

Research News Quarterly

OCTOBER 2018

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NEW

EDITOR

VEENA ANTONY, MD
Chair, Research Advocacy Committee

ADVISORY BOARD MEMBERS:

AMALI SAMARASINGHE, MD
Member, ATS Research Advocacy Committee

NUALA S. MOORE
Director of Government Relations

Letter from the Editor

Our feature article this month is an interview with the NIH's National Institute of Environmental Health Sciences (NIEHS) Director Linda Birnbaum, PhD. In the interview, Dr. Birnbaum outlines the institute's new strategic plan guiding its research portfolio over the next five years. She discusses the institute's continued research on the respiratory health effects of climate change and its efforts to study environmental exposures arising from such natural disasters as hurricanes. Dr. Birnbaum also discusses how the NIEHS' Worker Training Program equips emergency response and hazardous waste workers to protect their health as they respond to natural disasters.

Our next article is a report on the ATS's successful annual Hill Day, held Oct. 3, when ATS members advocated for research funding and other issues on Capitol Hill. In this edition, the Quarterly initiates a new series on NIH intramural programs with an overview of the National Institute of Allergy and Infectious Disease's expansive Division of Intramural Research. Shifting back to environmental health, I have written a complementary perspective to the NIEHS Director interview on environmental determinants of lung health, including the institute's Superfund Research Program.

ATS Research Advocacy Committee members Jay Kolls and Claude Le Saux report on the May 2018 Research Innovation Summit with industry stakeholders, followed by an update on the development of the National Institute of Child Health and Development's new strategic plan, the draft of which is expected by year's end. Next up is an announcement on the Patient-Centered Outcomes Research Institute's (PCORI) Oct. 31 Annual Meeting in Washington, DC.

Our next report is on the release of the NIH's Office of Disease Prevention's new strategic plan, which now includes a focus on tobacco regulatory science. This edition of the Quarterly concludes with an update from the ATS Washington Office on health research funding--specifically, the great news that NIH will receive a \$2 billion funding increase in 2019!

Veena Antony, MD

Editor
Chair, Research Advocacy Committee



INTERVIEW WITH NIEHS Director Linda Birnbaum, PhD, DABT, ATS

Q: The institute recently released its five-year strategic plan. What is your vision for the institute over the next five years?

A: [The NIEHS Strategic Plan 2018-2023](#) pulls together three main themes that are core components and priorities of NIEHS: 1) Advancing Environmental Health Sciences, 2) Promoting Translation – Data to Knowledge to Action, and 3) Enhancing EHS through Stewardship and Support. The first theme covers the overall institute priorities in its core environmental health research function, including basic research on the effects of environment on biological systems; studies of different aspects of individual susceptibility to environmental agents; and “predictive toxicology,” which involves using basic knowledge to create targeted testing regimens to predict adverse effects of chemical exposure.

Understanding the role of the microbiome has expanded priority in the new strategic plan, as does the exposome concept (framed as the totality of environmental exposures experienced over an individual’s lifespan).

The second theme encompasses a new way of thinking about NIEHS’s many translational and dissemination activities by bringing them together under the title of Promoting Translation – Data to Knowledge to Action. The priorities under this theme constitute a translational “cascade,” starting with the collection of research results into a body of knowledge that ultimately is used to promote public health action. All these efforts are supported by the third theme, which covers the institute’s priorities in training, impact evaluation, and infrastructure for data science and big data

Q: Rising temperatures the world over and across the U.S. are impacting people with environmental associated respiratory diseases. What research studies is the institute supporting to study the respiratory health effects of climate change?

A: NIEHS has an extensive history of research on the impacts of air pollution on respiratory health, including the main air pollution components responsible for climate change, such as ozone, carbon dioxide, and other greenhouse gases, as well as particulate matter. We have several current studies trying to tease out the exact relationship between variations in climate, air pollution, and impacts for respiratory health. One group of researchers is investigating the role of air pollution and the risks of lung cancer and COPD among California participants of the Multiethnic Cohort Study, using high-quality

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Linda Birnbaum Interview *(Continued from page 2)*

data on air pollution, health behaviors, neighborhood factors, C-reactive protein, and disease surveillance. This study is the first prospective air pollution and COPD study to include sizeable numbers of Africans and Latinos.

Also, climate change is expected to lead to more intense and longer-lasting extreme weather events. As we've seen so recently with Hurricane Florence, such events lead to more frequent power outage. Another NIEHS-funded group is evaluating whether frequency, duration, coverage, and certain causes of power outage are associated with increased risk of mortality from electricity-dependent diseases, including COPD. The findings and forecast models derived from this study will help guide environmental and health agencies in planning climate adaptation programs.

Q: What initiatives is the institute supporting to bring environmental health study findings into better treatments and prevention interventions for patients?

A: NIEHS research is advancing science to improve treatment, diagnosis, and prevention of disease across several areas. For example, researchers from MIT and other institutions are using nanotechnology to develop targeted treatments for drug-resistant bacteria. Their approach is adapted from a strategy they previously used to deliver targeted cancer drugs. Another team of researchers is focusing on identifying factors that exacerbate symptoms in people who suffer from asthma and allergies. These researchers conducted the nation's largest indoor allergen study to date, and their findings help manage risks for developing allergies and asthma. Importantly, their work helps patients and clinicians consider preventive actions to help reduce exposure to indoor allergens and irritants. I also point to a study from researchers at Columbia University which shows that taking B vitamins may reduce epigenetic effects (DNA methylation) associated with air pollution exposure. Their findings are particularly relevant for patients and clinicians in regions of the world with frequent periods of high levels of small particulate air pollution and lay the foundation for more research to develop interventions that can prevent and minimize the adverse effects of air pollution.

Q: Recent natural disasters such as in Puerto Rico have impacted disadvantaged communities. These disasters have both exacerbated and caused some new environmental exposure problems. What is the institute doing to prevent some of these exposures and also learn from them?

A: NIEHS is forward-leaning when it comes to the development, support, and promotion of disaster science in response to disasters and other emerging threats. NIEHS, in collaboration with the National Library of Medicine, leads the NIH Disaster Research Response (DR2) Program. Through DR2 we continue to strengthen communication across the environmental health and biomedical research enterprises, enabling relevant knowledge to be shared and research to be designed and executed quickly when disaster strikes. Currently, there are over 250 research protocols and data collection tools available on the ever-expanding and publicly-accessible DR2 website. Additionally, more researchers across the country are utilizing the DR2 resources and developing new capabilities, including IRB approvals for their own DR2 protocols in anticipation of disasters.

Using our time-sensitive funding mechanism, NIEHS awarded more than 10 grants focused on investigating health outcomes associated with hurricanes and wildfires last year. For example, in the aftermath of Hurricane Maria an interdisciplinary research team at the University of Puerto Rico is collecting indoor and outdoor samples from homes to identify indoor fungal microbiota associated with flood damage and airborne pro-inflammatory microbial compounds that contribute to poor respiratory health. The team is connecting their findings to the health of residents in the home and home conditions to inform the public, health practitioners, and others as to the respiratory health risks posed by home water damage and potential methods for mitigating these risks after a natural disaster.

Researchers at Oregon State University, Rice University, and Baylor College of Medicine were also awarded time-sensitive grants to investigate health outcomes associated with exposures resulting from Hurricane Harvey, including maternal and infant microbiome and birth outcomes and for neighborhoods with poorly controlled asthma.

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Linda Birnbaum Interview *(Continued from page 3)*

Researchers at the University of California, Davis, and University of Montana were awarded grants to assess health effects associated with the wildfires in the West. Each of these research projects can give us new insights into how better to protect public health in the event of future disasters. Last year NIEHS funded a new Superfund Research Center at Texas A&M focused on developing tools to address exposure to mixtures during environmental, emergency-related contamination events. The investigators quickly jumped into the response to Hurricane Harvey, collecting needed exposure information in collaboration with public health agencies and fielding important community health studies.

Our Worker Training Program is also on the frontlines of disaster response and recovery and helps equip emergency response and hazardous waste workers with the tools and knowledge they need to protect their health as they execute their response and cleanup missions. This program has provided critical training and education to a wide range of workers involved in disaster response and cleanup efforts including the Gulf oil spill; Superstorm Sandy; Hurricanes Harvey, Maria, and Irma; the Ebola response; and now for Hurricane Florence.

Q: Recently, there has been interest in PFOS and PFOA's (fluorinated organic chemicals) in drinking water with community concerns over the health effects of these chemicals. These chemicals also affect the immune system and may lead to respiratory infections or disease. What is the NIEHS doing to expand research into these chemicals?

A: NIEHS research to elucidate health effects associated with human exposure to per- and polyfluoroalkyl substances, or PFAS, has grown in recent years as the public has learned these chemicals can be found in drinking water and are used in a wide variety of consumer products. The chemical compositions of PFAS impart high stability for consumer product design, but also make PFAS extremely problematic in the environment because they do not easily degrade. While we have studies indicating adverse health effects associated with a few PFAS—mainly PFOS and PFOA, both of which have now been phased out of domestic production—we do

not have data for thousands of PFAS that have not been well studied. That's why our researchers are working to close the knowledge gap and improve our understanding of hazards associated with exposure to these chemicals. Potential effects include immune system dysfunction, endocrine disruption, obesity, diabetes, and cancer. Last year alone NIEHS funded over 40 different PFAS-focused research projects. These include epidemiological studies, biological plausibility and pathway studies in animals, mechanistic studies, and studies using rapid high throughput screening technology. Particularly noteworthy is the systematic literature review that the National Toxicology Program, which is headquartered at NIEHS, undertook a few years ago. In 2016, that review concluded that PFOA and PFOS are a hazard to healthy immune system function in humans.

NTP is beginning to undertake another systematic review that will focus on six related PFAS chemicals, including PFDA and PFHxS. NTP is also partnering with the EPA to study PFAS as a class due to potential similarities in chemical properties and toxicity. As a result, scientists will be able to compare one PFAS chemical to another and work toward understanding a common basis for toxicity. NIEHS is also engaged in the work exploring safer alternatives and our Superfund Research Program is investing in research to develop new PFAS remediation technologies. Last, I want to mention our time-sensitive awards. We funded researchers in Colorado who are studying PFAS exposures in residents near Colorado Springs, whose wells and public water systems have concentrations of a wide range of PFAS, including PFHxS. Closer to home we funded a study at North Carolina State University to help address community questions about GenX exposure given the impact on North Carolina's Cape Fear River. All this effort can help in the long run with development of intervention and prevention methodologies.

Q: Education, training, and recruitment are emphasized in the NIEHS strategic plan. What precise steps will the NIEHS take to recruit and sustain professionals to the field? Will there be more funding avenues aimed at junior investigators, especially to expand their basic/clinical research to include the realm of environmental

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Linda Birnbaum Interview *(Continued from page 4)*

factors? Will the NIEHS initiate training programs for field-related expertise development and collaborative science?

A: In the new strategic plan, NIEHS commits to continue its efforts to recruit and train the next generation of environmental health science researchers. The institute supports targeted efforts aimed at all levels of the workforce pipeline: students, trainees, young investigators, and mid-career investigators. A new researcher's first steps toward scientific independence are a particularly difficult time in the overall trajectory of a research career. NIEHS supports Pathway to Independence Awards combining postdoctoral support with subsequent independent research support up to three years. Another NIEHS-specific program is the Transition to Independent Environmental Health Research Career Awards, which provide three years of support for newly independent investigators interested in research careers in environmental health sciences. In the regular grant review process, NIEHS pays special attention to applications from "early established investigators" and "early stage investigators." All these efforts are aimed at helping young investigators establish themselves and providing incentives for researchers to look towards the environmental health sciences as a research career..

Q: As data overload occurs with advances made in each field (microbiome, infectious agents, toxicants, epigenetics, etc.) how does the NIEHS envision amalgamating new information with existing research and clinical information to assist clinicians/researchers make timely decisions that drive patient care/research avenues?

A: There is a critical need to integrate research data and information to support exploration of complex environmental health issues. New technologies generate massive amounts of data, which not only require totally new analytic techniques, but in the case of environmental health sciences, the ability to integrate very different data streams from genetic sequences to metabolomics to epidemiological and geographic data. NIEHS has given high priority in our strategic plan to investments in the overall area of data science and big data, including data infrastructure.

An exciting new resource, the NIEHS Data Commons, is being created to manage data and metadata coming from our various research labs so that these data sets are shareable, accessible, and findable, and, when appropriate, are published to established repositories. We are now integrating our genomic data sets in the Commons. Over time, we will increase the types of data and metadata managed within the NIEHS Commons. Projects and resources like the Commons will have the power to leverage our investments across all different types of environmental health sciences research. For more information on these and other NIEHS programs, visit the [NIEHS website](#) ■

RESEARCH ADVOCACY ATS Hill Day 2018



ATS Hill Day 2018: From right to left: Courtney White, ATS Staff, Manoj Mammen, MD,, Anna Nolan, MD, Jag Sunderram, MD, Karen Collishaw, ATS Executive Director

On Oct. 3, 30 ATS members and patient advocates traveled to Capitol Hill to advocate for increased research funding, COPD awareness, patient supplemental oxygen access, and domestic tuberculosis legislation. ATS and PAR members came from 20 states across the country, including Alabama, California, Colorado, Hawaii, Illinois, Louisiana, New Mexico, and Washington, and met with 60 House and Senate offices to advocate for these ATS federal legislative priorities. ATS members met with key

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ATS Hill Day 2018 (Continued from page 5)

members of Congress, including Sen. Roy Blunt (R-MO), chair of the Senate Labor-Health and Human Services Appropriations subcommittee, which determines NIH funding with its House counterpart, and Senate Health, Education, Labor and Pensions Committee chairman Lamar Alexander (R-TN). ■

RESPIRATORY INNOVATION

ATS Hosts Inaugural Respiratory Innovation Summit

By ATS Research Advocacy Committee former and current members **Jay Kolls, MD, and Claude Le Saux, MD**

Leaders from the ATS, Pharma, Biotech, and the investment community met for a one-day summit prior the official start of the 2018 ATS meeting on May 19, 2018, with the goal of uniting these stakeholders in advancing diagnostics and therapeutics for patients suffering from respiratory and sleep disorders. Cecilia Gonzalo from Vatera Holdings LLC and Dr. Tim Watkins from Gilead Sciences served as co-chairs for the event. The summit was aided greatly by Tom Salemi and his group at Healthegey, who helped develop the agenda and kept the program on time. The agenda was a diverse group of presentations that featured speakers from Pharma, early stage Bio-Tech, funders, as well as regulatory agencies in respiratory health. There were a number of exciting talks from early stage companies tackling significant unmet medical needs in the respiratory space. The agenda is [available here](#).

From the funding perspective, there were intriguing data presented that showed that although the oncology space has experienced huge investments in the last several years, respiratory health overall has not seen similar increases. Some funders argued that this could be a strength as some aspects of oncology may be oversaturated and thus respiratory health represents an unmet need for investment and growth. Another opportunity presented was the potential for developing smart technology to track and diagnose respiratory disease sooner and more accurately. Based on

the success of the summit, the 2nd Respiratory Innovation Summit is scheduled for ATS Dallas in 2019. ■

RESEARCH

ATS Convenes Child Health Congressional Briefing with Friends of NIEHS

On October 10, the ATS, in collaboration with the Friends of NIEHS, American Academy of Pediatrics and other partners, held a successful U.S. Congress briefing on child health entitled, *A Healthy Start for Every Child: How the Environment Influences Health and Development*. The educational event for congressional staff featured a panel of three speakers, which included National Institute of Environmental Health Sciences Director Linda Birnbaum, Ph.D., Margaret Karagas, Ph.D., Chair of the Department of Epidemiology at Dartmouth College, and Rebecca Fry, Ph.D., Carol R. Engle Distinguished Professor at the University of North Carolina School of Public Health.

The issue focus of the briefing was heavy metals exposures such as arsenic, lead and mercury through water supply's, power plant emissions and foods, which cause health effects including gestational diabetes in pregnant women and low birthweight in babies. Dr. Fry discussed how the NIEHS-funded Well Empowered study at the University of North Carolina is providing water filters to affected communities in North Carolina. ■



From right to left: Joe Laakso, Endocrine Society, Margaret Karagas, Ph.D., Linda Birnbaum, Ph.D., Rebecca Fry, Ph.D., and Nuala Moore, ATS Staff.

Quarterly Spotlight Series

NEW

Quarterly Spotlight Series on NIH Institute Intramural Divisions

NIAID Division of Intramural Research

The National Institute of Allergy and Infectious Diseases's (NIAID) Division of Intramural Research (DIR) studies all aspects of infectious diseases, including causative agents, vectors, and pathogenesis in human and animal hosts. Since 2004, the division has been headed by Steven Holland, MD, who also serves as chief of the immunopathogenesis section within the Laboratory of Clinical Infectious Diseases. The goals of the division are to:

- Expand knowledge of normal immune system components and functions
- Define mechanisms responsible for abnormal immune function (immunodeficiency, allergy, and autoimmunity)
- Understand the biology of infectious agents (viruses, bacteria, fungi, and parasites) and the host response to infection
- Develop strategies to prevent and treat immunologic, allergic, and infectious diseases



NIAID's intramural researchers are currently running over 100 clinical trials at the NIH Clinical Center and at collaborating domestic and international sites. The DIR comprises 120 principal investigators working in [21 different laboratories](#) on or around the main NIH campus in Bethesda, Maryland, including:

- [Laboratory of Allergic Diseases](#)
- [Laboratory of Immune System Biology](#)
- [Laboratory of Clinical Immunology and Microbiology](#) (includes TB lab)
- [Laboratory of Immunogenetics](#)
- [Laboratory of Infectious Diseases](#)

- [Laboratory of Molecular Immunology](#) (West Nile, inflammatory bowel disease, psoriasis)
- [Lab of Parasitic Diseases](#) (includes TB and NTM; lab identified biomarker for TB)

NIAID DIR Training Programs

Notably, trainees are the largest staff group in DIR as the division provides various laboratory and clinical research training opportunities for both pre- and postdoctoral physicians and scientists. The Office of Training and Diversity's [intramural research opportunities](#) support science and medical students, including from populations underrepresented in

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Quarterly Spotlight Series (Continued from page 7)

biomedical research, financially disadvantaged backgrounds, or those with disabilities. In addition, the DIR's Laboratory of Clinical Immunology and Microbiology has training opportunities for both basic scientists and clinical fellows through the NIAID [Infectious Disease Fellowship Training Program](#), the [Allergy and Immunology Training Program](#), and the [Transition Program in Clinical Research](#). Additional information about NIAID and NIH training programs for medical students, post-docs, and physicians, as well as numerous different opportunities at the NIH Clinical Center, can be found here.

Rocky Mountain Labs

The DIR has a large campus focused on basic research in Hamilton, Montana, called the Rocky Mountain Laboratories (RML). This facility houses the DIR's [Laboratories of Bacteriology, Persistent Viral Diseases and Virology](#). RML has conducted much of the groundbreaking research to improve our knowledge of vector-borne diseases, such as Rocky Mountain spotted fever and Lyme disease. RML are [currently studying](#) influenza and antibiotic-resistant bacteria, aiming to develop an alternative to antibiotic treatment for infections caused by *Klebsiella pneumoniae* bacteria resistant to carbapenem antibiotics.

Snapshot of Select NIAID DIR Divisions Conducting Research on Respiratory Diseases

The NIAID DIR is a vast network of laboratories conducting dozens of research studies across many different respiratory diseases. Below is a snapshot from a selection of the DIR laboratories conducting research on asthma, influenza, pneumonia, tuberculosis, and non-tuberculous mycobacteria.

Asthma

The [Laboratory of Allergic Diseases \(LAD\)](#) is composed of six subdivisions that do basic and clinical research on immunologic diseases targeted at understanding the genetics and pathology of immune dysfunction associated with allergic inflammation. The LAD includes the Allergy and Immunology Clinical Training Program, Genetics and Pathogenesis of Allergy Section, Inflammation Immunobiology Section, and Mast Cell Biology Section.

The LAD's Molecular Signal Transduction Section also studies the role of airway smooth muscle abnormalities in asthma. In 2014, the section's preclinical studies of severe asthma detected a pathogenic protease allergen from the common mold *Aspergillus fumigatus* (*Af*), which promotes bronchoconstriction through direct exchanges with bronchial smooth muscle ([PMID:25865874](#)). More recently, the section discovered that the level of

protease deposited in the lungs has a strong association with disease severity and lung impairment, which indicates that the association could be pursued as a clinical biomarker of disease ([PMID: 28882610](#)).

Laboratory of Immune System Biology

The Laboratory of Immune System Biology (LISB) conducts research across 13 subdivisions on the basic genetics, molecular biology, and cell biology of the immune system. The LISB serves as a hub across for the development of software tools for complex systems modeling, advanced imaging modalities, screening efforts, and new methods to microbiome analysis, all of which facilitate the expansion of immunology and systems biology efforts across all institutes.

Laboratory of Immunogenetics The Laboratory of Immunogenetics (LIG) encompasses 11 subdivisions focused on the cellular and molecular mechanisms underlying the signaling functions of immune cell receptors, including Molecular and Cellular Immunology, Receptor Cell Biology Section, and Structural Immunology. A significant area for this lab is on research to develop new tuberculosis treatments.

Influenza, Pneumonia and RSV The [Laboratory of Infectious Diseases \(LID\)](#) studies viral vaccine development, host immune response to viruses, and viral molecular biology and genetics and

Quarterly Spotlight Series (Continued from page 8)

includes clinical studies across ten subdivisions. Along with the Vaccine Research Center, the LID is working to develop a universal flu vaccine.

The lab maintains a long-term program on severe childhood respiratory diseases, from which the recombinant live, attenuated respiratory syncytial virus (RSV) vaccine candidate for infants was developed and is now in clinical trials. In collaboration with extramural NIAID researchers, the LID also developed the FluMist flu vaccine.

One of the DIR's most innovative trials is on drug-resistant pneumonia through the RML's Lab of Bacteriology. There, DIR researchers are working to develop new treatments for infections caused by *Klebsiella (K) pneumonia* bacteria resistant to carbapenem antibiotics. *K. bacteria* cause about 10 percent of all hospital-acquired infections in the U.S. The treatment intervention developed by NIAID uses antibodies to target the *K. pneumoniae* protective capsule polysaccharide, permitting immune system cells called neutrophils to attack and destroy the bacteria. In the next phase of study, researchers will evaluate the treatment concept in mice and test a preventive intervention. Ultimately, they hope either the antibody treatment alone or in combination with antibiotics could greatly improve care for people with multidrug-resistant *K. pneumoniae* infections.

Tuberculosis

The [Laboratory of Clinical Immunology and Microbiology](#) (LCIM), is a large division of 25 different sections and units conducting basic, clinical, and epidemiologic research into human immunologic, inflammatory, and infectious diseases aimed at developing novel diagnostic techniques and treatment interventions for primary immunodeficiencies and infectious diseases.

The LCIM houses the world-renowned Tuberculosis Research Section (TBRS) which focuses on discovery science to facilitate the development of drugs to treat TB. Some of the section's recent studies include determining the effectiveness of linezolid for drug-resistant TB, exploring new markers to speed accurate diagnosis of TB infection, and improving the monitoring of patient receptiveness to treatment.

Non-tuberculous mycobacteria

The LCIM is the main DIR lab studying non-tuberculous mycobacteria disease (NTM), a disease that is growing increasingly prevalent in the U.S. but for which there are few effective treatment options. A recent [study](#) by the LCIM's Epidemiology Unit found that yearly prevalence estimates for pulmonary NTM disease in the U.S. range from 1.4 to 13.9 per 100,000 persons, with higher prevalence among women and

Asian Americans, and much higher prevalence in Hawaii.

Vaccine Research Center NIAID's Dale and Betty Bumpers Vaccine Research Center (VRC) was created in 2000 to develop an AIDS vaccine. The center continues this focus but now also works to develop vaccines for Ebola, influenza, and Marburg virus. Discoveries, strategies, and resources from the Vaccine Center are also being utilized in vaccine research on other diseases.

International Sites

The [International Centers for Excellence in Research \(ICER\) program](#) was created by the DIR in 2002 to develop and sustain research programs in disease-endemic countries through partnerships with local scientists. The ICER program focuses on infectious disease clinical research; however, each center also helps meet the research and training needs of the local area, including laboratory and information technology infrastructure. The program's main sites are in Uganda, Mali, and India. In addition to these main sites, DIR has collaborative research programs in seven other countries, including Thailand, where the focus is on nontuberculous mycobacteria and immune deficiency, and in South Korea and China, where the focus is on tuberculosis. ■

Environmental Health Perspective

ENVIRONMENTAL HEALTH PERSPECTIVE

Research Reveals the Environmental Determinants of Lung Health

By Veena Antony, MD, Chair, ATS Research Advocacy Committee

Pollution remains the largest environmental cause of disease and premature death in the world today (1). The impact of the physical, social, and personal environment on lung health are multifaceted and may be cumulative. Although it is clearly recognized that the human exposome can cause lung disease, precipitate exacerbations, and effect longevity, the mechanisms remain complex and intertwined. Chronic obstructive pulmonary disease (COPD) has emerged as the third largest cause of mortality, which is exquisitely impacted by the environs in which the individual is positioned: indoor and outdoor air pollution, smoking, socioeconomic status, physical activity, and nutrition. The natural ecology, geology, and seasons may also affect the presence or exacerbation of disease. Age is recognized as an important factor and it was recently demonstrated that concentrations of PM_{2.5} and ozone below national standard levels caused adverse effects in the Medicare population (2).

Pollution is expensive since it endangers not only humans but planetary health with loss of ecosystems and chemical contamination with new synthetic materials that may not be tested for long-term safety and toxicity. Pollution remediation as well as prevention are important tools in our armamentarium against the detrimental cost to human health. Control strategies can snowball into collectively impacting multiple types of pollution. An example is the increased efforts worldwide to turn away from coal-related energy products.

Integrated research and multi-science partnerships can be powerful tools and can drive policy changes. The causal links between early, subclinical disease and air pollution

in diseases such as asthma, COPD, and susceptibility to lower respiratory tract infections need to be publicly advertised. Incentives for research innovation that can translate into public policy are needed.

The NIEHS continues to play a pivotal role in our advances in this field and through its extramural and intramural research and training has made major advances. Its latest strategic plan sets new standards for furthering our understanding of the role on the environment in lung disease.

The NIEHS superfund hazardous substance research and training program brings together biomedical, environmental engineering, and social sciences to bear on pollution-mediated impacts on human health.

The NIEHS recently announced continuation of the Superfund Hazardous Substance Research and Training Program on July 3; applications are due by Dec.19, 2018. More information is available through the NIEHS Website and the Request for Applications (RFA-ES-18-002). ■

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1. Landrigan PJ, Fuller R, Acosta NJR, Adeyi O, Arnold R, Basu NN, et al. The Lancet Commission on pollution and health. *Lancet*. 2017.
 2. Di Q, Dominici F, and Schwartz JD. Air Pollution and Mortality in the Medicare Population. *N Engl J Med*. 2017;377(15):1498-9.

CHILD HEALTH

New NICHD Strategic Plan in Development

The National Institute of Child Health and Development (NICHD) has begun development of a new strategic plan to guide its research efforts. The institute has put together a Strategic Planning Workgroup to develop themes and strategic priorities within focus areas. The workgroup is expected to release a draft strategic plan before the end of 2018, which will be available for public comment.

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PCOR

The NICHD is accepting comments from the public now to inform development of the strategic plan at NICHDStrategicPlan@nih.gov. The institute is also holding an October 31 [strategic planning webinar](#) that is open to the public with advance registration. The ATS recently submitted the following recommendations on child respiratory health to the Institute:

- Prioritization of study of the effects of preterm birth upon persistent respiratory morbidity, including bronchopulmonary dysplasia, pulmonary hypertension, and asthma
- Expand study of pediatric sleep disorders, particularly translational pediatric sleep studies
- Prioritize and expand training for all pediatric researchers, including opportunities for pediatric pulmonary research training programs

[View here for more information about the NICHD strategic planning process.](#) ■

PCORI

PCORI to Hold October 31 Annual Meeting

The Patient-Centered Outcomes Research Institute (PCORI) will hold its annual meeting Oct. 31 – Nov. 2 in Washington, DC. The PCORI meeting, entitled “From Evidence to Impact: Putting What Works into Action,” will feature results from PCORI-funded research studies and explore opportunities to utilize study evidence in ways that patients and other healthcare stakeholders find most useful. [Click here](#) for the PCORI Annual Meeting agenda and registration.

In other news from PCORI, the institute recently released a [broad funding announcement](#) for all five of its priority research areas, listed below. The letter of intent deadline for all of these opportunities is Nov. 6, 2018.

- Addressing Disparities
- Assessment of Diagnosis, Treatment, and Prevention Initiatives
- Communication and Dissemination Research
- Improving Healthcare Systems
- Improving Methods to Conduct PCORI. ■

DISEASE PREVENTION

NIH Office of Disease Prevention Releases New Strategic Plan

On Oct. 2, the NIH Office of Disease Prevention (ODP) released its new [Strategic Plan for Fiscal Years 2019 – 2023](#). The plan lays out the office’s strategic priorities over the next five years across the following three new cross-cutting themes, which will help the office integrate disease prevention across NIH:

- Leading causes and risk factors for premature mortality and morbidity
- Health disparities
- Dissemination and implementation research

In another step, the ODP has formally integrated the Tobacco Regulatory Science Program (TRSP), which has been a key focus of the ODP for several years, as a new strategic priority. By including the TRSP as a strategic priority, the ODP aims to help build sustained research across NIH to reduce the impact of tobacco on public health.

The ODP’s six strategic priorities are:

- Conduct Portfolio Analysis and Impact Assessments
- Identify Disease Prevention Research Gaps
- Improve Research Methods
- Promote Collaborative Research

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NIH Budget

- Advance Tobacco Regulator and Science Prevention
- Communicate Efforts and Findings

For more information about the NIH Office of Disease Prevention, [visit here.](#)

The bill also includes a short-term spending measure to fund agencies in the seven remaining annual spending bills that have not been agreed to (FDA, State, EPA, Homeland Security, etc.) until Dec. 7. The package does not include any policy riders on clean air, tobacco, or the Affordable Care Act. ■

NIH BUDGET

President Trump Signs 2019 NIH Funding Increase into Law

The fiscal year FY 2019 health and defense spending bill passed its final hurdles when it was approved by the House of Representatives by a vote of 361 – 61, and President Trump signed the measure into law in early October. The health spending measure, known as the Labor-Health and Human Services bill, includes a \$2 billion funding increase for the NIH, which sets FY 2019 NIH funding at \$39.1 billion. After expressing some disapproval of the health-defense spending package because it does not include border wall funding, President Trump signed the bill into law before the end of the fiscal year on Sept. 30, averting a government shutdown.



Senator Roy Blunt (R-MO), chair of the Labor-Health and Human Services Appropriations subcommittee and NIH Director Francis Collins, MD, PhD, at the September 12, 2018 Rally for Medical Research Capitol Hill Reception.