



**Mount  
Sinai**

*Children's  
Environmental  
Health Center*

# Annual Review 2015



## Annual Review 2015

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# Letter from the Director

As we conclude another successful year at the Children's Environmental Health Center (CEHC), I would like to highlight some of our team's most noteworthy accomplishments. From the awarding of prestigious grants to the establishment of important community partnerships, 2015 has been one of great achievement.

Most notably, our team was influential in securing two prestigious grants from the National Institutes of Health (NIH), awarded through the National Institute of Environmental Health Sciences (NIEHS). These two grants support Mount Sinai's groundbreaking work in the emergent field of "exposomics," the comprehensive study of environmental exposures in humans, from conception through development.

We also announced a number of leadership changes at the CEHC. In June, Philip J. Landrigan, MD, MSc, the CEHC's Founding Director, stepped down as the Ethel H. Wise Professor and Chair of the Department of Preventive Medicine. A true pioneer in the field of children's environmental health, we bid farewell to Dr. Landrigan and thank him for his many contributions—including building the foundations of our Center.

As I succeed Dr. Landrigan as CEHC Director, I am excited to continue growing the children's environmental health research program at Mount Sinai. To support this endeavor, the CEHC has appointed Rosalind J. Wright, MD, MPH to serve as Deputy Director. Together, we will continue to implement our transdisciplinary research model, which integrates disciplines like molecular biology, chemistry, biostatistics, bioinformatics, and phenotyping. By combining multiple disciplines, our goal is to develop new methods that address how the environment shapes health and disease.

In preparing for another year of innovation at the CEHC, I would like to thank you for your support. Through strong partnerships, we have built a world-class research program at Mount Sinai. The pages ahead demonstrate the tremendous growth of our Center, as we continue to make new discoveries in children's environmental health.



A handwritten signature in blue ink, appearing to read "RWright".

**Robert O. Wright, MD, MPH**

*Ethel H. Wise Professor and Chair, Department of Preventive Medicine  
Director, Children's Environmental Health Center  
Icahn School of Medicine at Mount Sinai*

# Letter from the Chairman

The CEHC has come a long way in just eight years. Founded by Philip J. Landrigan, MD, MSc in 2007 with a skeletal staff and a handful of donors, the CEHC is now the preeminent center for research on environmental health. Throughout his tenure, Dr. Landrigan assembled a world-class team of researchers, who built the Senator Frank R. Lautenberg Environmental Health Sciences Laboratory in which they could thrive. A milestone occurred this past June, when Dr. Landrigan transferred CEHC leadership to Robert O. Wright, MD, MPH, his self-appointed successor. In the six months he's been Director, Dr. Wright and his team have achieved great success, securing multiple NIH grants and recruiting new talent from across the globe. I'm so pleased to report that the CEHC is flourishing!

In addition to the science it produces, the CEHC also plays a critical role in educating the public and shaping responsible policy. Together with "Greening Our Children," its grassroots education and advocacy partner, the CEHC is reaching parents, schools, communities, legislators, and companies. Our objective is to provide the knowledge people need to make informed decisions. This model involves hosting events on a range of topics from Food to Flame Retardants and working with state legislators, NGOs, and other stakeholders to create policies that protect all children.

An unfortunate reality today is that science is often dismissed or distorted in the public dialogue. We've seen science denial occur on the issue of climate change. And we are seeing it on issues impacting children's health. Those who disparage science to create an illusion of safety have a clear financial motive. But we all stand to suffer from ignoring the warnings that science provides. One example is the practice of installing synthetic turf fields made from crumb rubber. When schools and municipalities do this, they expose children to risk. We don't know how much risk because the necessary studies have not been done. But an absence of data is not a guarantee of safety. On the contrary, it means the risk could be significant, but we won't know until appropriate testing is completed. Now, more than ever, the role of scientists in the public discourse is critical. We need their objective voices to guide us on the issue of safety because only then can we make informed decisions and develop smarter policies.

Many thanks to Dr. Landrigan, Dr. Wright, and their wonderful team of dedicated professionals for the work they do—researching, educating, and advocating—to protect the health and safety of all our children.

A handwritten signature in blue ink, appearing to read "Alexandra Mochary Bergstein".

**Alexandra Mochary Bergstein**  
*Chairman, CEHC Executive Board*



# The History of the Children's Environmental Health Center

Under the leadership of **Robert O. Wright, MD, MPH**, the Children's Environmental Health Center conducts groundbreaking research to identify the environmental causes of childhood diseases. We translate these findings into solutions that protect children's health, using research to educate families and change public policy.

Founded in 2007 by **Philip J. Landrigan, MD, MSc**, the Center builds upon Dr. Landrigan's pioneering work in the field of children's environmental health. In the early 1970s, Dr. Landrigan conducted a series of landmark studies that contributed to the discovery that lead causes brain damage to children—even when exposures are too low to cause obvious signs and symptoms. This research helped persuade the U.S. to ban lead from gasoline and paint in 1978 and set a precedent for future work in the field. In 1985, Dr. Landrigan joined the faculty of the Icahn School of Medicine at Mount Sinai, where he began building one of the country's first environmental health research programs.

Below is a brief history of children's environmental health at Mount Sinai.



4

4. The CEHC team past and present: Joel Forman, MD; Perry Sheffield, MD, MPH; Maida Galvez, MD, MPH; Anita Geehavarughese, MD; Michele La Merrill, PhD, MPH; Damiris Agu, MPA; Amir Miodownik, MD, MPH

5. Dr. Rosalind J. Wright and Dr. Robert O. Wright

The CEHC is recognized by the World Health Organization (WHO) for its international collaborations and is named a WHO Collaborating Centre in Children's Environmental Health—one of two Centres of its type in the U.S.

**Early 2014**—Under the leadership of Dr. Wright, the CEHC is awarded a prestigious Core Center grant from the NIEHS to elevate and expand its current research program. This grant enables the creation of the Mount Sinai Transdisciplinary Center on Health Effects of Early Environmental Exposures (TCEEE), which studies the health impacts of chemical, genetic, nutritional, and social exposures to understand how environmental exposures in early life influence health, development, and risk of disease across the life span.



5

**Mid 2015**—Dr. Wright succeeds Dr. Landrigan as the Ethel H. Wise Professor and Chair of the Department of Preventive Medicine, as well as the second Director of the CEHC. Rosalind J. Wright, MD, MPH is appointed to serve as the CEHC's Deputy Director (see page 11).

1990

Dr. Landrigan is named the Ethel H. Wise Professor and Chair of the Department of Preventive Medicine. He begins to build Mount Sinai's children's environmental health research program and recruit top scientists to support this endeavor.

1999

The Pediatric Environmental Health Specialty Unit (PEHSU) is established at Mount Sinai to diagnose and treat children affected by environmental exposures.



1

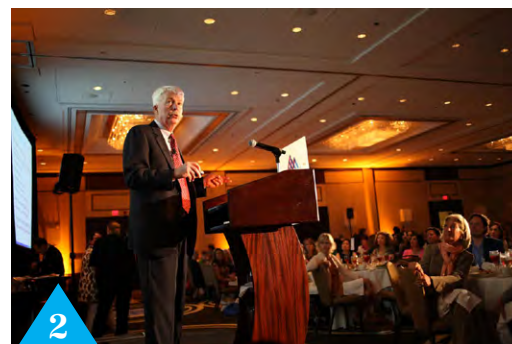
1. PEHSU Director Maida Galvez, MD, MPH;  
2. Dr. Landrigan educates the Greening Our Children community in 2013

2002

The NIEHS-funded Postdoctoral Fellowship in Children's Environmental Health is established at Mount Sinai to train the next generation of leaders in environmental pediatrics.

2007

Under the leadership of Dr. Landrigan, the CEHC is founded at the Icahn School of Medicine at Mount Sinai.



2

2010



3

3. Dr. Wright discusses his approach to children's environmental health research at a panel discussion in 2014

2012

Robert O. Wright, MD, MPH is recruited from Harvard to serve as the CEHC's Deputy Director and lead its new research strategy. This includes establishing and directing a new environmental health sciences laboratory, which will ultimately revolutionize how CEHC research is conducted.

2014

**Mid 2014**—Construction of the new lab is completed, and the facility is named the Senator Frank R. Lautenberg Environmental Health Sciences Laboratory.  
**Late 2014**—After nearly 25 years of service, Dr. Landrigan announces that he is stepping down as the Director of the CEHC and also as the Ethel H. Wise Professor and Chair of the Department of Preventive Medicine.

2015

**Late 2015**—Under the leadership of Dr. Wright, CEHC researchers are awarded two major NIH grants to support their groundbreaking work in the emergent field of "exposomics"—the comprehensive study of environmental exposures, from conception through development (see page 8).

# Our New Model

The research conducted at the CEHC employs a new **“transdisciplinary” model**—one based on the idea that no single field of science can explain the environmental origins of diseases. Our team integrates disciplines like molecular biology, chemistry, toxicology, biostatistics, bioinformatics, and phenotyping to develop new methods to address how the environment shapes health and disease.

From this **research**, we develop evidence-based strategies for disease prevention and treatment. The CEHC translates its findings to **educate** our communities and **advocate** for public policy that protect children’s health.

## The CEHC in Action: Research

### Spotlight on Homero Harari, ScD, MSc

Dr. Harari is an exposure scientist, who joined the CEHC team in September. He was recruited from Yale University, where he conducted research in occupational and environmental exposure assessment. At the CEHC, Dr. Harari is currently developing a pilot study that characterizes the chemical components of artificial turf and the potential inhalation and dermal exposure to these chemicals.

To raise awareness about his work, Dr. Harari joined U.S. Senator Richard Blumenthal (D-CT) at a press conference in November, where he advocated for further investigation into potentially harmful chemicals found in the crumb rubber filling of turf fields and playgrounds. Dr. Harari’s pilot study represents a new model of “policy-driven” research—projects that are intentionally designed to have significant public health impact.



Dr. Harari (right) joins Senator Blumenthal to advocate for further investigation into potentially harmful chemicals in crumb rubber filling found in turf fields and playgrounds

## The CEHC in Action: Education

### Spotlight on Alison P. Sanders, PhD



Dr. Sanders is a postdoctoral fellow who conducts molecular epidemiology research that investigates the health effects of metal exposure among susceptible populations. Her current work examines genomic and epigenetic markers of preterm birth and metal exposure during pregnancy, in

addition to the effects of prenatal and early life toxic metal exposure on children’s blood pressure and renal health. An accomplished researcher, she has published 14 papers—eight as first author—and presented her work at prestigious organizations like Harvard, the CDC, and the NIEHS.

Most recently, Dr. Sanders published a paper in *Epigenomics* that found an association between toxic metal exposure and adverse pregnancy outcomes, highlighting mRNAs in the human cervix as novel responders to maternal chemical exposure during pregnancy.

In addition to her cutting-edge research, Dr. Sanders devotes her time to educating the communities that surround her. She co-directs a special initiative for the Future Leaders in Science Education and Communication Training Program, where she teaches other postdoctoral fellows how to improve their science communication skills at both the graduate and K-12 levels. Dr. Sanders is also a Science Education Fellow at the New York Academy of Sciences, where she directs an afterschool program for East Harlem students.

## The CEHC in Action: Advocacy

### Spotlight on Maida Galvez, MD, MPH

Dr. Galvez is a pediatrician who directs the Mount Sinai PEHSU and co-directs the Community Outreach and Engagement Core of the Mount Sinai TCEEE. A longtime advocate of children’s environmental health policy, Dr. Galvez represented the CEHC at a press conference in December, which supported the Child Safe Products Act. She argued that research conducted at the CEHC, along with others at Mount Sinai, has advanced our understanding of the role played by low-dose chemical exposures in children’s growth and development—including chemicals found in toys such as arsenic, cadmium, and lead. Thus, environmental health leaders from across New York State gathered at this event to advocate for greater regulation of toxic chemicals in children’s products.

### Spotlight on Jennifer Beals

Jennifer Beals is an actress, producer, activist, and member of the CEHC’s Executive Board. A passionate proponent of children’s environmental health issues, Jennifer has lobbied both the Senate and Congress for stronger reform of the Toxic Substances Control Act. She has also helped to organize a growing group of concerned parents who successfully petitioned the City of Santa Monica to replace their artificial turf fields with alternative crumb rubber infills at Airport Park.



# 2015: The Year in Research

While this report cannot adequately cover all research developments at the CEHC, the pages ahead represent some of the most noteworthy accomplishments from 2015.

## Accelerating New Discoveries in Children's Environmental Health: Mount Sinai and RPI Team up to Earn Prominent Role in National Research Program

In November, CEHC researchers were awarded two prestigious NIH grants to lead major components of a new national environmental health research program. These grants, which total \$20 million, were presented to Mount Sinai through the NIH's newly-formed Child Health Environmental Assessment Resource (CHEAR) program. Mount Sinai is the only institution to receive grants for two of CHEAR's three components.

With increasing evidence that children's health and wellbeing are influenced by interactions between the environment and genetics, the new CHEAR program aims to provide researchers with the tools to assess the full array of exposures. The

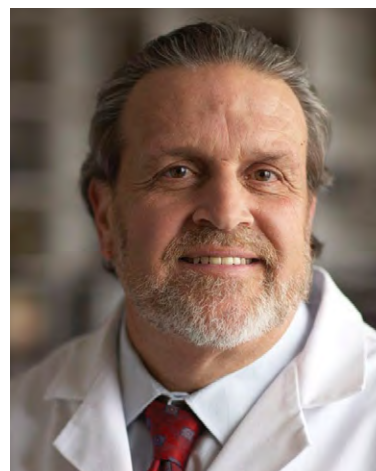
overarching goal of CHEAR is to combine environmental exposure analysis with genomic measures of health risk—which will ultimately aid in the prediction, prevention, and treatment of chronic diseases.

Led by the CEHC's Robert O. Wright, MD, MPH and Susan Teitelbaum, PhD, in collaboration with Deborah McGuinness, PhD of Rensselaer Polytechnic Institute (RPI), the two CHEAR grants will support Mount Sinai's groundbreaking work in "exposomics." An emergent field, exposomics is the comprehensive study of environmental exposures in humans, from conception through development.

*"Mount Sinai's commitment to studying the impact of environmental exposures on children's health is unparalleled, and these major grants are a testimony to the work done by Dr. Wright and his team."*

—Dennis S. Charney, MD

Anne and Joel Ehrenkranz Dean, Icahn School of Medicine at Mount Sinai  
President, Academic Affairs, Mount Sinai Health System



The national CHEAR infrastructure is comprised of three units, two of which—the Lab Network Hub and the Data Center—have components housed at Mount Sinai.

Researchers submit applications...

Coordinating Center approves funding...

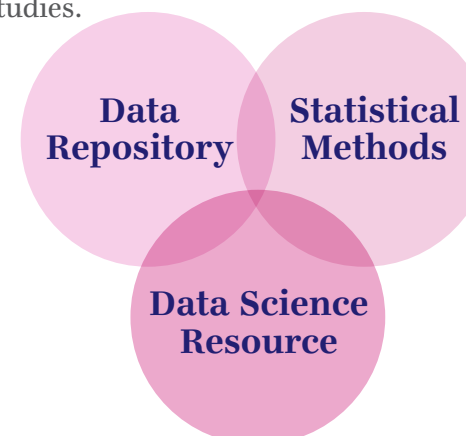
### Lab Network Hub

Based in the Senator Frank R. Lautenberg Environmental Health Sciences Laboratory, this Hub provides state-of-the-art exposure assessment and analytical services, including:

- **A Development Core**, which will generate unique biomarker measures of environmental exposure with a special emphasis on reconstructing past exposure.
- **Targeted chemical analyses** of both organic and inorganic toxicants, essential nutrients, and social stress markers.
- **Untargeted chemical analyses** for comprehensive assessment of the exposome and discovery of new biomarkers.
- **Biological response measures** to study the interaction between environmental exposures and child-specific physiology at the cellular and molecular level.

### Data Center

Made possible through Mount Sinai's partnership with RPI, this Center will create new methodologies that combine data from a wide range of environmental health studies.



Sophisticated statistical analyses in gene-environment interactions and chemical mixtures.

# 2015: The Year in Research

## Spotlight on Research in the Senator Frank R. Lautenberg Environmental Health Sciences Laboratory

Since the Lautenberg Laboratory was established in 2014, a number of studies related to chemical exposure in early childhood development have been launched:



Annemarie Stroustrup  
MD, MPH

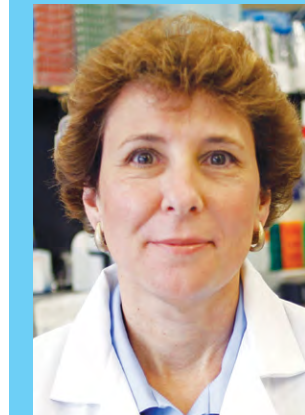
**Annemarie Stroustrup MD, MPH**, a neonatologist, is investigating premature infants' exposure to chemicals from medical products while they are being treated at the Neonatal Intensive Care Unit. Her project focuses on plasticizers known as phthalates, which can disrupt the endocrine system and have also been linked with poor developmental outcomes in newborns and children. The chemical analysis for this project is being undertaken by Syam Andra, PhD, an environmental chemist at the Lautenberg Laboratory.

**Manish Arora, BDS, PhD, MPH** has been leading a number of new studies that use teeth to reconstruct past chemical exposures. In particular, this technique allows his team to measure and evaluate a child's chemical exposure while determining precisely when exposure occurred during the developmental stages, including during pregnancy. Since autism has its origins in pregnancy, Dr. Arora's ability to reconstruct environmental exposures represents a major breakthrough in autism research.



Manish Arora, BDS, PhD,  
MPH

**Rosalind J. Wright, MD, MPH** continues her research on the connections between early life stress and developmental disorders. Her work was recently accepted in *Scientific Report*, an affiliate of the prestigious journal *Nature*. This paper discusses concerns of the long-term health trajectories caused by stressful experiences and environments for the developing child. When exposure to stress during early prenatal life is repeated, the child's response systems undergo phased development, which can disrupt, dysregulate, and ultimately compromise the resilience of these systems.



### Introducing the CEHC's Deputy Director: Rosalind J. Wright, MD, MPH

We are proud to announce that **Rosalind J. Wright, MD, MPH** has been appointed Deputy Director of the CEHC. Dr. Wright is an epidemiologist with transdisciplinary training in environmental health and stress mechanisms. Her primary interests include early life predictors of developmental diseases—such as asthma, neurobehavioral development, lung growth and development, obesity, and cardiovascular disorders—with a focus on the role of both social and physical environmental factors.

Dr. Wright is best known for her pioneering work that links prenatal and early childhood stress with asthma and allergy development in urban children. She has led longitudinal studies that examine mechanisms through which stress programs children for risk of chronic disease. Her team also conducts research that assesses how dietary factors may mitigate or enhance the impact of both environmental chemicals and stressors during early development.

In addition to her role at the CEHC, Dr. Wright is the Horace W. Goldsmith Professor of Children's Health Research in the Jack and Lucy Clark Department of Pediatrics. In November, she was appointed Dean for Translational Biomedical Sciences for the Mount Sinai Health System. Dr. Wright was also recently named a Fellow to the Academy of Behavioral Medicine Research (ABMR), which is comprised of distinguished scholars elected by their peers for outstanding contributions to behavioral medicine research.

*“After caring for numerous asthma patients and listening to their stories, it became quite clear that social stressors—like financial strain, trauma, or other negative life events—greatly impacted their disease and my ability to provide quality care. This led me to change my research focus to discovering the mechanisms through which stressful experiences drive health outcomes beyond asthma. I think of stress as a ‘social pollutant’ that is just as toxic as air pollution, tobacco smoke, and chemical factors in shaping children’s health.”*

—Rosalind J. Wright, MD, MPH  
CEHC Deputy Director

## Media Spotlight

In December, Dr. Wright's research was featured on a PBS News segment entitled “Why stress may be fueling the childhood asthma epidemic,” which was presented in partnership with the *Detroit Free Press*.

According to Dr. Wright's groundbreaking research, when children face “adverse childhood experiences,” such as exposure to violence, extreme poverty, or substance abuse, asthma symptoms can be triggered. In fact, these children are twice as likely to have asthma, regardless of the impact of contributing factors like allergens and air quality.

# 2015: The Year in Research

## Expanding the CEHC Team

The CEHC is proud to announce the recent hiring of **Allan Just, PhD**, who joined the team in September. Dr. Just is an environmental epidemiologist whose research focuses on identifying the links between early life environmental exposures and the subsequent development of adverse health outcomes.

Dr. Just received his doctoral degree at Columbia University's Mailman School of Public Health, where he focused on understanding exposure to endocrine disrupting compounds, particularly phthalate plasticizers and their associations with pediatric respiratory disease. This research on phthalate exposure in the home was cited as a critical factor in pressuring major retailers, such as Home Depot, to phase these chemicals out of their flooring products. Prior to his recruitment to Mount Sinai, Dr. Just was a postdoctoral fellow at Harvard University, where he expanded his research to understand how early exposures impact the epigenome.

Dr. Just's goal is to combine techniques from epidemiology, epigenetics, and computational methods with high-dimensional data analysis for children's environmental health. By addressing critical questions about how endocrine disrupting chemicals affect the human epigenome, he hopes to scientifically enrich the analytic toolset of environmental epidemiology—and ultimately reduce the impact of early-life environmental exposures on subsequent adverse health outcomes.

*Dr. Just is an exceptional young researcher whose work represents the future of children's environmental health. His ability to combine traditional epidemiologic tools with new epigenetic measurements and novel computational approaches are already leading to new discoveries that are substantially enriching the field. We are very excited to have Dr. Just join the CEHC team!"*

—Robert O. Wright, MD, MPH  
CEHC Director



# Training the Next Generation of Leaders

*Each year, the most accomplished pediatricians and postdoctoral students are selected to participate in Mount Sinai's Fellowship in Environmental Pediatrics. The goal of this interdisciplinary program is to provide mentored training to the next generation of physician-researchers and academic leaders in children's environmental health.*

*In 2015, the CEHC welcomed two new fellows.*

**Brandi Freeman, PhD** is a biomedical scientist who specializes in pathology, neuroscience, and immunology. She received her doctoral degree in Biomedical Sciences from Albert Einstein College of Medicine, where her thesis research focused on the origin and development of cerebral malaria. Using interdisciplinary approaches, Dr. Freeman examined a peptide modulator of the cerebral vasculature as a potential target for therapeutic intervention during cerebral malaria. At Mount Sinai, she will be continuing her research under the mentorship of Manish Arora, BDS, PhD, MPH.



Brandi Freeman, PhD

**Laura Zheng, PhD** is an environmental epidemiologist who studies the association between maternal stress, violent experiences, and delayed infant neurodevelopment. She received her doctoral degree from Johns Hopkins Bloomberg School of Public Health and also holds a Masters in Biological Engineering from Cornell University. At Mount Sinai, Dr. Zheng will be continuing her research under the mentorship of Robert O. Wright, MD, MPH and Manish Arora, BDS, PhD, MPH. She will also be administering a new case-control study of pediatric renal disease.



Laura Zheng, PhD



## Spotlight on Transdisciplinary Environmental Health Research

Last year, the CEHC was awarded a prestigious grant from the NIEHS to create a transdisciplinary environmental health research program at Mount Sinai. The Mount Sinai Transdisciplinary Center on Health Effects of Early Environmental Exposures (TCEEE) studies the health impacts of chemical, genetic, nutritional, and social exposures to understand how environmental exposures in early life influence health, development, and risk of disease across the life span.

In 2015, the TCEEE funded the career development of two junior faculty members, continued sponsoring its environmental health seminar program, developed a series of community engagement projects, and funded five new pilot research grants.



## Transdisciplinary Pilot Projects Funded in 2015

### Assessment of Past Phthalate Exposure in Adult Rats Using Teeth Microstructure Analysis

Syam Andra, PhD  
(Environmental Chemistry; Preventive Medicine)

### Predicting Neurotoxic Perturbations of Developmental Neuroplasticity via an Integrative Bioinformatics Approach

Joel Dudley, PhD  
(Genetics and Genomic Sciences; Population Health Science and Policy)

### Lead Exposure and Addictive Diseases: A Pilot Study of the Association between Tibia-Lead and Cocaine Addiction

Megan Horton, PhD  
(Preventive Medicine; Neuroimaging)

### Air Quality in the Neonatal Intensive Care Unit

Annemarie Stroustrup, MD, MPH  
(Pediatrics; Preventive Medicine)

### In Utero Chemical and Non-Chemical Stressors, Sex Hormones, and Infant Neurodevelopment

Rosalind J. Wright, MD, MPH  
(Pediatrics; Pulmonary and Critical Care; Preventive Medicine)

Left: Transdisciplinary research is supported by the Senator Frank R. Lautenberg Environmental Health Sciences Laboratory

## Select Publications by the CEHC Team—2015

Andra SS, Austin C, Wright RO, Arora M. Reconstructing pre-natal and early childhood exposure to multi-class organic chemicals using teeth: Towards a retrospective temporal exposome. *Environment International*. Oct 2015;83:137-145. PMID: 26134987

Buckley JP, Engel SM, Mendez MA, et al. Prenatal phthalate exposures and childhood fat mass in a New York City cohort. *Environmental Health Perspectives*. Aug 25 2015. PMID: 26308089

Chiu YH, Hsu HH, Coull BA, et al. Prenatal particulate air pollution and neurodevelopment in urban children: Examining sensitive windows and sex-specific associations. *Environment International*. Feb 2016;87:56-65. PMID: 26641520

Cowell WJ, Bellinger DC, Coull BA, Gennings C, Wright RO, Wright RJ. Associations between prenatal exposure to black carbon and memory domains in urban children: Modification by sex and prenatal stress. *PloS One*. 2015;10(11):e0142492. PMID: 26544967

Engel SM, Bradman A, Wolff MS, et al. Prenatal organophosphorus pesticide exposure and child neurodevelopment at 24 months: An analysis of four birth cohorts. *Environmental Health Perspectives*. Sep 29 2015. PMID: 26418669

Harley KG, Engel SM, Vedar MG, et al. Prenatal exposure to organophosphorus pesticides and fetal growth: Pooled results from four longitudinal birth cohort studies. *Environmental Health Perspectives*. Dec 18 2015. PMID: 26685281

Haynes EN, Sucharew H, Kuhnell P, et al. Manganese exposure and neurocognitive outcomes in rural school-age children: The communities actively researching exposure study (Ohio, USA). *Environmental Health Perspectives*. Oct 2015;123(10):1066-1071. PMID: 25902278

Kale A, Deardorff J, Lahiff M, et al. Breastfeeding versus formula-feeding and girls' pubertal development. *Maternal and Child Health Journal*. Mar 2015;19(3):519-527. PMID: 24916206

Lakshmanan A, Chiu YH, Coull BA, et al. Associations between prenatal traffic-related air pollution exposure and birth weight: Modification by sex and maternal pre-pregnancy body mass index. *Environmental Research*. Feb 2015;137:268-277. PMID: 25601728

Leon Hsu HH, Mathilda Chiu YH, Coull BA, et al. Prenatal particulate air pollution and asthma onset in urban children. Identifying sensitive windows and sex differences. *American Journal of Respiratory and Critical Care Medicine*. Nov 1 2015;192(9):1052-1059. PMID: 26176842

Mervish NA, Pajak A, Teitelbaum SL, et al. Thyroid antagonists (perchlorate, thiocyanate, and nitrate) and childhood growth in a longitudinal study of U.S. girls. *Environmental Health Perspectives*. Jul 7 2015. PMID: 26151950

Sanders AP, Burris HH, Just AC, et al. Altered miRNA expression in the cervix during pregnancy associated with lead and mercury exposure. *Epigenomics*. Sep 2015;7(6):885-896. PMID: 26418635

Sanders AP, Burris HH, Just AC, et al. microRNA expression in the cervix during pregnancy is associated with length of gestation. *Epigenetics*. 2015;10(3):221-228. PMID: 25611922

Vangeepuram N, Carmona J, Arniella G, Horowitz CR, Burnet D. Use of focus groups to inform a youth diabetes prevention model. *Journal of Nutrition Education and Behavior*. Nov-Dec 2015;47(6):532-539.e531. PMID: 26420055

Wolff MS, Teitelbaum SL, McGovern K, et al. Environmental phenols and pubertal development in girls. *Environment International*. Nov 2015;84:174-180. PMID: 26335517

Xu J, Hu H, Wright R, et al. Prenatal lead exposure modifies the impact of maternal self-esteem on children's inattention behavior. *The Journal of Pediatrics*. Aug 2015;167(2):435-441. PMID: 26047683

# Outreach and Education

## CEHC in the Community

In 2015, the CEHC participated in a variety of educational programs for parents, clinicians, and policymakers in the surrounding community of East Harlem, as well New York State and Connecticut, including:

- **Participating in a panel discussion at the New York City premiere of the film *The Human Experiment*.** In April, Maida Galvez, MD, MPH, shared her clinical expertise on environmental health during a panel discussion of *The Human Experiment*. The panel included representatives from WEAFT for Environmental Justice, the Center for Environmental Health, and Seventh Generation. Produced by Sean Penn, the film shares personal stories of individuals who believe their health has been affected by environmental chemicals and addresses shortcomings in industry regulations that lead to potentially harmful exposures.

- **Hosting a press event that launched the *Lancet* report titled “The 2015 *Lancet* Commission on Health and Climate Change: Policy Responses to Protect Public Health.”** This event, hosted in the summer, featured a panel discussion with leading health professionals, including the CEHC’s Perry Sheffield, MD, MPH and Philip J. Landrigan, MD, MSc.



1

- **Testifying at a New York City Council hearing in favor of a bill that would limit ambient classroom noise.** In June, CEHC pediatrician Lauren Zajac, MD, MPH highlighted the important health repercussions of prolonged exposure to elevated noise levels in children and the adverse effects of noise pollution on learning, memory, and academic performance.



2

- **Leading a workshop on incorporating pediatric environmental health in K-12 curriculum.** In July, the Children’s Environmental Literacy Foundation (CELf) hosted a Teaching Institute for educators from across New York and Connecticut, which promoted the integration of environmental sustainability into lesson plans for a wide range of academic topics and student ages. The CEHC’s Sarah Evans, PhD, MPH introduced key concepts in environmental health and proposed ways in which they can be integrated into classrooms. Alison P. Sanders, PhD presented her research on toxic metals and epigenetics, along with hands-on examples of how to translate research into lessons and activities.



3

1. Dr. Landrigan and Dr. Sheffield join public health experts at a Lancet press event
2. Dr. Zajac and medical student Thomas Hays testify at the New York City Council
3. Dr. Evans teaches other educators about children’s environmental health

- **Conducting a workshop on “Simple Steps to Reduce Environmental Exposures” at the Stanwich School in Greenwich, Connecticut.** In October, Kathryn Bambino, PhD, an Environmental Pediatrics Fellow at the CEHC, educated families on preventing potentially hazardous environmental exposures as a part of the Stanwich STEAM (Science, Technology, Engineering, Arts, and Math) Expo.

- **Participating in a community event on the benefits of sustainable foods and farming.** This special event was hosted at the Mill Street Bar and Table in Greenwich in November and was co-sponsored by Greening Our Children. It featured special presentations by the Stone Barns Center for Food and Agriculture and by the CEHC’s Dr. Landrigan.



4

4. Leaders from all over New York State gathered at Mount Sinai’s Regional Summit on Sustainable Funding for Asthma In-Home Interventions to discuss improving the quality of life for asthma patients

5. A panel discussion at the Regional Summit on Sustainable Funding for Asthma In-Home Interventions

6. The Mount Sinai team who organized the summit (left to right): Lauren Zajac, MD, MPH; Perry Sheffield, MD, MPH; Maida Galvez, MD, MPH; Damiris Agu, MPA; Rachel Manning; Rozalyn Paupaw; Cappy Collins, MD, MPH (front)

- **Hosting a regional summit on sustainable funding for in-home asthma interventions, in partnership with the Environmental Protection Agency (EPA).** This event, hosted in November, brought together key stakeholders in public health, housing, environmental programs, and health insurance plans to highlight innovative programs and foster collaborations across industries to advance preventive care services for asthma patients.



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# Greening Our Children

In May, the CEHC hosted its eighth annual benefit at the Hyatt Regency in Greenwich, Connecticut. The event was chaired by Courtney Evans and honored two pioneers in green business and children's environmental health.

Gary Hirschberg, Chairman and Co-Founder of Stonyfield Farm, the world's largest organic yogurt producer, was presented with the annual Mount Sinai Champion for Children award. A special tribute was also presented to Philip J. Landrigan, MD, MSc, former CEHC Director, to honor his contributions to the field of children's environmental health.



# Looking Forward

## The Importance of Partnerships

*Partnerships are crucial to advancing the field of children's environmental health.*

Around the world, rates of childhood disease are growing. Hazardous exposures in the modern environment are also on the rise, and scientific evidence is beginning to link these alarming increases together. In order to discover the environmental causes of disease—and develop new methods to prevent and treat these disorders—scientists must collaborate with community groups, educators, and policy makers to enact real change.

The CEHC would like to extend its gratitude to the dedicated partners who contributed to our success in 2015. Through active partnerships, we will continue to educate parents, consumers, and policymakers—translating our research into evidence-based strategies that improve children's health around the world.



1. Gary Hirschberg accepts the Mount Sinai Champion for Children award
2. Courtney Evans, Alex Berstein, Abby Levy
3. The CEHC research team at the Greening Our Children benefit: Manish Arora, BDS, PhD, MPH; Christine Austin, PhD; Jeanette Stingone, PhD; Robert O. Wright, MD, MPH; Philip J. Landrigan, MD, MSc; Megan Horton, PhD; Maida Galvez, MD, MPH; Sarah Evans, PhD
4. Alex Bergstein delivers a special tribute to Dr. Landrigan
5. Frits van Paasschen and Laura di Bonaventura
6. The 2015 event leadership team: Tiffany Costanzo, Courtney Evans, Leason Cercy, Catherine Staffieri
7. Jeanine Behr Getz, Ken Cook (President and Co-Founder of Environmental Working Group), Anne Ogilvy
8. Maida Galvez, MD, MPH joins other environmental health partners to testify at City Hall
9. Members of the CEHC Executive Board: David Murphy, Wendy Mindel Rubinstein, Alex Bergstein, Dr. Wright, Dr. Landrigan, Anne Robertson, Rhonda Sherwood, Ellen Lautenberg



**Mount Sinai** *Children's Environmental Health Center*

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