding interest in environmental health. Kodak worked hard to reduce emissions during the 1990's; by 2000, the company was producing 80% fewer emissions than in the 1980's.

Kodak's employees continue to show interest in environmental health, and their employee groups occasionally request informational talks on issues such as endocrine disruption, chemicals and aging, and lead exposure. Dr. Bernard Weiss and Dr. Jim Campbell gave talks on these topics in 2010. COEC was involved in seeking out researchers with expertise on employee interests, and assisting researchers in producing handouts as needed.



## Public Lecture Emphasizes Importance of Green Chemistry

There has been a great deal of interest in the Rochester community around chemicals found in food and other products, and their effects on health and the environment. Concerns voiced by members of the community have been not only about reducing personal exposures to these chemicals, but also about why these ingredients are in our products at all. Green chemistry, or the design of chemical products and processes that reduce or eliminate the generation and use of hazardous substances, is an emerging field that seeks to address the issue of unsafe chemicals in consumer products. Recognizing the importance of green chemistry to UR research and the local community, the Environmental Health Sciences Center hosted a lecture at UR by Dr. Terrence Collins, Lord Professor of Chemistry and Director of the Institute for Green Science, Carnegie Mellon University. The COEC staff saw an interest in the community for this information as well, and arranged a public version of the talk for the interested public as a separate event. Dr. Collins' talk, *"Green chemistry as a strategy for reducing hazardous chemicals in the environment"* addressed many of the advances in chemistry that have allowed scientists to develop safer products. The COEC worked with their colleagues at the Rochester Institute of Technology's Pollution Prevention Institute to advertise this opportunity to their network of businesses and others with relevant interests. This partnership allowed the COEC to leverage and EHSC seminar series to provide information to a targeted audience that we had not previously engaged.

## Graduate Course Teaches Students How to... Well...Teach

Although a significant number of biomedical graduate students achieve academic positions after completing their degrees, often the only “teaching” experiences that PhD graduate students have are through interdepartmental seminars for fellow graduate students and faculty. This typically results in junior faculty members who are unprepared for their important role as educators, leading to what neurobiologist James Bower of the California Institute of Technology describes as “the negative affects that the poor teaching of science in colleges and universities has on the rest of the educational system” (in his 2007 essay “Scientists and Science Education Reform”).

Graduate students who want to learn more about effective science teaching and, more importantly, learning, have few role models to turn to. Faculty in basic science departments are unlikely to also be involved in science education, particularly at a large research-based university where their primary function is to produce and publish research data.

To address the critical need to instruct graduate students on curriculum development and educational skills, Dina Markowitz, PhD and Michael DuPre, MS Ed co-teach a unique course, “Graduate Experience in Science Education” (GESE). This one-semester course gives students an overview of principles and concepts of learning theories, differentiated instruction, curriculum design and assessment. Each session provides case study models for instructional methods that students can use in their own teaching - present or future.

GESE is open to all University of Rochester graduate students and faculty. It has attracted students from almost every biomedical PhD training program at the University, mostly upper-level graduate students and post-docs; several faculty members have also taken the course. Many graduates who took this class now teach college or graduate level courses of their own.

GESE is now in its 7th year with a class of 12 students from various departments throughout the University. Students have been outspoken about the benefits of this course, emphasizing its relevance to their careers as scientists. “Regardless of whether I decide to teach, I will still need to communicate effectively”, commented one student on the course evaluation, while another student wrote, “Whether speaking to peers or to students, it is important to communicate well in a way that is engaging to one’s audiences.”

### Course modules include:



#### How students learn

This portion of the course provides an overview of well-accepted learning theories. Students learn about cognition, learning styles, and multiple intelligences.

#### Instructional methods

Students are taught a variety of instructional strategies that focus on active, student-centered learning, including peer review and cooperative learning, working with small and large groups, and the use of case-studies.



#### Assessment of learning

Students learn assessment strategies to collect evidence of student learning at all stages of teaching (before, during and after).

#### Lesson planning

Students must design a 1-2 hour lesson plan based on their areas of research.



#### Observations of Classroom Teaching

Students are required to complete three observations of classroom teaching and share what they learned as a result of the observations, and how these experiences can be applied to their teaching.



## New Course for Undergraduates Discusses the Ethics of Stem Cell Research

Rapid advances in stem cell research have raised many ethical issues, some of which are unique to this field. Those influencing the development of ethical and legal policies must be able to intelligently respond to these issues. As part of this process, the public must understand both the science behind stem cell therapies and the possible moral, social, and legal implications. To accomplish this, the public needs to:

- Obtain accurate and timely information on stem cell research
- Understand many different perspectives on stem cell research
- Develop skills for critically evaluating stem cell information
- Develop decision making skills needed to integrate scientific information with an understanding of the ethical, legal, and social implications that emerge from stem cell technology

This need is especially important for college-aged students, as these young adults are our future workforce, decision-makers, health care providers, and patients.

Dina Markowitz, PhD, and Richard Dees, PhD (UR Dept. of Philosophy) received a 2-year grant from the New York State Department of Health's Stem Cell Program (NYSTEM) to create an undergraduate stem cell course. This course will provide students with an overview of stem cell science and an opportunity to explore related ethical, legal and social implications (ELSI). The stem cell course development team also includes: Shaw-Ree Chen, PhD, Mark Noble, PhD, Cheeptip Benyajati, PhD (UR Dept. of Biology), and Judy Kaufman, PhD (Monroe Community College).

"The Science and Ethics of Stem Cells" will be taught in the fall semester of 2011 at the University of Rochester and Monroe Community College. Students will learn how to gather and critically evaluate current information on stem cell science. The course will also include a look at how information is presented in the media and on websites, as well as how to identify potential biases. Students will develop their own understanding of the issues and the ability to relate that understanding with how others in our society think about the issues.

The relative infancy of the field of stem cell research and the rapid emergence of new information make it difficult for instructors to develop curricula and become experts in the field. Utilizing a student-centered case study approach does not require the instructor to have extensive expertise in the scientific content area. The case study modules for the stem cell course will be posted online so that the individual modules can be used by other faculty in general introductory biology or in applied ethics courses. Over the next six months, Markowitz and her group will develop an instructor's guide for each case study module and will finalize the course syllabus.

**Students will be presented with these and other case studies covering scientific stem cell concepts and ethical issues:**

### **The Moral Status of Embryos**

Students learn how to analyze ethical arguments about whether embryos should be considered to have the same moral status as people who have been born.

### **Stem Cells and Disease Treatments**

This case explores broader issues of health care allocation by looking at a disease for which stem cell treatments may be valuable but not the only medical options.

### **Therapies for Spinal Cord Injuries**

This case explores the relative merits of three stem cell related approaches to the treatment of spinal cord injuries - using embryonic stem cells, cells derived from fetuses, and cells derived from an adult.

### **Stem Cell Tourism**

In this case, students evaluate a claim from an international facility that it is able to successfully treat patients using stem cells.

### **Evaluating Claims**

This case guides students through a process of critically evaluating the validity of claims made in an article on stem cell treatment for orthopedic patients.

### **What is a Cell?**

This case reviews how the human lifecycle occurs and lays the foundation for specific discussions of where stem cells come from.

### **In-Vitro Fertilization: Options for Embryos**

This case explores the options that couples face when deciding what to do with excess frozen embryos derived from in vitro fertilization. Students learn to articulate their opinion on the bioethical issues regarding these options.

### **Anti-Aging Stem Cell Creams**

Students assess the soundness of sales claims for cosmetic products purporting to contain stem cells.

## EHSC In the News

### Researchers Discover Vascular Effects of Exposure to Ultrafine Particles for Diabetics

Judith Stewart, MA was the lead author for a study recently published in *Environmental Health Perspectives* that pinpointed the effects of air pollution on the heart. The research team discovered that breathing in air with an elevated concentration of ultrafine particles can increase platelet activation in the blood. Platelets can stick to fatty buildup in blood vessels and lead to clots, a major cause of heart attacks. Increased activation of platelets could increase the risk of a heart attack in patients with fatty buildup in the arteries that supply the heart. While scientists have known that diabetes greatly increases a person's risk of heart attack, the specific mechanisms for this increased risk have been largely unknown. Knowing that exposure to air pollution can increase platelet activation in persons with diabetes is a significant step toward better understanding the health risks associated with air pollution. Other researchers involved in this study were Mark Frampton, MD; David Chalupa; Lauren Frasier; Li-Shan Huang, PhD; Erika Little; Steven Lee, MD; Richard Phipps, PhD; Anthony Pietrapaoli, MD; Mark Taubman, MD, PhD; and Mark Utell, MD. Robert Devlin, PhD of the U.S. Environmental Protection Agency also contributed.

#### For more information:

Stewart JC, Chalupa DC, Devlin RB, Frasier LM, Huang L-S, Little EL, et al. 2010. Vascular effects of ultrafine particles in persons with type 2 diabetes. *Environ Health Perspect* 118:1692-1698. doi:10.1289/ehp.1002237

<http://www.urmc.rochester.edu/news/story/index.cfm?id=3136>

### EHSC Researcher and Graduate Students Share Lead Research at National Meeting

Several members of the University of Rochester Medical Center Orthopaedics Department attended the 2011 Orthopaedics Research Society Annual Meeting in Long Beach, CA, including EHSC researcher Edward Puzas, PhD and graduate students Eric Beier and Diana Metz-Estrella. Meetings focused on the "bone and joint decade." Beier presented his dissertation work of the ways in which lead interferes with bone formation. His research led to the discovery that sclerostin, a protein factor, works with lead to produce skeletal toxicity. Metz-Estrella presented her work on a new gene that controls bone metabolism.

### Maternal Iron Deficiency Impacts Young Early in Pregnancy

#### For more information:

Mihaila C, Schramm J, Strathmann FG, Lee DL, Gelein RM, Luebke AE, Mayer-Pröschel M.. 2011. Identifying a window of vulnerability during fetal development in a maternal iron restriction model. *PLoS One* 6(3):e17483.

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0017483>

Researchers in Dr. Margot Mayer-Pröschel's lab recently published a paper describing the "window of vulnerability" of a fetus when the mother has an iron deficiency (ID). Using a mouse model, they discovered that neural disorders, which were previously thought to occur in offspring when the mother's ID causes anemia, can also occur in a non-anemic mother. This finding suggests that the current practice of testing expectant women for anemia may be inadequate. The researchers also found that the effects of ID are most significant during the first and second trimester. Likewise, these effects can occur if the mother has low iron prior to conception. Others involved in this study are Mihaila Camelia, PhD; Jordan Schramm, PhD; Frederick Strathmann, PhD; Dawn Lee, PhD; Robert Gelein, PhD; and Anne Luebke, PhD.

If you have questions or comments about this newsletter, please contact [Valerie\\_George@urmc.rochester.edu](mailto:Valerie_George@urmc.rochester.edu)