FEATURED ACTIVITIES of DERT
May 2011

MEETINGS

Disease Investigation through Specialized Clinically Oriented Ventures in Environmental Health (DISCOVER) Grantee Meeting
February 1, 2011
Research Triangle Park, North Carolina

Background: The DISCOVER programs were encouraged to integrate mechanistically driven and patient-oriented research for rapid translation of environmental health science research into clinical and public health applications.

Dr. Frederica Perera's Center at Columbia University focuses on the role of airborne polycyclic aromatic hydrocarbons (PAHs) and diesel/black or elemental carbon in the pathogenesis of childhood asthma. Dr.Patrick Breysse's Center at Johns Hopkins University focuses on the allergen effects on childhood asthma in the urban environment. Dr. Joel Kaufman's Center at University of Washington focuses on cardiovascular endpoints associated with particulate matter exposures. In addition, Dr. Steven Kleeberger presented results from his Intramural Director's Challenge program which was focused on mechanisms of oxidative stress-induced disease.

The goals of this meeting were to highlight the most promising translational efforts of these Centers and to provide input on the design of future translational efforts at NIEHS. All three DISCOVER Centers demonstrated success in translating their basic and clinical research findings into public policy and shaping future clinical interventions.

The Center presentations and panel discussion highlighted the benefits of the DISCOVER mechanism in allowing efforts that would otherwise be difficult to do. These included:

- providing a rich environment and infrastructure for the growth, development, and training of translational scientists and development of other junior investigators (as evidenced by multiple K awards and spin-off projects launched by young investigators);
- integrating the environmental health field research and guidelines into clinical societies and meetings (ex. AHA decided to add environmental focus recently due to DISCOVER efforts in part);
- providing more rapid translation of research due to the multi-disciplinary teams that allow investigators to see the multiple connections between different fields and projects; and
- allowing continuity of translational research for more educational translation and specific interventions to occur.

Recommendations: The panelists strongly recommended that NIEHS focus on developing evidence-based therapeutic guidelines for environmental health that would allow an increased clinical relevance of NIEHS-supported research and an emphasis on disease prevention translation. For example, panelists suggested a consensus conference for environmental exposure guidelines for asthma might be helpful in the near future.

Dr. Annette Kirshner, COSPB hosted the meeting. Dr. Kim Gray, SPHB, and Drs. Cindy Lawler and Sri Nadadur, COSBP, were session organizers and moderators. *Drs. Kim McAllister and Claudia Thompson, SPHB, Dr. David Balshaw, CRIS, Dr. Janice Allen, SRB, and Dr. Jerry Heindel, COSPB, also helped organize the meeting. Drs. Christie Drew and Kristi Pettibone*, PAB, attended this meeting.

For more about the meeting, please see:
http://www.niehs.nih.gov/news/newsletter/2011/march/spotlight-discover/

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From Epigenomic Discovery to Improvements in Human Health
March 8-9, 2011
Rockville, Maryland

The purpose of the meeting was to assess the breadth and complexity of strategies that NIH investigators are using to translate epigenomics discoveries to improvements in human disease therapeutics, diagnostics, and prevention efforts.

The obstacles and opportunities related to the following areas in particular were discussed: translating discoveries into preclinical projects, epigenetic therapy approaches in human and animal studies, epigenomic diagnostic and biomarker applications, and prevention approaches related to potential transgenerational epigenetic effects in human disease.

Some of the challenges that were discussed extensively were the needs related to bridging academia and industry; the capacity to integrate epigenetic biomarkers with genetic and environmental exposure data for risk assessment; timing and tissue specificity aspects of understanding epigenomic effects; and antibody quality control issues.

Opportunities highlighted at this workshop were the promising use of small molecule inhibitors, histone methyltransferases, and other key targets of chromatin modeling for therapeutic applications; the ability to leverage existing clinical trials; and the ability for academic scientists to collaborate more extensively with industry. *Drs. Kim McAllister and Fred Tyson, SPHB*, chaired sessions of this workshop.

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Air Pollution and Brain Health Meeting
February 2-3, 2011
Research Triangle Park, North Carolina

Background: The goals of the workshop, which was held at the Environmental Protection Agency, were to assess the state of the science in the field of Air Pollution and Brain Health and discuss where the gaps are that are opportunities for research in this evolving research area. The ultimate goal was to provide guidance to the Institute in develop strategies on how to address the critical issues to better understand the overall contributions of air pollutants on brain health effects.

***Highlights*:**
- Group 1 (Chair, Dr. David Dorman) discussed what are the most likely components of air pollution responsible for adverse effects on the nervous system (e.g., particulate matter size, PAHs, black carbon, heavy metals, ETS, ozone, CO etc.) and what we need to know physiologically about how these components access the brain.

• Group 2 (Chair, Dr. Robert Wright) discussed what the consequences are to brain health of air pollution exposure during periods of greatest vulnerability (prenatal to senescence) and from lifetime exposure.

• Group 3 (Chair, Dr. Allison Elder) discussed what the potential cellular mechanisms are by which inhaled pollutants compromise brain function (e.g., indirect effects of peripheral inflammation, changes in blood brain barrier, direct neuronal and white matter destruction).

The products of this workshop will include recommendations for (1) highest priority research areas that address the deleterious contribution of air pollution components to neuronal health; and (2) possible solutions to any barriers. *Drs. Cindy Lawler and Annette Kirshner, COSPB, and Kimberly Gray, SPHB,* helped organize and moderate sessions of this meeting.

DERT PAPERS OF NOTE

Human Induced Pluripotent Stem Cells Exhibit Extensive Epigenomic Reprogramming
Bing Ren, Ph.D., University of California, San Diego
U01ES017166

Reprogramming adult cells to regain their ability to differentiate into a variety of cells appears to leave indelible marks report NIEHS-supported researchers. When the team scoured the epigenomes of induced pluripotent stem (iPS) cells they found a consistent pattern of reprogramming errors. What's more, these incompletely reprogrammed hotspots were maintained when iPS cells were differentiated into a more specialized cell type, providing an iPS cell-specific signature enabling the researchers to determine whether a cell was an iPS or an embryonic stem cell simply by examining these hotspots.

These findings confirm that iPS cells, which by all appearances look and act like embryonic stem cells, differ in certain aspects from their embryonic cousins, emphasizing that further research will be necessary before they can be rightful substitutes for embryonic stem cells. The fact that reprogramming of somatic cells does not pose the same ethical issues as working with stem cells isolated from embryos, prompted scientists to develop iPS technology in the hope of producing cells that are just as potent as human embryonic stem cells.

Reprogramming induces a complete reconfiguration of the DNA methylation pattern throughout the genome returning it to an embryonic stem cell-like state. Overall, this process results in an iPS cell methylation pattern very similar to that of embryonic stem cells, but when the team looked further they discovered significant differences. Their experiments revealed considerable variability between iPS cell lines, including a memory of their tissue of origin. Regardless of their individual history, iPS cells showed a common defect -- hotspots near telomeres and centromeres that proved resistant to reprogramming. Averaging more than one million bases in length, these hotspots failed to acquire the methylation pattern typical of embryonic stem cells. The research team is planning additional research to understand why these regions can't be reprogrammed to a more embryonic stem cell-like state.

Citation: Lister R, Pelizzola M, Kida YS, Hawkins RD, Nery JR, Hon G, Antosiewicz-Bourget J, O'Malley R, Castanon R, Klugman S, Downes M, Yu R, Stewart R, Ren B, Thomson JA, Evans RM, Ecker JR. Hotspots of aberrant epigenomic reprogramming in human induced pluripotent stem cells. Nature. 2011 Mar 3;471(7336):68-73.

Arsenic Exposure may Increase Mortality from Tuberculosis
Allan H. Smith, MD, Ph.D., University of California Berkeley
P42ES004705 and R01ES010033

According to scientists supported by NIEHS and the Superfund Research Program, increased mortality from pulmonary tuberculosis could be yet another serious outcome from exposure to arsenic in drinking water. These findings are from an ongoing study in Chile and if verified, they will have important public health implications, since some of the largest arsenic-exposed populations are in developing countries with widespread tuberculosis.

Tuberculosis is a major public health problem worldwide causing over 2 million deaths in the last year alone and 9 million new infections. There is more tuberculosis today than at any other time in history. Increased susceptibility to tuberculosis has been identified with a variety of other diseases and exposures. Likewise, arsenic in drinking water is a serious public health problem affecting many countries, with millions of people throughout the world exposed. Marked increases in mortality from many different causes have been established resulting from prolonged consumption of arsenic-contaminated water.

The research team has been conducting research on arsenic exposure in Chile for some time. Their findings present the first evidence relating arsenic exposure to tuberculosis. They compared mortality rate ratios with time patterns of arsenic exposure, which increased abruptly in 1958 in a specific region in Chile and then started declining in 1971. Tuberculosis mortality rate ratios in men started increasing in 1968, 10 years after high arsenic exposure commenced. The peak male 5-year mortality rate ratio occurred during 1982–1986. The findings are biologically plausible in view of evidence that arsenic is an immunosuppressant and also a cause of chronic lung disease.

The research team concludes that if arsenic in water increases mortality from tuberculosis, then particular attention will be needed to ensure that patients with tuberculosis are not drinking arsenic-contaminated water. Confirmatory evidence is needed from other arsenic-exposed populations.

Citation: Smith AH, Marshall G, Yuan Y, Liaw J, Ferreccio C, Steinmaus C. Evidence from Chile that arsenic in drinking water may increase mortality from pulmonary tuberculosis. Am J Epidemiol. 2011 Feb 15;173(4):414-20.

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Tobacco Smoke Enhances the Progression of Diabetic Nephropathy
Edgar A. James, MD, University of Alabama Birmingham
R01ES014948

Using a diabetic mouse model, researchers at the University of Alabama Birmingham report that exposure to tobacco smoke worsens the progression of diabetic nephropathy likely mediated by increased expression of profibrotic cytokines.

Diabetic nephropathy is the most common cause of end-stage renal disease in the U.S. It is characterized by proteinuria, and irreversible changes, such as sclerosis, in the structure and function of the glomeruli, the filtering structures in the kidney. These changes effectively reduce the kidney's ability to filter waste and toxins from the blood by reducing the glomerular filtration surface. Cigarette smoking is now recognized as a risk factor in the progression of chronic kidney disease.

In the current study, the mice were exposed to tobacco smoke for 8 weeks at roughly the same levels as those found in active smokers. Tobacco smoke exposure caused significant increases in mesangial expansion accompanied by increases in expression of transforming growth factor β and fibronectin, as compared to the control group mice that breathed regular air.

These studies demonstrate that smoking and exposure to environmental tobacco smoke may further the progression of diabetic nephropathy. The researchers conclude, based on this and previous research, that nicotine may be mediating these effects. The results suggest that additional targeted smoking cessation efforts may be very beneficial for persons with diabetes.

Citation: Obert DM, Hua P, Pilkerton ME, Feng W, Jaimes EA. Environmental tobacco smoke furthers progression of diabetic nephropathy. Am J Med Sci. 2011 Feb;341(2):126-30.

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Resveratrol Protects Mother and Fetus from Immunotoxic Effects of TCDD
Prakash Nagarkatti, Ph.D., University of South Carolina School of Medicine
R01ES009098

A recent study by NIEHS grantees at the University of South Carolina School of Medicine found that administration of resveratrol protects the mother and developing fetus from the immunotoxic effects of dioxin. Resveratrol is a natural product found in grapes, red wine, nuts, berries, and other plants and is also available as an over-the-counter supplement. It has anti-inflammatory properties and is touted as a natural treatment for auto-immune disorders.

Pregnant laboratory mice were injected once with 2,3,7,8- tetrachlorodibenzo-p-dioxin at 10 micrograms/kilogram body weight on gestation day 14. The pregnant mice also received resveratrol at 100 milligrams/kg body weight orally from gestation day 14-19. The researchers observed that resveratrol protected the pregnant mice and their offspring from dioxin-induced thymic atrophy, apoptosis, and alterations in T-cell receptor expression. It also significantly reduced thymus expression of cytochrome P450-1A1.

These findings demonstrate that, in laboratory animals, administration of resveratrol during pregnancy affords protection to the mother and the fetus from the toxicity induced by environmental pollutants that have their effects through activation of the Ah receptor. Additional studies are needed before similar claims can be made for humans.

Citation: Singh NP, Singh US, Nagarkatti M, Nagarkatti PS. Resveratrol (3,5,4'-trihydroxystilbene) protects pregnant mother and fetus from the immunotoxic effects of 2,3,7,8-tetrachlorodibenzo-p-dioxin. Mol Nutr Food Res. 2011 Feb;55(2):209-19.

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Rapid Evolution in Hudson River Tomcod
Isaac Wirgin, Ph.D., New York University School of Medicine
P42ES007381, P30ES000260, and R01ES015447

New research findings by NIEHS grantees suggest that Hudson River tomcod have undergone rapid evolution in response to industrial contamination of the river with polychlorinated biphenyls over the last 50 years. Natural selection, the driving process in evolution, usually takes place over thousands of

years, but the research team reports that this is the first example in vertebrate animals of such a rapid evolutionary change.

The research team is made up of NIEHS and Superfund Research Program grantees at New York University and the Boston University School of Public Health. They found changes in the gene that codes for the Ah Receptor 2 (AHR2), which is important in mediating toxicity in early life stages. The AHR2 protein in the Hudson River fish is missing two amino acids, which causes a weaker bond between the receptor and PCBs, a necessary step in the metabolism of the compound. The variant is found in about 95 percent of the Hudson River fish and in about 5 percent in tomcod in two smaller streams in Connecticut and on Long Island. The variant can't be found at all in fish further down the Hudson.

Because the Hudson River fish is resistant to the toxic effects of PCBs, they are able to accumulate more of the chemical without becoming sick. However this evolutionary adaptation is not all good news for the ecosystem. Since the fish can bioaccumulate the compound at higher levels, consumption of them by other fish can lead to transfer of PCBs up the food chain.

Citation: Wirgin I, Roy NK, Loftus M, Chambers RC, Franks DG, Hahn ME. Mechanistic Basis of Resistance to PCBs in Atlantic Tomcod from the Hudson River. Science. 2011 Feb 17. [Epub ahead of print]

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Elevated Plasma Cytokines in Children with Autism Spectrum Disorder
Irva Hertz-Picciotto, MPH, Ph.D. and Isaac Pessah, Ph.D.
P01ES011269 and R01ES015359

New research findings report an altered plasma cytokine profile in children with autism spectrum disorders (ASD) compared to typically developing children. Elevated cytokine levels were directly correlated with impaired communication skills and aberrant behavior and demonstrate that immune alterations in ASD are associated with the severity of the condition.

ASDs are characterized by impairment in social interactions, communication deficits, and repetitive behaviors. These disorders have been on the rise for the past 25 years but no definitive cause has been found. Cytokines are small cell-signaling proteins that are secreted by glial cells of the nervous system and numerous cells making up the immune system that modulate immune responses.

The authors report a significant shift in cytokine profiles among children with ASD which suggests that ongoing inflammatory responses may be linked to behavioral disturbances. These findings need to be confirmed in larger studies, but they do suggest that the characterization of immunological markers may have important implications for diagnosis and therapeutic interventions to treat core symptoms and behavioral impairments associated with ASD.

Citation: Ashwood P, Krakowiak P, Hertz-Picciotto I, Hansen R, Pessah I, Van de Water J. Elevated plasma cytokines in autism spectrum disorders provide evidence of immune dysfunction and are associated with impaired behavioral outcome. Brain Behav Immun. 2011 Jan;25(1):40-5.

Glutathione Variant Linked to Lung Function Growth
Frank D. Gilliand, MD, Ph.D., and William J. Gauderman, Ph.D. University of Southern California
P01ES009581, P01ES011627, and P30ES007048

Scientists at the University of Southern California report that variations in one of four genes in the glutathione metabolism pathway is associated with differences in susceptibility to adverse effects of air pollutants on lung function growth. Glutathione is the most abundant intracellular antioxidant. It is an important defense mechanism in the lung in response to oxidative air pollutants and inflammation.

The gene, known as GSS, codes for glutathione synthetase. Polymorphisms in this gene and others in the pathway have been shown to be associated with reductions in lung function. Variation in GSS was found in 48 percent of the study population of 2,106 children from 12 Southern California cities.

The study results demonstrate that children with GSS variation were differentially susceptible to lung function growth deficits associated with air pollutants including nitrogen dioxide, particulate matter, elemental carbon, organic carbon, and ozone. The authors conclude that these findings place added emphasis on the identification of strategies for reducing levels of urban air pollutants for susceptible populations.

Citation: Breton CV, Salam MT, Vora H, Gauderman WJ, Gilliland FD. Genetic variation in the glutathione synthesis pathway, air pollution, and children's lung function growth. Am J Respir Crit Care Med. 2011 Jan 15;183(2):243-8.

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Interactions of Lifetime Lead Exposure and Stress
Deborah Cory-Slechta, Ph.D., University of Medicine and Dentistry of New Jersey
P30ES001247 and R01ES012712

Recent laboratory- based research by NIEHS-supported researchers at the University of Rochester and the Environmental and Occupational Health Sciences Institute confirm earlier epidemiologic studies that low-level lead exposure and chronic stress interact to cause behavioral and cognitive deficits.

Female laboratory rats were exposed to lead in their drinking water for two months prior to breeding and throughout gestation. At gestation day 16 and 17, some of the pregnant rats were subjected to a restraint stress procedure consisting of three 45 minute sessions. At weaning, offspring pups were provided with unlimited access to food and given the same drinking water regimen that their dams had received. Subsets of the offspring were used for various laboratory tests and some were subjected to a variety of stressors and behavioral tests including a fixed interval reward test.

Subject data suggest that lead and prenatal stress effects shift high numbers of test subjects towards the high end of the normal range of fixed interval performance values. These findings were consistent with a dose-response type of lead and stress additivity. The authors conclude that altered fixed interval performance represents behavioral inefficiency and possibly dysfunctional energy use.

Citation: Rossi-George A, Virgolini MB, Weston D, Thiruchelvam M, Cory-Slechta DA. Interactions of lifetime lead exposure and stress: behavioral, neurochemical and HPA axis effects. Neurotoxicology. 2011 Jan;32(1):83-99.

Mitochondrial Dysfunction in Children with Autism
Isaac Pessah, Ph.D. and Irva Hertz-Picciotto, MPH, Ph.D.
P01ES011269 and R01ES015359

Children with autism are far more likely to have deficits in mitochondrial function, specifically in their ability to produce cellular energy, than are typically developing children. These findings are from a new study by NIEHS-supported researchers at the University of California Davis. The results suggest that cumulative damage and oxidative stress in mitochondria could influence both the onset and severity of autism.

The brain is the second largest consumer of energy in the body after the heart. The investigators propose that deficiencies in the ability to fuel brain cells might lead to some of the cognitive impairments associated with autism. Mitochondrial dysfunction has already been associated with other neurological diseases and conditions included Parkinson's and Alzheimer's disease, schizophrenia, and bipolar disorder.

Although the study was small including only ten children with autism and ten age-matched controls, the findings may eventually help physicians provide early diagnosis. Larger studies are necessary to confirm these findings. The study does not identify the cause of autism which affects as many as one in every 110 children, but it does offer new insights into prevention and intervention efforts.

Citation: Giulivi C, Zhang YF, Omanska-Klusek A, Ross-Inta C, Wong S, Hertz-Picciotto I,Tassone F, Pessah IN. Mitochondrial dysfunction in autism. JAMA. 2010 Dec 1;304(21):2389-96.

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Sperm may be Harmed by BPA Exposure
Russ Hauser, MD, Sc.D., Harvard School of Public Health
P30ES000002 and R01ES009718

In one of the first human studies of its kind, researchers have found that urinary concentrations of the controversial chemical Bisphenol A (BPA) may be related to decreased sperm quality and concentration. This work was carried out by NIEHS-supported scientists at the Harvard School of Public Health.

The study included 190 men recruited through a fertility clinic. Sperm concentration, motility, shape, and DNA damage were measured in semen samples from the participants. BPA was detected in 89 percent of the men's urine samples. Sperm concentration was about 23 percent lower in men in the top quartile of exposure as compared with the lowest quartile. The highest exposed men also had about 10 percent more damaged sperm than the lowest exposed group.

These findings are consistent with a previous study suggesting that follicle stimulating hormone and Inhibin B concentrations are altered in response to BPA, which mimics the pattern in men with low sperm production. The researchers are continuing this line of research with a larger cohort of men to confirm their findings.

Citation: Meeker JD, Ehrlich S, Toth TL, Wright DL, Calafat AM, Trisini AT, Ye X, Hauser R. Semen quality and sperm DNA damage in relation to urinary bisphenol A among men from an infertility clinic. Reprod Toxicol. 2010 Dec;30(4):532-9.

DNA Damage Mapped Out
Trey Ideker, Ph.D., University of California San Diego
R01ES014811

Using a new technique called differential epistasis maps, an international team lead by NIEHS grantee Trey Ideker, Ph.D. from UC San Diego has documented for the first time how a cellular genetic network is completely reorganized in response to DNA damaging agents. The work, published the December 3rd edition of Science represents a technological leap in describing how genes actively work together.

Epistasis refers to the interaction of genes and how they suppress, activate, or alter other gene's functions. To create an epistasis map, the research team focused on 400 genes that govern signal transduction pathways in yeast. They them created approximately 80,000 mutant cell lines in which each mutant line carries mutations in a different pair of the 400 genes. When the cells grow much more slowly or quickly than expected, these mutant genes are said to interact. The map was created by identifying interactions before and after exposure to a DNA-damaging agent similar to compounds used in chemotherapy. To their surprise, the team found that most of the interactions identified after exposure to the drug were not present without the exposure, leading them to believe that the genetic network was completely reprogrammed by DNA damage.

This discovery suggests that similar systems in more advanced organisms will be even more complex and more complicated to study. It represents a new frontier in probing dynamic interactions that enable cells to survive and thrive in varying environmental and genetic contexts. Experiments at this higher level will give scientists deeper insights into the changing environment of a living cell.

Citation: Bandyopadhyay S, Mehta M, Kuo D, Sung MK, Chuang R, Jaehnig EJ, Bodenmiller B,Licon K, Copeland W, Shales M, Fiedler D, Dutkowski J, Guénolé A, van Attikum H, Shokat KM, Kolodner RD, Huh WK, Aebersold R, Keogh MC, Krogan NJ, Ideker T. Rewiring of genetic networks in response to DNA damage. Science. 2010 Dec 3;330(6009):1385-9.

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Less Toxic and More Effective Carbon Nanotubes for Drug Delivery
James Rusling, Ph.D., University of Connecticut
R01ES013557

NIEHS-supported researchers at the University of Connecticut have found that single-walled carbon nanotubes treated with polyethylene glycol (PEG) make more effective and less toxic drug delivery vehicles that untreated nanotubes. These results give further credence to the use of drug delivery systems utilizing single-walled carbon nanotubes.

Carbon nanotubes have been touted for their potential uses in products ranging from cosmetics and drug delivery devices to the construction of a space elevator. However, concerns over their toxicity and potential to cause inflammatory reactions have hindered their uses.

These researchers layered carbon nanotubes with PEG which has been shown to improve their dispersion in aqueous solutions. Both PEG treated and untreated nanotubes were then incubated with the chemotherapeutic drug cisplatin. The nanotubes were then injected into laboratory mice and a number of cytotoxicity assays were performed. Untreated nanotubes were found to clump together in lung tissue while PEG-treated nanotubes showed little or no accumulation. Other assays revealed biliary

or renal excretion routes of PEG-treated nanotubes. PEG-cisplatin nanotubes successfully inhibited growth of head and neck tumor grafts in the laboratory mice.

Citation: Bhirde AA, Patel S, Sousa AA, Patel V, Molinolo AA, Ji Y, Leapman RD, Gutkind JS, Rusling JF. Distribution and clearance of PEG-single-walled carbon nanotube cancer drug delivery vehicles in mice. Nanomedicine (Lond). 2010 Dec;5(10):1535-46.

PAPERS by DERT STAFF

Gene-Environment Interplay in Common Complex Diseases: Forging an Integrative Model—Recommendations From an NIH Workshop. 2011. Ebony B. Bookman, *Kimberly McAllister*, Elizabeth Gillanders, Kay Wanke, *David Balshaw*, Joni Rutter, Jill Reedy, *Daniel Shaughnessy*, Tanya Agurs-Collins, Dina Paltoo, Audie Atienza,Laura Bierut, Peter Kraft, M. Daniele Fallin, Frederica Perera, Eric Turkheimer, Jason Boardman,Mary L. Marazita, Stephen M. Rappaport, Eric Boerwinkle, Stephen J. Suomi, Neil E. Caporaso, Irva Hertz-Picciotto,Kristen C. Jacobson, William L. Lowe, Lynn R. Goldman, Priya Duggal, Megan R. Gunnar, Teri A. Manolio, Eric D. Green, Deborah H. Olster, and Linda S. Birnbaum for the NIH G X E Interplay Workshop participants. Genetic Epidemiology 35: 217–225.

GRANTEE HONORS and AWARDS

Three NIEHS grantees, neurobiologist *Marie-Francoise Chesselet, M.D., Ph.D., University of California Los Anggeles;* exposure science expert *Barbara J. Turpin, Ph.D.,* Rutgers University; and Agnes Kane, M.D., Ph.D., Brown University are among scientists elected as 2010 American Association for the Advancement of Science (AAAS) Fellows. Each received an official certificate and a gold and blue rosette pin February 19 during the AAAS Fellows Forum during the 2011 AAAS Annual Meeting in Washington, D.C.

The Scientific Review Panel of the Council for the Lindau Nobel Laureate Meetings selected *Dr. Judit Marsillach* to participate in the 61st Meeting of Nobel Laureates, to be held from June 26 to July in Lindau (Germany). Dr. Marsillach is working with Dr. Clement Furlong, University of Washington, and colleagues on several NIEHS-funded projects under a postdoctoral fellowship.

A publication from *Dr. Julian Schroeder's* research group (UC San Diego SRP), “Arsenic tolerance in Arabidopsis is mediated by two ABCC-type phytochelatin transporters,” has been awarded a Cozzarelli Prize from the Proceedings of the National Academy of Science (PNAS) Editorial Board as an exceptional paper for 2010This award recognizes recently published PNAS papers of outstanding scientific excellence and originality. The award certificate was presented during the PNAS Editorial Board Meeting on May 1 in National Harbor, Maryland.

On March 7, Oregon State University Superfund Research Program’s *Dr. Robert Tanguay* was awarded Oregon State University's Distinguished Professor title for excellence in teaching and collaborative research in biomedical sciences and environmental health science. The award is the University's top research honor.

Dr. Bruce Stanton, Andrew C. Vail Memorial Professor at Dartmouth Medical School and SRP investigator has been named this year’s Distinguished Honors Graduate by the University of Maine Honors College.

Superfund Research Program (SRP) trainee and 2006 Wetterhahn awardee *Dr. Alicia Timme-Laragy* was awarded first place in the Society of Toxicology's Molecular Biology Specialty Section (MBSS) Postdoctoral poster competition at their annual meeting, held March 6-10 in Washington, DC.

Kenneth S. Suslick, Ph.D., the Schmidt Professor of Chemistry at the University of Illinois at Urbana-Champaign and an NIEHS grantee has received a 2011 Guggenheim Foundation Fellowship. Dr. Suslick works at the forefront of chemical sensing. He developed an artificial "nose" capable of detecting harmful substances in the air. Guggenheim Fellowships are awarded annually on the basis of achievement and exceptional promise.

The research of R01 grantees *Dr. Upal Ghosh,* University of Maryland-Baltimore County, and *Dr. Richard Luthy,* Stanford University, was the cover article in the February 15 edition of the journal Environmental Science & Technology ES&T. In the article, Drs. Ghosh and Luthy report on the rationale and plans for deploying activated carbon as a super-sponge for organic contaminants.

Superfund Research Program (SRP) grantee and Louisiana State University (LSU) chemist *Dr. Barry Dellinger* was recognized for his progress with environmentally persistent free radicals. The journal Environmental Science & Technology (ES&T) selected Dellinger's paper, "Potential for Misidentification of Environmentally Persistent Free Radicals as Molecular Pollutants in Particulate Matter," for an Editor's Choice Award as one of ES&T's Best Papers of 2010.

STAFF ACTIVITIES

The NIEHS Worker Education and Training Program (WETP) is collaborating with multiple federal agencies on the HHS Strategic Plan to implement targeted activities to reduce health disparities associated with disproportionate exposure to environmental hazards and occupational health across HHS and to develop and implement an environmental justice strategy in collaboration with the Federal Interagency Working Group on Environmental Justice. The strategy will address community engagement, research, surveillance and analysis, service delivery, and capacity building in minority, low-income, and tribal populations. The activities will align with Healthy People 2020 objectives that are closely related to environmental justice, environmental health, and the social determinants of health.

The NIEHS Worker Education and Training Program (WETP) is collaborating with the Environmental Protection Agency (EPA) partners to discuss issues focused upon the federal government's approach to radon mitigation and recommending specific actions on the following three areas: 1)Demonstration of the importance, feasibility and value of radon testing and mitigation; 2)Developing financing and other (e.g. tax) incentives to encourage those who can pay and support those who cannot pay; and, 3)Building demand for a professional, nationwide radon services industry.

The NIEHS Worker Education and Training Program (WETP is responding to the disaster in Japan by supporting research of relevant grantee reference material as it relates to responder health and safety for workers involved in the disaster. Consolidated PowerPoint based contents addressing hazards as a result of earthquake, tsunami and radiological incidents that is relatively site specific will be developed and converted to hand-held booklet format.

The Program Analysis Branch (PAB) has been collaborating with the computer Technology Branch/SRA International Incorporated to develop a new web-based application to track scientific findings and longer term impacts. The High Impacts Tracking System (HITS) was moved to a test server in March and

will now begin beta testing the application. The system draws progress reports and program officer notes (heretofore not searchable) into a database, and allows users to highlight grants with specific accomplishments, findings, and other impact-relevant tags.

The NIEHS Worker Education Training Program (WETP) held its spring grantee meeting and technical workshop May 3-5 at the Renaissance Mobile Riverview Plaza Hotel in Mobile, Alabama. This meeting, "Deepwater Horizon Lessons Learned Workshop: Improving Safety and Health Training for Disaster Cleanup Workers," examined the training-related Deepwater Horizon Oil response activities (as seen through the eyes of the Worker Education and Training Program, WETP awardees, federal partners, community-based organizations, workers and other stakeholders) and developed consensus about the proper elements of pre-incident and deployment-phase training for support personnel performing cleanup work. In addition, policies to best ensure that workers receive that training (in a language and a literacy level they understand) before being deployed to work were explored.

Mrs. Beard, WETP, presented as a respondent on the opening panel on The Gulf Oil Spill Response and moderate a session on Environmental Job Training at the 2011 Environmental Justice in America Conference which was held April 27-29 in Washington, DC.

Dr. Drew, PAB, hosted a discussion with Dr. Giselle Corbie-Smith, the Director of the Community Engagement Core, NC TraCS Institute, University of North Carolina at Chapel Hill on April 20. Having heard about the PEPH Metrics manual, Dr. Corbie-Smith wanted to learn more about potential partnership activities with NIEHS. *Dr. Pettibone, PAB, Mr. O'Fallon, SPHB*, and Dr. Reid, Education Outreach Specialist in the NIEHS Office of the Director, participated.

Dr. Hebling Chadwick, COSPB, served on a panel at the Interplay of the Microbiome, Environmental Stressors, and Human Health meeting, April 27-28, in Washington DC. This meeting, part of the National Academy of Sciences 'Emerging Science for Environmental Health Decisions' series, focused on the human microbiome, how it's function is affected by external forces, and what this means for environmental health science research and risk assessment. This meeting was preceeded by an NHGRI-funded brainstorming workshop to solicit community input on developing the next iteration of the Human Microbiome Project, which Dr. Chadwick also attended.

Dr. Tyson, SPHB, attended the Non-coding RNA, Epigenetic Memory, and the Environment meeting convened in London, United Kingdom at The Royal Institute of British Architects, on April 14-15. The meeting covered all major aspects of small RNAs and chromatin in epigenetic and inheritance. There were four sessions focused on: ncRNA induced transcriptional silencing; ncRNA and epigenetic inheritance; ncRNA and transgenerational inheritance as well as epigenetic reprogramming in mammals. A variety of models systems were discussed relative to roles of ncRNA and transcriptional regulation and splicing.

Dr. Pettibone, PAB, presented a poster titled Evaluating Environmental Public Health Partnership Activities at the Science of Team Science Annual Conference, April 11-14, in Chicago, Illinois.

Mrs. Beard, WETP, in collaboration with EPA and various community based organizations planned and co-sponsored the Environmental Justice Caucus at the Brownfields 2011 conference in Philadelphia, Pennsylvania on Sunday, April 3, at the Academies of Natural Sciences. Mrs. Beard organized a breakout session on "Initiating a Job Training Program" in partnership with NIEHS WETP grantee, Dr. Ebony Turner, Dillard University Deep South Center for Environmental Justice and Mr. Joseph Bruss, EPA. In addition, Mrs. Beard organized and moderated a session on "Building a Sustainable Local-Federal

Partnership for Safe, Healthy Green Jobs" where several NIEHS WETP awardees and partners gave presentations on how this alliance is moving forward. Those speakers included Sylvester Servance, Hope Community Outreach Center (New Jersey/New York Consortium ARRA Supplement), Charlotte Brody, BlueGreen Alliance and Tim Fields, MDB, Inc. Mrs. Beard also conducted a meeting of the Minority Worker Training Program Awardees and other invited guests to share and exchange best practices and lessons learned about job training during this conference. Lastly, *Ted Outwater, WETP*, participated on a session on Green Jobs in Your Community at the conference.

On March 31st, the *Superfund Research Program (SRP)* initiated a new web seminar series: "Community Engagement: New Approaches and Success Stories" which began with a seminar titled "Community Engagement Activities at Superfund Sites." Dr. Birnbaum kicked off the series/seminar by speaking about how important it is to involve affected communities in the decisions made about sites. Presenter Anna Goodman Hoover, SRP grantee from the University of Kentucky, spoke about "Using Community-Based Participatory Communication in Superfund Communities". This overview focused on community-driven future vision for the Paducah Gaseous Diffusion Plant (PGDP) which has been impacted by trichloroethylene and technetium-99 contamination in the groundwater. Sharon Lin, US EPA, presented "Risk Reduction through Behavior Change", focusing on activities around the Palos Verdes Shelf Superfund Site, one of the largest DDT and PCB contaminated sediment sites in the country. She spoke about a community based social marketing approach used to educate local fishermen and community members about health risks of eating contaminated fish and to promote safer fishing and fish eating practices. SRP staff involved in the series includes *Ms. Anderson and Drs. Cakir, Carlin, and Henry*.

Mrs. Beard, WETP, presented as a respondent at the 68th Joint Annual Meeting of the Beta Kappa Chi/National Institute of Science on the Environmental Health Impact and Outcome of the Gulf Oil Spill during their Hot Zone Summit session on March 25. Mrs. Beard presented information on the NIEHS response to the BF Gulf Oil Spill including the Gulf Oil Worker Study, WETP training of trainers, workers, and the development of salient training resources including website material and the Oil Spill Response Booklet, and NTP studies on the impacts of oil dispersants. This session included a keynote presentation on "Geography of Vulnerability: Tracking Environmental and Public Health Impact of the British Petroleum Deepwater Horizon Oil Disaster" by Dr. Robert D. Bullard, Professor of Sociology and Director, Environmental Resource Center, Clark Atlanta University. Other presenters included Dr. Marian Johnson Thompson as moderator; Dr. Beverly Wright, Director, Dillard University Deep South Center for Environmental Justice; Dr. Gail Mattox, Chairperson and Professor of Clinical Psychiatry, Morehouse School of Medicine; and Mr. Timothy Fields, Vice President, MDB, Inc.

Dr. Suk, CRIS/SRP, was an invited speaker at the March 17th spring meeting of the International Academy of Oral Medicine and Toxicology in St. Louis Missouri. Dr. Suk presented a lecture entitled "Children's Special Vulnerability to Environmental Exposure and Disease Burden". The IAOMT is a network of dental, medical and research professionals who seek to raise the standards of scientific biocompatibility in the dental practice with information from the latest interdisciplinary research.

Dr. Tyson, COSPB, served as co-organizer for the Keystone Symposium entitled Environmental Epigenomics and Disease Susceptibility. The meeting was convened in Asheville, North Carolina at the Grove Park Inn on March 27-April 1. It was attended by 300 participants from 23 countries with speakers representing eight different nations adding to the international aspects of this meeting. Eleven speakers and/or session chairs were NIEHS supported investigators. The symposium featured the following sessions: Fetal Origins of Adult Disease Susceptibility; Epigenetic Mechanisms of Gene Regulation; *In vitro* Fertilization, Cloning and Stem Cells; Postnatal Epigenetic Programming of the Brain; Epigenetics and Complex Diseases; Epigenetic Transgenerational Inheritance; Epigenetics and Neurological

Disorders; and Mammalian Evolution and Disease Susceptibility. The meeting was highlighted by two keynote addresses, one to open the meeting by Eva Jablonka entitled, "Being Fit in Four Dimensions" and one to close the meeting by Mark Rothstein, entitled "Legal and Ethical Implications of Epigenetics."

Dr. Humble, COSPB, gave a presentation on March 25 at the University of North Carolina at Chapel Hill on the NIH grant application and review process, as well as on NIH grant mechanisms available to students, postdocs and new and early stage investigators. Approximately 15 graduate students and postdocs from area epidemiology and biostatistics programs attended the presentation.

Dr. Suk, CRIS/SRP, initiated discussions on March 23 with Dr. Jim Newhall on the spectrum of possible outcomes for the National Institute for Occupational Safety and Health's (NIOSH) Educational Resource Center grant program, which was not included in the President's budget. Both agreed to keep the lines of communication open as the FY 2011 and FY 2012 budgets unfold. Both parties considered the meeting very successful and have made commitments to continue meeting in the future to ensure effective collaboration and information sharing between the two agencies.

Dr. Tyson, SPHB, served as host for Dr. Daniel Baden, University of North Carolina-Wilmington, at the March 22nd Keystone Science Seminar Series entitled, Toxicology Mechanisms to Translational Medicine: Paracelsus Meets Sarandip, where Dr. Baden highlighted his NIEHS supported work on *Karenia brevis*, the dinoflagellate responsible for producing Florida Red Tides during harmful algal bloom events. The focus of this presentation was how using toxicological principles for evaluating marine toxins and mechanisms of toxicity, a biologically active compound, brevenal, was discovered. Brevenal has shifted some of the focus of Dr. Baden's team towards translational medicine as brevenal is being considered as a potential therapeutic for the treatment of cystic fibrosis and other respiratory diseases involving muco-ciliary clearance. He discussed pre-clinical work with brevenal as steps are being made to take the compound to clinical trial.

Dr. Drew, PAB, attended the 4th Annual NIH Dissemination and Implementation Science meeting March 21-22 in Bethesda, Maryland. This is an emerging focus at NIH, with strong overlaps to the NIEHS Partnerships for Environmental Public Health Program. Conference highlights included a keynote address from Carolyn Clancy, Director of the Agency for Healthcare Research and Quality, and an invited panel providing international perspectives on dissemination and implementation research.

On March 10th, Superfund Research Program (SRP) staff *Ms. Anderson, and Drs. Suk, Thompson, Henry and Carlin* traveled to Washington, D.C., to meet with Environmental Protection Agency (EPA) Office of Solid Waste Emergency Response Assistant Administrator, Mr. Mathy Stanislaus, and other EPA Superfund Science and Technology officials. Mr. Stanislaus expressed great interest in SRP scientific undertakings and in making the science applicable to communities. Also discussed at this meeting was the status of the memorandum of understanding (MOU) between NIEHS and Office of Superfund Remediation and Technology Innovation to promote the exchange of information and the mutual utilization of research outcomes and knowledge. The MOU is nearly complete and will be signed in the comings weeks.

Dr. Tyson, SPHB, served as session chair at the NIH Roadmap for Medical Research supported meeting, "From Epigenomic Discovery to Improvements in Human Health," convened at The Legacy Hotel and Meeting Centre in Rockville, Maryland on March 8-9. The purpose of the meeting was to provide an overview of diverse strategies that have the goal of translating epigenomics discoveries (such as those arising due to the Roadmap Epigenomics Program as well as efforts by other National Institutes of Health [NIH] Institutes and Centers [ICs]) into tangible improvements in human health. This meeting

provided information concerning the (1) efforts being pursued by different NIH ICs and organizations beyond NIH, (2) challenges and opportunities in this area, and (3) ways to stimulate program staff members at NIH ICs to begin to implement and improve existing translational projects and programs relevant to their mission. Dr. Tyson chaired the session entitled, Epigenetic Therapies in the Clinic (Human Studies). It focused on the use of epigenetics in drug discovery and the use of HDAC (histone deacetylase) inhibitors in cancer clinical trials and other targets involved in epigenetic processes that are dysregulated in disease pathogenesis.

Mr. Phelps, PAB, assisted in the planning and participated in the Staff Training in Extramural Programs (STEP) Seminar entitled "Look Who's Talking: Communicating Your Message Fearlessly and Flawlessly," which was held Tuesday, March 1 at NIH. Mr. Barrett Whitener, IQ Solutions, and Ms. Nan Tolbert, The Communication Center, spoke on honing skills in presentation development and delivery. Dr. Stephen Kosslyn, Stanford University, spoke on applying psychological principles to avoid common errors in presentations. Emmy and Golden Globe award winning actor, Mr. Alan Alda, spoke on his recent pursuits in science communication and the establishment of the Center for Communicating Science at Stony Brook University. Mr. Phelps had the opportunity to participate in improvisational exercises during the event with Mr. Alda and young scientists who have received training at the Center.

Mrs. Beard, WETP, Dr. Humble, COSPB, Mr. O'Fallon, SPHB, and Dr. Reinlib, SPHB, participated in the "Cell Biology and Cancer" teacher workshop held at NIEHS on Feb 28. The workshop was sponsored by the North Carolina Association for Biomedical Research (NCABR) and was attended by 28 North Carolina middle and high school science teachers. Mrs. Beard and Mr. O'Fallon gave Welcome and overview presentations to the teachers. Dr. Reinlib gave a presentation on "Breast Cancer and the Environment," and Dr. Humble was the moderator for the afternoon training session and introduced the cell biology and cancer curriculum and activities developed by NCABR and NIH.

Mr. Hughes, Mr. Remington and Mrs. Beard, WETP, conducted a meeting on February 24 on the Gulf Oil Spill response at the Deep South Center for Environmental Justice at Dillard University to update the local community about the NIEHS Gulf Oil Spill response activities and to acknowledge the great support from the many groups who have contributed to response. A roundtable discussion was also held to start the lessons learned process to evaluate the safety training of Gulf Oil Spill responders.

Mr. Hughes and Mrs. Beard, WETP, participated in the NIEHS Directors Community Forum visits on February 23 to New Orleans and surrounding Parishes to conduct discussions with local residents, community based organizations, the environmental health research community, and local and state health officials around environmental health issues impacting their communities. Information about NIEHS research, the Gulf Worker Health Study, worker training efforts, and other concerns were discussed at the meetings.

Dr. Suk, CRIS, was invited to participate in a conference of the Third Annual Predictive Toxicology conference February 22-24 at America Square Conference Centre, London, United Kingdom. The conference focused on the efficient use of existing and new Predictive Toxicology technologies, case studies highlighting the benefits of various strategies, the future of Predictive Toxicology technology and the issues surrounding certification of new techniques with regulatory bodies. Dr. Suk presented a lecture entitled, "Human Stem Cells: Understanding Mechanisms of Chemical Toxicity and Individual Responses." Predictive and computational toxicology is of interest to the field of toxicology and environmental health sciences as a transformative paradigm focusing on the research needed to provide a broad coverage of chemicals, chemical mixtures, disease outcomes, and life stages, and to reduce the cost and burden of disease, especially in vulnerable populations and developing economies.

Dr. Balshaw, CRIS, spoke on February 22 at the NIH-Wide GIS Infrastructure Workshop in a session discussing GIS activities across NIH. He presented an overview of the GEI Exposure Biology Program as a potential source of emerging tools for providing both data on temporal-spatial variation in the environment and for the analysis of geospatially localized data.

On February 14, the *Superfund Research Program* (SRP) held a Risk e-Learning webinar targeted toward its Environmental Protection Agency stakeholders. The webinar drew participants from around the world to hear two presentations featuring SRP grantees Dr. Harold D. May and Dr. Danny Reible. Dr. May, Professor, Microbiology and Immunology, Medical University of South Carolina presented "Integrating Microbial Biostimulation and Electrolytic Aeration to Degrade POPs" and Dr. Reible, Bettie Margaret Smith Professor of Environmental Health Engineering, Department of Civil, Architectural and Environmental Engineering, University of Texas presented "Enhancing Biodegradation in Sediment Caps Using Carbon Cloth Electrodes".

Dr. Henry, CRIS/SRP, met with EPA's SBIR/STTR program directors and staff (April Richards and Marti Otto) on February 8th and was invited to attend the EPA SBIR/STTR Grantee Kick-off Meeting in Washington, DC on March 22 where she presented a brief overview of the SBIR/STTR funding opportunities that the SRP offers to small businesses. As a result of these formal and informal meetings, SRP is exploring ways to work more closely with the EPA SBIR/STTR program.

On Tuesday February 8, *Ms. Anderson, CRIS/SRP*, presented an overview of the SRP and highlights of the new Strategic Plan to our interagency partners at the National Institute of Occupational Safety and Health. She thanked them for their participation in the Strategic Planning process, and fielded questions about the Strategic Plan and upcoming budget. She also provided a tutorial on how to use available web-based tools designed to provide easy online access to the research produced by SRP grantees.

On February 8th, *Dr. Henry, CRIS/SRP*, met with EPA/OSRTI contaminated sediment remediation coordinators: Karl Gustafson and Steve Ells. The purpose of the meeting was to follow up about the current SRP Solicitation (RFA ES-11-005 "Bioavailability Assays to Assess the Effectiveness of Contaminated Sediment Remediation") and the recent webinar series "New Approaches to Contaminated Sediment Remediation." They also explored opportunities for SRP grantees to utilize EPA or other contaminated sediments, collected from contaminated sites. Sites undergoing extensive EPA/ORD research activities (e.g. where ecological indicators are being measured) are of particular interest.

Mr. Hughes, Mr. Outwater and Mrs. Beard, WETP, conducted the second joint meeting with the Blue Green Alliance on February 7 entitled "Making Green Jobs Safe" to further discuss building a movement to ensure that Green Jobs Are Safe Jobs. This meeting built upon a meeting last May and the meeting report "Developing a Green Safety and Health Movement." Its purpose was to update and share information and to consider achievable, coordinated steps for 2011. Presentations were made by NIEHS, Blue Green Alliance, National Institute of Occupational Safety and Health and others about various topics such as prevention through design, international chemical awareness tools, building trades, and contractors approach to develop safety and health criteria to include into the US GBC LEED System.

Dr. Suk and Dr. Henry, CRIS/SRP, presented "Superfund Research Program – Past, Present, and Future" on February 4 at Dorado, Puerto Rico, as part of the Northeastern University P42 Center Retreat. The Northeastern program focuses on the effects of phthalates and TCE exposure to preterm birth in the

northwestern region of Puerto Rico, where underground caves dominate the groundwater system. The meeting brought together investigators from the Center's affiliate campuses and members of the Center's advisory committee composed of interagency stakeholders (USGS, US EPA), the March of Dimes, and several research universities.

On February 2, *Dr. Cakir and Ms. Anderson, CRIS/SRP*, convened a group of experts from the Environmental Protection Agency (EPA) and the Agency for Toxic Substances and Disease Registry (ATSDR) to discuss with the Superfund Research Program staff their thoughts on the P42 applications the Program is considering for funding. *Dr. Cakir* chaired the meeting and *Dr. Henry, Dr. Thompson, Dr. Carlin, Ms. Anderson and Dr. Suk* were in attendance for the Superfund Research Program.

On January 21, the *Superfund Research Program* (SRP) announced the acceptance of applications for the KC Donnelly Externship Awards. These awards are named in honor of Dr. KC Donnelly who passed away on July 1, 2009. He was one of the SRP Project Leaders from Texas A&M University and had a strong interest in mentoring students/post-docs and environmental research. This award is an excellent opportunity for graduate students and post-docs to receive additional and valuable training at either another SRP-funded institute or government agency. The recipient of the KC Donnelly Externship Award receives support for up to three months consisting of supplies, travel, and housing costs for the duration of the externship. In addition, funds are available to recipients to attend the Superfund Research Program Annual Meeting where the awardees will be invited to present their research experience. *Dr. Carlin*, the primary contact for these externships, hosted two teleconferences on February 15 and March 2, to discuss the guidelines for these externships with potential applicants.

A joint webinar for interagency Superfund Research Program stakeholders was held on January 19. Dr. Luthy of the Woods Institute for the Environment at Stanford University reviewed recent experimental studies and modeling work that described the up-take of hydrophobic organic contaminants by activated carbon amendment in sediment. The emphasis was on practical aspects of testing and modeling to assess the suitability of sediment for in-place treatment of persistent organic contaminants by activated carbon sorbent. A comparison of different feeding traits of benthic organisms illustrated the degree of treatment needed to achieve a desired remedial success of sorbent amendment. A follow-up by Dr. Charles Menzie of Exponent Inc. discussed the efficacy of various methods of application of SediMite, a pelletized agglomerate that consists of activated carbon, to contaminated sediments. He focused on the effectiveness of delivery methods designed to minimally disturb sediment, yet deliver activated carbon amendment to the depth inhabited by biota.

WETP staff presented and participated in several sessions at the Good Jobs, Green Jobs Conference that occurred in Washington DC on February 8-10. *Mrs. Beard*, WETP, moderated a session on February 8 at the conference entitled "Forgotten Communities: Environmental Justice and Building a Green Society" where NIEHS WETP awardees demonstrated how green principles are being incorporated into the recovery of impacted communities in New Orleans, Louisiana; Anniston, Alabama; and Chicago, Illinois. Presenters provided an overview of the environmental justice issues and how successful green jobs projects can become a path forward. *Mr. Outwater*, WETP, moderated a panel with OSHA and presented on worker safety and health regulations and training regarding green technology. *Mr. Hughes*, WETP, presented information on the NIEHS Gulf Oil Spill on the panel entitled "11 Workers Killed and the Worst Environmental Disaster Ever: How do we respond to the Deepwater Horizon explosion?"

UPCOMING MEETINGS and WORKSHOPS

The annual Reference Epigenome Mapping Consortium Steering Committee Meeting will be held May 25-26 in Crystal City, Virginia. This meeting will begin with a half-day joint meeting with the ENCODE consortium, to identify areas of possible coordination between the two groups. The steering committee meeting on the 26th will be reviewing progress since the November meeting, receiving input from the external scientific panel, and setting goals for the remainder of the year.

The *Superfund Research Program* is sponsoring a meeting, "Sustainable Remediation 2011: State of the Practice," June 1-3 at the University of Massachusetts – Amherst. The meeting will address the interrelated themes of green chemistry, human health, and environmental response. Session presentations by scientists, practitioners, and regulators will feature new research, field applications, and lessons learned. Leading researchers and regulatory experts will provide an overview of the sustainable remediation landscape and address research needs, policy, and regulatory challenges moving forward. *Dr. Henry, CRIS/SRP*, is on the steering committee. (http://www.umass.edu/tei/conferences/SustainableRemediation/)

The 12th International Congress on Combustion By-Products and Their Health Effects: Combustion Engineering and Global Health in the 21st Century - Issues and Challenges will be held June 5-8 at Zhejiang University in Hangzhou, China. The goal of this Congress, sponsored by the *Superfund Research Program*, is to provide an international forum to discuss topics on the origins, fate, and health effects of combustion. This field has gained significant relevance to worldwide environmental policy, as risk-based programs increasingly rely on the ability of advanced scientific research to provide mechanistic, diagnostic, and analytical answers to complex problems concerning air toxic exposure. *Dr. Carlin, CRIS/SRP*, is attending this meeting. (http://www.lsu.edu/piccongress/)

The *Superfund Research Program* is sponsoring the meeting, "Toxic Metals in the Northeast: From Biological to Environmental Implications," which will be held July 24 in Halifax, Nova Scotia, Canada. This meeting is one of the Coastal and Marine Mercury Ecosystem Collaborative (C-MERC) workshops. The goal of the C-MERC workshops is to bring together scientists conducting research on mercury fate in coastal and ocean systems from mercury sources to human receptors. The workshops will provide a forum in which to share and summarize data and results, to enhance communication among researchers, managers and policy-makers, to inform SRP goals and mandates, to support long-term mercury monitoring, and to synthesize, interpret and translate scientific findings that relate to policy questions on this issue. *Dr. Thompson, SPHB*, is on the steering committee for this meeting.

The NIEHS is sponsoring a workshop to examine interactions between environmental exposures and infectious agents and their role in the etiology of human disease. The workshop will be held in the Rodbell Auditorium on September 8-9. The workshop will bring together experts in the field to discuss the relationship and interaction between environmental exposures and infectious vectors (viruses, bacteria, fungi, parasites). The goal of the workshop is to utilize the input and expertise of the invited participants to determine the most appropriate and productive directions for future research announcements and opportunities, and to establish a cohesive long term research agenda to improve human health through the development of intervention and prevention strategies and new therapeutics. The planning committee is comprised of *Drs. Humble and Nadadur, COSPB; Drs. Allen and Nesbitt, SRB; Drs. Balshaw, Suk and Carlin, CRIS; Drs. Dilworth and Maul, SPHB*; Dr. Kleeberger, DIR; Dr. Karl Western, National Institute of Allergy and Infectious Disease; Dr. Sadis Matalon, University of Alabama Birmingham; Dr. Ellen Silbergeld, Johns Hopkins University; and Dr. Peter Spencer, Oregon Health Sciences University.

Members of the NIEHS' Division of Extramural Research and Training, National Toxicology Program and Division of Intramural Research are planning a trans-NIEHS Workshop, "Needs and Approaches for Assessing the Human Health Impacts of Exposure to Chemical Mixtures," to be held September 26-27, in Research Triangle Park, North Carolina. The objectives of this workshop include: (1) providing the state-of-the science pertaining to chemical mixtures research; (2) providing a prioritized list of research areas (3) developing a long-term coordinated NIEHS Mixtures research agenda; (4) providing input into the development of the NTP Mixtures Program (5) identifying an extramural niche in mixtures; and (6) developing collaborations between NIEHS scientists and extramural researchers. An agenda for the workshop is also currently under development.

STAFF CHANGES

Dr. J. Patrick Mastin has been named as the permanent Deputy Director of DERT.

Dr. Claudia Thompson has been named as the permanent Chief of the Susceptibility and Population Health Branch.

Arrivals:

Ms. Wynonah Sessoms, has Supervisory Extramural Support Program Specialist at NIEHS for the Division of Extramural Research and Training (DEAS). She came from the National Institutes of Health (NIH) in Bethesda, Maryland where she was the Lead Extramural Support Assistant for Surgical Sciences, Biomedical Imaging and Bioengineering (SBIB) at the Center for Scientific Review for two years.

Ms. Yolanda Eskridge-Nyass has joined DEAS she is the Extramural Support Assistant for DERT, Office of the Director. She came from the Internal Revenue Services (IRS) in Decatur, Georgia, where she was an Tax Compliance Officer for 3 years.

Ms. Kindra Morrison has joined DEAS as an Extramural Support Assistant for Scientific Review Branch. She came from Environmental Protection Agency (EPA) in Research Triangle Park, North Carolina.