

# **Division of Intramural Research**

## **NAEHS Council Update**

**May 2012**

## **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. Candidates are being interviewed.

### **Chief of the Comparative Medicine Branch, Attending Veterinarian, Animal Program Director**

The National Institute of Environmental Health Sciences (NIEHS) of the National Institutes of Health is searching for a Chief of the Comparative Medicine Branch (CMB), Attending Veterinarian, and Animal Program Director. CMB provides a broad range of services and collaborative support for NIEHS intramural research programs. The incumbent will be responsible for an AAALAC accredited animal care and use program and for support of NIEHS animal research programs that study the effects of environmental agents in order to develop methods of disease prevention and treatment. The incumbent will represent NIEHS on the NIH Animal Program Directors Committee and will serve as attending veterinarian on the NIEHS ACUC. The incumbent will be expected to actively support the NIEHS mission, participate in ongoing planning and management discussions to successfully resolve pertinent issues and challenges, participate in long range strategic planning processes to develop and implement effective goals and directions for the animal care program and provide information and recommendations to the Scientific Director. Minimum qualifications include a DVM/VMD from an AVMA-accredited or approved college, a current license to practice veterinary medicine in any state in the United States and board certification by the American College of Laboratory

Animal Medicine. In addition, applicants must demonstrate a proven record of management and operation of an AAALAC accredited animal care program of similar magnitude and complexity, and demonstrated experience meeting all regulations and policies pertaining to animal care and use. Applicants must possess demonstrable experience and skills in management and supervision, budget oversight, resource allocation, facility design, rodent colony management and disease control. In addition, applicants must possess the ability to analyze, prioritize and delegate resources while managing multiple projects and programs. Expertise and experience should include a positive and collegial interaction and cooperation with staff at all levels and with scientific staff to promote and facilitate their research. Dr. David Miller, Chief, Laboratory of Toxicology and Pharmacology, is chair of the search committee. Candidates for interview have been identified.

## **BSC REVIEW OF LABORATORY OF NEUROBIOLOGY AND DR. HONGLEI CHEN**

The DIR Board of Scientific Counselors reviewed the Laboratory of Neurobiology and Dr. Honglei Chen on March 18 to 20, 2012.

Members of the Board of Scientific Counselors that Attended:

- Jack Keene, Ph.D., BSC Chair, James B. Duke Professor, Department of Molecular Genetics and Microbiology, Duke University Medical Center, Durham, NC
- Steven A. Belinsky, Ph.D., Director, Lung Cancer Program, Lovelace Respiratory Research Institute, Albuquerque, NM
- Samuel M. Cohen, M.D., Ph.D., Professor, Department 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
- Thomas A. Louis, Ph.D., Professor, Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
- José E. Manautou, Ph.D., Associate Professor, Department of Pharmaceutical Sciences, University of Connecticut School of Pharmacy, Storrs, CT
- Roland A. Owens, Ph.D., Ex-Officio BSC Member, Assistant Director, Office of Intramural Research, NIH, Bethesda, MD

Ad Hoc Reviewers that Attended:

- Kenneth Bruce Adler, Ph.D., Department of Cell Biology, College of Veterinary Medicine, North Carolina State University, Raleigh, NC
- Gary S. Aston-Jones, Ph.D., Director, Center for Cognitive Neuroscience, Medical University of South Carolina, Charleston, SC
- Darwin Berg, Ph.D., Distinguished Professor of Neurobiology, Chair, Section of Neurobiology, Department of Biological Sciences, University of California at San Diego, La Jolla, CA
- Richard Goodman, M.D., Ph.D., Director, The Vollum Institute, Oregon Health and Science University, Portland, OR
- Simon Halegoua, Ph.D., Professor, Department of Neurobiology and Behavior, State University of New York at Stony Brook, Stony Brook, NY
- Eric Klann, Ph.D., Professor, Center for Neural Science, New York University, New York, NY
- Craig Montell, Ph.D., Professor, Department of Biological Chemistry, Johns Hopkins University School of Medicine, Baltimore, MD
- Walter A. Rocca, M.D., Professor, Division of Epidemiology, Department of Health Sciences Research, Mayo Clinic, Rochester, MN
- John J. G. Tesmer, Ph.D., Cyrus Levinthal Collegiate Professor in the Life Sciences, Professor of Pharmacology and Biological Chemistry, University of Michigan, Ann Arbor, MI

- Jing Zhang, M.D., Ph.D., Shaw Endowed Chair, Neuropathology, Professor of Pathology, University of Washington School of Medicine, Seattle, Washington

## Agenda

Sunday, March 18, 2012: Doubletree Guest Suites, Closed Session

- 7:00-8:00 pm Welcome and Discussion of Past Board Reviews, Drs. David Armstrong and Darryl Zeldin
- 8:00-10:00 BSC Discussion of Review, Jack Keene, Ph.D.

Monday, March 19, 2012: NIEHS Conference Rooms 101 ABC

- 8:30-8:45 am Welcome, Drs. Linda Birnbaum and Darryl Zeldin
- 8:45-9:05 Overview – Laboratory of Neurobiology, David Armstrong, Ph.D., Chief
- 9:05-9:55 Membrane Signaling Group, David Armstrong, Ph.D.
- 9:55-10:45 Developmental Neurobiology Group, Patricia Jensen, Ph.D.
- 10:45-11:00 Coffee Break
- 11:00-11:50 Transmembrane Signaling Group, Lutz Birnbaumer, Ph.D.
- 11:50-12:35 Closed Session with Investigators: Drs. Armstrong, Jensen and Birnbaumer
- 12:35-1:30 Lunch
- 1:30-2:20 Ion Channel Physiology Group, Jerryl Yakel, Ph.D.
- 2:20-3:10 Synaptic and Developmental Plasticity Group, Serena Dudek, Ph.D.
- 3:10-3:30 Coffee Break
- 3:30-5:00 Poster Session, Postdoctoral Fellows and other presenters
- 5:00-5:30 Closed Session with Fellows
- 5:30-6:00 Closed Session with Investigators, Drs. Yakel and Dudek
- 6:00-6:15 Return to Doubletree Hotel
- 6:15-8:00 Dinner
- 8:00-10:00 Closed Session: BSC Discussion of Review, Dr. Keene and all review team members

Tuesday, March 20, 2012: NIEHS Conference Rooms 101 ABC

- 8:30-9:20 am Aging and Neuroepidemiology Group, Epidemiology Branch, Honglei Chen, M.D., Ph.D.
- 9:20-9:35 Closed Session with Tenure Track Investigator, Dr. Chen
- 9:35-12:00 Closed BSC Executive Session
- 12:00-1:00 Closed Session: Board Debriefing to NIEHS/DIR Leadership, Dr. Keene, all review team members; Drs. Zeldin, Schrader and Birnbaum
- 1:00 Adjourn

## DIR RETREAT

DIR held a retreat at the Hilton Hotel in New Bern, North Carolina, from March 26-28, 2012, to develop an implementation plan of goals in support of the NIEHS Strategic Plan and to get an update on the research activities of the DIR tenure track investigators. The retreat was attended by 67 investigators including representatives from the NTP, DERT and OD.

### Agenda:

#### Monday, March 26, 2012

- 12:00-1:00 Lunch
- 1:00-1:30 Charge to Assembly by Darryl Zeldin
- 1:40-3:00 Tenure Track Investigator Presentation, Session I, Chair Karen Adelman  
Presenters: Leping Li, Donald Cook, Marilyn Diaz, Michael Fessler
- 3:00-3:30 Break
- 3:30-4:30 Tenure Track Investigator Presentation, Session II, Chair Stephanie London  
Presenters: Guang Hu, Patricia Jensen, Xiaoling Li
- 5:30-7:00 Brainstorming Session
- 7:00-8:00 Dinner
- 8:00-9:00 Future Hires Discussion, Chair Darryl Zeldin

#### Tuesday, March 27, 2012

- 7:30-8:30 Breakfast
- 8:30-9:00 Presentation of Implementation Drafts
- 9:00-10:15 Working Groups Breakout Session I
- 10:15-10:45 Break
- 10:45-12:00 Working Groups Breakout Session II
- 12:00-1:00 Lunch
- 1:00-3:00 Scientists Breakout Session
- 3:00-4:00 Tenure Track Investigator Presentation, Session III, Chair Serena Dudek  
Presenters: Raja Jothi, Honglei Chen, Carmen Williams
- 4:00-4:30 Break
- 4:30-5:30 Tenure Track Investigator Presentation, Session IV, Chair Paul Wade  
Presenters: Scott Williams, Humphrey Yao, Dmitri Zaykin
- 5:30-7:00 Brainstorming Session
- 7:00-8:00 Dinner
- 8:00-9:00 Team Building/Synergy Discussion, Chair Darryl Zeldin

#### Wednesday, March 28, 2012

- 7:30-8:30 Breakfast

8:30-9:45	Implementation Plan Presentation I
9:45-10:00	Break
10:00-12:00	Implementation Plan Presentation II
12:00-1:00	Lunch
1:00	Adjourn

## **DIR RESEARCH UPDATE**

### **The Consequences of DNA Replication Infidelity to Human Health**

**Thomas A. Kunkel, Ph.D.**

DNA Replication Fidelity Group  
Laboratory of Molecular Genetics and Laboratory of Structural Biology, DIR, NIEHS

**“It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material.”**

**Watson and Crick, Nature, 1953**

In the years since this remarkable understatement, we have come to realize the enormous complexity of the cellular machinery devoted to replicating DNA with the accuracy needed to maintain genetic information over many generations, balanced by the need for mutations on which selection can act. This complexity is strongly driven by the need to remove or tolerate a wide array of cytotoxic and mutagenic lesions in DNA generated by environmental stress. This presentation will briefly consider the fidelity with which undamaged and damaged DNA is replicated by the many DNA polymerases now known to exist. Some of these polymerases seriously violate Watson-Crick base pairing rules such that, depending on the polymerase, the composition and location of the error and the ability to correct errors (or not), DNA synthesis error rates can vary by more than a million-fold. This offers the potential to modulate rates of point mutations over a very wide range, with consequences that can be either beneficial or deleterious to human health. Several environmental health consequences of replication infidelity will be described, within the context of Goals 1, 2 and 3 of the new NIEHS Strategic Plan.



## TRAINING AND MENTORING

### **2011 NIEHS/NTA Biomedical Career Fair**

The Fifteenth Annual NIEHS Biomedical Career Fair was held Friday, April 27, 2012 at the Environmental Protection Agency Campus, Research Triangle Park, NC. The keynote address entitled “Surviving Your Stupid, Stupid Decision to go to Grad School” was delivered by Adam Ruben, Ph.D. The keynote address was followed by panel discussions. Areas covered included Networking: A Tool for Building Relationships and Exploring Career Options; Differences between Academic, Government and Industry Job Application Materials; Pathway to a Successful K99; Finding Your Career Path; Faculty Careers in Teaching-Intensive Schools; Regulatory Affairs; Project/Program Management; Careers in Big Pharma; Faculty Careers in Research-Intensive Schools; Science Communications; Science Outreach; Clinical Research; The Business of Science; Careers in Small Biotech; Federal Careers; The Industry Job Search: Navigating Towards your Next Opportunity; The Industry Job Search: Elements of a Modern Job Application; Converting Your CV into a High Impact Résumé; and Interviewing & Negotiating an Offer.

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; Environmental Protection Agency; and Burroughs Wellcome Fund.

Panelists included:

- Dara Wilson-Grant, MEd, NCC, Associate Director, University of North Carolina Office of Postdoctoral Affairs; Owner & Consultant, Careers in Bloom
- Patricia Phelps, Ph.D., Deputy Director, Graduate Partnerships Program, National Institutes of Health
- William T. Schrader, Ph.D., Deputy Scientific Director, Division of Intramural Research, National Institute of Environmental Health Sciences
- Carol Shreffler, Ph.D., Program Officer, Training and Career Development Program, National Institute of Environmental Health Sciences
- Diane Klotz, Ph.D., Director, Office of Training and Academic Services, Sanford-Burnham Medical Research Institute
- Shweta Trivedi, Ph.D., Teaching Assistant Professor, Department of Animal Science, North Carolina State University
- Jennifer Brigati, Ph.D., Assistant Professor of Biology, Maryville College
- Alyssa Summers, Ph.D., Assistant Professor of Biology, Sewanee University
- Erika Pfeiler, Ph.D., Microbiologist, Center for Drug Evaluation and Research, US Food and Drug Administration
- Ayoola Aboyade-Cole, Ph.D., Regulatory Associate, University of North Carolina Lineberger Comprehensive Cancer Center
- Nicole Zandy, Ph.D., Senior Operational Effectiveness Specialist, Quintiles
- Thaddeus Schug, Ph.D., Health Scientist, Extramural Division, National Institute of Environmental Health Sciences

- Anastacia Berzat, Ph.D., Scientific Program Manager, Novartis Institutes for Biomedical Research
- Vladimir Grubor, Ph.D., Scientist, BASF Plant Science
- Claudia Generaux, Ph.D., Investigator, Department of Drug Metabolism and Pharmacokinetics, GlaxoSmithKline
- Johannes Freudenberg, Ph.D., Computational Biologist, GlaxoSmithKline
- Marsha Cole, Ph.D., Assistant Professor, Department of Biochemistry and Molecular Biology, University of Louisville
- Jennifer Freedman, Ph.D., Research Scientist, GU Clinical Research, Duke Cancer Institute, Duke University
- Chris Geyer, Ph.D., Assistant Professor, Anatomy and Cell Biology Department, Brody School of Medicine, East Carolina University
- Camile Grubor, Ph.D., Technical Grant Writer, Advanced Liquid Logic
- Sophie Bolick, Ph.D., Medical Writer, MedThink Communications
- Anne Knowlton, Ph.D., Scientific Editor, Cell Press/Elsevier
- Jonathan Wai, Ph.D., Psychologist, Writer, and Research Scientist, Duke University Talent Identification Program
- Craig Roberts, Ph.D., Assistant Director of Education, Duke Institute for Brain Science, Duke University
- Josh Hall, Ph.D., Director, Post-baccalaureate Research Education Program, University of North Carolina
- Jana Stone, Ph.D., Scientific Coordinator, Duke Center for Systems Biology, Duke University
- Elaina Howard, Ph.D., Clinical Research Scientist, Impact Pharmaceuticals
- Linda Grasfeder, Ph.D., RAC, Clinical Pharmacology Associate, ClinPharm Consulting, LLC
- Joan P. Packenham, Ph.D., Director, Office of Human Research Compliance, National Institute of Environmental Health Sciences
- Jeff Sunman, Ph.D., Patent Agent, Alston & Bird LLP, Biotechnology and Pharmaceutical Patents Group
- Morten Jensen, Ph.D., Licensing Associate, North Carolina State University
- Stephanie Miller, Ph.D., Licensing Associate, University of Virginia Licensing & Ventures Group
- Brante Sampey, Ph.D., Study Director, Metabolon Inc.
- Patrick Robertson, Ph.D., Scientist II, Fujifilm Diosynth Technologies
- Stuart Williams, Ph.D., Research Scientist, Liquidia Technologies Inc.
- Kelly Mercier, Ph.D., Applications Scientist, LipoScience
- Kelley Spence, Ph.D., Environmental Engineer, US Environmental Protection Agency
- John Cowden, Ph.D., Biologist, US Environmental Protection Agency
- Jade Mitchell-Blackwood, Ph.D., Risk Analyst, Risk Assessment Division, Office of Public Health Science, USDA
- Andres Larrea, Ph.D., Field Application Specialist, Pacific Biosciences
- Peter Miller, Ph.D., Field Sales Manager, GE Healthcare Life Sciences
- Jacob Sawyer, Ph.D., Advanced Imaging Specialist, Nikon Instruments Inc.
- Angela Stewart, District Manager, Kelly Scientific Resources

- Melanie Sinche, NCC, Director, Office of Postdoctoral Affairs, Harvard University

## INTERNATIONAL ACTIVITIES IN DIR FOR FY 2011

### Collaborative Research Projects:

- Dr. Joel Abramowitz (Office of the Scientific Director) collaborates with scientists at the Department of Physiology, University of Saarland School of Medicine, Homburg, Germany, to study the roles played by the heterotrimeric G protein  $G_o$  in vomeronasal function and aggressive behavior in mice; and 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.
- 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*.
- Dr. Donna Baird (Epidemiology Branch) collaborates with investigators in the Department of Epidemiology and Biostatistics, Finnish Institute of Occupational Health, Helsinki, Finland, to examine the association between pesticide exposure and subfertility in women enrolled in the Agricultural Health Study.
- Dr. Douglas Bell (Laboratory of Molecular Genetics) collaborates with scientists at the INFANT Foundation, Buenos Aires, Argentina, to examine the role of candidate antioxidant genes in susceptibility to bronchopulmonary dysplasia and retinopathy of prematurity.
- Dr. Lutz Birnbaumer (Laboratory of Neurobiology) collaborates with scientists in the Department of Biological Chemistry, The Institute of Life Sciences, The Hebrew University of Jerusalem, Jerusalem, Israel, to study the role of TRPC1 in regulating catecholamine release; with scientists at Institute of Physiology, University of Wurzburg, Wurzburg, Germany, to study the role of transient receptor potential channels in cardiac hypertrophy; with scientists at the Department of Physiology, University of Saarland School of Medicine, Homburg, Germany, to study the roles played by the heterotrimeric G protein  $G_o$  in vomeronasal function and aggressive behavior in mice; with scientists in the Department of Physiology, School of Medicine, University of New South Wales, Sydney, Australia, to study the role of TRPC3 in hearing; and 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; and with researchers at the Department of Biomedicine Basel, Anatomical Institute, University of Basel, Basel, Switzerland and Institute for Neuroscience, TU Munich, Germany, to study calcium channel regulation neuronal dendritic growth.
- 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 Alexander Fleming Institute, Athens, Greece, to study multi-allele knockout of TTP and HU-R genes; with scientists at the Institute for Medical Immunology, Universite Libre de Bruxelles, on the involvement of interleukin 23 in TTP action; with scientists at the

- University of Liverpool, on the involvement of TTP in osteoarthritis; and with scientists at the University of Hamburg, on the involvement of MARCKS family proteins in neurite outgrowth.
- Dr. Honglei Chen (Epidemiology Branch) collaborates with scientists at Shanghai Hua-Shan Hospital, and the Shanghai Cancer Institute, Shanghai, China, on the Shanghai Parkinson Study. The Shanghai Parkinson Study is a prospective study on Parkinson's disease, focusing on etiologically-related biomarkers.
- Dr. John Cidlowski (Chief, Laboratory of Signal Transduction) collaborates with scientists at the Laboratory of Molecular Mechanisms of Carcinogenesis, Argentina National Council of Scientific Research (CONICET), Instituto de Biología y Medicina Experimental (IBYME), Buenos Aires, Argentina; with scientists at the Faculty of Medicine, Institute of Biomedical Sciences (ICBM), University of Chile, Santiago, Chile; and with scientists at the Department of Clinical Medicine, Pathology and Pharmacology, Perugia University Medical School, Perugia, Italy to study mechanisms of glucocorticoid action and glucocorticoid receptor function.
- 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 the role of protamines in the packaging of chromatin in the sperm head.
- Dr. Jonathan Freedman (Laboratory of Toxicology and Pharmacology) collaborates with scientists at the Instituto de Biomedicina de Sevilla, Sevilla, Spain on the roles of thioredoxin and glutaredoxin systems in *C. elegans* in ameliorating the toxicity of cadmium and oxidative stressors; and with scientist at the Department of Epidemiology, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Japan, to study the effects of short term arsenic exposure that occurred in infants on epigenomic and transcriptomic changes in the adults.
- Dr. Traci Hall (Laboratory of Structural Biology) collaborates with researchers at the Technion, Israel Institute of Technology, Haifa, Israel, to study the structure and function of yeast Puf1p and Puf2p proteins that regulate mRNAs encoding membrane-associated proteins.
- Dr. Jau-Shyong Hong (Laboratory of Toxicology and Pharmacology) collaborates with investigators scientists at the College of Pharmacy, Kangwon National University, Chunchon, South Korea to examine the pathophysiological role of dynorphin opioid peptide in the survival of dopamine neurons in rodent Parkinson's disease models.
- Dr. Anton Jetten (Chief, Laboratory of Respiratory Biology) has collaborations with scientists at the Department of Immunology and Cell Biology, School of Medicine, Kyoto University, Kyoto, Japan, to study claudin-4 induction by E protein activity in later stages of CD4/8 double-positive thymocytes; with scientists at Hokkaido Institute of Public Health, Sapporo, Japan, to identify environmental toxicants that interact with ROR $\alpha$  and ROR $\gamma$ ; with scientists at GlaxoSmithKline D&R Ltd, Medicines Research Center, Hertfordshire, UK, to study the function of ROR $\gamma$ -selective antagonist and antagonists; with scientists in the Department of Microbiology, College of Medicine, Soon Chun Hyang University, Cheonan, Korea, to study Glis3 in pancreatic development; and with scientists in the Department of Cell Signaling, Tokyo Medical and Dental University, Tokyo, Japan, to study of the role of Ikbz and ROR $\gamma$  in the regulation of TH17 development.

- Dr. Raja Jothi (Biostatistics Branch) collaborates with researchers MRC Laboratory of Molecular Biology, Cambridge, UK, to study the interplay between expression noise and gene regulatory network at different levels of organization.
- Dr. Freya Kamel (Epidemiology Branch) collaborates with investigators in the Department of Medical Epidemiology and Biostatistics at the Karolinska Institute, Stockholm, Sweden, to study amyotrophic lateral sclerosis and Parkinson's disease.
- 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.
- Dr. Kenneth Korach (Chief, Laboratory of Reproductive and Developmental Toxicology) is developing a collaborative training program with the Nanjing Medical School, Nanjing, China, in the area of reproductive and developmental toxicology.
- Dr. Thomas Kunkel (Chief, 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 Cambridge University, Cambridge, England, to study novel DNA polymerases created by applied molecular evolution; with scientists at the University of Sussex, Brighton, UK to study DNA replication in fission yeast; with scientists at the MRC Human Genetics Unit, Edinburgh, Scotland, to study the consequences of defects in human and mouse RNase H2; with scientists at CNRS/CEA, Fontenay aux Roses, France, to study *Helicobacter pylori* DNA polymerase 1; with scientists at Osaka University, Osaka, Japan, to study translesion DNA synthesis; 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.
- Dr. Leping Li (Biostatistics Branch) collaborates with investigators at the Child & Family Research Institute, University of British Columbia, Vancouver, BC, Canada, to identify CTCF binding sites in mouse islets and islet specific transcription enhancers and examine their roles in islet development and insulin production.
- Dr. Robert E. London (Laboratory of Structural Biology) collaborates with scientists at the Institute for Biochemistry, Justus Liebig University, Giessen, Germany, to study the structure, mechanism, and inhibition of biologically important nucleases.
- 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.

- Dr. James Mason (Laboratory of Molecular Genetics) has a collaboration with scientists at the Department of Genetics and Molecular Biology, University of Szeged, Szeged, Hungary, to study the role of chromatin structure in telomere function.
- 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; and with scientists at the University of Toronto School of Pharmacy, Toronto, Canada, to study of the vitamin D receptor in regulating ABC transporter expression at the blood-brain barrier.
- Dr. Shyamal Peddada (Biostatistics Branch) collaborates with investigators at the Department of Statistics, University of Valladolid, Valladolid, Spain, to study statistical methods for circular data with applications to analysis of cell-cycle experiments; with investigators at the Department of Statistics, University of Haifa, Haifa, Israel, to develop methodology for the analysis of multivariate binary data with applications to dose-response data; with investigators at the Department of Genes and Environment, Division of Epidemiology, Norwegian Institute of Public Health, Oslo, Norway, to study the Development of gut microbiota in healthy infants, delivered naturally at term; and with investigators at the Institute of Environmental Medicine, Karolinska Institute, Stockholm, Sweden, to evaluate the NTP 2-year cancer bioassay data base to obtain robust data on sex differences in susceptibility to carcinogens.
- Dr. Lars Pedersen (Laboratory of Structural Biology) collaborates with investigators at the Institute of Biochemistry, the Justus-Liebig-University, Giessen, Germany, to study crystal structure of the nuclease EndA, a potential drug target against *S. pneumoniae* infection.
- Dr. James Putney (Laboratory of Signal Transduction) collaborates with scientists at the Department of Physiology, University of Cambridge, Cambridge, UK, to study how store-operated calcium channels can communicate in privileged microdomains to signal to downstream effectors.
- Dr. Manas Ray (Laboratory of Reproductive and Developmental Toxicology) collaborates with researchers at the Department of Molecular Life Science, Division of Basic Molecular Science and Molecular Medicine, School of Medicine, Tokai University, Kanagawa, Japan to develop transgenic mice using targeted transgenesis in the ROSA locus.
- 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; with scientists in the Institute of Clinical Pharmacology and Toxicology, Charité - Universitätsmedizin Berlin, Berlin Germany, to study single nucleotide polymorphisms (SNPs) in the promoter of human FLT1; and with scientists in the Department of Biology, Technion, Haifa, Israel to study how sequences targeted by p53 can support transactivation of transcription.
- Dr. John Roberts (Laboratory of Molecular Carcinogenesis) collaborates with scientists in the Department of Surgical Oncology, Osaka City University Graduate School of Medicine, Osaka, Japan, to study the roles of dietary fats in the metastatic spread of tumors.

- 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.
- Dr. Stephen Shears (Laboratory of Signal Transduction) collaborates with scientists at the Department of Enzyme Chemistry, Institute of Physiological Chemistry, University of Hamburg, Hamburg, Germany, to study a non-catalytic, molecular scaffolding role for an inositol phosphate kinase that is critical for ribosomal RNA transcription; and with scientists in the Department of Pharmacy and Pharmacology, University of Bath, Bath, UK to study develop and use inositol pyrophosphate analogues as novel therapeutic drugs.
- Dr. Kenneth Tomer (Laboratory of Structural Biology) collaborates with scientists at the Russian Academy of Science, Moscow, Russia, to study the effects of long term isolation on humans by performing quantitative proteomics analyses of serum and modeling changes that will be encountered in space flights to Mars.
- 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.
- Dr. Allen Wilcox (Epidemiology 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 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.
- Dr. R. Scott Williams (Laboratory of Structural Biology) collaborates with scientists at the University of Manchester, Manchester, UK, to understand the molecular basis for direct reversal of DNA 5' adenylation by the Aprataxin protein.
- 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 Istituto Superiore di Sanità, Rome, Italy, to study the role of gene expression differences for Pol  $\beta$  in the cellular response to genotoxic stress; 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; 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; with scientists at the Department of Oncology, University of Alberta, Cross Cancer Institute, Edmonton, Alberta, Canada, to study the importance of PNK in the base excision repair pathway; and with scientists at the Department of Molecular Genetics, Institute of Development, Aging



and Cancer, Tohoku University, Aobaku, Sendai, Japan, to use novel imaging technology in living cells toward understanding the process of base excision repair.

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 ischemia-reperfusion, cancer and inflammation; with scientists at the Max Delbrück Centre for Molecular Medicine, Berlin, Germany to the role of P450-derived eicosanoids and other fatty acid products in cardiac hypertrophy; 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.

### **International Meeting Organized**

- Dr. E. Mitch Eddy (Laboratory of Reproductive and Developmental Toxicology) is the Chair, Organizing Committee: 2013 Gene Families and Isozymes Conference, St. Thomas V.I., December 8-13, 2013.
- Dr. Joyce Goldstein (Laboratory of Toxicology and Pharmacology) organized the Session on Transcriptional Regulation at the 17<sup>th</sup> International Conference on Cytochrome P450, Biochemistry, Biophysics and Structure, at the University of Sheffield, Manchester, UK.
- Dr. Raja Jothi (Biostatistics Branch) organized and served as co-chair on a workshop at the IEEE International Conference on Computational Advances in Bio and Medical Sciences.
- Dr. Richard Kwok (Epidemiology Branch) co-organized a workshop on “Health Effect Studies of Oil Spills” on September 13, 2011 in Barcelona, Spain.
- Dr. Richard Paules (Laboratory of Toxicology and Pharmacology) was Co-Organizer and Co-Chair, International Life Sciences Institute (ILSI) - Health and Environmental Sciences Institute (HESI) *Application of Genomics In Mechanism-Based Risk Assessment Technical Committee Annual Meeting*.
- Dr. Dale Sandler (Chief, Epidemiology Branch) co-organized a workshop on “Health Effect Studies of Oil Spills” on September 13, 2011 in Barcelona, Spain.
- Dr. Samuel H. Wilson (Laboratory of Structural Biology) was Co-Chair of the 4th Biannual Japan-US/US-Japan DNA Repair Meeting and served on the organizing committee for the 4th US-EU DNA Repair Meeting, Oslo, Norway.

### **Work with International, Multinational or Regional Foreign Organizations**

- Dr. Steven Akiyama (Laboratory of Molecular Carcinogenesis) served on the Evaluation Committee for Physics, Life Chemistry and Biotechnological Innovations, for the Young Investigators Program, Research Agency of France, Paris, France.
- Dr. Honglei Chen (Epidemiology Branch) served on the expert Panel on Global Burden of Diseases, Gates Foundation and World Health Organization.
- 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, Canberra, Australia.

- Dr. Jane Hoppin (Epidemiology Branch) served as a member of the Steering Committee of the Agricultural Health Consortium of the International Agency for Cancer Research, Lyon, France.
- 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 (Acting Clinical Director, 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.
- Dr. Geoffrey Mueller (Laboratory of Structural Biology) participated in a Doctoral Program review for the Austrian Science Fund, Vienna, Austria; and as an ad hoc reviewer for the Austrian Academy of Sciences, Vienna, Austria.
- 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.
- Dr. Clarice Weinberg (Chief, Biostatistics Branch) served on the Program Advisory Committee for a CIHR-funded training project called STAGE (Strategic Training for Advanced Genetic Epidemiology) through the University of Toronto, Toronto, Canada.
- 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; advised the Japanese National Institute of Health, Tokyo, on training opportunities at NIH.

### **Hosting of Foreign Delegations to the US**

- Dr. Richard Kwok (Epidemiology Branch) hosted a foreign delegation from China to discuss drinking water arsenic research in Inner Mongolia, China.
- Dr. Ronald Mason (Laboratory of Toxicology and Pharmacology) hosted a delegation from of the Japan Society for the Promotion of Science (JSPS) Core-to-Core Program.