

FEATURED ACTIVITIES of DERT **May 2009**

MEETINGS

3rd Annual CounterACT Network Research Symposium

April 14-16, 2009
Omni Shoreham Hotel
Washington, D.C.

Background: The overarching goal of the Countermeasures Against Chemical Threats (CounterACT) program is to enhance medical response capability during emergency situations; specifically, the goals of the program are the rapid development of therapeutics to treat the civilian population after exposures to chemical threats as well as detectors that may be used in the field to detect specific biomarkers of exposure and effect of these agents. The 2009 CounterACT Network Research Symposium brought together all of the investigators funded through the CounterACT Program to discuss progress to date as well as to share key concepts and potential areas of collaboration in the development of these new treatments and detectors. In addition, Program Staff involved with the CounterACT program use this forum as one part of their evaluation of the previous year's progress. All awards made in this program use a Cooperative Agreement mechanism, and include SBIR, Research Project, and Center awards.

Summary: After introductory comments from Dr. Story Landis, Director, NINDS, Dr. Ernie Takafuji, Director, Office of Biodefense Research Affairs, NIAID, and Dr. David Jett, CounterACT Program Director, NINDS, presentations were grouped into seven concurrent sessions based primarily on type of threat agents (cyanide, pulmonary agents, vesicants, and nerve agent sessions) with a total of 48-CounterACT related presentations. Highlights of the meeting included a series of talks from speakers of related organizations including BARDA (Biomedical Advanced Research and Development Authority - Drs. Robin Robinson and Sue Cibulsky) and FDA (Food and Drug Administration - Drs. Andrea Powell [CDER: Center for Drug Evaluation and Research] and Don Fink [CBER: Center for Biologics Evaluation and Research]). Dr. Carol Green, from SRI, a contract organization, discussed what is available to the CounterACT investigators through the CounterACT Preclinical Development Facility. Finally, Dr. David Siegel, NICHD, gave a presentation focused on the specific vulnerabilities of the fetus to exposures to nerve agents. Poster sessions were held during extended lunch hours and on Wednesday evening to provide the investigators and students time to network and exchange information. *Dr. Elizabeth Maull, SPHB*, chaired the session on Pulmonary Agents, the area in which most of the NIEHS awards were assigned. Overall, very good progress was demonstrated by the CounterACT investigators, with several lead therapeutic treatments identified for priority development.

This 3rd meeting represented the midpoint of the program. A review panel was established to provide an outside perspective of how well the investigators are meeting the requirements of the program. Included on the panel were Drs. Peter A. Ward (Chair), University of Michigan; James C. Cloyd, University of Minnesota; Janet Moser, Department of Homeland Security; David Greenhalgh, Shriners Hospital for Children (Northern California); Brad Leissa, FDA; Ronald Manning, BARDA/ASPR/HHS; Lewis Nelson, New York City Poison Control Center; Jonathan Newmark, US Army; Jerry Thomas, CDC; and Neil Upton, GlaxoSmithKline. Dr. Maull attended the Review Committee Meeting immediately after the close of the 3rd Annual CounterACT Symposium.

The CounterACT Pulmonary Scientific Interest Group held a satellite symposium titled "Countermeasures Against Injury from Inhaled Chlorine" at the Omni Shoreham on 13 April, prior to the Annual Meeting. Four sessions included discussions related to whole animal versus nose only exposures, chlorine injury to mammalian respiratory and cardiovascular systems, countermeasures to chlorine injury and a summary and future directions. The program planning committee was made up of Drs. Gary Hoyle, University of Louisville; Madhu Nambiar, Walter Reed Army Institute of Research; and Carl White, National Jewish

Medical and Research Center, with Sadis Matalon, University of Alabama and Elizabeth Maull, NIEHS, acting as Co-chairs for the symposium. The CounterACT Pulmonary Scientific Interest Group intends to publish the proceedings of the symposium.

**“Emerging Evidence for Epigenomic Changes in Human Disease” and satellite meeting
“Exploring International Epigenomic Coordination.”**

March 16-17, 2009, Natcher Auditorium, NIH

March 18, 2009, Marriott Pooks Hill.

Introduction: This meeting was held to publicize and provide outreach to the scientific community relating to the Epigenomics of Human Health and Disease RFA of the Epigenomics Roadmap initiative, on which NIEHS is the lead. *Dr. Lisa Chadwick, COSPB*, was the NIEHS representative on the planning committee for this meeting. Twenty two internationally recognized scientists, including several NIEHS grantees, were invited to speak, spanning a broad range of topics in the area of epigenetics of disease. The meeting was enthusiastically received by the scientific community with over 600 registrants; registration for the meeting quickly reached capacity, as did an overflow room. A satellite meeting was also held to discuss the possibility of organizing an international consortium for epigenomics research. Scientists and funding agency representatives from Australia, the United Kingdom, Korea, Canada, Singapore, Switzerland, China, Japan, the NIH and the European Commission were present at the meeting.

Highlights: Both meetings were very successful. *Dr. Frederick Tyson, COSPB*, moderated the first session, in which three of our mapping center grantees spoke about their progress in mapping reference epigenomes, as well as some of their own work. *Dr. Kim McAllister, SPHB*, moderated a session entitled “Epigenetics, Environmental Exposures and Contribution to Disease.” This session included a talk by NIEHS grantee *Dr. Michael Skinner, Washington State University*, who discussed his work on transgenerationally-inherited epigenetic changes in response to fetal exposure to the fungicide vinclozolin, as well as an intriguing talk by *Dr. Moshe Szyf, McGill University*, who hypothesized that socio-economic status could also impact a person’s epigenetic profile and disease susceptibility. *Dr. Chadwick* moderated a session on epigenetics and disease that featured one of the most exciting talks of the meeting; *Dr. Nathaniel Heintz, Rockefeller University*, described a novel form of DNA methylation identified in his lab.

The international meeting was also very well received. There was considerable interest in forming a larger international consortium for epigenetics research. Talks from NIH staff or grantees involved in other large-scale consortia, like ENCODE (Encyclopedia of DNA Elements), highlighted some of the potential issues to consider in forming such a consortium.

Recommendations: The international epigenomics consortium will begin to move forward. A planning meeting was discussed and an interim organizing committee was put together. At this time the committee includes *Drs. John Satterlee, National Institute on Drug Abuse, Peter Jones, University of Southern California, and Jacques Remacle, European Commission*, who will meet by teleconference. NIEHS program staff should be involved with this important effort if possible. Attendees developed the following mission statement for the group:

“The goal of the international human epigenome consortium is to identify all the chemical changes and relationships among chromatin constituents that provide function to the DNA code, which will allow a fuller understanding of normal development, aging, abnormal gene control in disease, as well as the role of the environment in human health. The consortium will integrate and recommend international standards for data production and analysis, provide to make rapid progress in detecting, preventing, and treating serious human conditions.”

The group also plans to hold a satellite meeting at a larger, international epigenetics meeting to obtain input from the broader scientific community. The organizational committee will begin to plan this meeting. In addition, the committee is developing a draft guideline policy based on that used by the International Cancer Genome Consortium (ICGC).

DEPT PAPERS OF NOTE

Pesticide Exposure Raises Risk of Parkinson's Disease

Beate Ritz, M.D., Ph.D.

University of California Los Angeles

P30ES007048, R01ES010544, and U54ES012078

NIEHS funded epidemiologists at the University of California Los Angeles found that exposure to the combination of the fungicide maneb and the herbicide paraquat increased the risk of later development of Parkinson's disease. For people diagnosed with the degenerative disease prior to age 60, the risk was increased four- to six-fold.

The study reports that living within 500 meters of agricultural operations where the pesticides were sprayed increased residents risk by 75 percent. The exposures occurred between 1975 and 1999 and the timing of the exposure proved to be a critical factor in the study. For people who were diagnosed at early ages, the exposure occurred when they were children, teens or young adults. The study participants included 368 long-term Central Valley residents with Parkinson's.

The research team developed a geographic information system approach for estimating exposure based on California pesticide-use records. All addresses for the study participants were used to give an accurate estimate of their total exposure from 1974 through 1999 coinciding with the dates of the pesticide-use records.

According to the study's senior author, Beate Ritz, the new study confirms previous observations in animal studies that exposure to multiple chemicals may increase the effects of each chemical and that the timing of the exposure is an important risk factor.

Citation: Costello S, Cockburn M, Bronstein J, Zhang X, Ritz B. Parkinson's disease and residential exposure to maneb and paraquat from agricultural applications in the central valley of California. *Am J Epidemiol.* 2009 Apr 15;169(8):919-26. Epub 2009 Mar 6.

Solution Found to Increase Nanotube Luminescence

Fotios Papadimitrakopoulos, Ph.D.

University of Connecticut

R01ES013557

Chemists at the University of Connecticut have found a way to increase the luminescence efficiency of single-walled carbon nanotubes, which could lead to better use of nanotechnology in medical imaging and other applications. Increasing the luminescence efficiency of carbon nanotubes could lead to their use in detecting tumors, arterial blockages and other internal problems that are now diagnosed with potentially harmful x-rays, radioactive dyes or more invasive methods. Physicians could scan patients with a device that would capture a very sharp image from the light given off by the carbon nanotubes.

Previous work in this and other laboratories had only been able to raise the light emitted from nanotubes by 0.5 percent. The new discovery is best described as a chemical sleeve wrapped tightly around the nanotube which reduces exterior defects. The chemical used is a derivative of vitamin B-12,

also known as flavin. The flavin molecules “self-assemble” into a tube that adsorbs to the carbon nanotube.

The researchers claim that the act of self-assembly not only forms a new tubular structure, but that it actively cleans the surface of the underlying nanotube. The cleaned nanotubes achieve luminescence efficiency as high as 20 percent.

The researchers are working closely with the university to patent their discoveries and license them to corporate partners. They anticipate that a number of important applications may be possible as the result of their discoveries including medical devices and in biosensor applications.

Citation: Ju SY, Kopcha WP, Papadimitrakopoulos F. Brightly fluorescent single-walled carbon nanotubes via an oxygen-excluding surfactant organization. *Science*. 2009 Mar 6;323(5919):1319-23.

Nasal Injury in Rats Exposed to Diacetyl may be Predictive of Lung Injury in Humans

John B. Morris, Ph.D.

University of Connecticut

R01ES014041

Exposure to the butter flavor ingredients diacetyl and butyric acid has recently been found to cause a respiratory condition called bronchiolitis obliterans. The popular press has dubbed the condition “popcorn workers lung” because it is otherwise a rare condition but strikes workers in the popcorn industry at a much higher rate than the general population. The condition causes scarring of the lungs inhibiting normal respiration.

NIEHS supported scientists investigating the health effects of butyric acid and diacetyl have discovered that the severity of airway injuries in rats above the level of the lung are predictive of similar injuries in human lung tissue. The current results suggest that simultaneous exposure to butyric acid and diacetyl may increase the toxicity and potential lung injury caused by diacetyl. Butyric acid is a potent inhibitor of an enzyme, diacetyl reductase, that metabolizes diacetyl. These findings highlight the need to consider the multiple components of butter flavoring vapors in comprehensive risk assessments and safety evaluations.

Citation: Morris JB, Hubbs AF. Inhalation dosimetry of diacetyl and butyric acid, two components of butter flavoring vapors. *Toxicol Sci*. 2009 Mar;108(1):173-83.

Increased Immunoglobulin in Children with Autism

Irva Herts-Picciotto, Ph.D.

University of California Davis

P01ES011269 and R01ES015359

New data on autism from NIEHS-supported grantees at the University of California Davis presents additional information that immune dysfunction is associated with autism disorders. Previous reports have shown abnormal immunoglobulin levels, including increases in blood levels of autoreactive antibodies in people with autism.

Since IgG is the predominant antibody isotype found in the blood, the researchers hypothesized that an altered immune response could result in an abnormal IgG profile in children with autism. They measured plasma levels of four different isotypes of IgG in 241 children from the Childhood Autism Risks from Genetics and the Environment study, a large epidemiologic case-control investigation. The study included 114 children with autism disorder, 96 typically developing control children, and 31 children with developmental delays.

They found significantly increased levels of the IgG4 subclass in children with autism disorder as compared with the control children and the children with developmental delays. The results suggest an underlying immunological abnormality in children with autism disorder. The researchers conclude additional investigation is necessary to determine the relationship between immunological findings and behavioral impairments in autism.

Citation: Enstrom A, Krakowiak P, Onore C, Pessah IN, Hertz-Picciotto I, Hansen RL, Van de Water JA, Ashwood P. Increased IgG4 levels in children with autism disorder. *Brain Behav Immun.* 2009 Mar;23(3):389-95.

Nanotechnology Delivers - First Report of Targeted Killing of Tumor Cells

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University of Connecticut
R01ES013557

Within the family of nanomaterials, carbon nanotubes have emerged as a new alternative and efficient tool for transporting drugs. In new research sponsored by NIEHS, researchers report the first targeted killing of cancer cells in animals using a single wall carbon nanotube drug delivery system.

Single-walled carbon nanotubes are on the order of a few nanometers (about 1/50,000th of the width of a human hair) in diameter and can be several millimeters in length. They have many novel properties that make them potentially useful in a number of applications including electronics, optics, material sciences, architecture, and as targeted drug delivery devices.

In the current study, carbon nanotubes were conjugated with the anti-cancer agent cisplatin along with epidermal growth factor to specifically target head and neck squamous carcinoma cells in mice. *In vitro* experiments showed that cancer cells treated with carbon nanotubes bound to cisplatin and epidermal growth factor killed selectively. Control treatments that did not include epidermal growth factor did not affect cell proliferation. *In vivo* experiments demonstrated rapid regression of tumor growth in mice treated with carbon nanotubes with both cisplatin and epidermal growth factor. Other studies showed that without epidermal growth factor, carbon nanotubes were cleared from the treated areas in less than 20 minutes. These results point to the potential of carbon nanotubes as targeted anticancer drug delivery systems.

Citation: Bhirde AA, Patel V, Gavard J, Zhang G, Sousa AA, Masedunskas A, Leapman RD, Weigert R, Gutkind JS, Rusling JF. Targeted killing of cancer cells *in vivo* and *in vitro* with EGF-directed carbon nanotube-based drug delivery. *ACS Nano.* 2009 Feb 24;3(2):307-16.

New Genetic Markers Identified for Increased Heart Attack Risk

Myocardial Infarction Genetics Consortium
NIEHS Grant P30ES007033

An international team of scientists partially supported by NIEHS has found nine new gene variants, also known as single nucleotide polymorphisms, associated with an increased risk of myocardial infarction or heart attack. These polymorphisms provide new insight for understanding genetic patterns of heart attack and for developing new treatment options.

One key finding of the report is that people that carry more than one of the markers have more than twice the risk for heart attack. The scientists performed a genome-wide scan of thousands of patients with hundreds of thousands of genetic markers. Heart attack patients, previously enrolled in an existing study, and healthy control persons participated in the study. In one study, suspect genes were mapped to

chromosomes 3 and 12. One of these genes, known as MRAS, plays an important role in cardiovascular biology. Another gene, HNF1A, is closely associated with cholesterol metabolism. Another study identified three previously unknown genes on chromosome 2, 6, and 21. Results from this study show that the higher the number of disease genes a person has, the higher the risk for heart attack.

The scientists conclude that the knowledge gained from their work will aid in addressing the risk of heart attack in order to develop preventive and early intervention strategies.

Citation: Myocardial Infarction Genetics Consortium. Genome-wide association of early-onset myocardial infarction with single nucleotide polymorphisms and copy number variants. *Nat Genet.* 2009 Mar;41(3):334-41.

Autism Increase Not Due to Better Diagnosis

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P01ES011269 and R01ES015359

A study conducted by NIEHS-funded researchers at the University of California Davis found that the seven- to eight-fold increase since 1990 in the number of children born in California and later diagnosed with autism cannot be explained by changes in how the condition is diagnosed or counted. The researchers also conclude that the trend is not slowing and suggest that the research focus should shift from genetics to the multitude of chemical and infectious agents in the environment that could be involved in the rapid rise in the incidence of autism.

The results of the investigation show that the incidence of autism by age six in California increased from fewer than 9 cases per 10,000 children born in 1990 to more than 44 per 10,000 children born in 2000. Migration patterns and changes in diagnosis were ruled out as possible reasons for the increase. The results show that less than one-tenth of the increase can be attributed to the inclusion of milder cases of autism.

These researchers are currently involved in two large studies aimed at discovering possible environmental factors and gene-environment interactions responsible for autism. They are focusing on the potential effects of metals, pesticides, and infectious agents on neurodevelopment.

Citation: Hertz-Picciotto I, Delwiche L. The rise in autism and the role of age at diagnosis. *Epidemiology.* 2009 Jan;20(1):84-90.

Extreme Temperature and Mortality Risk

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R01ES012054

A study on weather-related mortality conducted by Yale University researchers with funding from NIEHS found that extremes of hot and cold temperatures are risk factors for all cause mortality. The study was conducted in 107 communities in the U.S. and it identified regional variation, susceptible populations, acclimatization strategies, and air pollution as mediating factors.

Previous studies have identified links between mortality and temperature extremes, and extreme weather events such as the 2003 European heat wave and the concerns over global climate change have focused more attention on the issue. The researchers point out that a better understanding of how temperature affects mortality and susceptible populations is critical for the medical community, community leaders and policy makers responsible for intervention strategies.

Results show that heat-related mortality has a shorter lag time than cold-related mortality suggesting differences in intervention strategies. The strongest heat-related mortality association occurred with previous or same day exposure while cold-related mortality lagged up to 25 days suggesting that cold temperatures more indirectly affect mortality than heat. Some of this lag is attributable to death from infectious diseases.

Heat effects were generally lower in communities with higher average temperatures suggesting that communities and individuals can adapt even to extreme weather changes. However adaptation to extreme cold even in communities with average lower temperatures was not as apparent.

Citation: Anderson BG, Bell ML. Weather-related mortality: how heat, cold, and heat waves affect mortality in the United States. *Epidemiology*. 2009 Mar;20(2):205-13.

Clean Air Extends Life Expectancy

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P30ES00002

New NIEHS-supported research findings published in the *New England Journal of Medicine* claim that improvements in air quality over the last 20 years have increased average life expectancy in the U.S. by approximately five months. Researchers at Brigham Young University and the Harvard School of Public Health tracked particulate matter air pollution in 51 major metropolitan areas from 1978 through 2001 and compared those data to death records and census data. On average, life expectancy increased by 2.72 years with about 15 percent of that increase due to improved air quality. Cities that had the greatest air quality improvements saw the greatest gains in life expectancy. Overall, a reduction of 10 micrograms per cubic meter in the ambient air concentration of particulate matter was associated with an estimated increase in average life expectancy of 0.61 years.

The study signals that efforts to curtail the small, toxic particles known as PM_{2.5} produced by power plants, factories, cars, and trucks and inhaled by city-dwellers had significant health benefits over those two decades. Clean-air advocates and public health specialists have touted the findings and have said that even stronger standards for air pollutants are needed and justified.

Research over the past few decades has investigated particulate matter air pollution. The foreign matter inflames lung tissue, which leads to an increase in plaque build-up in arteries contributing to heart and lung disease.

Citation: Pope CA 3rd, Ezzati M, Dockery DW. Fine-particulate air pollution and life expectancy in the United States. *N Engl J Med*. 2009 Jan 22;360(4):376-86.

Variations in Human Gut Microbiome Linked to Obesity

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Marine Biological Laboratory, Woods Hole, Massachusetts
P50ES012742

A study partially funded by NIEHS and published in the journal Nature has found that the gut microbial population in humans is unique to each individual and that there are substantial differences between obese and lean people. Researchers at the NIEHS funded center at the Marine Biological Laboratory in Woods Hole, Massachusetts participated in the study.

The researchers analyzed the gut microbiomes of lean and obese, fraternal and identical female twins and their mothers. They found that the collection of bacteria is similar in related individuals, but not identical. The study participants are part of a long-standing study of Missouri-born twins designed to decipher the influence of the environment versus genetics on many aspects of human health.

Peter Turnbaugh, lead author of the study and a graduate student at Washington University, sequenced the microbial DNA of a subset of obese and lean twin pairs. He found that the obese individuals had an increase in nearly 300 bacterial genes primarily responsible for extracting calories from food and processing nutrients. These findings support earlier work in mice that established a connection between obesity and energy harvested from the diet by gut bacteria.

Family members were more likely to harbor similar communities of bacteria; however the degree of similarity was the same for identical and fraternal twins regardless of whether they lived together or in different regions of the U.S. This finding suggests that early environmental exposures play a key role in determining which bacteria colonize our intestinal tracts.

Citation: Turnbaugh PJ, Hamady M, Yatsunencko T, Cantarel BL, Duncan A, Ley RE, Sogin ML, Jones WJ, Roe BA, Affourtit JP, Egholm M, Henrissat B, Heath AC, Knight R, Gordon JI. A core gut microbiome in obese and lean twins. Nature. 2009 Jan 22;457(7228):480-4.

MicroRNAs Modulate Smoking Damage

Avrum E. Spira, M.D.

Boston University Medical Center

U01ES016035

A multidisciplinary study conducted at Boston University identified 28 microRNAs that are differentially expressed in bronchial airway epithelial cells from smokers compared to non-smokers. These microRNAs regulate gene expression changes occurring in people who smoke and who get smoking-related diseases, according to the study's senior author Dr. Avrum Spira.

The investigators harvested samples of cells from 10 smokers and 10 non-smokers. The majority of the microRNAs were down-regulated in smokers suggesting that restoration of expression to more normal levels could protect smokers from smoking-related diseases, such as emphysema and lung cancer. Mir-218 was identified as a key microRNA for controlling a group of genes involved in protection of lung tissues from oxidative damage.

The investigators speculate that mir-218 is crucial in preventing lung injury and thus the potential development of lung disease. Mir-218 activity could also be used as a marker for lung injury and might be useful in predicting which people are more likely to develop lung diseases as a result of smoking.

Citation: Schembri F, Sridhar S, Perdomo C, Gustafson AM, Zhang X, Ergun A, Lu J, Liu G, Zhang X, Bowers J, Vaziri C, Ott K, Sensinger K, Collins JJ, Brody JS, Getts R, Lenburg ME, Spira A. MicroRNAs as modulators of smoking-induced gene expression changes in human airway epithelium. Proc Natl Acad Sci U S A. 2009 Feb 17;106(7):2319-24.

New Treatment Found for Ozone-Caused Wheezing

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NIEHS Grants P30ES011961 and R01ES016126

A collaborative team of researchers at NIEHS and Duke University have discovered a cause of airway inflammation and irritation in response to breathing ozone, a common air urban air pollutant. Research over the past few decades has investigated particulate matter air pollution. The foreign matter inflames lung tissue, which leads to an increase in plaque build-up in arteries contributing to heart and lung disease. This is a dangerous condition in people with breathing abnormalities such as chronic obstructive pulmonary disease and asthma.

Using an animal model, the research team found increased amounts of a sugar known as hyaluronan and found the compound to be directly responsible for the airway constriction and irritation. The researchers think hyaluronan may contribute to asthma symptoms in humans also.

Adding to the importance of this work, the team identified several proteins which can alter the hyaluronan effect and that might be useful treatments for asthma. They were able to block the hyaluronan effect by administering a natural protein that binds to hyaluronan and thus prevents it from causing the airway irritation. The researchers conclude that pharmacologic modification of hyaluronan is a potential target for treatment of reactive airway disease.

Dr. John W. Hollingsworth, the senior author of the study, is a recipient of an Outstanding New Environmental Scientist award from NIEHS.

Citation: Garantziotis S, Li Z, Potts EN, Kimata K, Zhuo L, Morgan DL, Savani RC, Noble PW, Foster WM, Schwartz DA, Hollingsworth JW. Hyaluronan mediates ozone-induced airway hyperresponsiveness in mice. *J Biol Chem.* 2009 Jan 21.

PAPERS by DERT STAFF

Chadwick LH, Chadwick BP, Jaye DL, Wade PA. The Mi-2/NuRD complex associates with pericentromeric heterochromatin during S phase in rapidly proliferating lymphoid cells. *Chromosoma.* 2009 Mar 19. [Epub ahead of print]

GRANTEE HONORS and AWARDS

Palmer Taylor, Ph.D., University of California San Diego Superfund Basic Research Training Grant, Director of Training Core, was awarded the 2009 American Society for Pharmacology and Experimental Therapeutics (ASPET) Axelrod Award at the Experimental Biology meeting April 18. The Julius Axelrod Award in Pharmacology was established to honor the memory of the eminent American pharmacologist who shaped the fields of neuroscience, drug metabolism and biochemistry and who served as a mentor for numerous eminent pharmacologists around the world. The Award is presented annually by ASPET for significant contributions to understanding the biochemical mechanisms underlying the pharmacological actions of drugs and for contributions to mentoring other pharmacologists. Dr. Taylor will present the Julius Axelrod Lecture at the Experimental Biology meeting in 2010.

Kathleen M. McCarty, Sc.D., M.P.H, former doctoral student in the Harvard University Superfund Basic Research Program is one of ten scientists named as Environmental Health Science Communication Fellows, a program sponsored by Environmental Health Sciences (EHS), publisher of Environmental Health News (www.environmentalhealthnews.org) and The Daily Climate (www.dailyclimate.org). Each Fellow will receive a \$5,000 stipend for the year-long appointment. As part of this group she will work to

increase public awareness and understanding of environmental health science as Science Communication Fellows.

The Fellows program trains junior scientists to communicate and promote new research findings to the public and the media. Unique to the program is the use of scientists to find and place into context important new research results. This innovative training program puts the Fellows at the interface between science and journalism to address the large gap between current frontiers of environmental health science and public understanding of the discipline.

Every month, the Fellows will identify and translate important, newly published research results about the environment and its links to human health. Their published summaries will make the research conclusions more accessible to reporters and to a broader public audience. They will also write brief reviews commenting on how the media cover the science behind environmental health issues.

Dr. McCarty is an Assistant Professor in the Division of Environmental Health Sciences, with a joint appointment at the Yale University School of Medicine and the Graduate School of Arts and Sciences. She is a molecular epidemiologist who studies gene-environment interactions and host susceptibility factors and their influence on biomarker response and disease risk or survival. Her primary areas of interest include environmental exposure to metals, as well as breast cancer epidemiology.

Courtney Kozul, a student in the Dartmouth University Superfund Training Program, won four awards at the Society of Toxicology Annual Meeting, held in Baltimore, Maryland, March 15-19.

Kozul's research, exploring the effects of chronic low doses of arsenic ingested via drinking water, earned her the Women in Toxicology Vera W. Hudson and Elizabeth K. Weisburger Scholarship Fund Student Award, the Northeast Society of Toxicology 3rd place Graduate Student Travel Award, the Molecular Biology Specialty Section 1st Place Graduate Student Research Competition, and a graduate student travel award from the meeting organizers.

The awards point to the quality of research and caliber of students trained by the SBRP. According to Josh Hamilton, Kozul's research advisor and professor in the Dartmouth Medical School Pharmacology and Toxicology Graduate Program, "The success of her project also highlights how the interdisciplinary environment of the Superfund Training Program fosters high-caliber, innovative and highly translational science that addresses real-world problems."

STAFF ACTIVITIES

Dr. Nadadur, COSPB, and Dr. George Leikauf, University of Pittsburg, chaired a lunch time scientific session entitled, "Translational Research Efforts on Pulmonary Disease and Genetic Susceptibility to Air Pollution" at the annual meeting of American Thoracic Society on May 19th in San Diego, California. Speakers at this session included NIEHS grantees Drs. Leikauf, Andrew Fontenot, University of Colorado at Denver, and Dr. Steve Kleeberger, Acting Deputy Director, NIEHS and Dr. Sri Nadadur.

Dr. Gray, SPHB, organized and moderated three sessions at the Pediatric Academic Societies Annual meeting, which was held in Baltimore Maryland, May 2 -5: "Epigenomic Changes Related to Environmental Exposures in Children," Contributing Factors That Influence the Relationship between Environmental Exposures and Children's Health," and Environmental Influences on Development Disorders and Dysfunction in Young Children." Each session highlighted emerging areas of research and lessons learned within the NIEHS and EPA Children's Environmental Health Centers and the NIEHS Children's Environmental Health Research Program.

Drs. Nadadur and Heindel, COSPB, chaired a session at the Society of Toxicology (SOT) meeting on May 16 entitled "Grantsmanship Forum: Tools and Skills to Navigate Research Funding." This session was endorsed by the Career Resources and Development subcommittee of SOT. About 150 participants, mostly postdoctoral fellow, early investigators and graduate students attended this session. *Dr. Shreffler, COSPB*, co-chaired an Education and Career Development Session on the Future of Environmental Health Science on March 17. The session featured talks by three of the NIEHS funded Outstanding New Environmental Health Scientist (ONES) Awardees. The ONES program is a highly competitive research grant for early stage grantees who are expected to make an impact on the future direction of environmental health science research. This is the second year a session featuring ONES awardees has been presented at the SOT meeting.

NIEHS WETP hosted a grantee meeting and workshop, "Local, State and Federal Partnerships for Chemical Preparedness and Response," April 29-May 1, in Cincinnati, Ohio. The spring workshop shared knowledge, materials, and resources for chemical and all-hazards preparedness. *Dr. Collman, DERT/OD*, participated in this event, speaking on "Partnerships for Environmental Health (PEPH)" and how this activity can be integrated into the new challenges that we face. The meeting also reviewed a new draft training tool that addresses the health and safety hazards that response and recovery workers face following a chemical incident.

Dr. Heindel, COSPB, was invited to an invitation only one day workshop on Brown Adipose tissue sponsored by NIDDK. The meeting was held on the NIH campus on April 29.

Drs. Heindel and Nadadur, COSPB, developed and implemented a presubmission video conference on the NIEHS Grand Opportunities research agenda on April 24. One hundred and eight scientists signed up to learn the details of the NIEHS Grand Opportunities research opportunities in the area of Bisphenol A nanomaterials research. Part of the program focused on how to write an application for these initiatives. In addition there was a discussion of the review criteria by *Dr. Worth* who represented the Scientific Review Branch team of *Dr. Nesbitt* and himself. They will develop the reviews for these initiatives.

Dr. Heindel, COSPB, represented NIEHS at the University of North Carolina Greensboro, Science Day on April 22. He presented two talks on the research agenda and opportunities at NIEHS and had one-on-one discussion with several researchers interested in environmental health research.

Dr. Heindel, COSPB, was the keynote speaker at a half day meeting on, focused on the NIEHS Small Business and Innovation Research (SBIR) opportunities and Grantsmanship: How to write an SBIR application. This meeting was sponsored by the North Carolina Small Business Technology Development Center and was held at the Hamner Institute on April 21. Over 100 entrepreneurs from the local area attended.

Drs. Heindel, SPHB, Balshaw, CRIS, and Shaughnessy, SPHB, met with Department of Defense personnel on Monday, April 20 (*Drs. David Jackson, Reed Hoyt, and Craig Postlewaite*) to discuss mutual interests in personal exposure assessment and biomarkers of exposure. *Jerry, David and Dan* presented an overview the NIEHS GEI program on sensors and biomarkers including what NIEHS is funding in the GEI area in the SBIR program. DOD representatives presented information about their interests in personal sensors and what the needs of the armed services are in this area. The goal was to first see who is doing what and second to stimulate an ongoing dialogue that could lead to more interaction and collaboration in the area of sensors and biomarkers of exposure. NIEHS Director *Dr. Birnbaum* and DERT Interim Director *Dr. Collman* also spoke to the group.

Dr. Heindel, COSPB, was invited to chair a session on the Role of Environmental Exposures in Altering Thyroid Function at this year's American Thyroid Association Research Summit. The meeting was held in Washington DC, April 16th.

Dr. Heindel, COSPB, was a participant and rapporteur at a two day workshop on the regulatory status of Bisphenol A sponsored by the German Environment Agency. The meeting was held in Berlin, Germany, March 30-31.

Drs. Collman, DERT/OD, Claudia Thompson, CRIS/SPHB, and Kimberly Gray, SPHB, attended the conference, "Translating Science to Policy: Protecting Children's Environmental Health," which was held March 30 on the campus of Columbia University, New York, New York. Dr. Birnbaum, Director, NIEHS, was one of two Keynote speakers.

Mr. O'Fallon, SPHB, was invited to participate in the annual meeting of the State Environmental Health Directors to update them on the Partnerships for Environmental Public Health program and the opportunities for their agencies. Mr. O'Fallon addressed the program's goals, recent funding opportunity, and the PEPH-related challenge grant opportunities. He was able to interact with CDC staff of programs with a focus on environmental public health and update them on the PEPH program, too. The meeting was held March 23-24 in Denver Colorado.

Ms. Beard, WETP, attended and presented an update on activities of the NIEHS Worker Education and Training Program at the Brownfields Federal Partners Meeting on March 18 in Washington DC.

UPCOMING MEETINGS and WORKSHOPS

NIEHS will sponsor a scientific session at the United Mitochondrial Disease Foundation annual meeting in Tyson's Corner, Virginia, on Thursday, June 25. The purpose of this symposium/workshop is to explore the state of the science and technology with experts in the field of mitochondrial physiology and function with the goal of developing biomarkers of mitochondrial dysfunction related to genetics and environmental exposures. The session will feature talks on the effects of environmental exposures on mitochondrial function related to neurological diseases, the use novel technologies for markers of mitochondrial impairment, and current clinical measures of mitochondrial dysfunction with talks by Drs. Tim Greenamyre (University of Pittsburgh), Bruce Cohen (Cleveland Clinic), Gino Cortopassi (University of California, Davis) and Doug Wallace (University of California, Irvine) followed by a discussion on the opportunities and challenges of developing biomarkers of mitochondrial studies for environmental studies. The session/workshop is being planned by NIEHS intramural and extramural staff – Drs. William Copeland and Matthew Longley, DIR, *Daniel Shaughnessy and Kim McAllister, SPHB, Leroy Worth, SRB, and Cindy Lawler, COSPB*.

STAFF CHANGES

Arrivals

Ms. Wanda Boggs joined GMB on May 11. She comes to DERT from Research Triangle International. Mr. Dwight Dolby has come out of retirement to help GMB during the ARRA activities.

Transfers

Ms. Donna Roach transferred from DEAS to GMB on March 15.
Ms. Michelle Victalino transferred from DEAS to GMB on March 15.

Departures

Ms. Lerlita Garcia transferred from GMB to the Veterans Administration in Fayetteville on March 13.