

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

13-14 May 2014

Director's Message

NIEHS Strategic Plan Implementation. Two newly formed groups of scientists and staff across the Institute are working to guide implementation of some of the goals of our Strategic Plan. The NIEHS Exposome Faculty supports Goal 3 of the plan, which calls for transforming exposure science by enabling consideration of the totality of human exposures and incorporating exposure science into human health studies. Priorities identified under the goal include defining and disseminating the concept of the exposome, and creating the tools and technologies, as well as research capacity, needed to characterize the exposome. The NIEHS Inflammation Faculty is focused on issues surrounding this immune system response, which was identified as a high priority research area in the Strategic Plan due to its role in neurologic, cardiopulmonary, neoplastic, reproductive, metabolic, and autoimmune diseases and the impact of the environment on it.

Climate Change Reports. NIEHS staff has been involved as authors and reviewers on two recent reports on climate change, the Intergovernmental Panel on Climate Change Working Group 2 report on impacts and adaptation, and the 3rd National Climate Assessment (NCA). Each of these reports lays out the scientific basis for climate change impacts, including those specific to human health. In addition, NIEHS is currently co-leading with the CDC, EPA, and NOAA, the generation of an Interagency Special Report on the Impacts of Climate Change on Human Health that will focus on quantifying climate change impacts on health. That report is anticipated for release in early 2015.

DIR and DNTP Reviews. NIH Director Francis Collins has requested that all NIH intramural programs be reviewed. As NIEHS has two, both DIR and DNTP have created working groups that are preparing reports to be submitted by July 31 for review in August. Final reports will go to Dr. Collins and his advisory committee in September.

Coal Ash Spill Response. A team of NIEHS-funded scientists from the University of North Carolina at Chapel Hill (UNC) Superfund Research Program (SRP) is helping to respond to one of the largest coal ash spills in the nation's history, which occurred February 2 in Eden, N.C., at a Duke Energy containment pond on the banks of the Dan River. According to a U.S. Environmental Protection Agency (EPA) estimate, by the time the discharge was stopped, 50,000 to 80,000 tons of toxic coal ash had entered the Dan River, lining its banks and depositing waste along the riverbed for 70 miles downstream. SRP researchers are trying to

answer questions about the toxicity of the chemicals in the ash to enable regulators to better assess potential risks to human health in communities along the river.

NIEHS/NTP Staff Updates

- Charles Schmidt, Director of Informatics at the Renaissance Computing Institute (RENCI), is “on loan” to NIEHS for six months as a temporary Science Information Officer while the Institute searches for a permanent SIO. RENCi is an institute of the University of North Carolina at Chapel Hill that was launched in 2004 as a collaborative effort involving the UNC Chapel Hill, Duke University and North Carolina State University.
- The search committee has identified a promising candidate to fill the position as director of the NIEHS Clinical Research Unit and negotiations are ongoing.
- Dr. Hugh Tilson, Editor in Chief of *EHP*, has decided to retire. A search is currently underway for a new Editor for the Institute’s journal. With an impact factor of 7.26, *EHP* is the internationally second-ranked journal in Public, Environmental, and Occupational Health and the fourth-ranked journal in Environmental Sciences.

Legislative and Budget Report

Briefing on NIEHS Superfund Programs

On 13 March 2014, Dr. Birnbaum briefed Colin Vickery and Jackie Kilroy, Republican staff for the House Appropriations Subcommittee on Interior, Environment & Related Agencies on the NIEHS Superfund Research and Worker Training Programs. Although Vickery is very supportive of Superfund Programs, he stated clearly that any increase above the President’s Request would be very unlikely. He noted that NIEHS does an amazing amount of work with the funding we receive.

President’s Budget for FY 2015

The President’s Budget for FY 2015 submitted to Congress on 4 March 2014 kept to the limit of \$1.014 trillion for FY 2015 for all discretionary spending with \$521,272,000 for defense programs and \$492,356,000 for domestic. A chart showing funding for NIEHS and NIH is attached.

On 10 April 2014, the House passed the Ryan Budget Resolution which cuts \$5 trillion in spending over the next 10 years. It would bring federal spending and taxes into balance by 2024 through steep cuts to Medicaid and food stamps and a total repeal of the Affordable Care Act. Defense programs would increase; domestic spending would be severely cut. Research funding would move from non-defense agencies to defense with reductions in applied non-defense research while providing some protection for basic research. Financial aid programs for students would be greatly reduced.

Senate Democrats do not intend to draft a budget resolution for FY 2015, but will rely on the budget deal made last December.

House Labor, HHS Appropriations Hearing

On 26 March 2013, the House Labor, HHS Appropriations Subcommittee held a hearing on the Future of Biomedical Research in which Francis Collins (NIH Director) accompanied by Anthony Fauci (NIAID), Gary Gibbons (NHLBI), Story Landis (NINDS), and Harold Varmus (NCI) testified. For the most part it was non-confrontational, but hardly typical. The Chairman, Jack Kingston (R-GA), and the Ranking Member, Rosa DeLauro (D-CT) were both complimentary of NIH. The Chairman did, however, emphasize that he wants to see cures for cancer rather than seeing money spent on “inappropriate” grants. In his words, he “...wants the money to go to the scientist with the white jacket in the lab finding the cure.”

Representative DeLauro described the economic impact of NIH grants. She pointed out that the economic investment in the Human Genome Project of \$4 billion spurred almost \$800 billion in economic growth over the ten year period from 2000 to 2010. Representative Lowey, Ranking Member of the full committee echoed similar sentiments, stating NIH was an economic engine that also improved our quality of life. In addition, she committed on the slowdown in U.S. scientific research versus the scientific research being conducted by other countries.

In his testimony, Dr. Collins touched on some of the advances NIH has made in recent years in areas such as basic science, genomics, proteomics, imaging and other technologies which have led the way for uncovering 1000's of new risk factors and therapeutic targets. One example Dr. Collins cited was the universal influenza vaccine that would not only eliminate the need for an annual flu shot but would also protect against outbreaks such as the H5N1 and H7N9.

Dr. Collins also talked about the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative which will provide a platform for major advances in Alzheimer's disease, autism, schizophrenia, traumatic brain injury, epilepsy, and many other brain disorders.

In addition, Dr. Collins described NIH research on ways to harness the body's immune system to fight cancer using T cells collected from cancer patients and then engineered to produce special proteins on their surface. The T cells are then infused back into the patient where they destroy the cancer cells. *Science Magazine* declared cancer immunotherapy as the 2013 breakthrough of the year.

Issues about which members asked questions include:

- How NIH sets priorities for research – Kingston (R-GA), Harris (R-MD), Womack (R-AR), and Joyce (R-OH)

- Taps on NIH funding required by Congressional mandate – Kingston (R-GA)
- Economic impact of NIH grants – DeLauro (D-CT) and Honda (D-CA)
- Strategic planning and goals – Harris (R-MD) and Fleischmann (R-TN)
- Women in clinical studies – DeLauro (D-CT)
- Research fraud – Roby (R-AL)
- Measles outbreak in New York – Lowey (D-NY)
- Duplication of research – Fleischmann (R-TN)
- Hepatitis B drugs – Honda (D-CA)
- IDeA program – Womack (R-AR)
- Research important to minorities – Lee (D-CA)
- Shrinking number of young investigators – Harris (R-MD)
- Accelerating Medicines Partnerships program – DeLauro (D-CT)
- Global competitiveness – DeLauro (D-CT) and Harris (R-MD)
- Social behavior and economic research – Roybal-Allard (D-CA)
- NIH funding supporting the Affordable Care Act -- Fleischmann (R-TN)
- COPD – Joyce (R-OH) and Lee (D-CA)

Senate Labor, HHS Appropriations Hearings

On 26 Feb 2014, the Senate Labor, HHS Appropriations Subcommittee chaired by Tom Harkin (D-IA) held a hearing on Alzheimer's disease. Each member expressed strong support for NIH. Senator Mikulski thinks of NIH as her very special constituent. "I was just at NIH on Monday. I'm so proud of the fact that it is in Maryland. I call it the National Institutes of Hope."

On 2 April 2014, the Committee held a hearing on the President's Request for NIH for FY 2015. All of the members present praised NIH for hard work and dedication to public health and noted their commitment to investing in biomedical research, but the source of any additional funding remains elusive.

This was the last appropriation hearing for NIH to be chaired by Senator Harkin (D-IA). He provided a relatively in-depth review of the NIH budget since the late 1980s and noted the positive economic impact that NIH has on this country. Although other Senators spoke about this issue as well, Senator Harkin summed it up by saying that an investment of \$3.8 billion in the Human Genome Project between 1989 and 2003 yielded a return of approximately \$796 billion. Senator Harkin pointed out that the Murray-Ryan budget deal partially replaced the funds lost to the Sequester. Senator Moran discussed the set-aside that would transfer \$142 million from NIH to HHS. Senator Mikulski spoke about steady financial growth versus a large all-at-once financial infusion. While discussing the budget many Senators spoke about, and asked about, how NIH sets priorities for spending.

Dr. Collins spoke about the negative impact the Sequestration had on NIH. He explained that the subsequent shutdown forced him to send 12,000 scientists home for 16 days, and

as a result some patients were actually turned away from NIH. He is optimistic that the corner has been turned with the FY14 budget after a difficult decade in funding. He reminded the panel that NIH has still lost more than 20% of its purchasing power over the last decade. He explained that a little more than half of the budget is used for basic science, genomics, proteomics, imaging, and therapeutic targets.

One example of an area of increased interest and opportunity Dr. Collins cited was the universal flu vaccine. A universal flu vaccine would not only eliminate the need for an annual flu shot but it would also protect against outbreaks such as the H5N1 and H7N9 in Southeast Asia. In addition to basic science advances Dr. Collins talked about other programs such as the Accelerating Medicines Partnership (AMP). He explained that the AMP program is a partnership that includes the FDA, pharmaceutical firms and a number of non-profit organizations. The AMP program will initially focus on Alzheimer's disease, diabetes type II and autoimmune disorders such as lupus and rheumatoid arthritis. The knowledge gained from this partnership will hopefully lead to new developments in diagnosis and therapeutics. This knowledge will also be openly shared. In addition, just as in the House Labor hearings, he talked about the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative and recent advances in cancer treatment that include the use of T Cells.

Issues about which members asked questions include:

- Brain Research through Advancing Innovative Neurotechnologies (BRAIN) – Harkin (D-IA)
- Cancer – Harkin (D-IA) and Moran (R-KS)
- Plan to retire chimpanzees – Harkin (D-IA)
- Alzheimer's disease – Moran (R-KS) and Mikulski (D-MD)
- AIDS – Mikulski (D-MD) and Cochran (R-MS)
- Autism – Mikulski (D-MD)
- Sustained growth for NIH at inflation plus 5 % - Mikulski (D-MD) and Durbin (D-IL)
- Economic Impact of NIH – Shelby (R-AL)
- Autoimmune diseases – Shelby (R-AL)
- Stroke – Kirk (R-IL)

Bills

S. 1961 – On 3 April 2014, the Senate Environment and Public Works Committee reported the Chemical Safety and Drinking Water Protection Act. Senators Manchin (D-WV), Rockefeller (D-WV), and Boxer (D-CA) introduced the bill after the West Virginia chemical spill that left 300,000 people without drinking water for over a week. It tightens oversight of chemical facilities and strengthens state inspection procedures. It is likely to pass the Senate; its fate in the House is uncertain.

S. 2100 – On March 10, 2014, Senator Collins (R-ME) introduced the Clean Cookstoves and Fuels Support Act. The bill authorizes such sums as may be necessary for NIH to work with the Global Alliance for Clean Cookstoves to support health research and training to improve the health of those at risk from household burning of solid fuels.

H.R. 4186 – On March 10, 2014, Congressman Bucshon (R-IN) introduced the Frontiers in Innovation, Research, Science, and Technology Act (FIRST Act). The legislation is the majority's version of the reauthorization of the America Competes law. The bill reauthorizes NSF, OSTP, and NIST, and includes provisions on Science, Technology, Engineering, and Mathematics Education (STEM) and information network IT research and development. This bill would prohibit the Administration's proposed STEM consolidation and create a STEM advisory panel and coordinating office. It encourages federal science agencies to use innovative funding models for research, such as prize competitions and crowdsourcing, to solve big problems. This bill would create sweeping oversight of NIH's training and educational activities, research computing, and data use, with coordination by groups outside of NIH. For NSF, the bill would impose strict requirements in its grant making process including justifications for the research and verification that there is no duplication by other agencies.

S. 2115 – On March 12, 2014, Senator Richard Durbin (D-IL) introduced S. 2115, the American Cures Act. The bill would create a mandatory fund to provide steady, predictable funding for breakthrough research conducted at the National Institutes of Health, Centers for Disease Control and Prevention, the Department of Defense Health Programs and the VA's Medical and Prosthetic Research Program. The new fund would start with \$1.8 billion and increase gradually each year for 10 years with a dedicated \$150 billion over the 10 year period

S. 994 – On March 27, 2014, the Senate Committee on Homeland Security and Government Affairs reported the Digital Accountability and Transparency Act (DATA Act). The bill expands current requirements to publish federal spending, mandates that the information appear in a form that is both easily searchable and downloadable, makes uniform the manner in which agencies provide such data for online posting, and requires agency Inspectors General and the Comptroller General to audit and report on agency compliance with the law's mandate.

Science Advances

One NIEHS (NIEHS authors' groups in parens):

- **Development of a stable cell line with an intact PGC-1alpha/ERRalpha axis for screening environmental chemicals.** Teng, CT (NTP), Beames, B (NTP), Alex Merrick, B (NTP), Martin, N (DIR), Romeo, C (DIR) and Jetten, AM (DIR). *Biochem. Biophys. Res. Commun.* (2014) [InPress] <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3801471/>

- **NAG-1/GDF15 prevents obesity by increasing thermogenesis, lipolysis and oxidative metabolism.** Chrysovergis K (DIR), X Wang (DIR), J Kosak (DIR), SH Lee, J Sik Kim (DIR), JF Foley (NTP), G Travlos (NTP), S Singh (DIR), S Joon Baek and TE Eling(DIR). *Int J Obes* (Lond) (2014) InPress.
<http://dx.doi.org/10.1038/ijo.2014.27>
- **Predictors of Plasma DDT and DDE Concentrations among Women Exposed to Indoor Residual Spraying for Malaria Control in the South African Study of Women and Babies (SOWB).** Whitworth KW, RM Bornman, JI Archer, MO Kudumu, GS Travlos (NTP), RE Wilson (NTP) and MP Longnecker (DIR). *Environ. Health Perspect* (2014) [ePub].
<http://dx.doi.org/10.1289/ehp.1307025>

DNTP

- **The National Toxicology Program Web-based Nonneoplastic Lesion Atlas: A Global Toxicology and Pathology Resource.** Cesta, MF (NTP), Malarkey, DE (NTP), Herbert, RA (NTP), Brix, A, Hamlin, MH, 2nd, Singletary, E, Sills, RC (NTP), Bucher, JR (NTP) and Birnbaum, LS (DIR). *Toxicol Pathol.* 2014;42(2):458-60. doi: 10.1177/0192623313517304.
<http://www.ncbi.nlm.nih.gov/pubmed/24488020>
- **Disposition of fragrance ingredient [C]1-(1,2,3,4,5,6,7,8-octahydro-2,3,8,8-tetramethyl-2-naphthalenyl)ethanone in male Fisher rats following oral administration and dermal application.** Waidyanatha S (NTP) and K Ryan (NTP). *Xenobiotica.* 2014 Feb 17. [Epub ahead of print].
<http://www.ncbi.nlm.nih.gov/pubmed/24533629>
- **Polyfluoroalkyl chemicals and menopause among women 20-65 years of age (NHANES).** Taylor KW (NTP), K Hoffman, KA Thayer (NTP) and JL Daniels. *Environ Health Perspect.* 2014 Feb;122(2):145-50. doi: 10.1289/ehp.1306707. Epub 2013 Nov 26.
<http://www.ncbi.nlm.nih.gov/pubmed/24280566>

DIR

- **A genetic model of differential susceptibility to human respiratory syncytial virus (RSV) infection.** Ciencewicki, JM (DIR), Wang, X (DIR), Marzec, J (DIR), Serra, ME, Bell, DA (DIR), Polack, FP and Kleeberger, SR (DIR). *FASEB J.* (2014) [ePub].
<http://dx.doi.org/10.1096/fj.13-239855>
- **Asymmetry in family history implicates nonstandard genetic mechanisms: application to the genetics of breast cancer.** Weinberg, CR, Shi, M, Deroo, LA, Taylor, JA, Sandler, DP and Umbach, DM. *PLoS Genet* (2014) v. 10 (3): pp. e1004174.
<http://dx.doi.org/10.1371/journal.pgen.1004174>
- **Genome-wide age-related DNA methylation changes in blood and other tissues relate to histone modification, expression and cancer.** Xu Z and JA Taylor. *Carcinogenesis* (2014) v. 35 (2): pp. 356-364.

<http://dx.doi.org/10.1093/carcin/bgt391>

- **CpG Sites Associated with Cigarette Smoking: Analysis of Epigenome-Wide Data from the Sister Study.** Harlid S, Xu Z, Panduri V, Sandler DP, Taylor JA. *Environ Health Perspect.* 2014 Apr 4. [Epub ahead of print]
<http://www.ncbi.nlm.nih.gov/pubmed/?term=Harlid+S+AND+Taylor+JA>
- **Obesity, rather than diet, drives epigenomic alterations in colonic epithelium resembling cancer progression.** Li R¹ (DIR), Grimm SA², Chrysovergis K¹ (DIR), Kosak J¹ (DIR), Wang X¹ (DIR), Du Y², Burkholder A², Janardhan K³, Mav D⁴, Shah R⁴, Eling TE¹ (DIR), Wade PA⁵ (DIR). *Cell Metab.* 2014 Apr 1;19(4):702-11. doi: 10.1016/j.cmet.2014.03.012.
<http://www.sciencedirect.com/science/article/pii/S1550413114001168>
- **Fine-tuning of epigenetic regulation with respect to promoter CpG content in a cell type-specific manner.** R Li (DIR), D Mav, SA Grimm (DIR), R Jothi (DIR), R Shah and PA Wade (DIR). *Epigenetics* (2014) v. 9 (5) [ePub]
<http://dx.doi.org/10.4161/epi.28075>
- **Prevalence of allergic sensitization in the United States: Results from the National Health and Nutrition Examination Survey (NHANES) 2005-2006.** Salo PM (DIR), SJ Arbes, Jr., R Jaramillo, A Calatroni, CH Weir, ML Sever, JA Hoppin (DIR), KM Rose, AH Liu, PJ Gergen, HE Mitchell and DC Zeldin (DIR). *J. Allergy Clin. Immunol.* (2014) [InPress]
<http://dx.doi.org/10.1016/j.jaci.2013.12.1071>
- **Selective unfolding of one Ribonuclease H domain of HIV reverse transcriptase is linked to homodimer formation.** Zheng X, LC Pedersen, SA Gabel, GA Mueller, MJ Cuneo, EF Derose, JM Krahn and RE London. *Nucleic Acids Res* (2014) [ePub]
<http://dx.doi.org/10.1093/nar/gku143>
- **Estrogen hormone physiology: Reproductive findings from estrogen receptor mutant mice.** Hamilton, KJ, Arao, Y and Korach, KS. *Reproductive biology* (2014) v. 14 (1): pp. 3-8.
<http://dx.doi.org/10.1016/j.repbio.2013.12.002>
- **The Naturally Occurring Luteinizing Hormone Surge Is Diminished in Mice Lacking Estrogen Receptor Beta in the Ovary.** Jayes, FL, Burns, KA, Rodriguez, KF, Kissling, GE and Korach, KS. *Biol. Reprod.* (2014) v. 90 (2) 24.
<http://dx.doi.org/10.1095/biolreprod.113.113316>

DERT

- **Bisphenol A promotes human prostate stem-progenitor cell self-renewal and increases in vivo carcinogenesis in human prostate epithelium.** Prins GS, Hu WY, Shi GB, Hu DP, Majumdar S, Li G, Huang K, Nelles JL, Ho SM, Walker CL, Kajdacsy-Balla A, van Breemen RB. *Endocrinology.* 2014 Mar;155(3):805-17. doi: 10.1210/en.2013-1955. Epub 2014 Jan 1.
http://press.endocrine.org/doi/abs/10.1210/en.2013-1955?url_ver=Z39.88-

[2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed&](http://dx.doi.org/10.1038/jes.2013.68)

- **A novel system to generate WTC dust particles for inhalation exposures.** Vaughan JM, Garrett BJ, Prophete C, Horton L, Sisco M, Soukup JM, Zelikoff JT, Ghio A, Peltier RE, Asgharian B, Chen LC, Cohen MD. *Journal of Exposure Science and Environmental Epidemiology* (2014) v. 24 (1): pp. 105-112.
<http://dx.doi.org/10.1038/jes.2013.68>
- **Hormonal Regulation of Epithelial Organization in a Three-Dimensional Breast Tissue Culture Model.** Speroni L, Whitt GS, Xylas J, Quinn KP, Jondeau-Cabaton A, Barnes C, Georgakoudi I, Sonnenschein C, Soto AM. *Tissue Eng. Part C-Methods* (2014) v. 20 (1): pp. 42-51.
<http://dx.doi.org/10.1089/ten.tec.2013.0054>
- **Occupational Determinants of Cumulative Lead Exposure: Analysis of Bone Lead Among Men in the VA Normative Aging Study.** Ji JS, Schwartz J, Sparrow D, Hu H, Weisskopf MG. *J Occup Environ Med.* 2014 Apr;56(4):435-40.
<http://www.ncbi.nlm.nih.gov/pubmed/24709766>
- **Mutation of POLB Causes Lupus in Mice.** Senejani AG, Liu Y, Kidane D, Maher SE, Zeiss CJ, Park HJ, Kashgarian M, McNiff JM, Zelterman D, Bothwell AL, Sweasy JB. *Cell Reports* (2014) v. 6 (1): pp. 1-8.
<http://dx.doi.org/10.1016/j.celrep.2013.12.017>
- **Loss of Hypoxia-Inducible Factor 2 Alpha in the Lung Alveolar Epithelium of Mice Leads to Enhanced Eosinophilic Inflammation in Cobalt-Induced Lung Injury.** Proper, SP, Saini, Y, Greenwood, KK, Bramble, LA, Downing, NJ, Harkema, JR and LaPres, JJ. *Toxicol. Sci.* (2014) v. 137 (2): pp. 447-457.
<http://dx.doi.org/10.1093/toxsci/kft253>
- **Differential methylation of the arsenic (III) methyltransferase promoter according to arsenic exposure.** Gribble, MO, Tang, WY, Shang, Y, Pollak, J, Umans, JG, Francesconi, KA, Goessler, W, Silbergeld, EK, Guallar, E, Cole, SA, Fallin, MD and Navas-Acien, A. *Arch. Toxicol.* (2014) v. 88 (2): pp. 275-282.
<http://dx.doi.org/10.1007/s00204-013-1146-x>
- **Gut Microbiome Phenotypes Driven by Host Genetics Affect Arsenic Metabolism.** Lu, K, Mahbub, R, Cable, PH, Ru, HY, Parry, NMA, Bodnar, WM, Wishnok, JS, Styblo, M, Swenberg, JA, Fox, JG and Tannenbaum, SR. *Chem. Res. Toxicol.* (2014) v. 27 (2): pp. 172-174.
<http://dx.doi.org/10.1021/tx400454z>
- **A simulation model of building intervention impacts on indoor environmental quality, pediatric asthma, and costs.** Fabian MP, Adamkiewicz G, Stout NK, Sandel M, Levy JI. *J Allergy Clin Immunol.* 2014 Jan;133(1):77-84. doi: 10.1016/j.jaci.2013.06.003. Epub 2013 Jul 31.
<http://www.sciencedirect.com/science/article/pii/S0091674913009135>

- ***Elevated serum pesticide levels and risk for Alzheimer disease.*** Richardson JR, Roy A, Shalat SL, von Stein RT, Hossain MM, Buckley B, Gearing M, Levey AI, German DC. *JAMA Neurol.* 2014 Mar;71(3):284-90. doi: 10.1001/jamaneurol.2013.6030. <http://archneur.jamanetwork.com/article.aspx?articleid=1816015>

NIEHS News and Highlights

Training and Mentoring

- Andy Shapiro, an MPH student trainee in the UNC Superfund Research Program (SRP), has developed a Health Assessment Workplace Collaborative, which is an online workspace to create, store, share, and display data and analyses for human health chemical risk assessments. Shapiro was guided by his mentor, SRP grantee Ivan Rusyn.
- Webinar for Young EH Investigators on Data Sharing
- The 17th Annual NIEHS Biomedical Career Symposium was held on April 25. The symposium targets postdoctoral fellows and graduate students, and provides 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.
- NIEHS has announced new Transdisciplinary Environmental Health Fellowships in Epigenetics and Stem Cell Research. Trainees will gain extensive laboratory training in either epigenetics research or stem cell research in the NIEHS Division of Intramural Research (DIR). DIR is also partnering with the Division of Extramural Research and Training (DERT) and the Division of the National Toxicology Program (DNTP) to broaden the fellows' experience in grants administration, data analysis, environmental health policy, and toxicology. Individuals will be mentored by faculty from each of the three divisions, providing a broad-based experience in environmental health-focused basic laboratory research; grant preparation; program development, review, and analysis; and applied toxicological research and testing.
- NTP recently hosted its first flash mentoring session on March 20. Flash mentoring refers to a rapid-fire verbal interchange, typically around five or six minutes in length, between a senior figure, or mentor, — in the case of NIEHS and NTP, a lead scientist or program manager — and a less experienced individual, typically a trainee, job seeker, or aspiring employee. The mentor and trainee discuss career development issues, in a situation that's been described as similar to speed dating, with mentees rotating to different people every few minutes. The NTP session engaged 10 senior scientists and 10 trainees.
- NIH officially launched the new Office of Equity, Diversity, and Inclusion with a full schedule of activities on March 24-27 including a special flash mentoring session at NIEHS targeted at women scientists and staff, as the event coincided with the Institute's celebration of National Women's Month.
- Dr. Birnbaum will be the featured speaker at the 2014-2015 NIEHS Scholars Connect Seminar Series on June 10. The program is designed to provide an opportunity for highly motivated science, technology, engineering, and math (STEM) focused undergraduate students from the surrounding Historically Black Colleges & Universities (HBCU) and other nearby academic institutions with students from underrepresented groups to

solidly connect with NIEHS and engage in many of its educational, informational, training, and career-oriented outlets.

Data Management and Technology

- In April, the NTP Office of Health Assessment and Translation published its [Systematic Review and Evidence Integration for Literature-Based Environmental Health Science Assessments](#) in EHP. Next steps include future publications to describe each step in detail.
- Public comment has been received in response to an RFI: Input on Development of a Language Standard for Environmental Health Sciences, and a working group from across the Institute, in consultation with colleagues at EPA, is planning a September workshop in Raleigh to explore how best to classify, annotate, and store environmental health data to ensure interoperability of databases and promote sharing, reuse, and reanalysis of data.
- BD2K. The NIH Big Data to Knowledge (BD2K) program is now accepting applications for the following funding announcements:
 - [Courses in for Skills Development in Biomedical Big Data Science \(R25\)](#)
 - [Open Educational Resources for Biomedical Big Data \(R25\)](#)
 - [Mentored Career Development Award in Biomedical Big Data Science for Clinicians and Doctorally Prepared Scientists \(K01\)](#)
 - [Predoctoral Training in Biomedical Big Data Science \(T32\)](#)
 - [Revisions to Add Biomedical Big Data Training to Existing Training Programs \(T15s\)](#)

Past Meetings and Events

A daylong forum on the public **health impacts of hydraulic fracturing** attracted about 190 people to the University of Pennsylvania's (UP) Perelman School of Medicine on February 18. The symposium was sponsored by the UP Center of Excellence in Environmental Toxicology, which is funded in part by NIEHS and the Center for Public Health Initiatives, and featured presenters from industry, academia, government, and the community. The presentations focused primarily on the Marcellus Shale activities in northern Pennsylvania counties where the politics and science of fracking have clashed most dramatically, and where several new NIH/NIEHS-funded studies of health effects, looking at insurance claims data, hospital records, and community perceptions, are taking shape.

A March 3-4 workshop at NIEHS on the “**Health Effects and Mitigation of Arsenic: Current Research Efforts and Future Directions**” brought together 150 leading experts from universities, NIEHS, NTP, and the U.S. Environmental Protection Agency to work toward a common goal of better understanding how low levels of arsenic impact human health, and how to best prevent exposure to arsenic, whether it occurs naturally or as a consequence of human activity.

The NIEHS-funded Duke University and University of North Carolina at Chapel Hill (UNC) Superfund Research Program's Research Translation Cores (RTC) co-hosted a workshop March 5-6, focused on **communicating science to the media**. Eighteen journalists from national and local news outlets interacted with RTC scientists to learn about SRP issues and how they are relevant in people's everyday lives.

The NIEHS-sponsored Institute of Medicine (IOM) Roundtable on Environmental Health Sciences, Research, and Medicine explored the benefits and challenges of **sharing environmental health data**, and ways to maximize data sharing and satisfy a federal mandate for public access to government data in a March 19 workshop in Washington, DC.

At the 53rd annual meeting of the **Society of Toxicology (SOT)** in Phoenix in March, the NIEHS and NTP delegation showcased cutting-edge science and provided opportunities for people to network and form new collaborations. Also at the conference, Dr. Birnbaum signed a memorandum of understanding (MOU) between SOT and NIEHS that sets forth a framework for an alliance between NIEHS and SOT to foster a shared dedication to provide global leadership toward creating a safer and healthier world, by increasing the impact of the science of toxicology.

The NIEHS **Environmental Health Science Centers Directors' Meeting** was held April 7-9, in Los Angeles, California. In addition to the usual reporting and information sharing among the Center Directors, NIEHS staff also participated in a number of other activities including a **Community Forum on Public Health and Local Planning** and a **Disaster Response Tabletop Exercise**. At the Community Forum was hosted by the University of Southern California Dr. Birnbaum participated in a panel discussion on environmental health research taking place in the Los Angeles area. Panelists included local and state transit officials, local planners, and community organizations along with researchers and public health officials. The Disaster Response Tabletop Exercise brought together staff of the NIEHS Worker Education and Training Program with local emergency responders, firefighters, police and other public safety personnel, environmental and local officials, and others to gauge their ability to respond to a simulated environmental disaster.

On April 22, the NIEHS held a **Virtual Forum on Autism and the Environment**. The event was online and open to the public. The panel included NIEHS and NTP Director Linda Birnbaum, and autism research experts Alan Brown, Columbia University; Irva Hertz-Picciotto, UC Davis MIND Institute; Avi Reichenberg, Ichan School of Medicine at Mount Sinai, and Seaver Center for Autism Research and Treatment; and Heather E. Volk, Keck School of Medicine, and Saban Research Institute, Children's Hospital Los Angeles. Cindy Lawler, Ph.D., the lead representative for NIEHS-funded autism activities, moderated.

The Interagency Center for the Evaluation of Alternative Toxicological Methods (NICEATM), in collaboration with North Carolina State University, sponsored a Collaborative Workshop on **Aquatic Models and 21st Century Toxicology** on May 5-6 in Raleigh. The discussions

focused on how small aquarium fish species may be used as model organisms to (1) screen and prioritize compounds for further *in vivo* testing and (2) assess mechanisms of chemical toxicity.

Upcoming Meetings and Events

- Consortium of Universities for Global Health Annual Meeting, May 13-14, Washington, D.C.
- American Thoracic Society, May 17-22, San Diego
- Disaster Research Response (DR2) Initiative Meeting, June 13, NIH
- Alaska Community Forum (St. Lawrence Island), Meeting with health care officials (Nome), and Scientific Meeting (Anchorage), July 24-25
- ISCHE & ISEE Future of Children's Environmental Health, August 19-25, Whidbey Island, Washington State
- ISEE Annual Meeting, August 24-28, Seattle, Washington
- Adverse Outcome Pathways: From Research to Regulation Workshop, September 3-5, 2014, NIH

Awards and Recognition

NIEHS Awardees

- Dr. Linda Birnbaum will be awarded an honorary degree, Doctor of Philosophy Honoris Causa, from Ben Gurion University of the Negev in Beer-Sheva, Israel on May 20.
- Dr. Sam Wilson, former Acting Director and Deputy Director, NIEHS, has been awarded the 2014 SER-CAT (Southeast Regional Collaborative Access Team) Outstanding Science Award. SER-CAT is an organization consisting of 21 member institutions, formed in 1997 to provide third generation x-ray capabilities to macromolecular crystallographers and structural biologists in the southeastern region of the U.S.
- The International Rett Syndrome Foundation awarded a 2-year, \$98,000 grant to NIEHS researcher Serena Dudek, Ph.D., to study the role of insulin-like growth factor 1 (IGF-1) receptor in hippocampal CA2 plasticity and function. Rett Syndrome is a severe neurological disorder caused by a mutation in the MECP2 gene.
- Biostatistician Shyama Peddada, Ph.D. was awarded the 2013 Professor P.V. Sukhatme Gold Medal Award by the Indian Society of Agricultural for his career-long work in statistical theory and methods, as well as his collaborative research in cell biology, environmental health, fibroid growth in women, the microbiome, and toxicology.
- Three NIEHS scientists have achieved their certification as Diplomates of the American Board of Toxicology:
 - Mamta Behl, Ph.D, is a former NTP fellow and current contract toxicologist in the NTP Systems Toxicology Group

- Arun Pandiri, Ph.D., is a contract pathologist in the NTP Investigative Pathology Group
- Sheetal Thakur, Ph.D., is an IRTA fellow in the NTP Systems Toxicology Group
- NIEHS Biostatistics Branch summer intern Mitas Ray was recognized as one of 300 semifinalists for the prestigious Intel Science Talent Search (Intel STS) competition. Ray's project was to design a new chemical testing method using computer science and cell-based assays to test a wide range of chemicals at once.
- Two NIEHS trainees received top honors from the North Carolina Triangle Consortium for Reproductive Biology.

Shannon Whirlledge, Ph.D., an IRTA fellow in the Laboratory of Signal Transduction, won for best oral presentation in competition. Her work at NIEHS focuses on the glucocorticoid receptor (GR) signaling in the uterus.

Chang Liu, a predoctoral fellow in the Laboratory of Reproductive and Developmental Toxicology, won best poster describing work investigating cell lineage establishment during organogenesis using mouse models and how defects in this process affects fertility.

NIEHS-related Awardees

- The Kids + Chemical Safety website, supported in part by the NIEHS-funded Harvard Superfund Research Program Research Translation Core, received the 2013 Risk Communication Award from the Alliance for Chemical Safety. The site provides up-to-date information on health hazards of chemicals and the safe use of chemicals around children.
- The American Association for the Advancement of Sciences elected four NIEHS grantees as fellows in the Biological Sciences and Medical Sciences:
 - Frank Gilliland, M.D., Ph.D., is a professor of preventive medicine and directs the Division of Environmental Health within the Keck School of Medicine at the University of Southern California (USC). He is the director of the NIEHS-supported Southern California Environmental Health Sciences Center.
 - Oliver Hankinson, Ph.D., who holds an NIEHS grant for training in molecular toxicology, is a professor of pathology and laboratory medicine at the University of California, Los Angeles. In 2000, he became the founding director of the university's doctoral program in molecular toxicology.
 - Michael Kastan, M.D., Ph.D., is executive director of the Duke Cancer Institute at Duke University. Along with grants from the National Cancer Institute, Kastan receives NIEHS support for studies of cellular stress response signaling pathways.
 - Rob McConnell, M.D., is a professor of preventive medicine and deputy director of the NIEHS/EPA-supported Children's Environmental Health Center at USC. He is the lead researcher on two NIEHS grants.

