

# **Division of Intramural Research**

## **NAEHS Council Update**

**May 2011**

## **DIR RECRUITMENTS**

### **Director Division of Intramural Research**

The NIEHS is seeking an exceptional scientific leader interested in being a part of a dynamic management team to fill the position of Director, Division of Intramural Research. In addition, the selectee will also serve as the Scientific Director. The incumbent of this position will direct laboratory and clinical research. The Director, DIR, also serves as a principal advisor to the Institute Director on intramural scientific activities involving interdisciplinary biomedical research programs; develops and recommends policies for the execution of research programs; determines effectiveness of current programs and recommends policies for new programs; and develops new and revised programs to meet national environmental health needs. The Division is organized into five scientific programs, including the Clinical Research Program, which highlight the areas of research excellence of NIEHS. These programs are highly interrelated, interactive and synergistic. Using the interdisciplinary biomedical research approach, the mission of the DIR is to contribute to the basic understanding of biological and chemical processes, understanding of the contributions of environmental agents to human disease and dysfunction and to the underlying mechanisms of environmentally associated diseases. Dr. Patricia Grady, Director, National Institute of Nursing Research, is chair of the search committee.

### **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.

### **Staff Scientist, Veterinarian, Comparative Medicine Branch**

The NIEHS is recruiting for a Staff Scientist who will serve as a veterinarian in the Comparative Medicine Branch. The Comparative Medicine Branch (CMB) provides core services that include full veterinary diagnostic and surgical services, rederivation of rodent lines, embryo cryopreservation, radiographic, ultrasonic and bioluminescence imaging, and behavioral phenotyping. The Branch advises Institute scientists of appropriate animal models for use in Institute research programs, provides support for the Institute's Animal Care and Use Committee, maintains collaborative laboratories in microbiology, experimental surgery and laboratory animal medicine, and plans and conducts research appropriate to these laboratory functions. The responsibilities of this position require the applicant to hold a DVM/VMD from an AVMA-accredited or approved college, a current license to practice veterinary medicine in any state in the United States, board certification in laboratory animal medicine, and excellent interpersonal skills. Expertise and experience should include interaction and cooperation with scientific staff in a manner that promotes and facilitates their scientific programs. Experience training or teaching laboratory animal medicine residents is desirable. In addition to a DVM/VMD, a Ph.D. in a discipline related to CMB support services and laboratories such as but not limited to pathology, microbiology, biology, anatomy, genetics, etc., is desirable. The staff scientist will assist the animal care program in maintaining the highest standards and AAALAC accreditation, provide professional support to the research efforts of all Division of Intramural Research scientists using animals, and assure the continued growth of the large and complex CMB core services (previously listed) in the animal care program. Staff scientist positions within the NIH system are equivalent to research assistant professor positions in academia. Dr. John Roberts (Laboratory of Molecular Carcinogenesis) is chair of the search committee. Dr. David Kurtz from the U.S. Environmental Protection Agency in Research Triangle Park, NC, has accepted the position and is scheduled to start in May, 2011.

### **Staff Scientist for Oil Spill Study, Biostatistics Branch**

The Biostatistics Branch is seeking a Staff Scientist with a strong background in biostatistics and a lively interest in methods and epidemiologic applications to participate in team-oriented research on a large prospective study of clean-up workers exposed to petroleum products, chemicals and other environmental hazards following the BP/Deepwater Horizon oil spill in the Gulf of Mexico. The position is ideal for a person with proven experience in applications to environmental epidemiology and interest in working collaboratively to assess potential human health effects of this recent environmental disaster. The position offers opportunities for collaboration with other ongoing projects in biostatistics and epidemiology and will include time and support for carrying out investigator-initiated methodology research related to inference in epidemiologic studies. Minimum qualifications include a doctoral degree (Ph.D. or equivalent) with a strong background in biostatistics and documented interest in epidemiology. Familiarity with methods for exposure assessment and modeling in the context of longitudinal studies is desirable. Dr. Freya Kamel, Epidemiology Branch, is chair of the search committee. Applicants are currently being interviewed.

## **DIR RESEARCH UPDATE**

### **Permanent Reprogramming of Gene Expression In Response To Neonatal Phytoestrogen Exposure: Implications for Female Reproductive Tract Function and Pathology.**

**Carmen J. Williams, M.D., Ph.D., Principal Investigator**

Reproductive Medicine Group  
Laboratory of Reproductive and Developmental Toxicology, DIR, NIEHS

Preimplantation embryo loss during oviductal transit contributes to the complete infertility observed in adult mice exposed neonatally to the soy phytoestrogen genistein. The genistein dose used in this model achieves serum levels that closely approximate those in human infants fed soy-based formula. We found that as adults, these mice had abnormal oviduct morphology attributable to changes in expression of genes that modulate neonatal oviduct morphogenesis, including *Hoxa*, *Wnt*, and hedgehog signaling genes. The oviduct was stably posteriorized as indicated by altered *Hoxa* gene patterning and permanent upregulation of homeobox genes normally expressed only in the cervix and vagina, including *Six1*, *Pitx1*, and *Nkx3-1*. This effect was mediated by estrogen receptor action because it was blocked by co-administration of the estrogen receptor antagonist ICI 182,780. Numerous immune response genes were significantly altered in the adult oviduct before and during early pregnancy, suggesting that the posteriorized oviduct responded inappropriately to hormone-mediated modulation of mucosal immunity that is required for survival of allogeneic embryos. Embryos that managed to survive transit through this oviductal environment had an altered development rate and cell allocation, but developed to term if transferred to pseudopregnant surrogate mice. We conclude that exposure to estrogenic environmental chemicals during sensitive developmental windows permanently impairs fertility by disrupting oviduct morphogenesis and immune function, and has significant effects on survival and development of the subsequent generation. These findings have implications for the diagnosis, treatment, and prevention of human infertility and reproductive tract disease.

## TRAINING AND MENTORING

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

The Fourteenth Annual NIEHS Biomedical Career Fair was held Friday, April 29, 2011 at the Environmental Protection Agency Campus, Research Triangle Park, NC. The keynote address entitled “The Postdoctoral Experience: Preparing to Lead” was delivered by Richard Weibl, Director, Center for Careers in Science and Technology, American Association for the Advancement of Science. The keynote address was followed by panel discussions. Areas covered included Navigating the Process in Academia, Government, Industry and Biotech; Planning for Career Satisfaction and Success, The Job Search, Cover Letters, CVs, and Resumes, Grant Management, Finance and Venture Capital, Patents and Law, Non-Profit Organizations, Consulting and Business, Science Policy, Program Management, Entrepreneurs and Business, Technology Transfer, Science Outreach, Media and Communication, Clinical Research, Finding and Applying for Fellowships, Networking: A Tool for Building Relationships and Exploring Career Options, Interviewing and 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; National Postdoctoral Association; Environmental Protection Agency; and Burroughs Wellcome Fund.

Panelists included:

- Bill Barnes, Ph.D., Professor, Coordinator Molecular Biology/Biotechnology Program, Clarion University
- Brant F. Eichman, Ph.D., Associate Professor of Biological Sciences & Biochemistry, Vanderbilt University
- Thomas Kash, Ph.D., Assistant Professor, Department of Pharmacology, UNC Chapel Hill
- Jerry Stumph, Ph.D., Professor of Biology, Marian University
- Robert Ahern, Ph.D., Entomologist, Plant Epidemiology and Risk Analysis Laboratory, USDA APHIS
- Angela Davis, Human Resources Specialist, Office of Human Resources, NIEHS/NIH
- John Vandenberg, Ph.D., Director, National Center for Environmental Assessment, Office of Research and Development, US EPA
- Scott Williams, Ph.D., Principle Investigator, Laboratory of Structural Biology, NIEHS/NIH
- Humphrey Yao, Ph.D., Principle Investigator, Laboratory of Reproductive and Developmental Toxicology, NIEHS/NIH
- Melanie Sinche, M.A., M.Ed., NCC, Career Counselor and Consultant, NIH
- Lori Conlan Ph.D., Director, Office of Postdoctoral Services, OITE/NIH
- Lisa Edwards, MBA, Grants Management Officer, DERT, NIEHS/NIH
- Mike Dial, Ph.D., Analyst, Hatteras Venture Partners
- Jason Seifert, J.D, Ph.D., Senior Associate, Life Sciences Law
- Naina Bhasin, Ph.D., Vice President of Business Development and Operations, The Hamner Institute

- Rob Lindberg, Ph.D., R.A.C., Senior Director, BATON Program, North Carolina Biotechnology Center
- John Vandenberg, Ph.D., Director, National Center for Environmental Assessment, Office of Research and Development, US EPA
- Michael Humble, Ph.D., Program Administrator, DERT, NIEHS/NIH
- Timothy Haystead, Ph.D., Associate Professor, Duke University Medical Center
- Kelly Sexton, Ph.D., Assistant Director, Outreach and New Ventures, Office of Technology Transfer, North Carolina State University
- Neasha Graves, MPA, Community Outreach and Education Manager, Environmental Resource Program, UNC Institute for the Environment
- Banalata (Bono) Sen, Ph.D., Science Education and Outreach Program Manager, Environmental Health Perspectives, NIEHS/NIH
- Maria Schroeder, Ph.D., Senior Clinical Project Manager, Cardiovascular and Metabolic Therapeutic Delivery Unit, Quintiles
- Shawn Hayes, Ph.D., Clinical Science Manager, Abbott Laboratories
- Kay Lawton, Ph.D., Director of Research and Intellectual Property, Metabolon, Inc.
- Christine Kerlin, Recruiter, Manpower Professional
- Derek Schorzman, Ph.D., Principle Scientist, Liquidia Technologies
- Benjamin Corb, Director of Public Affairs, ASBMB
- Kacee Deener, MPH, Environmental Health Scientist, Office of Research and Development, US EPA
- Shobha Parthasarathi, Ph.D., Technology Development Director, North Carolina Biotechnology Center
- Cynthia R. Robinson, Director, Science & Technology Policy Fellowships, AAA
- Dara Wilson-Grant, MEd, NCC, Associate Director, UNC Office of Postdoctoral Affairs, Owner & Consultant, Careers in Bloom
- Melanie Sinche, M.A., M.Ed., NCC, Career Counselor and Consultant, NIH

### **The NIH Pathway to Independence Award (K99/R00)**

The Pathway to Independence (PI) Award Program is designed to facilitate receiving an R01 award earlier in an investigator's research career. The primary, long-term goal of the PI Award Program is to increase and maintain a strong cohort of new and talented, NIH-supported independent investigators. The PI Award will provide up to five years of support consisting of two phases. The initial phase will provide 1-2 years of mentored support for highly promising, postdoctoral research scientists. This phase will be followed by up to 3 years of independent support contingent on securing an independent research position. Award recipients will be expected to compete successfully for independent R01 support from the NIH during the career transition award period. The PI Award is limited to postdoctoral trainees who propose research relevant to the mission of one or more of the participating NIH Institutes and Centers.

Craig J. Burd, Ph.D., received the K99/R00 grant for his proposal entitled “Chromatin Dynamics of Endocrine Disruptor Compounds on Estrogen Receptor Function.” Dr. Burd will train in the Laboratory of Molecular Carcinogenesis under the mentorship of Dr. Trevor Archer.

Saurabh Chatterjee, Ph.D., received the K99/R00 grant for his proposal entitled “Free Radical Mechanism in Obesity Potentiation of Environmental Hepatotoxicity.” Dr. Chatterjee will train in the Laboratory of Toxicology and Pharmacology under the mentorship of Dr. Ronald Mason.

## INTERNATIONAL ACTIVITIES IN THE DIR FY 2010

### Collaborative Research Projects:

- Dr. Joel Abramowitz (Office of the Scientific Director) collaborates with scientists at Institute of Physiology, University of Wurzburg, Wurzburg, Germany, to study the role of transient receptor potential channels in cardiac hypertrophy.
- 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. 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 Physiology, University College London, London, United Kingdom, to study the role of inhibitory heterotrimeric G proteins in the control of heart function; with scientists at Institute of Physiology, University of Wurzburg, Wurzburg, Germany, to study the role of transient receptor potential channels in cardiac hypertrophy; and 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.
- 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; and with scientist at Alexander Fleming Institute, Athens, Greece, to study multi-allele knockout of TTP and HU-R genes.
- Dr. Lauranell Burch (Laboratory of Molecular of Genetics) collaborates with scientists at Universiti Sains Malaysia, Kelantan, Malaysia, to study the prevalence of TLR4 gene polymorphisms in the Malay population in relation to the development of typhoid fever.
- 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, to study mechanisms of glucocorticoid action.
- Dr. Donald Cook (Laboratory of Respiratory Biology) collaborates with scientists in Department of Cell Biology and Histology, University of Amsterdam, 1105 AZ

Amsterdam, Netherlands, to study the role of the langerin in dendritic cell function.

- Dr. William Copeland (Acting Chief, Laboratory of Molecular Genetics) collaborates with scientists at the University of Newcastle upon Tyne, Newcastle upon Tyne, UK, to develop guidelines for physicians and genetic counselor in the diagnosis and management of POLG related mitochondrial disorders.
- Dr. Gregg E. Dinse (Biostatistics Branch) has a collaboration with scientists at the Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China, and scientists at University of Hong Kong, Pokfulam, Hong Kong, to develop procedures for estimation and regression analysis of hazard functions when some censoring indicators are missing at random.
- Dr. Leesa Deterding (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. John Drake (Laboratory of Molecular Genetics) has a collaborative research program with scientists at the Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warsaw, Poland investigating the structural basis of DNA polymerase fidelity.
- Dr. Darleen Dixon (Molecular and Cellular Pathology Branch) collaborates with scientists at the Nanjing Medical University School of Public Health, Nanjing, Jiangsu, China and the Bureau of Health of Wujin District, Changzhou, Jiangsu, China to study the effects of environmental exposures on the pathogenesis of reproductive tract cancers/disorders in women.
- 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; and with investigators at Chiba University, Chiba, Japan; and Universidad Pablo de Olavide, Sevilla, Spain, to study the role of Type 1 Hexokinase in the control of sperm motility.
- Dr. Dori Germolec (National Toxicology Program) collaborates with scientists at the University of Milan, Milan, Italy; Utrecht University, Utrecht, The Netherlands; ECCVAM, JRC, Ispra, Italy; and RIVM (National Institute of Public Health & Environment), Bilthoven, The Netherlands to examine whether *in vitro* tests can be used to predict the potential immunotoxicity of perfluorinated compounds.
- Dr. Dmitri Gordenin (Laboratory of Molecular Genetics) has a collaboration with scientists in the Department of Medical Biochemistry and Biophysics, Umea University, Umea, Sweden, to study the role of dNTP pools in lagging strand replication.
- Dr. Stavros Garantziotis (Clinical Research Program; Laboratory of Respiratory Biology) collaborates with scientists at the Institute of Molecular Science of Medicine, Aichi University, Aichi, Japan and University of Manchester, Manchester, UK to study mechanisms of hyaluronan signaling in airway disease.
- Dr. Jean Harry (Laboratory of Toxicology and Pharmacology) collaborates with scientists at the Laboratoire de Biochimie et de Génétique Moléculaire, Faculté des Sciences, Université de La Réunion, Réunion, France to study addressing the

impact of environmental contaminants, organometals, pesticides, soy products, on inflammation of adipose tissue and on the extended shift in the cytokine expression and secretion in adipocytes and macrophages.

- Dr. Anton Jetten (Acting Chief, Laboratory of Respiratory Biology) has collaborations with scientists at the Division of Mucosal Immunology, The Institute of Medical Science, The University of Tokyo, Tokyo, Japan; Department of Cell Signaling, Tokyo Medical and Dental University, Tokyo, Japan; Department of Immunology and Cell Biology, School of Medicine, Kyoto University, Kyoto, Japan; and Novartis Pharma AG, Basel, Switzerland to study the role of retinoid-related orphan receptors in immunity and differentiation of TH17 cells; with scientists at Hokkaido Institute of Public Health, Sapporo, Japan, to identify environmental toxicants that interact with ROR $\gamma$ ; with scientists at GlaxoSmithKline D&R Ltd, Medicines Research Center, Hertfordshire, UK, and Abbott, Hannover, Germany, to study the function of ROR $\gamma$ -selective agonist and antagonists; and with scientists in the Department of Microbiology, College of Medicine, Soon Chun Hyang University, Cheonan, Korea, to study Glis3 in pancreatic development.
- Dr. Steven Kleeberger (Acting Deputy Director, 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. 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, Edinburg, 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 Universita' 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 scientists at the British Columbia University and the British Columbia Cancer Agency, Vancouver, British Columbia, Canada, to study the roles of a few key proteins in mammalian organogenesis, in particular, liver, pancreatic islets and heart.
- 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. Stephanie London (Epidemiology Branch and Laboratory of Respiratory Biology) collaborates with scientists at National Institute of Public Health, Cuernavaca Mexico, to study childhood asthma; with scientists at National Institute of Public Health, Oslo, Norway, to study early life factors and asthma; and with scientists at the Indo-U.S. Centre of Excellence for Environmental Lung Diseases to study gene by environment interaction with respect to COPD and other lung diseases. Dr. London is the group leader of an international consortium called CHARGE to examine genome wide associations with pulmonary function and related phenotypes as well as examination of interactions.
- 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 researchers at the National Institute of Public Health in Cuernavaca, Mexico to examine the relation between maternal serum levels of the androgenic DDT metabolite DDE in relation to anthropometric measures in 200 male newborns in Tapachula, Mexico; 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 Biology Centre, Academy of Sciences of the Czech Republic, Institute of Entomology, Ceske Budejovice, Czech Republic and with scientists at the Department of Genetics and Molecular Biology, University of Szeged, Szeged, Hungary the role of non-LTR retrotransposons in telomere maintenance.
- Dr. David Miller (Acting Scientific Director) 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 Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands, to study the mechanisms of regulation of ABC transporters in kidney.
- Dr. Frederick Parham (National Toxicology Program) collaborates with scientists at the University of Bern, Bern, Switzerland to study the health effects of low frequency electromagnetic fields.
- 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. James Putney (Laboratory of Signal Transduction) collaborates with scientists at University of Kyoto, Kyoto, Japan, to study the role of TRPC signaling in B-lymphocytes; with investigators at University of Oxford, Oxford, UK, to study the

- mechanisms by which store-operated channels act as signaling conduits leading to expression of specific genes; and with investigators at the University of Paris, Paris, France, to study the mechanisms of intracellular calcium oscillations.
- 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 Institute of Clinical Pharmacology and Toxicology, Charité - Universitätsmedizin Berlin, Berlin Germany, to study single nucleotide polymorphisms (SNPs) in the promoter of human FLT1.
- 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 the PI3-Kinase/Akt pathway in metastatic spread of tumors.
- Dr. Dale Sandler (Chief, Epidemiology Branch) collaborates with scientists at Charles University, Prague, Czech Republic and the Center for Epidemiologic Studies, Uranium Miners Health Institute, Příbram, Czech Republic to study cancer incidence and other health outcomes in a cohort of Czech uranium miners whose exposures were lower than those of most other cohorts of uranium miners.
- 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.
- Dr. Raymond Tice (National Toxicology Program) collaborates with scientists at the Japanese Center for the Validation of Alternative Methods, Japanese National Institute of Health Sciences in Tokyo, Japan, on the validation of the in vivo and in vitro Comet assays; and with scientists at Kyoto University and Osaka Medical College, Japan, to identify compounds that induced DNA damage using high throughput screening.
- 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. David Umbach (Biostatistics Branch) collaborates with scientists at Italian National Cancer Institute, Genoa, Italy, to functionally characterize mutations in TP53 associated with cancer in humans.
- 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; and environmental causes of pregnancy problems.

- 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; 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; and with scientists at the National Centre for Biological Sciences GKVK Campus, Bellary Road, Bangalore, India, to study the mechanism of DNA Pol  $\beta$  nucleotidyl transferase reaction.
- Dr. Darryl Zeldin (Acting Clinical 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 Delbrueck 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 William Harvey Research Institute, Queen Mary University, London, England, to study the role of P450-derived eicosanoids in regulating inflammatory processes.

### **International Meeting Organized**

- Dr. John Drake (Laboratory of Molecular Genetics) participated in organizing the Latin American Congress of Genetics, Santiago, Chile; and the NATO Advanced Research Workshop on Radiobiological Issues Pertaining to Environmental Security and Ecoterrorism, Alushta, Ukraine.
- Dr. E. Mitch Eddy (Laboratory of Reproductive and Developmental Toxicology) was on the organizing committee of the 2011 North American Testis Workshop, March 30 – April 2, 2011, Montreal, Canada, and the 2<sup>nd</sup> World Congress of Reproductive Biology, September 14, 2011, Cairns, Australia.
- 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, Manchester, UK. June 26-30, 2011.
- Dr. Shyamal Peddada (Biostatistics Branch) participated in organizing the International conference on frontiers of interface between statistics and sciences, Hyderabad, India, December 2009.

- Dr. James Putney (Laboratory of Signal Transduction) was the Co-organizer of the 3<sup>rd</sup> International Congress on Calcium Signaling and TRP Channels, Isparta, Turkey, June 23-28, 2010.
- Dr. William Stokes (Director of the NTP Interagency Center for the Evaluation of Alternative Toxicological Methods, NICEATM), served on the Scientific Committee for the meeting on testing vaccines held by the German Federal Ministry of Health in Langen, Germany, December, 2010.
- Dr. Samuel H. Wilson (Laboratory of Structural Biology) is Co-Chair of the 4<sup>th</sup> Biannual Japan-US/US-Japan DNA Repair Meeting.

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

- Dr. Karen Adelman (Laboratory of Molecular Carcinogenesis) served as an external grant reviewer for the Agence Nationale de la Recherche, Paris, France.
- Dr. John Bucher (Program Director, National Toxicology Program) coordinates scientific development and review activities with the Ramazzini Institute, Bentivoglio, Italy, to standardize methods and reporting capabilities for a major European cancer bioassay facility; and hosted a visit by scientists from the Korean Center for the Validation of Alternative Methods, National Institute of Food and Drug Safety Evaluation, Korea Food and Drug Administration, Osong, South Korea, to discuss renewal of a Memorandum of Understanding.
- Dr. June Dunnick (National Toxicology Program) served on the committee on evaluation of carcinogenic risks to humans of the International Agency for Research on Cancer (IARC), Lyon, France.
- 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. Dori Germolec (National Toxicology Program) is a member of a WHO working group that is finalizing an environmental health criteria document on Risk Assessment in Immunotoxicology.
- Dr. Ron Herbert (Cellular and Molecular Pathology Branch) served as an advisor/member of the Animal Carcinogenesis Working Group of the International Agency for Research on Cancer (IARC), Lyon, France; and was a member of a team to review pathology procedures at the Ramazzini Institute, Cancer Research Center, Bentivoglio, Italy.
- Dr. Richard Kwok (Epidemiology Branch) hosted a delegation from the Inner Mongolia Infectious Disease Institute, Huh Hot, Inner Mongolia, China, to discuss future collaborations, October 2010.
- 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.

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. William Stokes (Director of the NTP Interagency Center for the Evaluation of Alternative Toxicological Methods, NICEATM), hosted a visit by representatives from the European Union and the Republic of Korea June 16, 2010, to discuss progress on international efforts to reduce the number of animals required for product safety testing and to develop internationally consistent regulations and guidelines for human toxicological methods. Dr. Stokes also serves on the International Validation Management Team for test methods for acute eye irritation; peptide reactivity assay; skin sensitization test; and induction of human cytochrome P450.

Dr. Kenneth Tomer (Laboratory of Structural Biology) serves on the Scientific Advisory Committee of the Portuguese National Mass Spectrometry Network, Lisbon, Portugal.

Dr. Mary Wolfe (National Toxicology Program) hosted a visit by scientists from the Korean Center for the Validation of Alternative Methods, National Institute of Food and Drug Safety Evaluation, Korea Food and Drug Administration, Osong, South Korea, to discuss renewal of a Memorandum of Understanding.

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.