

Report to the National Advisory Environmental Health Sciences Council

Director, NIEHS

June 4-5, 2018

Budget and Legislative Report

FISCAL YEAR 2018 APPROPRIATIONS ENACTED INTO LAW

On March 23, 2018, the President signed into law H.R. 1625, the *Consolidated Appropriations Act, 2018*, making appropriations for all departments and agencies of the federal government for the fiscal year ending on September 30, 2018 (FY2018). This legislation became Public Law 115-141 on the 174th day of Fiscal Year 2018, and followed the enactment of six different Continuing Resolutions, which kept the federal government operating at slightly reduced FY2017 funding levels since Fiscal Year 2017 expired on September 30, 2017. The House of Representatives passed this year-end, omnibus legislation on March 22 by a vote of 256-167 and the Senate passed it on March 23 by a vote of 65-32.

Under this law, the NIEHS receives total appropriations of \$828,492,000—\$751,143,000 under Division H, *Departments of Labor, Health and Human Services, Education, and Related Agencies Act, 2018*, and \$77,349,000 under Division G, *Department of the Interior, Environment and Related Agencies Act, 2018*, for the Superfund Research Program and the Worker Training Program. Additionally, report language contained in the explanatory statement accompanying the final bill under Division D, *Energy and Water Development and Related Agencies Appropriations Act, 2018*, requires the Department of Energy to fund “hazardous waste worker training,” which traditionally is administered by the NIEHS pursuant to an interagency agreement, at \$10,000,000. When accounting for that “pass through” funding, the total budget for the NIEHS in FY2018 would be \$838,492,000—which is the 11th highest amount among the 24 NIH Institutes and Centers that receive annual discretionary appropriations from Congress.

The law provides a total of \$37 billion for the NIH, an increase of \$3 billion above the FY2017 enacted level. Within this amount are targeted increases for several research initiatives, including:

- \$1.8 billion for Alzheimer’s disease research;
- \$543 million for Clinical and Translational Science Awards; and
- \$400 million for the BRAIN Initiative;
- \$351 million for research on combating antibiotic-resistant bacteria;
- \$351 million for Institutional Development Awards (IDeA);
- \$290 million for the “*All of Us*” Program;
- \$100 million for research to develop a universal flu vaccine; and
- \$10 million for regenerative medicine research.

The law also supports a new multi-year Down syndrome research initiative that will expand NIH support for research on Trisomy 21 and related diseases and disorders. Additionally, Section 226 of Division H of the law prohibits the NIH from instituting a cap on reimbursing grantee research institutes for facilities and administrative (F&A) costs and keeps intact application of policy governing such reimbursements as it was applied in the third quarter of FY2017 (45 CFR 75).

FISCAL YEAR 2019 APPROPRIATIONS UPDATE

Fiscal Year 2019 President's Budget Request

On February 12, the President transmitted the FY2019 budget request to Congress. The budget proposes to fund the NIH in FY2019 at \$34.767 billion, and the NIEHS at \$747,166,000—\$693,199,000 through the Departments of Labor, Health and Human Services, Education and Related Agencies Appropriations bill and \$53,967,000 for the Superfund Research Program and Worker Training Program through the Department of the Interior and Environment and Related Agencies Appropriations bill.

HHS Budget Hearings with the HHS Secretary

House LHHS Appropriations Subcommittee Hearing: March 15, 2018

On March 15, the Secretary of Health and Human Services testified before the House Appropriations Subcommittee on Labor, Health and Human Services, Education, and Related Agencies at a hearing about the FY2019 HHS budget request. Thirteen of the 15 Subcommittee members participated at this hearing. Additionally, the Chairman and Ranking Member of the full House Appropriations Committee participated in this Subcommittee hearing as ex officio Subcommittee members, as did the immediate previous Chairman of the full Committee. Topics addressed by members during the March 15 House Subcommittee hearing included:

- Proposed funding for the overall NIH budget;
- Proposed funding for the National Institute on Minority Health and Health Disparities (NIMHD) budget;
- Proposed transfer of the National Institute for Occupational Safety and Health (NIOSH) from CDC to the NIH;
- Creation of a Federal Public Health Emergency Response Fund;
- Legislation designed to help prevent maternal mortality (H.R. 1318);
- CDC development of new public health surveillance data systems;
- Heritable disorders in newborns and children;
- Opioids research and related public-private sector collaboration;
- National HIV/AIDS strategy;
- Costs of prescription drugs; and
- Prevention of rural hospital closures.

Senate LHHS Appropriations Subcommittee Hearing: May 10, 2018

On May 10, the Secretary of Health and Human Services testified before the Senate Appropriations Subcommittee on Labor, Health and Human Services, Education and Related Agencies at a hearing about the FY2019 HHS budget request. Seven of the 20 Senators who participated at the May 10 hearing specifically referenced the NIH as part of their general remarks or as part of their questions directed at the Secretary. These Senators addressed the following topics pertinent to the NIH:

- Proposed funding for the overall NIH budget;
- Alzheimer's treatment research;
- Opioids research;
- Health effects associated with e-cigarettes and vaping;
- Proposed transfer of certain HHS components—including NIOSH from CDC and the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) from the Administration for Community Living (ACL)—to the NIH; and
- Concern about vulnerability of NIH-funded university research to foreign intellectual property theft.

NIH Budget Hearings with the NIH Director

House LHHS Appropriations Subcommittee Hearing: April 11, 2018

On April 11, the House Appropriations Subcommittee on Labor, Health and Human Services, Education, and Related Agencies held its hearing on the FY2019 NIH budget request. The NIH Director testified and was accompanied by four Institute Directors: the NIAID Director; the NICHD Director; the NCI Director; and the NIDA Director. Thirteen of the 15 Subcommittee members participated at this hearing, and addressed the following topics:

- Proposed funding for the overall NIH budget;
- Proposed transfers to the NIH of NIOSH from CDC, the NIDILRR from ACL, and the Energy Employees Occupational Illness Compensation Program (EEOICP) from the Department of Labor;
- Budget proposal to cap the percentage of investigator salary that can be paid with NIH grant funds, and to reduce the dollar limit for salaries paid with NIH grant funds;
- The new trans-NIH research initiative aimed at improving the health and well-being of individuals with Down Syndrome;
- Proposed funding for the NIMHD budget;
- Costs of prescription drugs;
- The Institutional Development Award (IDeA) program;
- NICHD Task Force on Research Specific to Pregnant Women and Lactating Women (PRGLAC);
- NHLBI Framingham Heart Study;
- NIH Helping to End Addiction Long-term (HEAL) Initiative;
- NIH Brain Research through Advancing Innovative Neurotechnologies® (BRAIN) Initiative;
- NIH Cancer Moonshot funding;
- Accelerating Medicines Partnership (AMP); and
- NIH research related to Alzheimer's disease; early detection of cancer; Chronic obstructive pulmonary disease (COPD); Lupus; maternal mortality; medical and recreational marijuana use; Multiple sclerosis (MS); opioids; sickle cell disease (SCD); substance use disorder; Type 1 diabetes; and universal influenza vaccine.

Senate LHHS Appropriations Subcommittee Hearing: May 17, 2018

On May 17, the Senate Appropriations Subcommittee on Labor, Health and Human Services, Education, and Related Agencies held its hearing on the FY2019 NIH budget request. The NIH Director testified and was accompanied by five Institute Directors: the NCI Director; the NIA Director; the NIAID Director; the NIDA Director; and the NINDS Director. Nine Senators participated at this hearing, and addressed the following topics:

- Public-private partnerships for opioids-related research;
- The NIH Strategic Plan for Data Science;
- NCI's pediatric oncology programs;
- NIH's Pediatric Research Initiative;
- The value of the Fogarty International Center, and risk assessment for the Ebola virus;
- Genome editing technologies and CRISPR;
- Health effects associated with e-cigarettes and vaping;
- The "All of Us" Research Program;
- Research relating to Alzheimer's disease; cancer; health effects on adolescents of social media and digital screen exposure; neonatal abstinence syndrome; opioids and non-addictive pain treatment; universal influenza vaccine; and the Zika virus.

Advancement of Fiscal Year 2019 Appropriations Bills

Interior and Environment Appropriations Bill: Funding for NIEHS Superfund-related activities

On Tuesday, May 15, the House Appropriations Subcommittee on Interior, Environment and Related Agencies marked up and reported out its version of the FY2019 Interior and Environment Appropriations bill that funds the Department of the Interior, EPA, and other select agencies—including the Indian Health Service (IHS), the Agency for Toxic Substances and Disease Registry (ATSDR) and NIEHS Superfund-related activities within HHS. In total, the draft bill provides \$35.252 billion, equal to the FY2018 enacted level. The Subcommittee proposes to fund NIEHS Superfund-related activities—that is, the Superfund Research Program and the Worker Training Program combined—at \$80,000,000, which is \$2,651,000 above the FY2018 enacted level of \$77,349,000 and \$26,033,000 million above the President’s requested level of \$53,967,000. This represents a 3.43% increase and would be the first change in funding for this part of the NIEHS budget since FY2014.

The full House Appropriations Committee was scheduled to mark up the bill on May 22, but that markup session was postponed indefinitely.

The Senate Appropriations Committee is scheduled to mark up its version of the FY2019 Interior and Environment appropriations bill the week of June 11-15, 2018.

Labor-HHS-Education (LHHS) Appropriations Bill: Core Funding for NIEHS Budget

The Senate Appropriations Committee is scheduled to mark up its version of the FY2019 Labor, HHS, Education appropriations bill—which provides for the NIH budget except for the NIEHS Superfund-related activities—the week of June 25-29, 2018.

As of this writing, no date has been announced for the markup session to be held by the House Appropriations Committee for its version of the FY2019 Labor, HHS, Education appropriations bill.

Energy and Water Appropriations Bill: DOE-Funding for Hazardous Waste Worker Training

On May 24, the Senate Appropriations Committee marked up and reported out its version of the FY2019 Energy and Water Appropriations bill which funds the Department of Energy, the Army’s Civil Works Program (U.S. Army Corps of Engineers), and the Bureau of Reclamation at the Department of the Interior, among select other federal agencies and commissions. This bill was reported from the Senate Appropriations Subcommittee on Energy and Water Development on May 22. The Senate Appropriations Committee Report, approved at the May 24 markup session as accompanying the approved bill text, directs the Department of Energy (DOE) “to fund the hazardous waste worker training program at \$10,000,000.” This amount falls under the DOE Defense Environmental Cleanup account, which the Senate Appropriations Committee proposes to level fund at \$5.988 billion. Comparatively, the House Appropriations Committee proposes a \$228.8 million (3.82%) reduction to this DOE account and its report is silent on the matter of hazardous waste worker training. This report language—which traditionally is carried in either the House or Senate committee reports—supports the annual transfer of approximately \$10 million from DOE to NIEHS for the NIEHS/DOE Nuclear Worker Training Program.

The House Appropriations Subcommittee on Energy and Water Development approved its version of this legislation on May 7, and the full House Appropriations Committee approved it out on May 16. The House bill, H.R. 5895, is expected to be considered by the full House of Representatives during the week of May 28-June 8 as part of a three-bill “minibus”—that is combined with the

Legislative Branch (H.R. 5894) and the Military Construction-Veterans Affairs (MILCON/VA) Appropriations Acts (H.R. 5786). These will be the first three of 12 annual appropriations bills to reach either the House or Senate floor in the FY2019 appropriations cycle.

NIEHS News and Highlights

NIH Disaster Research Response Program

In March of 2013, NIH Director Dr. Francis Collins joined with former Assistant Secretary of Preparedness and Response Dr. Nicole Lurie, and former CDC Director Tom Frieden in a commentary in the *New England Journal of Medicine* to raise awareness of a number of challenges that impede our nation's ability to perform high quality human health studies in response to emerging threats and disasters. In reference to the importance of disaster research, the authors stated: *"The knowledge that is generated through well-designed, effectively executed research in anticipation of, in the midst of, and after an emergency is critical to our future capacity to better achieve the overarching goals of preparedness and response: preventing injury, illness, disability, and death and supporting recovery"*

The importance of NIEHS helping the nation respond to disasters and emerging threats was identified, with our stakeholders, as one of the goals of our 2012-2017 Strategic Plan:

Goal 5: Identify and respond to emerging environmental threats to human health, on both a local and global scale.

As part of this strategic goal we were called upon to:

1. **Enlist the capacity of the EHS research enterprise** to elucidate information necessary for timely and effective public health action on important environmental issues of concern.
2. **Act proactively with other public health partners** and stakeholders to provide responses to emerging threats and emergencies, both natural and man-made.
3. **Focus on EHS research areas** or situations in which the current lack of knowledge hampers effective decision making and policy development

NIEHS efforts toward the development and launch of the NIH Disaster Response Research (DR2) program have been part of our implementation of this goal. This goal is being carried forward into the update of our Strategic Plan, which will guide us over the next five years.

Why DR2 is needed. In many cases following disasters, long-standing challenges have been often encountered by NIH and our partners resulting in delayed and missed opportunities to perform time-critical research. Examples of some of the challenges that compromise our ability to get timely research into the field and to connect with impacted communities include:

- While FEMA can marshal needed resources to quickly respond to disasters, including acute surveillance, the Federal government lacks the formal regulations, frameworks, or mechanisms to activate and coordinate needed human health research
- There are typically lengthy delays in funding, as seen with efforts that needed special appropriations such as the case for Hurricane Sandy (11 months to initiation) and the Zika response, while incredibly expeditious, 4+ months is still slower than we would like

- The IRB review process, including guidance for ethical considerations and reliance agreements, for disaster research can be too long or difficult to execute in an emergency. As was the case with the H1N1 response, where an antiviral drug was provided through an FDA Emergency Use Authorization nationally to patients without any ability to evaluate or study the safety and efficacy of its use
- The availability of useful and/or validated data collection instruments, forms, and guidance, as well as ready-to-go protocols that can be quickly modified for a specific situation routinely causes additional delays and missed opportunities
- The lack of trained researchers familiar with emergency management and incident command issues, health and safety considerations, or other matters that can impede implementation of studies and create undue risks to staff and participants
- Proactive platforms for engagement and inclusion of diverse stakeholders, including the impacted community, are lacking resulting in low participation, misperceptions and distrust, poorer study designs, and less effective implementation and communications.

Goals of DR2. In the fall of 2013, with initial seed money from the NIH Director's Discretionary fund and NIEHS OD support, we collaborated with NLM to start the NIH Disaster Research Response (DR2) Program. Dr. Aubrey Miller, our Senior Medical Advisor, is the NIEHS lead for this activity, which spans all of the divisions of the Institute. The DR2 Program was created to see if we could improve our NIH, and in turn our nation's, capacity to perform timely human health research in response to disasters and other emerging threats by providing:

- Improved access to human health data collection tools and information for all researchers
- Faster processes including IRB reviews, ethical guidance, decision-making, and funding approaches
- Trained researchers versed in using disaster data collection tools and protocols, and with improved understanding of the disaster management, and health and safety issues to ensure the well-being of staff
- Integration into HHS emergency operations and coordination with other federal agencies and stakeholders to help elevate the importance of disaster science and the value of the NIH expertise, activities, and resources
- Partnering with public health, academia, and impacted workers and communities to foster engagement of our vast network of NIH funded researchers and their partners to help us improve our collective capabilities together.

DR2 Online Repository While most disaster-related research studies describe how the research was conducted (e.g., in the Methods section) very few publish the actual tools used for data collection. This has the effect of hindering the development of new tools and standardized measures, the ability to replicate or reproduce research findings, and ability to make cross-comparisons between studies. To address these issues, one of the first tasks was to create a publicly accessible DR2 Repository of surveys, questionnaires, protocols, and other data collection instruments and materials that had been previously used, or were considered to be useful, for disaster research. NIEHS worked with the National Library of Medicine (NLM) to identify useful tools through targeted literature searches (both peer reviewed and gray literature), searches of other federal agency websites; and reviewing of more than 10,000 abstracts and items of interest. They then incorporated useful "non-disaster" tools that are applicable to disaster situations, such as

leveraging the NIH PHENX and PROMIS databases, as well as databases and materials created by CDC and others. NLM hosts the DR2 website through which users can access the repository.

Currently, the repository contains 345 data collection instruments that focus mainly on human population studies (versus clinical studies), and enable activities including: enrollment and consent; participant tracking; health history and symptoms; mental health; exposure and diet; social support and resiliency, and others. The tools are characterized in the repository in such a way that users can make a rapid assessment of whether or not a tool meets their need for a particular study given the circumstances of the disaster and the setting in which it will be used. Some of the metadata provided for each tool includes:

- Short description and number of Items, which provides a quick synopsis of the elements captured in the questionnaire (anxiety, PTSD, general health, demographics, etc.) as well as the number of questions
- Purpose and Uses, which provides citations of other studies that have used the instrument
- Mode of administration (e.g., Is the questionnaire self-administered or administered by an interviewer?)
- Time to administer (e.g., How long does it take to administer the questionnaire?)
- Population of interest (e.g., children, adults, responders)
- Special interviewer training (e.g., Does the questionnaire require a specialist such as a mental health professional to administer, or can it be administered by a lay person?)

Efforts are ongoing to make these tools as user-friendly as possible to our community of researchers, such as by making them available for download for electronic data collection in the field or for quickly building new questionnaires through inputting them into the NLM common data elements (CDEs) system, which is intended to improve data quality and opportunities for comparison and combination of data from multiple studies and with electronic health records.

RAPIDD Protocol. Another component developed as part of DR2 is a novel NIH human subject, pre-reviewed study protocol called Rapid Acquisition of Pre/Post Incident Disaster Data or RAPIDD. This protocol can be quickly deployed and includes a menu of standardized instruments that can be individually selected to fit the needs of the situation. In addition to health, diet, and exposure information, RAPIDD includes sections for medical testing and the collection of biospecimens.

The development, review, and ultimate approval of the RAPIDD protocol highlighted several ethical and regulatory challenges of the Institutional Review Board process. In response to these challenges, the Office of Human Research Compliance at NIEHS formed a Working Group with the goals of: preparing IRBs for the review of disaster research protocols, outlining duties of the IRB in the rapid review of research involving disaster affected communities, and exploring participant burden and vulnerability of disaster research participants and communities. This Working Group comprises a diverse mix of stakeholders including academic researchers, bioethicists, community advocates, disaster response workers, disaster survivors, regulatory/IRB chairs, and officials from all levels of government. In July 2016, 60 representatives of these groups from 23 states attended a 2.5-day workshop led by Dr. Joan Pakenham from the NIEHS Clinical Research Branch and Dr.

Miller, that led to a set of 15 recommendations around Conducting Science in Disasters. A paper describing these recommendations was published online in September in *Environmental Health Perspectives* [Packenham JP, Rosselli RT, Ramsey SK, Taylor HA, Fothergill A, Slutsman J, Miller A. Conducting Science in Disasters: Recommendations from the NIEHS Working Group for Special IRB Considerations in the Review of Disaster Related Research. *Environ Health Perspect.* 2017 Sep 25;125(9):094503. doi: 10.1289/EHP2378. PubMed PMID: 28949918.]

Networks and Tabletop Training Exercises. Making tools available, however, is not enough—we realized that a committed and ongoing effort is needed in training both researchers and the various other actors they would encounter in a post-disaster situation on the need for access for research and the best way to conduct it so that it does not interfere with critical response efforts. To this end, new networks linking academia, public health, law enforcement, and other government officials; first responders, medical systems, and impacted communities have also been created. NIEHS has been engaging in conversations with our funded research centers and grantees to gauge their interest in participating in disaster research and identify ways in which we might be able to help them contribute their expertise and skills to needed research efforts. Several of our, NIEHS Centers received supplemental funding for DR2 related activities including those at the University of Washington, University of Iowa, Harvard University, MIT, Texas A&M University (for an SRP disaster-focused center), and the University of Cincinnati, which has launched a new DR2 Program for the Cincinnati area in partnership with local public health, hospitals, emergency management, University of Kentucky, the CDC, and others. International interest has also grown. Health Canada began a DR2 Program last summer, and we recently signed an MOU with Japan to work together to advance needed disaster research platforms and resources together in the coming months. Action items include a joint symposium/session at 2018 ISEE/ISES Conference in Ottawa (accepted), bi-directional translation of DR2 materials into Japanese and English for use by the broader research community, contribution by Japan NIES to exposure assessment tools for DR2 website, and development an exercise of the DR2 tools and programs for the Annual Meeting of the Japanese Society of Public Health in Fukushima or another location to be held in 2019. We've also been approached by the Ministry of Health in Thailand to sign a similar MOU focused on research and training in hospital and health systems.

In tandem with the networks, large-scale tabletop exercises have been conducted to test DR2 initiatives and facilitate the implementation of environmental health and exposure research in response to emergencies. Exercises have been held in Los Angeles (tsunami in the port of LA), Houston (scenario almost identical to Hurricane Harvey), and Boston (flooding of East Boston and Chelsea), involving more than 300 participants. An upcoming exercise is planned for Tucson, AZ (chemical exposure scenario with population health impacts and medical treatment investigations) in September 2018. Some of the focus areas of these exercises include:

- The importance for all parties involved to understand the need for research to address both unique and longer-term problems that can help reduce injuries and illness and protect people in the future
- Assessment of the communities' current, real-world capacity to perform such research if a disaster situation were to occur today
- The critical need to coordinate disaster research with many non-traditional partners

2017 Hurricanes. The DR2 efforts have already begun to pay off. In the immediate aftermath of Hurricane Harvey, NIH-funded researchers began: using IRB pre-reviewed protocols and tools from the DR2 repository; leveraging pre-existing relationships and partnering with community organizations, state and local health departments, and others; and joining with researchers funded by other federal agencies (CDC, NSF, NIST, DHS) to maximize effectiveness of research. Some of the activities included [environmental](#) testing of floodwater for microbial contamination, and testing of floodwater, sediments, and soils for chemicals and heavy metals.

Through a time-sensitive research funding announcement, NIEHS has funded six research projects regarding environmental health effects related to Hurricane Harvey to researchers working in the field. Three related studies are working with an existing cohort in communities affected by flooding to explore a number of outcomes. The study investigators deployed wristband environmental sensors, obtained health care questionnaire data, and collected oral, nasal, and fecal biosamples from 150 individuals within 30 days of the hurricane. The new studies plan to extend enrollment to 300 persons and to conduct follow-up at 6 and 12 months.

- **Melissa Bondy** from Baylor College of Medicine will integrate the health data with the wristband exposure and microbiome data; and continue community engagement activities including dissemination of research findings to the affected communities.
- **Kim Anderson** at Oregon State University will use the exposure data to evaluate whether exposure differs with home flooding and area level exposures, as well as the effect of clean-up activities and time on individuals' exposures. The exposure data will also be used in associated studies on the microbiome and health assessments.
- **Joseph Petrosino**, also at Baylor, will combine the exposure and health care questionnaire data to identify microbiome-environment interactions associated with adverse health outcomes, and test the hypothesis that microbiome data better informs flood-related health outcomes than current environmental monitoring.
- **Winifred Hamilton** at Baylor is leveraging an Asthma Control Intervention of high risk asthmatic African Americans who completed the intervention within 12 months of the Hurricane. The project adds a post-Harvey in-home clinical and home assessment and additional follow-up 6 and 12 months later.
- **Marie Lynn Miranda at Rice University** is using data and exposure science to identify who was (and continues to be) exposed to what from the Hurricane, and in so doing establish baseline understanding of the risks for longer term environmental health effects from the storm. The project includes development of an open web platform for storing, sharing, and analyzing data from the greater Houston area that will be made available to the research and public health communities.
- **Kjersti Marie Aagaard** at Baylor will examine the effect of exposure to natural hurricane and flooding disasters on the placental, maternal and infant microbiome in an ongoing cohort of maternal-infant pairs from whom samples have been collected throughout gestation pre-Harvey and compare them to those collected post-Harvey to gain insight into the mechanistic effects of natural disasters on resilient or susceptible maternal and infant microbial communities and their functions, as well as their potential contribution to pre-term birth and secondary skin and respiratory infections.

In July, the Colorado Natural Hazards Center is planning to hold a side-event as part of its annual conference that will bring together funded researchers focusing on the hurricane-affected communities. NIEHS is working with HHS/ASPR to provide funds for NIH grantees to attend.

DR2 and WETP. Our Worker Education and Training Program continues its efforts to facilitate clean-up worker training in Texas, Florida, Puerto Rico, US Virgin Islands, and California (wildfires). Efforts will continue locally from the train-the-trainers completed through our grantees. Local community partners in Houston, led by the organization Fe Y Justicia, held a public forum on December 14, 2017 to highlight the role of day laborers, construction, domestic, and other migrant workers as second responders to climate change disasters, and to build a more grounded understanding of what types of support second responders need as they rebuild their cities and homes, as well as what types of support are available. To address the need for more mental health resiliency training by impacted population and workers, World Cares Center, a sub-grantee out of the New Jersey/New York Consortium for Hazardous Materials Worker Training Center, will deliver a train-the-trainer course on resiliency in early June, in collaboration with grantees at the University of Texas School of Public Health.

DR2 Integration, Coordination, and Engagement. As part of our efforts to promote interaction and communication about various disaster-related activities and interests, NIEHS also initiated an NIH Disaster Interest Group (I-DIG) to share information. This group, led by NIEHS, hosts an annual Federal Interagency Disaster Research Meeting, most recently in April 2018, in which the focus was on improving multidisciplinary coordination and networking between federally funded disaster research centers and grantees. NIEHS also coordinates and promotes NIH efforts with HHS/ASPR Programs and the White House Subcommittee on Disaster Reduction.

Several NIH ICs have partnered with HHS/ASPR, CDC, NSF, and USGS to form a new NASEM Standing Committee on Medical and Public Health Research During Large-Scale Emergency Events. Also, in coordination with NASEM, NIEHS has supported recent NAS Reports:

- *NAS Integrating Clinical Research into Epidemic Response: The Ebola Experience (April 2017)*
- *Strengthening the Disaster Resilience of the Academic Biomedical Research Community: Protecting the Nation's Investment (August 2017)*

Next Steps. The DR2 Program is exploring development of a DR2 Café, an online environment that would enable the leveraging of DR2's libraries of standardized and validated tools and resources with existing NIH activities and databases to help support faster assembly and implementation of clinical and population research protocols. The idea would be that researchers working at their computer could use the NIH DR2 website to readily review, modify, and build research protocols to fit their needs from differing categories or "menus" of tools and resources. The smaller scale would enable a nimbler framework that could also be used as a platform to for other NIH initiatives, such as BD2K.

DR2 is also looking to adapt toolkits for special populations including children, pregnant and lactating women, and families with special needs. Some of the research gaps that need to be addressed for these groups include

- What are the severe short-term and long-term effects on vulnerable populations

- What are appropriate medical countermeasures for affected children and mothers
- How to develop and implement surveys, protocols, etc. for children and maternal populations
- How best to leverage existing federal and other research networks and collaborations relevant to such groups

NIEHS is also working with Drs. Collins, Lurie, and Frieden to develop a 5-year retrospective article of DR2 accomplishments since their 2013 commentary. We invite our extramural and other partners to participate in this effort by helping to ensure that the described progress and activities are fully representative of the strides we are making at NIH to further DR2.

Science Advances

One NIEHS (NIEHS authors' groups in parens)

- ***Effect of cell phone radiofrequency radiation on body temperature in rodents: Pilot studies of the National Toxicology Program's reverberation chamber exposure system.*** Wyde ME [DNTP], TL Horn, MH Capstick, JM Ladbury, G Koepke, PF Wilson, GE Kissling [DIR], MD Stout [DNTP], N Kuster, RL Melnick [DNTP], J Gauger, JR Bucher [NTP] and DL McCormick. *Bioelectromagnetics* (2018) v. 39 (3): pp. 190-199
<http://dx.doi.org/10.1002/bem.22116>
SP Goals 3, 5
- ***Associations between Personal Care Product Use Patterns and Breast Cancer Risk among White and Black Women in the Sister Study.*** Taylor KW [DNTP], MA Troester, AH Herring, LS Engel, HB Nichols, DP Sandler [DIR] and DD Baird [DIR]. *Environ Health Perspect* (2018) v. 126 (2): 027011.
<https://doi.org/10.1289/ehp1480>
SP Goal 4
- ***Cytokine signaling through Drosophila Mthl10 ties lifespan to environmental stress.*** Sung EJ [DNTP], M Ryuda, H Matsumoto, O Uryu, M Ochiai, ME Cook [DIR], NY Yi, H Wang, JW Putney [DIR], GS Bird [DIR], SB Shears [DIR] and Y Hayakawa. *Proc Natl Acad Sci* (2017) [ePub].
<http://dx.doi.org/10.1073/pnas.1712453115>
SP Goals 1c

DNTP

- **A hybrid gene selection approach to create the S1500-plus targeted gene sets for use in high-throughput transcriptomics.** Mav D, Shah RR, Howard BE, Auerbach SS [DNTP], Bushel PR [DIR], Collins JB [DERT], Gerhold DL, Judson RS, Karmaus AL, Maull EA [DNTP], Mendrick DL, Merrick BA [DNTP], Sipes NS [DNTP], Svoboda D, Paules RS [DNTP]. *PLoS One* (2018) 13(2):e0191105.
<https://www.ncbi.nlm.nih.gov/pubmed/29462216>
SP Goals 1
- **The US Federal Tox21 Program: A strategic and operational plan for continued leadership.** Thomas RS, Paules RS [DNTP], Simeonov A, Fitzpatrick SC⁴, Crofton KM, Casey WM [DNTP], Mendrick DL. *ALTEX*. 2018 Mar 8. doi: 10.14573/altex.1803011. [Epub ahead of print]
<https://www.ncbi.nlm.nih.gov/pubmed/29529324>
SP Goal 1
- **HAFts are novel lncRNA transcripts from aflatoxin exposure.** Merrick BA [DNTP], Chang JS [DNTP], Phadke DP, Bostrom MA, Shah RR, Wang X, Gordon O, Wright GM. *PLoS One* (2018) 13(1):e0190992.
<https://www.ncbi.nlm.nih.gov/pubmed/29351317>
SP Goal 1

DIR

- **GATA3 zinc finger 2 mutations reprogram the breast cancer transcriptional network.** Takaku M [DIR], SA Grimm [DIR], JD Roberts [DIR], K Chrysovergis [DIR], BD Bennett [DIR], P Myers [DIR], L Perera [DIR], CJ Tucker [DIR], CM Perou and PA Wade [DIR]. *Nat Commun* (2018) v. 9 (1): 1059 [ePub]
<http://dx.doi.org/10.1038/s41467-018-03478-4>
SP Goal 1c
- **Evidence that DNA polymerase delta contributes to initiating leading strand DNA replication in *Saccharomyces cerevisiae*.** Garbacz MA [DIR], SA Lujan [DIR], AB Burkholder [DIR], PB Cox [DIR], Q Wu, ZX Zhou [DIR], JE Haber and TA Kunkel [DIR]. *Nat Commun* (2018) v. 9 (1): 858 [ePub]
<http://dx.doi.org/10.1038/s41467-018-03270-4>
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 SP Goals 4, 5

Meetings and Events

Past Events

- The **27th Annual Meeting of the Triangle Consortium for Reproductive Biology (TCRB)** brought together regional scientists who conduct basic, translational, and clinical research in reproduction and male and female reproductive tract development and disease. The meeting was held on the NIEHS campus on February 10. Over 100 scientists, fellows, and students from area universities and institutions such as UNC-Chapel Hill, NCSU, Duke, NCCU, East Carolina University, Wake Forest University, UNC-Greensboro, Appalachian State University, NIEHS, the EPA, and RTI International were expected to attend. The conference highlighted the depth of reproductive science being conducted in the Triangle and surrounding areas. Scientists presented their work and awards were given for the best trainee presentations. **SP Goals 1, 2**
- NIEHS and National Toxicology Program Director Linda Birnbaum, Ph.D., brought an environmental lens to global health February 16 during the **Triangle Global Health Career Day**, held at Duke University. NIEHS supports global environmental health through grant-funded research and its Global Environmental Health program, Birnbaum said. She explained that the NIEHS vision is to provide global leadership for innovative research that improves public health by preventing disease and disability. Events included speed mentoring, skill-building sessions, and networking. **SP Goals 5, 8, 9**
- NIEHS sponsors the National Academies' Standing Committee on Use of Emerging Science for Environmental Health Decisions (ESEHD), which hosted the **Informing Environmental Health Decisions Through Data Integration** in Washington DC on February 20-21. The workshop brought together scientists, policymakers, risk assessors and regulators to explore the promise and potential pitfalls of environmental health data integration. Speakers, including Dr. Linda Birnbaum, presented a general framework for data visualization and participants worked together to conceptualize future research directions that could help incorporate these analyses into environmental health decision-making. **SP Goals 7, 11**
- Scientists, environmental advocates, and state and county health officials from across North Carolina travelled to NIEHS on February 23 to attend the inaugural **Endocrine Disrupting Chemical Research in North Carolina (EDC-NC) meeting**. The day-long gathering, which drew approximately 150 people, featured oral and poster presentations on the role of endocrine disruptors on human and ecological health. Jerry Heindel, Ph.D., a former health scientist administrator in the NIEHS Division of Extramural Research and Training, led the group of organizers. Kimberly Gray, Ph.D. and Kembra Howdeshell, Ph.D., both NIEHS health scientist administrators, as well as several NIEHS grantees also served on the organizing committee. **SP Goals 2, 3, 4**
- NIEHS and National Toxicology Program Director Linda Birnbaum, Ph.D., delivered a keynote address at the March 2-5 meeting of the **American Academy of Allergy, Asthma and Immunology (AAAAI)** in Orlando, Florida. She was introduced by NIEHS grantee Dave Peden, M.D., who is the immediate past president of AAAAI and a professor of pediatrics at the University of North Carolina at Chapel Hill (UNC). Birnbaum spoke as the fifth annual

recipient of the AAAAI Foundation and Dr. William and Judith H. Busse Lectureship: Investing Together in Our Future Award. It is one of 10 named lectureships established by the foundation. **SP Goals 3, 4, 5**

- Researchers supported by NIEHS are working to gain a deeper understanding of environmental factors with potential links to breast cancer. They and others spoke March 9 during “**Breast Cancer and the Environment**,” a symposium sponsored by the Duke University Program in Environmental Health and Toxicology and the Duke Superfund Research Center. **SP Goals 1, 2, 3**
- NIEHS and National Toxicology Program (NTP) scientists shared new findings and methodological advances through approximately 100 scientific presentations at the **Society of Toxicology (SOT) 57th Annual Meeting and ToxExpo** March 12-15 in San Antonio. NIEHS staff from the Division of Extramural Research and Training answered questions from potential grantees in the Research Funding Insights room throughout the conference. They also reviewed the results of NIEHS-funded work in numerous oral and poster presentations. Danielle Carlin, Ph.D., from the Superfund Research Program, led a symposium titled “Atherosclerosis as a Model to Understand the Combined Effects of Environmental Chemical and Non-Chemical Stressors.” In a standing-room only session, the Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM), a committee under the NTP Interagency Center for the Evaluation of Alternative Toxicological Methods (NICEATM), continued the rollout of a January 2018 strategic roadmap. **SP Goals 1, 2**
- At the **11th semi-annual Meeting of the Human Heredity and Health in Africa (H3Africa) Consortium** in Kampala, Uganda, three scientists from NIEHS discussed ways to build environmental exposure research into genomics and genetics studies. Members of the consortium gathered March 21-25 in Kampala, Uganda. The H3Africa initiative was established by the National Institutes of Health (NIH) Common Fund and the Wellcome Trust, to correct the extreme imbalance found in worldwide genetics studies, according to a 2014 article in the journal Science. **SP Goals 1, 5, 6**
- A panel of external scientific experts met March 26-28 at NIEHS for the **Peer Review of the Draft NTP Technical Reports on Cell Phone Radiofrequency and Radiation**. The panel of experts recommended that some National Toxicology Program (NTP) conclusions be changed to indicate stronger levels of evidence that cell phone radiofrequency radiation (RFR) caused tumors in rats. The panel agreed with NTP conclusions that there was little indication of RFR-related health problems in mice. The panel reviewed the conclusions of two draft technical reports, one in rats and one in mice, based on 10 years and \$25 million of research. **SP Goals 1, 2, 3**
- The **Understanding the combined effects of environmental chemical and non-chemical stressors: Atherosclerosis as a model workshop** took place on April 3-4. In the first workshop of its kind, clinicians, psychologists, and researchers gathered at NIEHS to explore approaches for studying interactions in the body from exposures to both chemicals and nonchemical stressors. Organizers from NIEHS and the National Heart, Lung, and Blood Institute (NHLBI) selected atherosclerosis as the model disease for the workshop because both types of exposures are known to play a role in its development. Danielle Carlin, Ph.D.,

and two scientists from NHLBI led the organizing effort. They and others will prepare a paper on outcomes from the two days of presentations, discussions, and brainstorming sessions, for publication in a peer-reviewed journal. **SP Goals 1, 3, 4**

- More than 650 women gathered for the fourth annual **Women's Health Awareness Day (WHAD)** at North Carolina Central University (NCCU) in Durham, North Carolina on April 7. WHAD provides a diverse group of women and families from across North Carolina with education, screenings, medical services, and other resources. Individuals from NIEHS provided screenings, environmental health talks, and shared information on participating in clinical research at the institute. This year, participants hailed from 27 counties in the state. Speakers and participants alike voiced their hope that the event will continue to expand. NIEHS co-sponsors WHAD as a way to get involved and give back to the community it serves, according to lead NIEHS organizer Joan Packenham, Ph.D., director of the NIEHS Office of Human Research Compliance. She worked with co-sponsors from the Delta Sigma Theta Sorority, Inc., and the NCCU Public Health Education Department. **SP Goals 4, 6**
- Brian Berridge, D.V.M., Ph.D., Associate Director of the NTP and Scientific Director of DNTP, was one of the organizers and presenters at the **Organs- and Tissues-on-Chips Keystone Symposium**, held in Big Sky, Montana on April 8-12. Organs- or Tissues-on-Chips are innovative, alternative approaches that would enable early indications and potentially more reliable readouts of toxicity and efficacy. This conference touched on ongoing efforts and various applications of tissue-on-chips technology to studies in precision medicine, environmental exposures, reproduction and development, cancer and for use at the International Space Station. **SP Goals 1, 2, 4**
- Scientists from around the world gathered at the National Institutes of Health in Bethesda April 11-12 to present computer models that predict toxicity. The **Predictive Models for Acute Oral Systemic Toxicity workshop** brought model developers together with regulatory agency representatives to discuss how these models might reduce animal use for chemical safety testing. The Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM) launched this modeling project in November 2017. The group provided data sets and invited scientists to develop models that would predict specific acute oral toxicity endpoints needed by regulatory agencies, such as whether a substance is highly toxic or nontoxic. **SP Goals 1, 3, 7**
- On April 12, Temple Grandin, Ph.D., brought a message about "**Developing Individuals Who Have Different Kinds of Minds,**" to NIEHS. The professor of animal sciences at Colorado State University delivered an enlightening **2018 NIEHS Spirit Lecture** to a packed auditorium. More than 600 individuals watched her talk, about 300 attending in person and 300 via free public webcast. Grandin has published numerous scientific articles and books on animal behavior. Her designs for humane handling of livestock are widely used today. She is also a well-known author and speaker about autism, which she discusses with authority as a person with autism. **SP Goals 6, 8, 11**
- The **NIEHS Scholars Connect Program (NSCP)** completed its sixth year on April 20 with the annual **Spring Symposium**. The NSCP brings undergraduates from universities in the NIEHS area to the institute for a year-long research experience. During the symposium, the scholars present their research to the NIEHS community. This year, for the first time since

the program began in 2012, NSCP recruited a full complement of ten young people. More emphasis on outreach to specific faculty advisors at the local schools by program organizers contributed to a noticeable increase in applications. **SP Goals 6, 8, 9**

- A unique mix of science and music drew an enthusiastic crowd April 22 for an NIEHS-sponsored Earth Day celebration at the downtown Durham Convention Center. The **Music and Your Health community forum** featured talks by scientists and leaders of local organizations devoted to the healing power of music, with performances by professional and amateur musicians alike. In opening remarks, NIEHS and National Toxicology Program (NTP) Director Linda Birnbaum, Ph.D., spoke of the presence of music in our environment. **SP Goals 8, 11**
- The **Toxicology and Risk Assessment Conference (TRAC)** 2018 was a 4-day meeting co-sponsored by the Centers for Disease Control and Prevention (CDC)/Agency for Toxic Substances Disease Registry, CDC/National Institute for Occupational Safety and Health, National Institute for Environmental Health Sciences, US Air Force, and US Army. TRAC presents current toxicology and risk assessment research, methodologic, and practice issues from relevant federal agencies, academic institutions, industry, and other organizations. The conference was held in Cincinnati April 23-26. **SP Goals 8, 9, 11**
- A panel of external scientific experts reviewed the findings of the CLARITY-BPA Core Study April 26 at NIEHS during the **Peer Review of the Draft NTP Research Report on the CLARITY-BPA Core Study** and agreed that for this first of the two CLARITY-BPA components, there were minimal toxic effects of bisphenol A (BPA) exposure in rats for the range of doses studied. The study is a research collaboration among NIEHS, the National Toxicology Program (NTP), and the Food and Drug Administration (FDA). The experts recommended revisions to several specific interpretations of the study findings, which will be considered by NTP and FDA staff as they finalize the core study report. **SP Goals 1, 2, 3**
- NIEHS partnered with the **University of Minnesota College of Veterinary Medicine**, the National Institute for Allergy and Infectious Diseases (NIAID), the Food and Agriculture Organization of the United Nations (FAO), and the University of Minnesota for the **3rd International Conference on One Medicine One Science**. Hosted by the University of Minnesota, iCOMOS is a global One Health forum featuring state-of-the-art scientific presentations and concurrent interactive sessions. The meeting explored new ways to solve pressing health issues, facilitate interdisciplinary collaborations, and promote science's role in influencing public policy at the interface of humans, animals, and the environment. **SP Goals 2, 5, 8, 11**
- The NIEHS hosted the **2018 STEMposium** on Wednesday, May 2. This symposium is a joint effort of the Wake County Public School System (WCPSS), Wake Education Partnership, and the NIEHS. Teachers and students from more than 40 primary and secondary WCPSS schools attended this symposium and demonstrated artifacts from their science, technology, engineering, and mathematics project-based learning experiences. These teachers attended the 2017 SummerSTEM workshop and some of them had their immersion learning at NIEHS. **SP Goals 8, 9**
- The annual **NIEHS Biomedical Career Symposium**, now in its 21st year, is one of the largest assemblies of biomedical organizations and young scientists in Research Triangle

Park, NC. The symposium was held on May 4 on the EPA's RTP campus. Targeting postdoctoral fellows and graduate students, the Career Symposium provided young scientists with an opportunity to explore a myriad of career options and create a contact network as they plan for their future careers in the biomedical sciences. This year there were 10 workshops in addition to the 8 career panels, as well as an afternoon networking session. **SP Goals 8, 9**

- NIEHS held its annual **Outstanding New Environmental Scientist (ONES) Awardee Symposium** May 8-9, to highlight the exciting research being performed by a group of especially promising young researchers. ONES awards provide early-career investigators with up to five years of support, to advance research designed to answer important questions about environmental health, as they build a laboratory, cohesive research group, and body of work to help establish themselves as full-fledged members of the research community. Grantees come from a variety of scientific disciplines, including genetics, toxicology, epidemiology, neuroscience, and many others, and all display a commitment to investigating the relationships between environmental exposures and human disease. **SP Goals 1, 4, 6**
- The semi-annual **WTP Awardee Meeting** brought awardees together to provide program updates, exchange information regarding training, and discover new areas of interest to awardees. The **7th National Trainer's Exchange** was hosted by the Western Region Universities Consortium (WRUC) in conjunction with the National Institute of Environmental Health Sciences (NIEHS) Worker Training Program (WTP). The National Trainers' Exchange brought together safety and health trainers and training stakeholders from the Department of Energy and the NIEHS Worker Training Program to exchange ideas about how to make training for hazardous materials and emergency response workers more effective and empowering. Through participatory workshop sessions, participants shared best practices, training techniques, and ways to overcome challenges. The joint meeting was held May 9-11 in Phoenix, AZ. **SP Goals 5, 6, 8**
- The Signal Transduction laboratory and Molecular Genomics Core hosted **NIEHS Genomics Day** on May 10 on the NIEHS main campus. The day consisted of oral presentations and posters by NIEHS researchers and trainees, as well as posters from vendors. It was a great opportunity to learn about research being conducted across the institute. **SP Goals 1, 4, 8**
- NIEHS hosted the **Free Radicals: Past, Present, and Future** on May 25. Topics included frontiers in free radical research, fast advancing views on redox signaling paradigms, the role of the redox environment to cell fate, free radical production in inflammation and disease processes, and reflections on future techniques and innovations. The symposium was held in honor of Ronald Mason. Ph.D.'s retirement. Dr. Mason is an investigator in the Free Radical Metabolism Group. **SP Goal 1**
- NIEHS is one of the supporters of the **PPTOX: International Conference on Fetal Programming and Developmental Toxicity**, held in the Faroe Islands on May 28-30. The overall purpose of the conference was to assess the weight of evidence and highlight new achievements on the effects of prenatal and early postnatal exposure to toxicants, as well their effects on the development. The overall aims of the conference were therefore: to

disseminate front-line information on developmental toxicity and fetal programming, in regard to environmental health research; to enhance discussion and synthesis of information, thereby leading to discussions on improved research approaches to elucidate and unravel ambiguities in current understanding; and to stimulate improved interaction between research strategies and needs for documentation that can inspire decision-making to protect against adverse effects from developmental exposures to environmental hazards or modifying. **SP Goals 1, 2, 3**

Upcoming Events

- Global Environmental Health Day, NIEHS, June 6
- Central and Eastern European Conference on Health and the Environment (CEECH), Krakow Poland, June 10-14
- CounterACT Annual Symposium, Westminster CO, June 13-15
- Society of Toxicologic Pathology 37th Annual Symposium, Indianapolis IN, June 16-21
- Center for Excellence in Environmental Toxicology Symposium 2018, Philadelphia, June 18
- Society for Epidemiologic Research Annual Meeting, Baltimore MD, June 19-22
- Teratology Society 2018 Annual Meeting, Clearwater FL, June 23-27
- Chronic Kidney Diseases in Agricultural Communities, Bethesda MD, June 25-26
- Tribal Environmental Health Summit 2018, Corvallis OR, June 25-26
- NEHA 2018 Annual Educational Conference (AEC) & Exhibition and HUD Healthy Homes Conference, Anaheim CA, June 25-28
- The Toxicology Forum 44th Annual Summer Meeting, Annapolis MD, July 9-11
- Annual Environmental Health Sciences Core Centers Meeting and Community Forum, Davis CA, July 16-19
- 2018 HiBR Conference – Health in Buildings for Today and Tomorrow: Making Connections, Bethesda MD, July 19-20
- Pan-American Conference for Alternative Methods 2018, Rio de Janeiro, August 23-24
- ISES-ISEE Joint Annual Meeting, Ottawa Canada, August 26-30
- 7th Annual Meeting of the American Society for Cellular and Computational Toxicology (ASCCT), Bethesda MD, September 11-12

Awards and Recognition

- **NIEHS**
 - The National Institutes of Health (NIH) awarded a two-year, \$300,000 Bench-to-Bedside grant to epidemiologist **Chandra Jackson, Ph.D.**, head of the NIEHS Social and Environmental Determinants of Health Equity research group. Jackson will use the funding to study how multiple metabolites, or products of metabolism, are linked with type 2 diabetes. Jackson, a Stadtman Tenure-Track Investigator who joined the Epidemiology Branch in 2017, is the first NIEHS researcher in more than a decade to receive this award. She holds a joint appointment with the National Institute of Minority Health and Health Disparities.

- NIEHS postdoctoral fellow **Symielle Gaston, Ph.D.**, won a travel grant from the American Heart Association’s Council on Epidemiology and Preventions. Thanks to the EPI Minority Travel Grant, Gaston will attend the Epidemiology and Prevention–Lifestyle and Cardiometabolic Health conference March 20-23 in New Orleans.
- NIEHS and National Toxicology Program Director **Linda Birnbaum, Ph.D.**, delivered a keynote address at the March 2-5 meeting of the American Academy of Allergy, Asthma and Immunology (AAAAI) in Orlando, Florida. Birnbaum spoke as the fifth annual recipient of the AAAAI Foundation and Dr. William and Judith H. Busse Lectureship: Investing Together in Our Future Award. It is one of 10 named lectureships established by the foundation.
- **Alicia Richards**, who works in Birnbaum’s National Cancer Institute laboratory, won the Graduate Student Travel Award from the SOT Dermal Toxicology Specialty Section. The award, sponsored by Charles River Laboratories, supported her attendance at the SOT meeting, where she presented her study of brominated flame retardants. The award recognized the excellence of Richards’ research poster, “Dermal Uptake of Three Brominated Phenols: Tetrabromobisphenol A (TBBPA), Tetrabromobisphenol A bis(2,3-dibromopropyl ether) (TBBPA-BDBPE), and 2,4,6-tribromophenol (TBP).”
- **Allen Wilcox, M.D., Ph.D.**, received the Society for Epidemiologic Research 2018 Kenneth Rothman Career Accomplishment Award. The Career Accomplishment Award is given to honor an outstanding scholar with extraordinary contributions to the field of epidemiology, or an individual whose work has had a profound impact on epidemiology and shifted the way we practice epidemiology. Career accomplishment and leadership impact on the field are core criteria that are used for selection of the annual awardee.
- **Humphrey H-C Yao, Ph.D.**, Reproductive and Developmental Biology Laboratory, was awarded tenure by the NIH Central Tenure Committee on April 2, 2018.
- **Big Picture-Small Talk 3-Minute Communication Challenge Winners**
 - **Lee Langer, Ph.D.**, Epigenetics & Stem Cell Biology Laboratory
 - **Dhirendra Kumar, Ph.D.**, Epigenetics & Stem Cell Biology Laboratory
 - **Sreenivasa Ramaiahgari, Ph.D.**, Division of the National Toxicology Program
- **HHS Green Champions Awards**
 - **Change Agents: NIH Changing the Way We Think about Environmentally Sustainable Campus Design**
Chris Long (OM), Debi Del Corral (OM), Mitch Williams (OM), Amanda Thompson (OM), Don Jackowski (OM), Victor Stancil (NIHOD), Kyle Hawkins (NIHOD), Allison Karver (NIHOD), Matt Hunt (NIHOD), Greg Holland (NIHOD)
 One of the core values of the National Institute of Environmental Health Sciences (NIEHS) is to preserve and protect the environment. In support of this value, NIEHS supports sustainability efforts through design and construction activities including water and energy conservation and reuse,

reduction and recycling efforts that impact the generation of solid waste and the potential release of pollutants into the environment. Pursuit of these ideals has changed the way projects are conceived and executed on the NIEHS Campus. Each project is reviewed for potential environmental impacts and efficiency opportunities as a "new way of thinking." In 2017, NIEHS and the NIH Office of Research Facilities collaborated on several projects that support environmentally responsible sustainability and energy efficiency goals which exemplify the new Campus approach. Significant projects planned or accomplished in 2017 include a Net Zero Energy Warehouse, Central Plant Re-claimed Water, Roadway Asphalt Replacement and planning of the Computational Science Building.

- **Environmental Stewardship: NIH Sustainable Warehouse Cleanout Project**
Kim Jones (OM), Rick Weaver (OM), April Byrd (OM), Ron Faison (OM)
In July and August of 2017, the NIEHS inventory management staff and contractors from two other warehouses were consolidated and relocated to a new warehouse. This complicated move involved clearing out a leased warehouse that had to be returned to the lessor. The cleanout included the recycling of 20,400 pounds of old periodicals, 185,000 pounds of furniture and plastic items, two batteries from an old forklift at 600 pounds, 5,520 pounds of confidential paper, and a 2,500-pound tiger lift. In total approximately 214,020 pounds were diverted from landfill.
- **Green Hero Video: NIH NIEHS Campus Pollinator Program Team**
Bill Willis (OM), Bill Steinmetz (OM), Brian Harris (NIHOD), Paul Poliachik (NIHOD), Paul Johnson (OM), Jeff Taylor, John McLamb (OM)
The National Institute of Environmental Health Sciences (NIEHS) is a Sustainability Hero for its advanced efforts to promote pollinator habitat. The NIEHS campus, located in Research Triangle Park, North Carolina, encompasses 375 acres, including woodlands, wetlands, grasslands, and a 27-acre lake. The NIEHS Pollinator Program is comprised of numerous activities and efforts working together to expand pollinator habitat on campus. NIEHS maintains much needed natural habitat by conserving transitional vegetation zones along the forest margins for pollinators and other wildlife and dedicated wildlife meadows as part of the North Carolina Wildlife Federation Butterfly Highway Program. Common Milkweed, a native plant that serves as a crucial survival plant for the Monarch Butterfly, exists naturally on campus but has been successfully cultivated to create a designated Monarch butterfly garden. The Milkweed provides food and habitat and is essential for both the caterpillar and adult stage of the Monarch Butterfly. Pollinator-friendly sites for cavity nesting bees have been placed in strategic locations on the NIEHS campus. Bee blocks are heavily used by Orchard Mason and Leafcutter bees. The NIEHS also supports pollinator efforts by hosting honeybee hives as part of an EPA citizen-science project, in which scientists are researching the honeybee

immune system and local hive health. Additional support of pollinators stems from NIEHS's promotion of native habitat on campus and aggressive control of invasive species. The NIEHS provides and maintains dozens of nesting areas for other pollinators, such as birds and bats as a part of the Wildlife and Industry Together (WAIT) education program. Through the region-based WAIT program, NIEHS partners with the North Carolina Wildlife Federation to increase awareness of the importance of wildlife to the environment. Education and awareness is also an important part of the NIEHS pollinator program.

- **Sustainable Design & Facilities: *NIH NIEHS Net-Zero Energy Warehouse***
James Victor Stancil III (NIHOD), Kyle Askins (NIHOD), Greg Holland (NIHOD), Debi Del Corral (OM), Amanda Thompson (OM), Dan Cushing (NIHOD), Mitch Williams (OM), Bill Blair (NIHOD), Chris Long (OM), Daniel Burk (NIHOD)

The NIH Office of Research Facilities, Research Triangle Park (RTP) and the National Institute of Environmental Sciences (NIEHS) completed design and construction of the HHS first Net-Zero Energy facility on the NIEHS Campus in RTP, NC. The project was designed to produce more renewable energy annually than it uses. To accomplish this task, the project used Leadership in Energy and Environmental Design (LEED) principals to minimize the amount of energy required to operate the facility achieving an 85.46% reduction in the amount of energy used by a comparable facility following minimum ASHRAE 90.1 guidelines. For renewable energy, the project installed a 120 kilo-watt photo-voltaic (solar) array on the roof generating an anticipated average of 158,614 kW-hours of energy annually over the 20-year lifetime of the system. By comparison, the annual anticipated energy consumption is only 157,408 kw-hours. The facility was substantially complete and occupied in late July 2017. From August to December 2017 the facility has exceeded the Net-Zero Energy goals of the project by producing over 77,500 kw-hours of clean renewable solar energy and using less than 71,500 kw-hours of total energy.

- **Grantees/Others**

- **NIEHS Outstanding New Environmental Scientist Award (ONES)**

- **Deyu Li, Ph.D.**, University of Rhode Island - His research will shed light on tumor development associated with mutations generated by two important aromatic amines.
- **Robery Sargis, M.D., Ph.D.**, University of Illinois at Chicago - Sargis and his team will examine whether proteins that contain the essential element selenium protect against arsenic-induced metabolic dysfunction. Specifically, they will study whether so-called selenoproteins defend against arsenic-induced damage to pancreatic beta cells, which are defective or destroyed in individuals with diabetes.

- **Justin Colacino, Ph.D.**, University of Michigan – Colacino will examine the possibility that increased environmental exposures alter stem cell biology, thereby raising the risk in African Americans of this aggressive type of cancer.
 - **Natalie Johnson, Ph.D.**, Texas A&M University - Johnson will study whether the severity of respiratory syncytial virus disease in offspring is increased by impaired antioxidant responses in pregnant mothers exposed to particulate matter.
 - **Robert Tighe, M.D.**, Duke University – Tighe will study the role of immune molecules called chemokines in ozone-induced lung injury. His team will determine whether DNA variants that affect the chemokine receptor CXCR3 play a role in susceptibility to ozone-induced changes in airway inflammation and lung barrier function.
- The Hispanic Organization of Toxicologists (HOT) selected **Tomas Guilarte, Ph.D.**, as the recipient of its Distinguished Toxicologist Award. Guilarte accepted his award March 13 and gave a talk about his journey from Cuba to a position as dean of the FIU Robert Stempel College of Public Health and Social Work. Guilarte is a world-renowned neurotoxicologist who completed a three-year term on the NIEHS National Advisory Environmental Health Sciences Council in 2017.
- **Paloma I. Beamer, Ph.D.**, associate professor of environmental health sciences at the University of Arizona Mel and Enid Zuckerman College of Public Health, recently was named president-elect of the International Society of Exposure Science. As president, Dr. Beamer hopes to increase the visibility and prominence of exposure science as an essential discipline within environmental health, diversify the society's membership and perspectives in addition to enhancing student and new researcher programs to help develop the future exposure science leaders of tomorrow for this growing field.
- NIEHS grantee **Karletta Chief, Ph.D.**, caught the attention of producers of Breakthrough: Portraits of Women in Science, a collection of short films sponsored by Science Friday and the Howard Hughes Medical Institute. The film on Chief, "Breakthrough: Bitter Water," is the last of the six films in the series. Released in January, it tells the story of her family roots and the goals of her scientific research. Chief, who is a member of the Navajo Nation, is a hydrologist at the University of Arizona, where she works with two NIEHS-funded centers. She directs the Community Engagement Core of the Superfund Research Program, is an advisory board member of the Center for Indigenous Environmental Health Research (CIEHR), and a pilot researcher with Southwest Environmental Health Sciences Center.
- Junior scientists are getting exposure to research and helping to solve real-world problems before they graduate from high school — thanks, in part, to a grant from NIEHS. One student, **Natalia Orlovsky**, took home \$175,000 in prize money for her research. Orlovsky won second place March 13 in the 2018 Regeneron Science Talent Search for her study of the health effects of e-cigarettes. She collaborated

with **Jeffrey Field, Ph.D.**, a pharmacologist at the University of Pennsylvania Perelman School of Medicine. Field directs the Teen Research and Education and Environmental Science (TREES) program, which is part of the Community Outreach and Engagement Core of the university's NIEHS-funded Center for Excellence in Environmental Toxicology.