

**Report to the National Advisory Environmental Health Sciences Council  
Director, NIEHS**

**February 23-24, 2016**

**Budget and Legislative Report**

*Appropriations*

	FY 2015 Omnibus Appropriation	FY 2016 President's Request	FY 2016 House Appr Committee	FY 2016 Senate Appr Committee	FY 2016 Omnibus Appropriation
<b>NIEHS</b>	\$ 667,333,000 <sup>a</sup>	\$ 681,782,000	\$ 675,783,000	\$ 695,900,000	\$ 693,533,000 <sup>a</sup>
<b>NIH (LHHS)</b>	\$30,084,000,000	\$31,084,000,000	\$31,184,000,000	\$32,084,000,000	\$32,084,000,000
<b>Common Fund</b>	\$ 545,639,000 <sup>b/</sup>	\$ 565,639,000 <sup>b/</sup>	\$ 688,239,000 <sup>b/</sup>	\$ 556,677,000 <sup>b/</sup>	\$ 675,639,000 <sup>b/</sup>
<b>Superfund</b>	\$ 77,349,000	\$ 77,349,000	\$ 77,349,000	\$ 77,349,000	\$ 77,349,000
<b>NIEHS/DOE Training</b>	\$ 10,000,000		\$ 10,000,000		\$ 10,000,000

a/ Reduced by \$169,000 transfer to the NIH Office of AIDS Research.

b/ Includes addition of \$12.6 million for the Gabriella Miller Kids First Act pediatric research initiative.

- **FY16 Appropriations:** The FY 2016 Omnibus Agreement was passed by Congress (Senate Vote: 65-33 and House Vote: 316-113) and signed into law by President Obama on Dec. 18<sup>th</sup>, 2015. The amendments provides approximately \$1.15 trillion in discretionary appropriations in fiscal year 2016 for federal departments and agencies and would make more than a dozen expired or expiring tax provisions permanent and extend various others for either two or five years. Included in that total is: \$21.75 billion for Agriculture, \$55.7 billion for Commerce-Justice-Science, \$572.7 billion for Defense, \$37.2 billion for Energy-Water, \$23.2 billion for Financial Services, \$41 billion for Homeland Security, \$32.2 billion for Interior-Environment, \$162.1 billion for Labor-HHS-Education, \$4.4 billion for Legislative, \$79.9 billion Military Construction-Veterans Affairs, \$52.8 billion for State-Foreign Operations, and \$114 billion for

Transportation-HUD. The measure would end the U.S. ban on crude oil exports and would reauthorize health care and victim compensation programs for 9/11 first-responders.

The final agreement provided NIH a \$2 billion increase, which is the largest bump NIH has seen since its budget was doubled in the late 1990s. The bill includes specific increases for Alzheimer’s disease research, BRAIN initiative, antibiotic research, the follow-on of the Children’s Study, the Precision Medicine Initiative, and Gabriella Miller Kids First Research Act. Plus, it provides a general increase to all NIH Institutes and Centers to continue basic bio-medical research and translational research through various programs. In the agreement, NIEHS received a \$26,369,000 increase from FY15 appropriation or 3.925% increase, for an FY16 total of \$693,702,000. With Interior and Environment Appropriations, the Superfund Program was flat at \$77,349,000 and in the Energy and Water Appropriations, the NIEHS Hazardous Waste Worker Training remains at \$10,000,000, the same as FY15 appropriations.

Including the reduction in Superfund appropriation, it is notable that the overall NIEHS budget for FY2016 is less than \$2M greater than the appropriation for FY2010 (see table below.)

***Budget Comparison (\$ in millions)***

	NIEHS	Superfund	Total
2010	689.781	79.212	768.993
2016	693.533*	77.349	770.882
2017 PB	693.533	77.349	770.882

- Includes reduction of \$169K for AIDS

***Briefings***

- **Congressional Briefing within USGS Briefing Series.** On October 9<sup>th</sup>, 2015, Dr. Aubrey Miller presented at a USGS Congressional briefing with Geoff Plumlee, USGS, and Chris McEntee, American Geophysical Union. The focus was on understanding the health implications of disasters and the importance of USGS science in support of environmental health, as well as showcasing how NIEHS responds and supports needed environmental health information in response to disasters. The briefing was attended by about 40 hill staffers and other stakeholders. The briefing was hosted by the American Geosciences Institute (AGI). Feedback from USGS, AGU, and others was excellent with respect to NIEHS the presentation and

presence at the briefing to discuss the vital importance of collaboration between earth sciences and health sciences to support timely environmental health research.

- A Congressional briefing titled "*A Healthy Start for Every Child: How the Environment Influences Health & Development*" was held on Wednesday, October 28, 2015. Dr. Birnbaum and Gwen Collman, Ph.D., DERT director, provided remarks, among others. The event was hosted by Representatives Renee L. Ellmers (R-NC) and G.K. Butterfield (D-NC) and co-sponsored by the Friends of the NIEHS, American Thoracic Society, American Academy of Pediatrics, and the Endocrine Society. Other speakers included:
  - **EPA and NIEHS:** Thomas Burke, Ph.D. Deputy Assistant Administrator for the EPA Office of Research and Development
  - **The developing brain: effects of prenatal exposure to pesticides and air pollution:** Bradley Peterson, M.D., Co-Director of the Columbia Center for Children's Environmental Health at Columbia University
  - **Decreased air pollution: a public health triumph, but work remains:** Rob McConnell, M.D., Director of the Southern California Children's Environmental Health Center at the University of Southern California
  - **Childhood leukemia: chemical exposures before and after birth:** Catherine Metayer, M.D., Ph.D., Director of the Center for Integrative Research on Childhood Leukemia and the Environment at the University of California, Berkeley
  
- "*Small Doses, Large Effects: How Environmental Health Science Improves Patient Care.*" On December 17, 2015, Dr. Birnbaum presented remarks at a Congressional briefing co-sponsored by the Friends of the NIEHS and the Endocrine Society. During this briefing, speakers provided an overview of new research funded by NIEHS, and NIEHS-funded scientists described how new environmental health research helps us understand disease susceptibility and impacts patient care. Other speakers included:
  - Shuk-Mei Ho, Ph.D., Endocrine Society member, NIEHS grantee
  - Jennifer A. Lowry, M.D., Chair, American Academy of Pediatrics Council on Environmental Health Executive Committee

### **Meetings**

- **TSCA Reform.** Dr. Birnbaum met with Jean Fruci and Tuley Wright with the House Energy and Commerce Committee on December 17<sup>th</sup>, 2015 to discuss issues on Alternatives to Animal Testing language in the House vs. Senate versions of the TSCA reform language. She was joined on the phone by John Bucher and Warren Casey from NTP, and accompanied by Dr. Aubrey Miller, April Bennett, Anne Tatem (NIH OD), and Alexandra Khalife (HHS ASL). Dr. Birnbaum spoke of the current efforts and the state-of-the-science regarding Alternatives to Animal Testing and ICCVAM efforts. The committee members mentioned language of the proposed

Senate bill regarding requirements regarding alternative testing and the potential for overly restrictive effects on EPA.

- Dr. Birnbaum had a follow-up phone meeting with Jean Fruci and Tuley Wright from the House Energy and Commerce Committee Staff on February 4, 2016 to continue to discuss technical issues on Alternatives to Animal Testing language in the House vs. Senate versions of the **TSCA reform** language. She was joined on the phone by Dr. John Bucher (NTP), Dr. Mary Wolfe (NTP), Dr. Warren Casey (NTP), April Bennett (NIEHS OD-Bethesda), and Anne Tatem (NIH OD).

### ***Hearings of Interest***

- On October 7<sup>th</sup>, 2015, the Senate Appropriations Subcommittee on Labor, Health and Human Services, Education and Related Agencies held a hearing on National Institutes of Health. Dr. Collins (NIH Director), Dr. Douglas Lowry (Acting Director, NCI), Dr. Griffin Rodgers (Director, NIDDK), Dr. Walter Koroshetz (Director, NINDS), Dr. Jon Lorsch (Director, NIGMS), and Dr. Nora Volkow (Director, NIDA) all were on the witness panel to the Committee.

Senate Health, Education, Labor and Pensions Chairman Lamar Alexander (R-TN), who also is a senior Appropriations committee member, told Dr. Collins that he was hesitant to expand the agency's funding beyond the federal government's regular discretionary spending operating funds. He stated, "Our visceral reaction is against new mandatory funding but I am convinced that this is a critical time in science and a critical time of opportunity, so I am willing to think about that." Alexander asked Collins to report back to him on how NIH would use the mandatory funding proposed in the 21<sup>st</sup> Century CURES bill (H.R. 6).

Subcommittee Chairman Roy Blunt (R-MO) expressed that the subcommittee and full committee have placed a "high priority on research," and that the purchasing power of NIH over the past decade has "decreased by about 22 percent." Chairman Blunt also raised concerns about "the challenge of young researchers having research grants approved" being "dramatically less than they have."

Ranking member of the Subcommittee, Senator Patty Murray (D-WA), praised NIH for the "incredible work done to improve health and well-being for families across the country and really around the globe." She also stated she sees maintaining our country's role in the life sciences as a "top priority."

Throughout the hearing and in his testimony, Dr. Collins spoke about the innovation and success stories of NIH research, along with the Precision Medicine Initiative, the Brain Initiative, and others. Dr. Collins also mentioned NIH is developing a Strategic Plan scheduled to be delivered to Congress in mid-December. Collins also addressed the need to have more

sustained funding for the agency, factoring in the rising expenses involved with medical research. “I think we are not limited at the present time by ideas or talent, we're limited by resources and certainly if it were possible to have more resources in '16 we could start projects that otherwise would have to wait longer.”

The Subcommittee members asked questions of the panel about Precision Medicine, AIDs research, mandatory vs. discretionary funding, developing young researchers for their future careers, Alzheimer’s Research, drug abuse, among numerous other topics.

### ***Research Relevant Legislation***

- **Bipartisan Budget Agreement of 2015 (H.R. 1314)**, the budget-debt ceiling deal was signed by the President on Nov. 2, 2015. This bipartisan deal negotiated with the White House was part of one of Speaker Boehner’s final acts before leaving office. The budget agreement suspends the debt limit until March 15, 2017 and it partially rolls back the sequester of discretionary spending scheduled for FY16 and FY17 to increase caps for those two years by a total of \$80 billion, split equally between defense and non-defense (\$50 billion for FY16 and \$30 billion for FY17). Those increases would set a \$1.067 trillion limit on discretionary spending for FY16 and a \$1.070 trillion limit for FY17. The deal also includes nearly \$79.9 billion in savings to offset the bill’s cost, which includes \$47.6 billion in reductions in direct (mandatory) spending and \$32.3 billion in increased revenues. \$22.8 billion in savings are derived from modifications to Social Security and health care programs, \$14 billion in modifications to the Budget Control Act’s automatic sequester of certain direct spending, and the remaining \$43.1 billion comes from numerous other offsets (i.e. tax compliance, Strategic Petroleum Reserve, etc.). The bill would reduce the deficit by \$497 million according to the CBO. If the House and Senate have not reached an agreement on an FY17 budget resolution by April 15, 2016, the bill establishes a process for implementation of an enforceable budget process in the Senate to allow the FY17 appropriations process to proceed.
- **TSCA Reform (H.R. 2576 and S. 697)**: On June 23<sup>rd</sup>, 2015, the House passed **H.R. 2576 (398-1), the TSCA Modernization Act of 2015 (Shimkus, R-IL)** and on December 17<sup>th</sup>, 2015 before adjourning for recess, the Senate amended the bill in the form of a substitute with their language to H.R. 2576 to send it to conference to reconcile the differences between the two chambers. The reconciliation is still ongoing. The Senate version of the bill was **S. 697 the Frank R. Lautenberg Chemical Safety for the 21st Century Act (Udall, D-NM)**. The Senate finally passed the bill after Senator Boxer agreed to the re-written Senate version after they fixed language to not preempt stricter state laws. The overhaul legislation directs the EPA to complete industry-requested risk assessments of chemicals in commercial products while

- working on a three-year deadline for EPA-initiated studies. Also, the Senate’s version of the bill would establish a four-year mandatory deadline for industry compliance with EPA regulations while expediting EPA regulation on 90 chemicals (including asbestos) that are known to be dangerous. The legislation also would raise to \$25 million from \$18 million the cap on fees the industry pays to help offset the EPA's costs in conducting the reviews. The bill also defines the Safety Standard for chemicals to be: *“a standard that ensures, without taking into consideration cost or other non-risk factors, that no unreasonable risk of injury to health or the environment will result from exposure to a chemical substance under the conditions of use, including no unreasonable risk of injury to—(A) the general population; or (B) any potentially exposed or susceptible population that the Administrator has identified as relevant to the safety assessment and safety determination for a chemical substance.”*
- Senator Vitter’s (R-LA) statement on the bill’s passage: *“This is an historic day on which we’ve come together to pass significant chemical safety legislation. As we honor the legacy of the late Sen. Frank Lautenberg, D-N.J., we also move toward the future embracing these major, necessary reforms to our nation’s broken chemical safety law.”*
  - Senator Boxer’s (D-CA) statement on the bill’s passage: *“First, the bill has been vastly improved over the original bill, which in my opinion would have been harmful to our families, because it overrode our state laws and set up an ineffective and nonexistent way to regulate most toxic pollutants. Secondly, I have been assured that as the House and Senate bills are merged into one, the voices of those who have been most deeply affected, including nurses, breast cancer survivors, asbestos victims, and children, will be heard. I will have the opportunity to be in the room at every step and express their views.”*
- **21<sup>st</sup> Century Cures Act (H.R. 6):** On July 10<sup>th</sup>, 2015, the House passed the 21<sup>st</sup> Century Cures Act (344-77). The Act is the product of the “21<sup>st</sup> Century Cures” initiative, launched last year by Energy & Commerce Chairman Fred Upton (R-MI) and Representative Diana DeGette (D-CO). The bill is currently in the Senate.

The Senate Innovation for Healthier Americans Act is expected to start moving forward as companion legislation to the 21<sup>st</sup> Century Cures bill in a package of bills instead of one bigger piece of legislation. The Senate Health, Labor, Education and Pensions (HELP) Committee announced that it has scheduled an executive session for February 9, 2016, when lawmakers are expected to vote on bills on topics that range from electronic medical records to rare diseases. This will be the first of 3 executive sessions on biomedical innovation. The other two sessions are expected to be in March and April.

- **Scientific Research in the National Interest Act (H.R. 3293):** The House Committee on Science, Space and Technology passed H.R. 3293 on February 2, 2016, which was introduced by Representative Lamar Smith (R-TX and Chairman of House Science, Space, and Technology). The bill requires NSF to tell the public why every award is “in the national interest.” It lists seven criteria: enhancing the economy, improving the scientific workforce, advancement of the well-being of the American public, increased public scientific literacy and public engagement with science and technology, fostering partnerships with industry and academia, support for national defense, and promotion of the progress of science for the U.S. The bill is expected to come to the House floor in early February.

NSF Director France Córdoba has said that the agency is already engaged in an effort to increase transparency. Program managers are working with PIs to make sure the abstracts and titles of every grant convey the value of the research being funded. NIH’s authorizing committee is House Energy & Commerce Committee.

## Science Advances

One NIEHS (NIEHS authors’ groups in parens)

- **Blood transcript immune signatures distinguish a subset of people with elevated serum ALT from others given acetaminophen.** Fannin RD (DIR), K Gerrish (DIR), SO Sieber (DIR), PR Bushel (DIR), PB Watkins and RS Paules (NTP). *Clin. Pharmacol. Ther.* (2015) [InPress]  
<http://dx.doi.org/10.1002/cpt.328>  
SP Goal 2

DNTP

- **Use of alternative assays to identify and prioritize organophosphorus flame retardants for potential developmental and neurotoxicity.** Behl, M (DNTP), Hsieh, JH, Shafer, TJ, Mundy, WR, Rice, JR (DNTP), Boyd, WA (DNTP), Freedman, JH (DNTP-former), Hunter, ES, 3rd, Jarema, K, Padilla, S (DNTP), Tice, RR (DNTP). *Neurotoxicol Teratol.* 2015. 2015/09/20  
<http://dx.doi.org/10.1016/j.ntt.2015.09.003>  
SP Goal 1
- **Genomic profiling reveals unique molecular alterations in hepatoblastomas and adjacent hepatocellular carcinomas in B6C3F1 mice.** Bhusari, S, Pandiri, AR (DNTP), Nagai, H, Wang, Y, Foley, J (DNTP), Hong, HL (DNTP), Ton, TV (DNTP), DeVito, M (DNTP), Shockley, KR, Peddada, SD, Gerrish, KE, Malarkey, DE (DNTP), Hooth, MJ (DNTP), Sills, RC (DNTP), Hoenerhoff, MJ (DNTP). *Toxicol Pathol.* 2015. 2015/08/21  
<http://dx.doi.org/10.1177/0192623315599853>

SP Goal 1

- **Developmental Effects of the ToxCast™ Phase I and II Chemicals in Caenorhabditis elegans and Corresponding Responses in Zebrafish, Rats, and Rabbits.** Boyd, WA (DNTP), Smith, MV, Co, CA, Pirone, JR, Rice, JR (DNTP), Shockley, KR, Freedman, JH (DNTP-former). *Environ Health Perspect.* 2015. 2015/10/27  
<http://dx.doi.org/10.1289/ehp.1409645>

SP Goal 1

DIR

- **Overall and central adiposity and breast cancer risk in the Sister Study.** White AJ, Nichols HB, Bradshaw PT, Sandler DP (DIR). *Cancer.* 2015 Oct 15;121(20):3700-8.  
<http://www.ncbi.nlm.nih.gov/pubmed/26193782>

SP Goal 2

- **Endotoxin Exposure: Predictors and Prevalence of Associated Asthma Outcomes in the United States.** Thorne PS, Mendy A, Metwali N, Salo P, Co C, Jaramillo R, Rose KM, Zeldin DC. *J Respir Crit Care Med.* 2015 Dec 1;192(11):1287-97.  
<http://www.ncbi.nlm.nih.gov/pubmed/26258643>

SP Goal 4,6

- **LIN28A Modulates Splicing and Gene Expression Programs in Breast Cancer Cells.** Yang J(DIR), Bennett BD(DIR), Luo S, Inoue K(DIR), Grimm SA(DIR), Schroth GP, Bushel PR(DIR), Kinyamu HK(DIR), Archer TK (DIR). *Mol Cell Biol.* 2015 Sep;35(18):3225-43.  
<http://www.ncbi.nlm.nih.gov/pubmed/26149387>

SP Goal 1

- **Capturing snapshots of APE1 processing DNA damage.** Freudenthal BD (DIR), Beard WA (DIR), Cuneo MJ, Dyrkheeva NS (DIR), Wilson SH (DIR). *Nat Struct Mol Biol.* 2015 Nov;22(11):924-31.  
<http://www.ncbi.nlm.nih.gov/pubmed/26458045>

SP Goal 1

- **Soy-Based Infant Formula Feeding and Ultrasound-Detected Uterine Fibroids among Young African-American Women with No Prior Clinical Diagnosis of Fibroids.** Upson K (DIR), Harmon QE (DIR), Baird DD (DIR). *Environ Health Perspect.* 2015 Nov 13. [Epub ahead of print]  
<http://www.ncbi.nlm.nih.gov/pubmed/26565393>

SP Goal 2, 3, 6

DETR

- **Multigenerational epigenetic inheritance in humans: DNA methylation changes associated**



- with maternal exposure to lead can be transmitted to the grandchildren.** Sen A, Heredia N, Senut MC, Land S, Hollocher K, Lu X, Dereski MO, Ruden DM. Sci Rep. 2015 Sep 29;5:14466. <http://www.ncbi.nlm.nih.gov/pubmed/26417717>  
SP Goal 1, 2, 3, 4
- **Prenatal Exposure to Organophosphorous Pesticides and Fetal Growth: Pooled Results from Four Longitudinal Birth Cohort Studies.** Harley KG, Engel SM, Vedar MG, Eskenazi B, Whyatt RM, Lanphear BP, Bradman A, Rauh VA, Yolton K, Hornung RW, Wetmur JG, Chen J, Holland NT, Barr DB, Perera FP, Wolff MS. Environ Health Perspect. 2015 Dec 18. <http://www.ncbi.nlm.nih.gov/pubmed/26685281>  
SP Goal 2, 3, 6
  - **Flavoring Chemicals in E-Cigarettes: Diacetyl, 2,3-Pentanedione, and Acetoin in a Sample of 51 Products, Including Fruit-, Candy-, and Cocktail-Flavored E-Cigarettes.** Allen JG, Flanigan SS, LeBlanc M, Vallarino J, MacNaughton P, Stewart JH, Christiani DC. Environ Health Perspect. 2015 Dec 8. [Epub ahead of print] <http://www.ncbi.nlm.nih.gov/pubmed/26642857>  
SP Goal 4, 5
  - **Bacterial microbiome of breast milk and child saliva from low-income Mexican-American women and children.** Davé V, Street K, Francis S, Bradman A, Riley L, Eskenazi B, Holland N. Pediatr Res. 2016 Jan 12. <http://www.ncbi.nlm.nih.gov/pubmed/26756784>  
SP Goal 4, 6
  - **Prenatal phthalate exposures and body mass index among 4 to 7 year old children: A pooled analysis.** Buckley JP, Engel SM, Braun JM, Whyatt RM, Daniels JL, Mendez MA, Richardson DB, Xu Y, Calafat AM, Wolff MS, Lanphear BP, Herring AH, Rundle AG. Epidemiology. 2016 Jan 6. [Epub ahead of print] <http://www.ncbi.nlm.nih.gov/pubmed/26745610>  
SP Goal 2, 3
  - **Two-hit exposure to polychlorinated biphenyls at gestational and juvenile life stages: 1. Sexually dimorphic effects on social and anxiety-like behaviors.** Bell MR, Thompson LM, Rodriguez K, Gore AC. Horm Behav. 2016 Feb;78:168-77. <http://www.ncbi.nlm.nih.gov/pubmed/26592453>  
SP Goal 2, 6
  - **Two-hit exposure to polychlorinated biphenyls at gestational and juvenile life stages: 2. Sex-specific neuromolecular effects in the brain.** Bell MR, Hart BG, Gore AC. Mol Cell Endocrinol. 2016 Jan 15;420:125-37. <http://www.ncbi.nlm.nih.gov/pubmed/26620572>  
SP Goal 1, 2, 6

- ***Nail polish as a source of exposure to triphenyl phosphate.*** Mendelsohn E, Hagopian A, Hoffman K, Butt CM, Lorenzo A, Congleton J, Webster TF, Stapleton HM. Environ Int. 2016 Jan;86:45-51.

<http://www.ncbi.nlm.nih.gov/pubmed/26485058>

SP Goal 3, 9

## **NIEHS News and Highlights**

### ***50<sup>th</sup> Anniversary***

On January 21, the NIEHS kicked off its 50<sup>th</sup> Anniversary year-long celebration with five esteemed alumni sharing remembrances of five decades of accomplishment at the Institute. Speakers and their tenures at NIEHS included:

- Former Executive Officer Charles Leasure — 1984-1998.
- Former NTP Associate Director George Lucier, Ph.D. — 1969-2000.
- Former Scientific Director John McLachlan, Ph.D. — 1972-1995.
- Former NIEHS and NTP director Kenneth Olden, Ph.D. — 1991-2005.
- Former Division of Extramural Research and Training (DERT) Director Anne Sassaman, Ph.D. — 1986-2006

NIEHS Director Linda Birnbaum also unveiled a grandfather clock that will become a “time capsule” to be filled with Institute memorabilia.

### ***NIEHS Strategic Plan Implementation***

As part of the implementation of the NIEHS Strategic Plan, we have created new webpages that capture major accomplishments of the Institute across each of the 11 Strategic Goals (note: Goal 11 page is still in development). These pages, which are accessible from the NIEHS website (<http://www.niehs.nih.gov/about/strategicplan/implementation/index.cfm>) contain highlights in areas including Research Funding, Selected Programs and Awards, Workshops and Conferences, Selected Scientific Advances, and Other Implementation Activities. Although these highlights are representative of all of the Institute’s efforts, they are part of ongoing efforts to make transparent to the public and stakeholders both the way in which we are pursuing our Strategic priorities and our impact and success in that effort. In addition, internal webpages are being developed to further facilitate cross-divisional coordination of implementation activities.

### ***Staff Updates***

- **Jed Bullock** joined the NIEHS as Legislative Liaison in the OD-Bethesda office on February 8. Bullock has spent 15 years working on Capitol Hill, the last five years serving as a senior policy advisor to Congressman Pedro Pierluisi, Puerto Rico’s delegate in the U.S. House of

Representative. Prior to that he served on the legislative staff for the House Natural Resources Committee during the 111<sup>th</sup> Congress (2009-2010) supporting the activities of its Subcommittee on Insular Affairs, Oceans and Wildlife. Bullock interned in the office of former Congressman Robert Walker of Pennsylvania, who chaired the House Science Committee in the 104<sup>th</sup> Congress, and at the American Public Power Association. He earned a Bachelor of Arts in government and a Master of Public Administration from George Mason University.

- **David Fargo**, Ph.D., former director of the NIEHS Integrative Bioinformatics Core, has been named the NIEHS's first Scientific Information Officer (SIO). Because of increasing technical capabilities and decreasing costs, the use of big data in biomedical research is on the rise. As SIO, Fargo will work across divisions to direct development of the infrastructure needed by NIEHS scientists for scientific big data. Fargo has said that he is interested in creating systems and algorithms that empower broader use of large consortia data. He shared a vision that researchers will be able to query large datasets without having to individually download or reformat the raw data, essentially creating a user-friendly way to search, analyze, and understand the data.
- **Natalie Shaw**, M.D., has joined NIEHS as the new head of the Pediatric Neuroendocrinology Group in the NIEHS Clinical Research Branch. Shaw is the first NIEHS Lasker Clinical Research Scholar, a joint partnership between NIH and the Lasker Foundation to support a small number of exceptional clinical researchers in the early stages of their careers. Shaw is lead researcher on the NIH Body Weight and Puberty Study, in which she and her team will compare breast maturation scores, which will be determined by the gold standards of physical examination and breast ultrasound. They will also investigate potential differences in the sources of estrogen, such as adipose tissue, ovaries, or endocrine disruptors, in obese and normal weight girls. Prior to coming to NIEHS, Shaw was a research fellow at Massachusetts General Hospital in Boston.

### ***Special Visitors***

- U.S. Representative David Price (D-NC), whose congressional district includes the NIEHS campus, visited the institute Dec. 14 for a town-hall style meeting with an extended question and answer session. Among the topics Price discussed were the national budget and funding for science in particular, climate change, and the importance of childhood vaccines. Price expressed admiration and respect for the research and activities of the NIEHS.
- U.S. Senator Richard Burr (R-NC) got his first firsthand look at the NIEHS on October 15, touring the facility and taking time to talk with NIEHS and National Toxicology Program Director Linda Birnbaum and other members of the NIEHS leadership team. Burr displayed keen interest in the range of research, training, education, and other work conducted at the institute.

### ***Flint Lead Crisis***

Beginning in 2014, the city's of Flint, Michigan's drinking water had a series of issues that culminated with lead creating a serious public health danger. The crisis began when the city

changed the source of the water supply from Lake Huron in Detroit to the Flint River. The corrosive Flint River water caused lead from aging pipes to leach into the water supply, causing extremely elevated levels of lead. As a result, residents, especially children, have high levels of lead in the blood (above the CDC action level of concern of 5 ug/dl) and experienced a range of serious health problems.

NIEHS and the Disaster Research Response (DR2) team has been asked by Dr. Nicole Lurie, the Assistant Secretary for Preparedness and Response (ASPR), to help lead the HHS science response for the lead crisis in Flint, MI. We are working with the Science Preparedness Research Interagency Team (SPiRIT) in ASPR on the goals of community engaged data collection and research activities to improve our understanding of the broad health-related impacts of the situation, to help support ongoing response activities, to facilitate longer-term recovery, and to enhance ability to prevent and prepare for future events. Dr. Aubrey Miller, Senior Medical Advisor is the NIEHS lead for coordination of these efforts.

#### Current NIEHS Efforts:

- NIEHS is leading the federal “Science Response” for ASPR including the Science Preparedness Research Interagency Team (SPiRIT) with representation from NIH (NIEHS, FIC, NICHD, NLM, NIMHD, NIMH), CDC/ATSDR, HRSA, SAMHSA, and ACF.
- The NTP will conduct a review of low-lead effects in children. NTP staff will also lead a new working group on lead of the President’s Task Force on Environmental Health Risks and Safety Risks to Children.
- The Division of Extramural Research and Training will be reviewing proposals for Time Sensitive & Investigator Initiated R01 grants. NIEHS Grantees at the University of Michigan, Michigan State, Wayne State are engaged in response efforts. And at the University of Michigan’s Flint facility, grantees are providing translated information, training, and supporting community engagement efforts.
- The Worker Training Program is providing lead health and safety training for workers removing lead pipes in Flint.

#### ***Children’s Environmental Health***

NIEHS spends approximately \$115 million each year on children’s health. Recent months have been particularly active and productive for NIEHS/NTP efforts related to Children’s Environmental Health across the spectrum from research programs to Congressional briefings to meetings and outreach. The

information below provides a brief overview of some major points of progress for the Institute in this priority area.

## **Research**

**Children's Health Exposure Analysis Resource (CHEAR)/Environmental influences on Child Health Outcomes (ECHO):** In July 2014, the Advisory Committee to the NIH Director (ACD) was charged with evaluating whether the National Children's Study (NCS) was still feasible. In December 2014, the ACD concluded that the NCS was not feasible, and recommended that the study be closed down. Supporters of the study expressed concern that the NIH should continue to emphasize research that will remain true to the original intent of the NCS, and they strongly encouraged the NIH to use funds appropriated for the NCS to support only research at the intersection of children's health and the environment that supplements ongoing activities. They also advocated for a longitudinal study to investigate pregnancy and *in utero* development, along with the inclusion of basic research and training.

Following the discontinuation of the NCS, NIH developed a new plan for the use of these funds and NIEHS is the lead on several aspects. Details of programs developed using FY15 and FY16 funds are below.

### **Plan for FY15 Funds**

- **Initiative 1:** Develop tools that would enhance studies of environmental influences of pediatric diseases
  - Pediatric Research using Integrated Sensor Monitoring Systems (PRISMS) [NIBIB: \$28M]: No NIEHS funding. NIEHS is providing Science Officer support (review progress report, provide scientific input, work with grantees, identify potential collaborators to increase scientific output and attend annual meetings).
  - **Children's Health Exposure Analysis Resource (CHEAR)** [NIEHS: \$49.8M] NIEHS has made these awards and these are detailed in the Council book report of David Balshaw, PhD, DERT. The CHEAR website is at <https://chearprogram.org/>
  - Validation of Pediatric Patient Reported Outcomes in Chronic Diseases (PEPR) Consortium [NIAMS: \$12M]
- **Initiative 2:** Study the influence of environment on *in utero* development with the goal of identifying the "seeds" of future diseases and conditions
  - **Tox21 Developmental Toxicity Program** [NCATS/NIEHS; \$8M] In support of the second NIH initiative, building understanding of the influence of the environment on in utero development, NTP, which is housed at NIEHS, will work with the National Center for Advancing Translational Sciences to offer new tools for researchers

working to understand human developmental processes. The two organizations received funds to adapt high-throughput screening and other technologies developed in the Tox21 predictive toxicology effort.

- Developing Paradigm-Shifting Innovations for *in vivo* Human Placental Assessment in Response to Environmental Influences [NICHD: \$41.1M]
- **Initiative 3:** Expand examination of environmental influences on later child development by leveraging extant programs
  - **Collaborative activities to promote High Dimensional Molecular Analyses in NIEHS-supported Children's Environmental Health Studies** [NIEHS: \$5M]
- Total FY15 funds supporting FOAs: **\$143.9M**. All programs were forward funded for four years.

### **Plan for FY16 Funds – Environmental influences on Child Health Outcomes (ECHO) Program**

**Overarching Goal:** Investigate the longitudinal impact of pre-, peri-, and postnatal environmental exposures on pediatric development and health outcomes with high public health impact by leveraging extant cohorts and other available resources. Specific goals include building a repository on the trajectory of healthy development over childhood (controls), and leveraging innovative tools that record early childhood exposures and can be linked to health outcomes, particularly those developed as a result of the FY15 program. FOAs were released on December 7, 2015. The application deadline is anticipated to be in Spring 2016, with review occurring in Summer 2016. Awards are expected to be made by Fall 2016.

#### **Pediatric Health Outcome Focus Areas**

- *Upper and lower airway* – (e.g., asthma, allergies, sleep disordered breathing)
- *Obesity* – (e.g., nutrition, diabetes, metabolic risk factors, cardiovascular disease)
- *Pre-, peri-, and postnatal outcomes* – (e.g., mother and baby, at-risk pregnancy populations, birth defects)
- *Neurodevelopment* – (e.g., autism, ADHD, depression, cognition, social/behavioral development)

#### **Core Elements** – To be collected from all participants

- Genetic influences on early childhood health and development
  - Optional sub-element: Epigenetics
- Environmental exposures (e.g., behavioral, biological, chemical, social,)
- Patient/Person (parent and child) reported outcomes (PROs)

### **IDeA States Pediatric Clinical Trials Network**

- Create a national network for pediatric research to increase racial/ethnic/SES diversity by linking existing IDeA state centers with experts in clinical trials
- Facilitate partnership between IDeA state centers and academic institutions outside the IDeA consortium
- Expand pediatric clinical trials to improve access to relevant populations, accelerate overall accrual, and support advances in pediatric clinical research
- Linked, in part, to the ECHO program by prioritizing proposed pediatric trials in one of the four ECHO Focus Areas

### **Other Potential Features of ECHO**

- Serve as a test bed for validating new technologies, tools, and approaches for efficient and effective environmental and pediatric monitoring
  - A supplement to CHEAR will provide analytical support to measure and characterize environmental exposures using biological samples collected through ECHO
- Take maximal advantage of existing tissue banks collected across pregnancy (e.g., maternal DNA, cord blood, placenta) and data sets by funding additional analyses
- Use systems approaches to develop multi-variable models to predict disease
- Recruit women during subsequent pregnancies to compare outcomes of first and second children
- Basic mechanistic studies that can only be done using human cohorts are encouraged

**NTP Proposal on Fluoride and Neurodevelopmental Effects.** NTP Office of Health Assessment and Translation is proposing to use systematic review methods to examine data from human epidemiological, experimental animal, and mechanistic studies in order to assess the potential developmental effects of fluoride exposure on neurobehavioral outcomes in children. NTP also plans to perform laboratory rodent studies. The findings from the animal studies will be included in the literature-based evaluation.

**Household Air Pollution Health Outcomes.** HAP is associated with low birth weight and higher infant mortality, increased respiratory infections in children, and increased rates of stroke, cardiovascular disease, lung cancer, and cataracts. HAP exposures disproportionately affect women and children, as they spend more time inside the home environment. NIEHS is a co-sponsor of a funding announcement for cooperative agreement research grants (UM1) to conduct a clinical trial across three or more Low and Middle Income Country (LMIC) settings to test improved stove

and fuel interventions on health outcomes in exposed populations. Co-sponsors include NHLBI, NCI, NICHD, FIC, and the NIH Common Fund, as well as the Gates Foundation, the Global Alliance for Clean Cookstoves, and the Global Alliance for Chronic Diseases. Applications were due in January.

**Environmental and Genetic Risk Factors for Juvenile Dermatomyositis and other Pediatric Systemic Rheumatic Diseases.** NIEHS researchers Lisa G. Rider, MD, and Frederick W. Miller MD, PhD, in the Environmental Autoimmunity Group are engaging in large natural history studies of children with orphan autoimmune muscle diseases called myositis to identify phenotypes in order to better understand their environmental and genetic risk factors. Another study, the **Twin Sibling** study protocol, has enrolled more than 200 twins and same-gender (close in age) sibling pairs discordant for systemic rheumatic diseases in recently-diagnosed patients with juvenile and adult myositis, rheumatoid arthritis, lupus, and scleroderma to examine risk factors common to these systemic diseases. Environmental risk and severity factors, including ultraviolet light [[LINK](#)] and viral genes [[LINK](#)], have recently been identified for juvenile dermatomyositis and other pediatric systemic rheumatic diseases, including juvenile idiopathic arthritis and juvenile systemic lupus erythematosus. Genome-wide association studies have revealed genetic risk factors for juvenile dermatomyositis. [[LINK](#)]

**White House Childhood Obesity Task Force.** The NIEHS recently reported to the White House Childhood Obesity Task Force progress on goals related to chemical exposures and risk of childhood obesity. NIEHS currently funds 57 grants focusing on developmental exposures to environmental chemicals and obesity in childhood and across the lifespan and generations. Of these, 32 grants are in human birth cohort studies examining a variety of chemicals including phthalates and other endocrine disruptors, BPA, traffic pollutants, PCBs, pesticides, and arsenic, lead and other metals.

### ***Programs and Activities***

**WHO Collaborating Centre for Environmental Health Sciences, Focus Area on Children's Environmental Health.** NIEHS-WHO Collaborating Centre has led the organization of WHO collaborating centres working on similar problems affecting children to form a Network of WHO Collaborating Centres for Children's Environmental Health around the world. NIEHS is helping to provide logistical support for establishing the Network's website and regular teleconferences. Members of the Network have also been able to meet at several international meetings for side events where presentations have addressed the special vulnerability of children and highlighted risks in specific environments and special topics including the health effects of gold mining, electronic waste, hydraulic fracturing, environmental exposures, and emerging pollutants. **SP Goals: 3, 5, 6, 9, 10, 11**



### Meetings:

- NIEHS and EPA have jointly funded 23 **Children’s Environmental Health and Disease Prevention Research Centers** across the country since 1998. The centers examine the effects of air pollution, metals, pesticides, and other environmental contaminants on children’s health and developmental outcomes. They also provide outreach and education to those concerned about children’s environmental health. The annual centers meeting was held in Washington, DC, on October 29-30, where grantees presented new research on topics ranging from obesity, reproductive health, and neurodevelopmental disorders, to air pollution, nutrition, stress, and poverty. Grantees also discussed how to make their research findings useful for the development of health policies. **SP Goals: 2, 3, 9, 11**
- On October 19, the Principals to the **President’s Task Force on Environmental Health Risks and Safety Risks to Children** met to recommit federal agencies to the activity, which was originally established under an Executive Order by President Clinton. NIEHS staff participates on the group’s Steering Committee and as co-chairs of its Chemical Exposures and Climate Change Subcommittees. At the meeting, which was co-chaired by Sylvia Burwell, HHS Secretary, and Gina McCarthy, EPA Administrator, a call was issued for the Task Force to develop a new work plan, which is currently in development with leadership by the NIEHS. **SP Goals: 5, 6, 8, 10, 11**
- The first regional meeting of the **International Society for Autism Research** was held Nov. 6-8 in Shanghai. It was organized to extend the global reach of the society, and drew more than 700 participants from 31 countries, primarily from Asia and the Pacific region. Gwen Collman, Ph.D., director of the NIEHS Division of Extramural Research and Training, gave a plenary talk on early environmental exposures and the risk of autism spectrum disorders (ASD), and several NIEHS-funded scientists also participated. **SP Goals: 1, 2, 3, 10**
- NIEHS co-sponsored a meeting on Nov. 9-11 titled **Environmental Health at School: Ignored Too Long**. The meeting was organized by the Healthy Schools Network to look child-specific health and learning outcomes that result from environmental health exposures in school buildings or on or near school grounds, how to address children with suspected exposures, and how to prevent or reduce hazards in schools. A policy report based on the meeting was released in Jan. 2016 at <http://www.healthyschools.org/clearinghouse.html>.
- The **International Society for Children’s Health and the Environment** Retreat, was held in Cuernavaca, Mexico, January 6-9. The group is composed of children’s environmental health professionals with the goal of using research, training, policy, clinical care, community outreach, and education to reduce the impact of adverse chemical, physical,

biological and social influences on children's health. NIEHS Director Linda Birnbaum participated in the meeting. **SP Goals: 1, 2, 3, 9, 10**

### ***Selected Publications***

- The *EHP* Children's Health Collection 2015 is now available. This online collection compiles the past year's children's health research, commentary, and news published in the NIEHS journal. Access online at <http://ehp.niehs.nih.gov/chc-2015/>.
- *Association of cesarean delivery and formula supplementation with the intestinal microbiome of 6-week-old infants*. Madan JC, Hoen AG, Lundgren SN, Farzan SF, Cottingham KL, Morrison HG, Sogin ML, Li H, Moore JH, Karagas MR. *JAMA Pediatr*. 2016 Jan 11:1-8. PubMed PMID: 26752321. – This paper by Margaret Karagas, director of the NIEHS-EPA Children's Environmental Health and Disease Prevention Research Center at Dartmouth, and colleagues reveals an important association between the way in which infants are delivered and fed, and the composition of their microbiome. PubMed: <http://www.ncbi.nlm.nih.gov/pubmed/26752321>.

*Association of improved air quality with lung development in children*. Gauderman WJ, Urman R, Avol E, Berhane K, McConnell R, Rappaport E, Chang R, Lurmann F, Gilliland F. *N Engl J Med*. 2015 Mar 5;372(10):905-13. This study by NIEHS grantees found that long-term improvements in air quality were associated with statistically and clinically significant positive effects on lung-function growth in children. The paper was named a New England Journal of Medicine Notable Article of 2015. PubMed: <http://www.ncbi.nlm.nih.gov/pubmed/25738666>.

### ***Awards***

- Walter Rogan, M.D., who continues to work at NIEHS as a special volunteer after retiring in July, received the 10th annual Child Advocate Science Award from the Children's Environmental Health Network (CEHN) during a Nov. 12 ceremony. Rogan, who was the first epidemiologist hired at NIEHS, in 1976, is credited with helping found the field of children's environmental health in the 1970s

## **Past Meetings and Events**

NIEHS scientists and grantees made key contributions at the **International Society for Environmental Epidemiology (ISEE)** 27th annual meeting, Aug. 30-Sept. 3 in Sao Paulo, Brazil. Organizers held the

meeting in South America to highlight environmental health needs in developing countries, with the theme of Addressing Environmental Health Inequalities. **SP Goals: 2, 3, 5, 6**

NIEHS collaborated with organizers in India to host a Sept. 22-24 training workshop, **Understanding Climate and Health Associations in India (UCHAI)**. “Uchai” means “peak” in Hindi, India’s official language. The event was held to raise awareness and train public health researchers and professionals on the health impacts of climate change. The NIEHS-WHO Collaborating Centre for Environmental Health Sciences, in partnership with the Indian Meteorological Society and TARU Leading Edge, an Indian consulting firm focused on climate change and disaster risk reduction, organized the workshop, which was held in New Delhi. **SP Goals: 4, 5, 6, 8**

More than 60 representatives from regulatory agencies, academia and industry discussed the state of the science of alternatives to animal use for acute systemic toxicity testing and explored ways to facilitate their implementation at a meeting, **Alternative Approaches for Identifying Acute Systemic Toxicity: Moving from Research to Regulatory Testing**, held at NIH on Sep 24-25. Workshop attendees identified several resources as necessary for meaningful progress in identifying and implementing alternatives: high quality reference data, training on use and interpretation of computational approaches, and global harmonization of testing requirements. Attendees particularly noted the need to characterize variability in reference data being used to evaluate new approaches. **SP Goals: 1, 2, 3, 4**

NIEHS scientists and grantees met Sept. 26-30 at the 46th **Environmental Mutagenesis and Genomics Society (EMGS)** conference in New Orleans, Louisiana, where participants discussed developments in understanding environmental threats to genomic integrity, from DNA damage, DNA repair, and mutagenesis, to heritable effects and epigenetic alterations in genome function. **SP Goals: 1, 7**

How individuals react to toxins, and how this influences the regulation of environmental pollutants, were the topics of a workshop, **Interindividual Variability: New Ways to Study and Implications for Decision Making**. The workshop was sponsored by the NAS Committee on the Use of Emerging Science for Environmental Health Decisions in Washington, D.C. on September 30-October 1. One participant characterized a need for a new approach to healthcare as “personalized, predictive, preventive, [and] participatory medicine. The four Ps.” **SP Goals: 1, 2, 7, 10, 11**

NIEHS staff and grantees joined the Research Triangle Environmental Health Collaborative (EHC) Oct. 26-27 for its 2015 **Environmental Health Summit, Safe Water from Every Tap**. NIEHS was a co-sponsor of the meeting, which brought together scientists, community members, and public health professionals, with representatives from industry, local health departments, and local, state, and federal agencies to develop recommendations for improving access to safe drinking water from private wells. Heather Henry, Ph.D., health scientist administrator with the NIEHS Superfund Research

Program (SRP), highlighted SRP-funded research, nationwide, related to detecting and measuring contaminants in water, and treating it to meet safe drinking water standards. NIEHS Director Linda Birnbaum presented a talk on the NIEHS research investment in drinking water as a route of chemical exposure. **SP Goals: 3, 4, 6, 10**

The Genetics and Environmental Mutagenesis Society held a meeting **The Impact of Environmental Exposures on Genomic Health Across Generations**, in RTP on October 28. NIEHS and National Toxicology Program (NTP) scientists from across the institute participated as invited speakers, poster presenters, and attendees. This year's president-elect Stephanie Smith-Roe, Ph.D., is a genetic toxicologist in the NTP Biomolecular Screening Branch. NIEHS Deputy Director Rick Woychik, Ph.D., who heads the Mammalian Genome Group, gave a talk in which he examined how repetitive elements, once referred to as junk DNA, or DNA believed to be non-functional, may influence gene expression in a variety of ways. **SP Goals: 1, 2, 9**

The **American Public Health Association** annual meeting in Chicago on October 31-November 4 offered an opportunity for participation of many NIEHS staff and grantees around the theme of creating the healthiest nation in one generation. Sessions led by NIEHS included topics such as health disparities and environmental justice, climate change and human health, disaster response training, Ebola response, and others. **SP Goals: 5, 6, 8, 9, 10, 11**

NIEHS Director Linda Birnbaum and Rick Paules, Acting Chief, Biomolecular Screening Branch, participated in the **9<sup>th</sup> Congress of Toxicology in Developing Countries**, in Natal, Brazil on November 7-10. Birnbaum presented a keynote address *Chemicals Safety in Limbo: How low should we go?* Paules gave an invited talk on the use of Tox21 high throughput and toxicogenomic screening procedures. **SP Goals: 1, 5**

The **Superfund Research Program Annual Meeting**, themed "Collaboration for Innovation," encouraged participants to find ways to work across disciplines and with different SRP grantees and partners from the U.S. Environmental Protection Agency (EPA) and the Agency for Toxic Substances and Disease Registry. The meeting, held Nov 18-20 in San Juan, Puerto Rico, was hosted by the Puerto Rico Test site for Exploring Contamination Threats (PROTECT) SRP Center. The PROTECT Center studies exposure to environmental contaminants and preterm birth in Puerto Rico, which, according to the Centers for Disease Control and Prevention, has one of the highest rates of preterm birth among U.S. states and territories. **SP Goals: 3, 4, 5, 6, 11**

**FutureTox III: Bridges for Translation** focused on "Transforming 21st Century Science Into Risk Assessment and Regulatory Decision-making." Nearly 20 NTP scientists and contract staff participated in the meeting, held Nov. 19-20 in Arlington, Virginia, and sponsored by the Society of Toxicology. The

goal of the meeting was to assess how high throughput laboratory methods and big data analysis techniques could be applied to chemical safety testing. **SP Goals: 1, 3, 9**

Tribal leaders and scientists met Dec. 3-4 at the National Institutes of Health (NIH) in Bethesda, Maryland, to discuss how tribal ecological knowledge (TEK) can inform environmental health and biomedical research. The **Tribal Ecological Knowledge Workshop** was organized by NIEHS in collaboration with tribal representatives and other federal agencies. TEK incorporates observations about the natural world, connections between people and the environment, and responsible use of resources. NIEHS is looking to identify opportunities to incorporate more TEK into research. **SP Goals: 3, 5, 6, 7, 11**

NIEHS grant recipients funded through the **Research to Action** program met Jan. 12-13 at NIEHS to report results, share research progress, and explore new collaborations. Nearly 50 representatives from community organizations, academic institutions, and government agencies participated in the meeting on projects to address environmental inequities or health disparities. Research to Action projects require partnerships between scientists and community members. And research findings must be used to inform concrete public health actions that benefit the partner communities affected by pollution or other environmental health concerns. **SP Goals: 5, 6, 8, 9, 11**

The NIEHS-sponsored NAS Committee on the Use of Emerging Science for Environmental Health Decisions, hosted a workshop in Washington, DC on January 14-15 titled **Environmental Health: What's the Human Microbiome Have to Do with It?** Speakers at the meeting described and discussed issues including interactions between the microbiome and environmental exposures to the effect of the microbiome on interindividual susceptibility to research challenges. **SP Goals: 1, 2, 3, 4, 10**

The **Gulf of Mexico Research Initiative (GoMRI)**, created in the aftermath of the Deepwater Horizon oil spill, held its annual meeting on Feb 1-4 in Tampa, Florida. NIEHS staff and grantees presented in a session titled One Health: Unraveling the Interconnectedness between Human and Ecosystem Health through the Lens of Oil Spills, on issues such as cleanup exposures and hypertension (Dale Sandler) and improving disaster research to better understand the impact of oil spills on human health (Chip Hughes). NIEHS Director Linda Birnbaum participated in a Capstone panel on data gaps, and also presented a tribute to Louis Guillette, a long-time NIEHS grantee known for his ability to translate findings about endocrine disruption from species such as alligators to the harmful effects in humans. Guillette passed away in August. **SP Goals: 3, 4, 5, 11**

**Breast Cancer and the Environment Program** grantees held their annual meeting on Feb. 4-5 on the NCI campus in Rockville, MD. The program is co-funded by NIEHS and NCI. Goals of the meeting included identify opportunities for collaboration in support of BCERP's goal to define transdisciplinary

science of breast cancer and the environment, establish a tone for the consortium that fosters trust, collaboration, and inclusion, identify thematic working groups, and approve members of the Steering Committee and consortium policies for publications and dissemination. **SP Goals: 1, 2, 4, 6**

Data from high throughput *in vitro* tests are being generated for many chemicals of environmental and commercial interest, with the expectation that *in vitro* assay data could ultimately be used to predict adverse effects of chemical exposures *in vivo*. Translating values obtained from *in vitro* assays into estimates of *in vivo* outcomes is a complex process involving the use of mathematical modeling and increasingly complex test systems. The workshop ***In Vitro to In Vivo Extrapolation for High Throughput Prioritization and Decision Making***, held in RTP, on February 17-18 was the culmination of a series of four webinars to address the capabilities and the limitations of in vitro to in vivo extrapolation (IVIVE) within the context of risk decision making. **SP Goals: 3, 7, 9**

On February 18, NIEHS Director Linda Birnbaum was joined by four local grantees from Duke, UNC-Chapel Hill, and NC State in a **Community Forum** in Research Triangle Park, NC. The topic of the forum, hosted by the Research Triangle Foundation, was “Gene-Environment Interaction.” This event is part of a series of Community Forums and provided an opportunity for NIEHS to hear from neighbors in North Carolina and to share its research findings with the public. **SP Goals: 8, 11**

## Upcoming Meetings and Events

- TENDR II, Monterey, CA, February 29-March 3
- Deepwater Horizon Research Consortium Grantee Mtg, Mobile, AL, March 7-8
- Society of Toxicology, New Orleans, March 13-17
- Genetics and Environmental Mutagenesis Society, RTP, April 19
- Addressing Challenges in the Assessment of Botanical Dietary Supplement Safety (NTP), NIH, April 26-27
- NTP Workshop Shift Work at Night, Artificial Light at Night, and Circadian Disruption, RTP, March 11

## Awards and Recognition

### ***NIEHS Awardees***

- ***NIH Director’s Awards***
  - **David Balshaw**, Ph.D., and **Les Reinlib**, Ph.D., both of DERT, for work on the NIH Microphysiological Systems (Tissue Chip) Program Team
  - **Lisa Chadwick**, Ph.D.; **Astrid Haugen**; **Pat Mastin**, Ph.D.; **Kimberly McAllister**, Ph.D.; and **Fred Tyson**, Ph.D., DERT, for work on the NIH Epigenomics Roadmap Program

- **William (QB) Quattlebaum**, (retired) for work on the Sexual and Gender Minority Research Coordinating Committee
- **Samuel Wilson**, M.D., head of the DNA Repair & Nucleic Acid Enzymology Group, was given a Ruth L. Kirschstein Mentoring Award
- **Warren Casey**, Ph.D., director of the NTP Interagency Center for the Evaluation of Alternative Toxicological Methods, has been named the winner of the 2016 Enhancement of Animal Welfare Award by the Society of Toxicology.
- **Srikanth (Sri) Nadadur**, Ph.D., NIEHS program director for Nanotechnology Environmental Health and Safety became the first NIEHS U.S. Embassy Science Fellow; Nadadur spent 90 days in India focusing on research and bilateral consultations on urban air quality.
- **Masahiko Negishi**, Ph.D., head of the NIEHS Pharmacogenetics Group, has been named the 2016 recipient of the Bernard B. Brodie Award in Drug Metabolism by the American Society for Pharmacology and Experimental Therapeutics (ASPET). Negishi's discovery of CAR and elucidation of the molecular mechanism of induction of cytochromes P450 by phenobarbital was considered by several reviewers as one of the most important accomplishments in this field over the past 40 years.
- **Alisa Suen**, a visiting predoctoral fellow in the Reproductive Medicine Group headed by Carmen Williams, M.D., Ph.D., was awarded a Fellows Award for Research Excellence at the NIH Research Festival for work indicating that uterine SIX1 expression is a biomarker for exposure and disease, suggesting that SIX1 could play a role in carcinogenesis.
- *DHHS Green Champion Awards*
  - NIEHS Transshare and Telework Program, led by Jenn Evans and Claire Long in the Office of Management, was awarded The Corporate Responsibility Award for combining innovation and resourcefulness to create successful alternative commuting.
  - NIEHS Site Ecology team won an honorable mention for Environmental Stewardship. NIEHS members include:
    - Bill Steinmetz
    - Bill Willis
    - Scott Capouch
    - Gordon Caviness
    - Brian Harris
    - Steve Herndon
    - Chris Hunt Jr
    - Versal Mason

- John McLamb
  - Paul Poliachik
  - David Sawyer
  - Mitch Williams
  
- **Raja Jothi**, PhD, lead researcher of the Systems Biology Group in the NIEHS Laboratory of Epigenetics and Stem Cell Biology, has achieved NIH Tenure.
  
- **Sara Andres**, Ph.D., a visiting fellow in the Genome Stability Structural Biology Group, received a Best Talk by a New Investigator award for her presentation, “Ctp1 Orchestrates DNA Binding and Bridging in DNA Repair,” at the Environmental Mutagenesis and Genomics Society meeting in New Orleans.
  
- *Pathway to Independence Awards (now Assistant Professors):*
  - **Anne Marie Jukic**, Ph.D., from the Reproductive Epidemiology Group is now at the Yale School of Public Health
  - **Bret Freudenthal**, Ph.D., from the DNA Repair and Nucleic Acid Enzymology Group is now at the University of Kansas Medical Center. His work looks at the mutagenic properties of 5-chlorocytosine, a known inflammation biomarker that could suggest a functional link between chronic inflammation and cancer.
  - **Natalie Gassman**, Ph.D., also from the DNA Repair and Nucleic Acid Enzymology Group, is now at the University of South Alabama Mitchell Cancer Institute. Her work focuses on work on how bisphenol A affects cell survival after oxidative stress.
  
- NIEHS Scholars Connect students win travel awards to Annual Biomedical Research Conference for Minority Students (ABRCMS)
  - **Alanna Burwell**, in the NTP Molecular Pathogenesis Group
  - **Carri Murphy**, in the Chromosome Stability Group
  - **Porscha Walton**, in the National Toxicology Program (NTP) Office of Health Assessment and Translation
  
- **Erin Quist**, postdoctoral fellow in the Reproductive Endocrinology Group, won the Roger O. McClellan Student Award, taking first place in the Young Investigator in Toxicologic and Industrial Pathology competition for her work on a developmental toxicity model of prenatal PFOA exposure.

***Grantees/Others***



- **Aziz Sancar**, MD, PhD, at the University of North Carolina and a longtime NIEHS grantee, was named a winner of the 2015 Nobel Prize in chemistry. He shares the award with Paul Modrich, Ph.D., from Duke University School of Medicine and the Howard Hughes Medical Institute, and Tomas Lindahl, Ph.D., from the Francis Crick Institute and Clare Hall Laboratory in Great Britain. All three were honored for their work on the mechanisms of DNA repair.
- **Dana Dolinoy**, Ph.D., University of Michigan School of Public Health, has received an NIH Transformative Research Award as part of the High Risk-High Reward program. Dolinoy, a former ONES awardee, will conduct epigenetic science with a four-year, \$2.4 million project called Development of piRNAs for Target-Specific Methylation.
- **Howard Hu**, M.D., Sc.D., dean of the Dalla Lana School of Public Health at the University of Toronto and an outgoing member of the NIEHS advisory council, received the John Goldsmith Award for Outstanding Contributions to Environmental Epidemiology at the International Society for Environmental Epidemiology meeting for his contributions to research on children's environmental health.
- *Society of Toxicology Awards:*
  - **Lauren Aleksunes**, Pharm.D., Ph.D. at Rutgers U. and an NIEHS Outstanding New Environmental Scientist in 2012, will be awarded the SOT Achievement Award for making significant contributions to the field of toxicology within 15 years of obtaining her highest degree. Her lab studies how transporters in the kidney, liver, and brain help remove pharmaceuticals and environmental chemicals from the body to protect against toxicity
  - **Kenneth Reuhl**, Ph.D., Rutgers U., and **John Wise Sr.**, Ph.D., University of Louisville in Kentucky, will receive SOT Education Awards. Reuhl is being honored for his commitment to excellence in training, and significant contributions to toxicology education. Wise's studies examine the cellular and molecular mechanisms that lead to lung cancer following exposure to hexavalent chromium.
  - **I. Glenn Sipes**, Ph.D., professor emeritus of the Department of Pharmacology at the University of Arizona, will receive the 2016 SOT Distinguished Toxicology Scholar Award.
  - **Susan Sumner**, Ph.D., director of Systems and Translational Sciences at RTI International in Research Triangle Park, North Carolina, was a co-author of the paper that will receive the SOT Board of Publications Best Paper in Toxicological Sciences Award. Citation: Church RJ, Wu H, Mosedale M, Sumner SJ, Pathmasiri W, Kurtz CL, Pletcher MT, Eaddy JS, Pandher K, Singer M, Batheja A, Watkins PB, Adkins K, Harrill AH 2014. A systems biology approach utilizing a mouse diversity panel identifies genetic differences influencing isoniazid-induced microvesicular steatosis. *Toxicol Sci* 140(2):481-492.

- **Cheryl Walker**, Ph.D., professor and director of the Center for Translational Cancer Research in the Texas A&M Institute of Biosciences and Technology, will receive the 2016 SOT Leading Edge in Basic Science Award.
- **Nishad Jayasundara**, Ph.D., postdoctoral researcher at Duke University in their Superfund Research Program center, received the Karen Wetterhahn Memorial Award. Jayasundara is currently studying an estuarine fish, *Fundulus heteroclitus*, which has become resistant to PAHs.
- *American Association for the Advancement of Science 2015 Fellows:*
  - **Karlene Cimprich**, Ph.D., professor of chemical and systems biology at the Stanford School of Medicine is studying the regulation of two critical regulatory genes that help to reduce mutations arising from DNA replication stress.
  - **John DiGiovanni**, Ph.D., professor of pharmacology and toxicology and Coulter R. Sublette Chair at the University of Texas at Austin was an NIEHS-supported training program director and cancer researcher during his 1996-2009 tenure at the University of Texas M.D. Anderson Cancer Center.
  - **Gerd Pfeifer**, Ph.D., professor and head of the Laboratory of Epigenetic Pathways in Disease at the Van Andel Research Institute was previously a longtime NIEHS grantee, studying the mechanisms of ultraviolet radiation in producing mutations and epigenetic modifications linked to cancer.
  - **LuZhe Sun**, Ph.D., a professor in the Department of Cellular and Structural Biology at the University of Texas Health Science Center at San Antonio is exploring the effects of bisphenol A exposure on mammary gland stem cell function and transformation involved in cancer development.
  - **Janos Zempleni**, Ph.D., Willa Cather Professor of Molecular Nutrition and director of the Nebraska Center for the Prevention of Obesity Diseases Through Dietary Molecules at the University of Nebraska-Lincoln, previously received NIEHS grants to identify epigenetic mechanisms through which changes in the dietary uptake of biotin (vitamin B7) alter expression of retroviral elements involved in cancer and other genomic events.
- **David Sedlak**, Ph.D., and **Fiona Doyle**, Ph.D., from the UC-Berkeley SRP were elected to the National Academy of Engineering (NAE). Election to the NAE is among the highest professional distinctions accorded to an engineer. They will be inducted in October.