

Division of Intramural Research

NAEHS Council Update

May 2013

DIR RECRUITMENTS

Director, Clinical Research Program

The NIEHS is searching for a senior investigator to direct its Clinical Research Program. The Director, Clinical Research Program, is responsible for the development, administration, coordination and oversight of investigator-initiated clinical research; provides general advice to the Director and Scientific Director, NIEHS, on matters relating to human and clinical studies; supervises the Office of Research Compliance; and develops policies and programs for the execution of clinical research at NIEHS. The Clinical Director is responsible for creating and maintaining a research environment in which clinical findings influence the direction of laboratory studies and laboratory findings are applied back to the clinical and clinical research communities. The incumbent will facilitate intramural clinical research by identifying opportunities for translating basic science into clinical studies. The Clinical Director will ensure that Institute research reflects the highest standards of scientific excellence and ethical conduct for the protection of human subjects. The incumbent will review matters pertaining to the provision of patient care in research protocols and oversee research allocation, scientific review, and recruitment of staff. The Clinical Director will provide advice and training on the conduct of clinical studies, facilitate clinical research collaborations between intramural and extramural investigators, and develop long-range clinical research goals and objectives relevant to the mission of NIEHS. It is expected that the successful candidate will oversee a personal clinical research program that will involve some combination of outpatient oriented studies within the Clinical Research Unit, epidemiological studies, basic laboratory studies, or inpatient studies at the Clinical Research Center in Bethesda. Emphasis will be placed upon investigators with a primary research interest in clinical research; however, the selected candidate may have a modest independent basic laboratory research program, particularly if the basic research intersects with the candidate's clinical studies. Dr. Carter Van Waes, Clinical Director, National Institute on Deafness and Other Communication Disorders, is chair of the search committee. The committee reviewed 13 candidates and 3 were referred for further consideration. Interviews will take place in June and July.

NEW HIRES AND CHANGES IN DIR LEADERSHIP

Comparative Medicine Branch

Dr. Kathy Laber will be joining NIEHS as Chief of the Comparative Medicine Branch, Attending Veterinarian, and Animal Program Director. Currently, Dr. Laber is a Professor in the Department of Comparative Medicine at the Medical University of South Carolina, and Director of the Animal Resource Program for the Ralph H. Johnson Medical Center. Dr. Laber received her D.V.M. in 1984 from Michigan State University and completed her residency in Laboratory Animal Medicine at Bowman Gray School of Medicine. She also completed a Masters in Molecular and Cellular Pathobiology from Wake Forest University in 1988. Dr. Laber has been active in many national and international organizations within her field. She is the immediate Past-President of the American Association of Laboratory Animal Science Association (AALAS), an educational organization that serves a membership of 13,000 professionals dedicated to supporting quality animal research. Dr. Laber served as President of the Association for the Assessment and Accreditation of Laboratory Animal Care International (AAALAC). In her 16 years with AAALAC she conducted more than 170 site visits in the U.S. and abroad. She has also served on the American College of Laboratory Animal Medicine and the Association of Veterans Affairs Veterinary Medical Officers. She will begin work in June 2013.

Laboratory of Neurobiology

Dr. Jerrel L. Yakel has been named Acting Chief of the Laboratory of Neurobiology. Dr. Yakel is a Senior Investigator and group leader of the Ion Channel Physiology Group in the Laboratory of Neurobiology which studies the structure, function and regulation of the Cys-loop ligand-gated ion channel superfamily, with a particular focus on the nicotinic acetylcholine receptor channels and their role in neurological disorders.

Office of the Scientific Director

Mr. Kent Stone has been selected as the Chief of Operations in the Office of the Scientific Director. Mr. Stone was an Administrative Officer in the Administrative Management Branch, NIEHS, prior to taking the position of Chief of Operations.

Earl Stadtman Tenure-Track Investigators

As part of the NIH-wide Stadtman tenure-track investigator searches, DIR has offered two candidates positions.

The first candidate is Dr. Guo Huang from University of Texas Southwestern Medical Center, Dallas, TX. Dr. Huang studies the role of retinoic acid signaling in cardiac regeneration. Upon acceptance of the position, his primary appointment will be in the Laboratory of Molecular Carcinogenesis with a secondary appointment in the Laboratory of Reproductive and Developmental Toxicology.

The second candidate is Dr. Alberto Ciccia from the Harvard Medical School, Boston, MA. Dr. Ciccia studies the role of a chromatin remodeling complex in DNA repair. Upon acceptance of the position, he will have a primary appointment in the Laboratory of Molecular Genetics with secondary appointments in the Laboratory of Signal Transduction and the Laboratory of Structural Biology.

DIR RESEARCH UPDATE

Genome-wide interactions with smoking – served two ways

Stephanie London, MD, DrPH

Epidemiology Branch and the Laboratory of Respiratory Biology, DIR, NIEHS

This talk will present two types of analyses examining genome wide interactions with smoking. The first incorporates smoking into genome wide interaction studies of pulmonary function in adults. Here we conducted a genome-wide meta-analysis of single nucleotide polymorphisms (SNPs) in smokers and non-smokers and associations with spirometric measures of pulmonary function. Our findings demonstrated that joint testing of SNP and SNP-by-environment interaction identified novel loci associated with complex respiratory traits that are missed when considering only the genetic main effects. The second analysis examines the influence of maternal smoking on the epigenome of newborns using a genome-wide DNA methylation platform (the Illumina Methy1450k). We examined maternal plasma cotinine (an objective biomarker of smoking) measured during pregnancy in relation to DNA methylation in newborn cord blood. We identified a set of genes with methylation changes present at birth in children whose mothers smoked during pregnancy. Our findings implicate epigenetic mechanisms in the pathogenesis of the adverse health outcomes associated with this important in utero exposure.

BSC REVIEW OF THE LABORATORY OF TOXICOLOGY AND PHARMACOLOGY AND DR. XIAOLING LI

The DIR Board of Scientific Counselors reviewed the Laboratory of Toxicology and Pharmacology and Dr. Xiaoling Li April 14-16, 2013.

Members of the Board of Scientific Counselors that Attended:

- Jack Keene, Ph.D. [BSC Chair], James B. Duke Professor, Dept. of Molecular Genetics & Microbiology, Duke University School of Medicine, Durham, NC
- Kenneth B. Adler, Ph.D., Professor, Dept. of Molecular Biomedical Sciences, College of Veterinary Medicine, North Carolina State University, Raleigh, NC
- Juan C. Celedón M.D., Dr.P.H., Neil K. Jerne Professor, Dept. of Pediatrics, Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA.
- Samuel M. Cohen, M.D., Ph.D., Professor, Dept. of Pathology and Microbiology, University of Nebraska Medical Center, Omaha, NE
- Jay I. Goodman, Ph.D., Professor, Department of Pharmacology and Toxicology, Michigan State University, East Lansing, MI
- Serrine S. Lau, Ph.D., Professor and Director, Southwest Environmental Health Sciences Center, Dept. of Pharmacology & Toxicology, University of Arizona College of Pharmacy, Tucson, AZ
- José E. Manautou, Ph.D., Associate Professor, Department of Pharmaceutical Sciences, University of Connecticut School of Pharmacy, Storrs, CT
- Donald P. McDonnell, Ph.D., Glaxo-Wellcome Professor and Chairman of Pharmacology and Cancer Biology, Duke University School of Medicine, Durham, NC
- Karen M. Vasquez, Ph.D., Professor, Division of Pharmacology and Toxicology, Dell Pediatric Research Institute, The University of Texas at Austin, Austin, TX
- Roland A. Owens, Ph.D., Ex-Officio BSC Member, Assistant Director, Office of Intramural Research, NIH, Bethesda, MD

Ad Hoc Reviewers that Attended:

- Tom J. Abbruscata, Ph.D., Professor, Dept. of Pharmaceutical Sciences, Texas Tech University School of Pharmacy, Amarillo, TX.
- Aaron Barchowsky, Ph.D., Professor, Department of Environmental and Occupational Health, University of Pittsburgh, Pittsburgh, PA
- Rafael de Cabo, Ph.D., Senior Investigator, Chief, Experimental Gerontology Section, National Institute on Aging, NIH, Baltimore, MD
- Thomas P. Davis, Ph.D., Professor, Department of Pharmacology, University of Arizona College of Medicine, Tucson, AZ
- Xinxin Ding, Ph.D., Lab Chief, Laboratory of Molecular Toxicology, Biggs Laboratory, Wadsworth Center, New York State Department of Health, Empire State Plaza, Albany, NY
- Tomás R. Guilarte, Ph.D., Leon Hess Professor and Chair of Environmental Health Sciences, Columbia University Mailman School of Public Health, New York, NY

- Timothy Hla, Ph.D., Professor, Depts. of Pathology & Laboratory Medicine, Weill Cornell Medical College, New York, NY
- Kenneth V. Honn, Ph.D., Distinguished Professor, Department of Pathology, Wayne State University, Detroit, MI
- Balaraman Kalyanaraman, Ph.D., Chairman and Professor of Biophysics, Director, Free Radical Research Center, Medical College of Wisconsin, Milwaukee, WI
- Curtis D. Klaassen, Ph.D., Distinguished Professor, Dept. of Pharmacology, Toxicology and Therapeutics, The University of Kansas Medical Center, Kansas City, KS
- Susan Lees-Miller, Ph.D., Professor, Department of Biochemistry and Molecular Biology, Health Research Innovation Centre, Southern Alberta Cancer Research Institute, University of Calgary, Calgary, AB, Canada
- Richard Jay Smeyne, Ph.D., Member, Department of Developmental Neurobiology, Saint Jude Children's Research Hospital, Memphis, TN
- Nancy L. Weigel, Ph.D., Professor, Dept. of Molecular & Cellular Biology, Baylor College of Medicine, Houston, TX
- David A. Wink Jr., Ph.D., Senior Investigator, Head, Molecular Mechanisms Section, Radiation Biology Branch, National Cancer Institute, NIH, Bethesda, MD

Agenda:

Sunday, April 14: Doubletree Guest Suites, Closed Session

Closed Evening Session

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| 7:00 - 8:00 p.m. | Welcome and Discussion of Past Board Reviews, Drs. Linda Birnbaum, David Miller, John Cidlowski and Darryl Zeldin |
| 8:00 -10:00 | BSC Discussion of Review, Dr. Jack Keene; BSC Chair |

Monday, April 15, 2013: NIEHS Rodbell Conference Rooms 101 ABC

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| 8:30 -8:45 a.m. | Welcome, Drs. Birnbaum and Zeldin |
| 8:45 - 9:05 | Overview--Laboratory of Toxicology and Pharmacology, David Miller, Ph.D., Chief |
| 9:05 - 9:55 | Intracellular Regulation Group, David Miller, Ph.D. |
| 9:55 - 10:45 | Neuropharmacology Group, Jau-Shong (John) Hong, Ph.D. |
| 10:45 - 11:00 | Break |
| 11:00 - 11:50 | Human Metabolism Group, Joyce Goldstein, Ph.D. |
| 11:50a.m. - 12:35p.m. | Closed Sessions with Investigators, Drs. Miller, Hong and Goldstein |
| 12:35 - 1:30 | Lunch |
| 1:30 - 3:00 | Poster Session Postdoctoral Fellows and other Presenters |
| 3:00 - 3:15 | Break |
| 3:15 - 3:45 | Closed Sessions with Fellows and Staff Scientists |
| 3:45 - 4:35 | Environmental Stress & Cancer Group, Richard Paules, Ph.D. |
| 4:35 - 5:25 | Free Radical Metabolism Group, Ronald Mason, Ph.D. |
| 5:30 - 6:00 | Closed Sessions with Investigators, Drs. Paules and Mason |
| 6:00 | Return to Doubletree Hotel |
| 6:00 - 8:00 | Dinner |

8:00 - 10:00 Closed Session. BSC Discussion and completion of individual review assignments by each member. All BSC reviewers

Tuesday, April 16, 2013: Rodbell Conference Rooms 101 ABC

8:30 - 9:20 a.m. Comparative Genomics Group, Jonathan Freedman, Ph.D.
9:20 - 10:10 Metabolism, Genes, and Environment Group, Xiaoling Li, Ph.D.
10:10 - 10:25 Break
10:25 - 11:05 Closed Session with Investigators, Drs. Freedman and Li
11:05a.m. - 12:00p.m. Closed – BSC Executive Session
12:00 - 1:00 Lunch, Exec Conf Room
1:00 - 2:00 Closed Session – Reports & Scoring Consolidation
2:00 - 3:30 Closed Session – Debriefing to NIEHS/DIR Leadership, Drs. Birnbaum, Zeldin, Schrader
3:30 Adjourn

TRAINING AND MENTORING

2013 NIEHS/NTA Biomedical Career Fair

The Fifteenth Annual NIEHS Biomedical Career Fair was held Friday, April 26, 2013 at the Environmental Protection Agency Campus, Research Triangle Park, NC. The keynote address entitled “A Crook in the Road: A Real World Path in Bioscience Entrepreneurship” was delivered by Patricia Beckmann, Ph.D., Founder, BioStrategy, LLC. The keynote address was followed by panel discussions. Areas covered included: Running a Successful Lab, Using your Degree to Make a Change: Jobs in Science Policy, Networking: A Tool for Building Relationships and Exploring Career Options, Management and Leadership Skills for Scientists, CV/ Résumé Consultation, NIH Funding, Contract Research Organizations – What Can a PhD Do?, Education and Outreach: Careers for the Scientific Extrovert, Careers in Consulting, Setting Your Career Goal and Charting Your Course, New Paradigms and Opportunities for Funding Your Research: Think Beyond the Grant, Careers in Public Health Protection and Promotion, Drug Development, Oh the Places We Go! Biomedical PhDs Outside of Pharma and Biotech, Preparing for the Academic Job Market, The Interview: What You Need to Do Before, During, and After to Get the Job, Career Transitions: From Academia to Industry (and Back Again), Overseeing Science: Program Administration and Grant Management, Resumes for Non-academic Positions – One Size Does Not Fit All, and You Know More than you Know: Recognizing and Articulating Your Unique Value.

There were more than 300 registered attendees from universities and research institutions in the Triangle Area and the rest of North Carolina. This event was cosponsored by the NIEHS, Office of Scientific Director; NIEHS Trainees Assembly and the Environmental Protection Agency.

Panelists included:

- Alison Harrill, Ph.D., Institute for Drug Safety Sciences, Hamner Institutes for Health Sciences, Research Triangle Park, NC
- Sue Jinks-Roberston, Ph.D., Professor, Department of Molecular Genetics and Microbiology, Duke University Medical Center, Durham, NC
- Roger Woodgate, Ph.D., Chief, Laboratory of Genomic Integrity, Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, Bethesda, MD
- Neal Fann, US Environmental Protection Agency, RTP, NC
- Scott Jenkins, Ph.D., US Environmental Protection Agency, RTP, NC
- Kei Koizumi, Office of Science and Technology Policy, Washington, D.C.
- Dara Wilson-Grant, M.S.Ed., NCC, UNC Chapel Hill, Chapel Hill, NC
- Lori Conlan, Ph.D., Director-Office of Postdoc Services, OITE, NIH, Bethesda, MD
- Cynthia Holley, Ph.D., Scientist II at Fujifilm Diosynth Biotechnologies, Cary, NC
- Chris Learn, Ph.D., PMP, Quintiles Senior Clinical Project Manager, Durham, NC
- Radhika Nagarkar, Ph.D., Scientist II at KBI Biopharma, Raleigh-Durham, NC
- Gillian Backus, Ph.D., Associate Professor, Biology, Northern Virginia Community College, Washington DC
- Heather B. Miller, Ph.D., Assistant Professor of Biochemistry, High Point University, High Point, NC

- Kelly Leovic, Ph.D., Director, STEM Program, U.S. Environmental Protection Agency, RTP, NC
- Laurence Frabotta, Ph.D., Director, Office of Postdoctoral Affairs, University of Virginia, Charlottesville, VA
- Brian Dewar, Ph.D., Assistant Professor, Biology, Taylor University, Upland, IN
- Geoff Banks, Ph.D., President and CEO, Kinetigen, Inc. RTP, NC
- Patricia Beckmann, Ph.D., Founder, BioStrategy, LLC.
- Mary Jane Selgrade, Ph.D., Expert Consultant ICF International, Durham, NC
- Diane Klotz, Ph.D., Director, Office of Training and Academic Services, Sanford-Burnham Medical Research Institute, San Diego, CA
- Alaina G. Levine, President, Quantum Success Solutions, Tucson, AZ
- Eva McLanahan, Ph.D., LCDR, US Public Health Service Toxicologist, EPA, RTP, NC,
- Emily E. Sickbert-Bennett, Ph.D., MS, CIC, Associate Director, Hospital Epidemiology, UNC, Chapel Hill, NC
- Heather Stapleton, Ph.D., Associate Professor, Duke University, Durham, NC
- Bill Pan, Dr.P.H., Assistant Professor, Duke University, Durham, NC
- Emma-Jane Poulton, Ph.D., Research Investigator, Sanofi, Waltham, MA
- Rajesh Ranganathan, Ph.D., Director, Office of Translational Research, National Institute for Neurological Disorders and Stroke, NIH, Bethesda MD
- Ann Beaulieu, Ph.D., Director, Regulatory Affairs at AgroFresh, Greater Philadelphia Area, Philadelphia, PA
- Christal Bowman, Ph.D., Senior Scientist, Bayer CropScience, Research Triangle Park, NC
- Sarah Taylor, Ph.D., Director of Editing Operations at American Journal Experts, Raleigh-Durham, NC
- Melanie Sinche, M.A., M.Ed., NCC, Director, FAS Office of Postdoctoral Affairs, Harvard University, Medical School
- Stefan Bekiranov, Ph.D., Associate Professor of Biochemistry and Molecular Genetics, University of Virginia
- Donald Cook, Ph.D., Principal Investigator, Immunogenetics Group, National Institute of Environmental Health Sciences, NIH, RTP, NC
- Gary R. Burleson, Ph.D., CEO/President, BRT©-Burleson Research Technologies, Inc., Morrisville, NC
- Danielle Carlin, Ph.D., DABT, Program Administrator, Superfund Research Program
- Michael C. Humble, Ph.D., Program Administrator, NIEHS, NIH, RTP, NC
- Jana Stone, Ph.D., Scientific Coordinator, Duke University, Durham, NC
- Thaddeus Schug, Ph. D., Health Scientist Administrator, NIEHS, NIH, RTP, NC
- Pat Phelps, Ph.D., Educational Specialist, Smithsonian National Museum of Natural History, Washington, DC

INTERNATIONAL ACTIVITIES IN DIR FOR FY 2012

Collaborative Research Projects:

- Dr. Joel Abramowitz (Office of the Scientific Director) collaborates with scientists at Pharmacology and Cell Physiology, Division of Biomedical Sciences, Cranmer St. George's, University of London, London, UK, to study the role played by TRPC1 in regulating vascular smooth muscle function; with scientists at the Wolfson Institute for Biomedical Research, University College London, London, UK, to study the roles played by TRPC3 and TRPC6 in hearing and normal touch; and with scientists from the Department of Physiology, the New South Wales University School of Medicine, Sydney, Australia, to study the role of TRPC3 to channels facilitate endothelium-derived hyperpolarization-mediated resistance artery vasodilator activity. These collaborations were supported in part by 1ZIAES101684.
- Dr. Steven Akiyama (Laboratory of Molecular Carcinogenesis) collaborates with scientists at the Glasgow Biomedical Research Centre, Glasgow, Scotland, United Kingdom, To characterize the mechanism by which astrocytes become reactive in vivo. This collaboration was funded in part by 1ZIAES023025.
- Dr. Donna Baird (Epidemiology Branch) collaborates with scientists at the Finnish Institute of Environmental Health, Helsinki, Finland, to examine infertility associated with pesticide use among spouses in the Agricultural Health Study. This collaboration was funded in part by 1ZIAES049003.
- Dr. Douglas Bell (Laboratory of Molecular Genetics) collaborates with scientists at the Ludwig Institute for Cancer Research, Nuffield Department of Clinical Medicine, University of Oxford, Oxford, UK, to study a unique polymorphic p53 responsive enhancer in the KIT ligand gene and its influence on cancer risk. This collaboration was funded in part by 1ZIAES100475.
- Dr. Lutz Birnbaumer (Laboratory of Neurobiology) collaborates with scientists at Pharmacology and Cell Physiology, Division of Biomedical Sciences, Cranmer St. George's, University of London, London, UK, to study the role played by TRPC1 in regulating vascular smooth muscle function; with scientists at the Institute of Physiology and the Institute of Pharmacology at the University of Wuerzburg, Germany to study the roles of TRPC3 and TRPC6 in the regulation of blood pressure by atrial natriuretic peptide; with scientists at the Anatomical Institute, University of Basel, Switzerland to study the role of TRPC3 in inhibition of dendritic growth of cerebellar Purkinje cells; with scientists at the Institute of Neuroscience at Catholic University of Leuven, Belgium, to study the role of TRPC1 in regulation of myoblast differentiation; with scientists at the Physiology Institute at Maximilian-Ludwig University of Munich, Germany, to study synaptic activation of TRPC1 and TRPC4 channels in olfactory bulb granule cells; with scientists at the Wolfson Institute for Biomedical Research, University College London, London, UK, to study the roles played by TRPC3 and TRPC6 in hearing and normal touch; and with scientists from the Department of Physiology, the New South Wales University School of Medicine, Sydney, Australia, to study the role of TRPC3 to channels facilitate endothelium-

derived hyperpolarization-mediated resistance artery vasodilator activity. These collaborations were supported in part by 1ZIAES101684.

- Dr. Perry J. Blackshear (Laboratory of Signal Transduction) collaborates with scientists at St. Bartholomew's Hospital, London, UK, on the study of maternofetal microchimerism in twins with type 1 diabetes; with scientists at the Universidad Austral de Chile, Valdivia, Chile, on anatomical studies of the RFX4_v3 mutant mice, with reference to non-communicating hydrocephalus; with scientists at the Uppsala University, Sweden, on characterization of the Toe1 exonuclease; with scientists at the Alexander Fleming Institute, Athens, Greece, to study multi-allele knockout of TTP and HU-R genes; with scientists at McGill University, Montreal, Canada, on studies of cNot1 involvement in TTP-dependent deadenylation and mRNA decay; and with scientists at the Institute for Medical Immunology, Universite Libre de Bruxelles, on the involvement of interleukin 23 in TTP action. These collaborations were supported in part by 1ZIAES090080.
- Dr. William Copeland (Chief, Laboratory of Molecular Genetics) collaborates with scientists at Newcastle University, Newcastle upon Tyne, UK, to study mutations in human mitochondrial DNA polymerase γ . This collaboration is supported in part by 1ZIAES065078.
- Dr. E. Mitch Eddy (Laboratory of Reproductive and Developmental Toxicology) collaborates with investigators at the Gwangju Institute of Science and Technology, Gwangju, Korea, to study a mouse strain-specific modifier of Protamine-2 gene expression. This collaboration is supported in part by 1ZIAES070076.
- Dr. Michael Fessler (Laboratory of Respiratory Biology) collaborates with investigators at Lawson Health Research Institute, University of Western Ontario, London, ON, Canada on a project to define the role of apolipoprotein E in acute lung injury. This collaboration is supported in part by 1ZIAES102005.
- Dr. Guang Hu (Laboratory of Molecular Carcinogenesis) collaborates with scientists at the Institute of Health Science, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, Shanghai, China, to study stem cell biology. This collaboration is supported in part by 1ZIAES102745.
- Dr. Anton Jetten (Chief, Laboratory of Respiratory Biology) has collaborations with scientists at Hokkaido Institute of Public Health, Sapporo, Japan, to identify environmental toxicants that interact with ROR α and ROR γ ; with scientists at GlaxoSmithKline D&R Ltd, Medicines Research Center, Hertfordshire, UK, to study the function of ROR γ -selective agonist and antagonists with scientists in the Department of Microbiology, College of Medicine, Soon Chun Hyang University, Cheonan, Korea, to study Glis3 in pancreatic development; with scientists in the Department of Cell Signaling, Tokyo Medical and Dental University, Tokyo, Japan, to study of the role of I κ B ζ and ROR γ in the regulation of TH17 development; and with scientists at Klinisches Institut für Pathologie, Vienna, Austria, on a study of GLIS in cystic kidney disease. These collaborations were supported in part by 1ZIAES101586 and 1ZIAES100485.

- Dr. Maria Kadiiska (Laboratory of Toxicology and Pharmacology) as part of the Biomarkers of Oxidative Stress Study collaborates with scientists at Faculty of Medicine, Uppsala Univ., Uppsala, Sweden; Unilever Health Institute, Vlaardingen, The Netherlands; University of Essex, Colchester, UK; the Heart Research Institute, Sydney, Australia; the Center for Hepatology, University College London, London, UK; the National Institute of Advanced Industrial Science and Technology, Ikeda, Osaka, Japan; the Center for Vascular Research, University of New South Wales, Sydney, Australia; and the Otto-Von-Guericke University, Magdeburg, Germany to evaluate techniques for the non-invasive measurement of oxidative stress. These collaborations were supported in part by 1ZIAES048012, 1ZIAES050117 and 1ZIAES050139.
- Dr. Freya Kamel (Epidemiology Branch) collaborates with investigators in the Department of Medical Epidemiology and Biostatistics at the Karolinska Institute, Stockholm, Sweden, to study environmental risk factors for amyotrophic lateral sclerosis. This collaboration was supported in part by 1ZIAES049005.
- Dr. Steven Kleeberger (Laboratory of Respiratory Biology) collaborates with scientists at the INFANT Foundation, Buenos Aires, Argentina, to study the role of innate immunity and antioxidant enzyme genes in respiratory syncytial virus infection and disease progression, and the role of oxidant susceptibility genes in severity of neonatal diseases associated with hyperoxic injury; and with scientists at the University of Tsukuba, TARA Center, Tsukuba, Japan to study the role of Nrf2 in susceptibility to oxidant-induced lung injury. These collaborations were supported in part by 1ZIAES100513 and 1ZIAES100557.
- Dr. Thomas Kunkel (Laboratory of Structural Biology, Laboratory of Molecular Genetics) has collaborations with scientists at the Umeå University, Umeå, Sweden to investigate the functions and fidelity of DNA polymerase epsilon and the effects of dNTP pool imbalances on mutagenesis in yeast; with scientists at the University of Sussex, Brighton, UK to study DNA replication in fission yeast; with scientists at Università degli Studi di Milano, Milan, Italy, to study the consequences of defects in yeast RNases H1 and H2; and with scientists at the University of Montreal, Montreal, Canada, to study the effects of altered histone methylation on genome stability. These collaborations were supported in part by 1ZIAES065070 and 1ZIAES065089.
- Dr. Stephanie London (Epidemiology Branch and Laboratory of Respiratory Biology) collaborates with scientists at National Institute of Public Health, Cuernavaca Mexico, to study childhood asthma; and with scientists at National Institute of Public Health, Oslo, Norway, to study early life factors and asthma. Dr. London is the group leader of an international consortium called CHARGE and a member of the Transnational Asthma Genetics Consortium to examine genome wide associations with pulmonary function and related phenotypes as well as examination of interactions. These collaborations were supported in part by 1ZIAES025045, 1ZIAES049019 and 1ZIAES043012.
- Dr. Matthew Longnecker (Epidemiology Branch) has collaborations with scientists at the Erasmus University, Rotterdam, The Netherlands to study the effects of exposure to phthalates, bisphenol A, and organophosphate pesticides; with scientists at The Norwegian Institute of Public Health, Oslo, Norway to study the relation of early-life

- exposure to subsequent health; and with scientists at the University of Pretoria, Pretoria, Republic of South Africa, to study the effects of DDT on reproductive function. These collaborations were supported in part by 1ZIAES101575, 1ZIAES044008 and 1ZIAES102845.
- Dr. David Miller (Chief, Laboratory of Toxicology and Pharmacology) collaborates with scientists at University of Heidelberg, Germany, to study the mechanisms of regulation of ABC transporters in kidney and blood-brain barrier. This collaboration was supported in part by 1ZIAES080048 and 1ZIAES080056.
- Dr. Masahiko Negishi (Laboratory of Reproductive and Developmental Toxicology) collaborates with scientists at Toyama University, Toyama, Japan, to study phosphorylation of PPAR in immune cells. This collaboration was supported in part by 1ZIAES080040.
- Dr. Shyamal Peddada (Biostatistics Branch) collaborates with investigators at the Norwegian Institute of Public Health, Oslo, Norway, to study changes in infant gut microflora over time and its association with various health outcomes; with scientists at the University of Haifa, Israel, to develop general methods for analyzing complex multivariate data that are commonly encountered in health sciences; and with scientists at the University of Valladolid, Valladolid, Spain, to develop methods for analyzing angular data such as those obtained from cell-cycle experiments, circadian clock experiments etc. These collaborations were supported in part by 1ZIAES101744 and 1ZIAES103066.
- Dr. Nicholas Plummer (Laboratory of Neurobiology) collaborates with scientists at the Institute of Experimental Medicine, Hungarian Academy of Sciences, Budapest, Hungary to investigate the localization of TRPC6 cation channels in the adult rat hippocampus. This collaboration was supported in part by 1ZIAES101684.
- Dr. James Putney (Laboratory of Signal Transduction) collaborates with scientists at the Department of Physiology, Anatomy and Genetics, University of Cambridge, Cambridge, UK, to study gene regulation through store-operated calcium channels. This collaboration was supported in part by 1ZIAES090087.
- Dr. Manas Ray (Laboratory of Reproductive and Developmental Toxicology) collaborates with scientists at the Department of Molecular Life Science, Tokai University, School of Medicine, Kanagawa, Japan, to develop techniques for the generation of transgenic mice using targeted transgenesis in the ROSA locus via recombinase mediated cassette exchange. This collaboration was supported in part by 1ZICES102425.
- Dr. Michael Resnick (Laboratory of Molecular Genetics) has collaborations with scientists in the Mutagenesis Laboratory, National Institute for Cancer Research, Genoa, Italy; and scientists at the Centre for Integrative Biology, University of Trento, Trento, Italy, to study mutations in the tumor suppressor p53; and with scientists in the Department of Biology, Technion, Haifa, Israel; and with scientists at the Department of Biochemistry, Weizmann Institute of Science, Rehovot, Israel to study how sequences targeted by p53 can support transactivation of transcription. These collaborations were supported in part by 1ZIAES065079.

- Dr. Walter Rogan (Epidemiology Branch) collaborates with scientists at the Karolinska Institute in Stockholm, Sweden, to study the effects of succimer chelation on blood cadmium in children; and with scientists at the National Taiwan University in Taipei, Taiwan, to study excess mortality from stomach cancer after exposure to polychlorinated biphenyls and dibenzofurans. These collaborations were supported in part by 1ZIAES043011 and 1ZIAES043002.
- Dr. Roel M. Schaaper (Laboratory of Molecular Genetics) collaborates with investigators at the Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warsaw, Poland, to study the mechanisms responsible for the differential error rate of leading and lagging strand replication of DNA; and with investigators at the Department of Industrial Chemistry, University of Bologna, Bologna, Italy, to study DNA Polymerase III subunit interactions. These collaborations were supported in part by 1ZIAES065086.
- Dr. Stephen Shears (Laboratory of Signal Transduction) collaborates with scientists in the Department of Pharmacy and Pharmacology, University of Bath, Bath, UK to study and develop the use of inositol pyrophosphate analogues as novel therapeutic drugs; and with scientists at the University of Saga, Saga, Japan, on the discovery of the participation of the inositol phosphate/calcium signaling cascade in a pathway of innate immunity in fruit flies that may also represent the basis of a novel pathway of immunity in humans. These collaborations were supported in part by 1ZIAES080046.
- Dr. Clarice Weinberg (Chief, Biostatistics Branch) has a collaboration with scientists at McGill University, Montreal, Canada, to study potential serious bias and misinterpretations of findings due to improper adjustment for gestational length in studies of adverse reproductive outcomes; and with scientists at the University of Bergen in Bergen, Norway, to study the relationship between migraine and risk of breast cancer. These collaborations were supported in part by 1ZIAES102245 and 1ZIAES103086.
- Dr. Allen Wilcox (Epidemiology Branch) has a collaboration with scientists at the University of Bergen and the Norwegian Public Health Institute to study of reproductive and perinatal problems including: the length of pregnancy on genetic characteristics passed from the father to his offspring; facial clefts in Norway; environmental causes of pregnancy problems; and the development of cerebral palsy. This collaboration was supported in part by 1ZIAES044003
- Dr. R. Scott Williams (Laboratory of Structural Biology) collaborates with scientists at the University of Manchester, Manchester, UK, scientists at Biomedical Sciences Division, Human Genetics Research Centre, St George's University of London, London, UK, and scientists at the Butenandt Institute of Physiological Chemistry, Ludwig Maximilians University of Munich, Munich, Germany, to study the hydrolysis of ribose-ribose bonds in poly(ADP-ribose) associated with DNA repair. These collaborations were supported in part by 1ZIAES102765.
- Dr. Samuel H. Wilson (Laboratory of Structural Biology) collaborates with scientists in the Department of Microbiology, Oslo University Hospital, Oslo, Norway to study the role of oxidative stress induced DNA damage in triplet repeat expansion; with scientists at the Institute of Chemical Biology and Fundamental Medicine,

Novosibirsk, Russian Federation, Russia, to study the role of PARP-1 in the base excision repair pathway; and with scientists at the Department of Radiation Genetics, Faculty of Medicine, Kyoto University, Kyoto, Japan, to study the effects of gene deletions in the base excision repair pathway. These collaborations were supported in part by 1ZIAES050158 and 1ZIAES050159.

Dr. Darryl Zeldin (Scientific Director, Laboratory of Respiratory Biology) had a collaboration with scientists in the Gene Therapy Center, Tongji Medical Center, Wuhan, Peoples Republic of China to study the roles of Cytochrome P450 CYP2J2 in the heart, ischemia-reperfusion, diabetes, cancer and inflammation; with scientists at the Max Delbrueck Centre for Molecular Medicine, Berlin, Germany to study the role of P450-derived eicosanoids and other fatty acid products in cardiac hypertrophy; with scientists at the William Harvey Research Institute, Barts & the London, Queen Mary University of London, Charterhouse Square, London, UK, to study the roles of P450-derived eicosanoids and other fatty acid products on endothelial function; and with scientists at the Pharmacokinetics and Bioanalysis Center, Shin Nippon Biomedical Laboratories, Ltd., Wakayama, Japan, to study the role of P450-derived eicosanoids in cynomolgus monkeys. These collaborations were supported in part by 1ZIAES025034.

International Meeting Organized

Dr. E. Mitch Eddy (Laboratory of Reproductive and Developmental Toxicology) served on the Organizing Committee: XXIIth North American Testis Workshop, April 13-16, 2013, San Antonio, Texas; and served as Chair: 2013 Gene Families and Isozymes Conference, December 1-7, 2013, Antigua.

Dr. Masahiko Negishi (Laboratory of Reproductive and Developmental Toxicology) served on the Organizing Committee: the 50th Anniversary Symposium on Cytochrome P450, History and Future of Cytochrome P450, December 2 and 3, 2012, In Fukuoka, Japan.

Dr. Richard Paules (Laboratory of Toxicology and Pharmacology) served as Vice Chair of the HESI Technical Committee on the Application of Genomics to Mechanism-Based Risk Assessment, to organize the HESI Assembly Annual Meeting and Mini-Symposium, Prague, Czech Republic, July 2012.

Dr. James Putney (Laboratory of Signal Transduction) was on the Organizing Committee, First International Meeting on “Calcium Signaling: from Basic Science to Clinical Application” held in Marrakech, Morocco, March 14-16, 2011; and was the Vice chair, 4th International Congress on Cell Membranes and Oxidative Stress: Focus on Calcium Signaling and TRP Channels” held in Isparta, Turkey, July 26-27, 2012.

Dr. Samuel H. Wilson (Laboratory of Structural Biology) was Co-Chair of the 4th Biannual Japan-US/US-Japan DNA Repair Meeting.

Work with International, Multinational or Regional Foreign Organizations

- Dr. Steven Akiyama (Laboratory of Molecular Carcinogenesis) is a member Evaluation Committee for Physics, Life Chemistry and Biotechnological Innovations—Young Investigators Program, Research Agency of France; and a member Review Panel for the University Funding Program of the Italian Ministry of University and Scientific Research.
- Dr. E. Mitch Eddy (Laboratory of Reproductive and Developmental Toxicology) served as an external reviewer for grant and fellowship applications for National Health and Medical Research Council, Australia.
- Dr. Stephanie London (Epidemiology Branch and Laboratory of Respiratory Biology) served on the Scientific Advisory Board of the Helmholtz Institute for Environmental Health in Munich, Germany.
- Dr. Matthew Longnecker (Epidemiology Branch) served as member of the Science Advisory Board on Obesogenic Endocrine Disrupting Chemicals for RIVM (National Institute for Public Health and the Environment), Amsterdam, The Netherlands.
- Dr. Fred Miller (Clinical Research Program) is a member of The International Myositis Genetics Consortium (MYOGEN) to define genetic risk and protective factors for myositis; is a member of The International Myositis Assessment and Clinical Study Group to standardize the conduct and reporting of myositis clinical studies; is a member of The International Myositis Classification Criteria Project to develop new classification criteria for myositis and its subgroups; and is a member of The Pan-American League of Associations for Rheumatology (PANLAR) Myositis Consortium to study the ethnogeographic variations in risk factors and pathogenesis of myositis in the Americas. This work is supported in part by 1ZIAES101074 and 1ZIAES101081.
- Dr. Richard Paules (Laboratory of Toxicology and Pharmacology) served on the Scientific Advisory Board Review of the Netherlands Toxicogenomics Centre, Amsterdam, The Netherlands.
- Dr. Lisa Rider (Clinical Research Program) is a member of The International Myositis Genetics Consortium (MYOGEN) to define genetic risk and protective factors for myositis; is a member of The International Myositis Assessment and Clinical Study Group to standardize the conduct and reporting of myositis clinical studies and is a member of The International Myositis Classification Criteria Project to develop new classification criteria for myositis and its subgroups. This work is supported in part by 1ZIAES101074 and 1ZIAES101081.
- Dr. Samuel H. Wilson (Laboratory of Structural Biology) serves on the Advisory Board of the Weizmann Institute, Rehovot, Israel, on the topics of genotoxic stress and cancer; and serves on the Advisory Board of the Netherlands Toxicogenomics Center, Amsterdam, The Netherlands, on the use of various toxicogenomic technologies in The Netherlands. Dr. Wilson also serves on the European Union Scientific Advisory Board, the Norwegian Research Council Advisory Board, and the Cancer Research of the United Kingdom Advisory Board.