

Division of Intramural Research

NAEHS Council Update

June 2021

DIR RECRUITMENTS

Chief of the Comparative Medicine Branch

The National Institute of Environmental Health Sciences is searching for an Animal Program Director, Attending Veterinarian and Chief of the Comparative Medicine Branch (CMB). 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 engage in molecular, reproductive, neurological, and immunological research as well as studying the effects of environmental agents in order to develop methods of disease prevention and treatment.

The incumbent actively supports the NIEHS mission, participates in ongoing planning and management discussions to successfully resolve pertinent issues and challenges, participates in long-range strategic planning processes to develop and implement effective goals and directions for the animal care program, and provides information and recommendations to the Scientific Director. The incumbent will also conduct/collaborate in research relevant to the mission of CMB and NIEHS. Applicants must have a DVM/VMD degree 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. Dr. Donald Cook, Senior Investigator in the Immunity, Inflammation and Disease Laboratory and Chair of the NIEHS Animal Care and Use Committee serves as chair of the search committee which was launched on August 21, 2020. Two outstanding candidates for the Senior Scientist position will be interviewed in June 2021.

Tenure-Track Investigator in the Clinical Research Branch

The National Institute of Environmental Health Sciences (NIEHS) is recruiting outstanding candidates for a Tenure-Track Investigator position in the Clinical Research Branch within the Division of Intramural Research at the NIEHS in Research Triangle Park, NC. The individual selected for this position will have a strong record of participation and publications in patient-oriented research, defined as research that requires direct interactions with human subjects and may include the development of new technologies, understanding mechanisms of human disease, therapeutic interventions and/or clinical trials. The Clinical Research Branch is interested in candidates with expertise in areas such as endocrinology, neuroendocrinology, metabolism, exercise, sleep, immune-mediated diseases, pulmonology, and human genetics, among others. Applicants should have an M.D. or equivalent doctoral degree with direct clinical research experience, with three or more years of research training in clinical research and publications and other evidence of the ability to design and carry out original, innovative patient-oriented research. Dr. Alison Motsinger-Reif, Chief of the Biostatistics and Computational Biology Branch serves as chair of the search committee which was launched on July 8, 2019. This recruitment has been temporarily placed on hold.

Medical Director of the Clinical Research Unit

The Division of Intramural Research is seeking an accomplished physician scientist to serve as Senior Clinician in the Clinical Research Branch and Medical Director of the Clinical Research Unit (CRU), a stand-alone facility that sees over 1,000 patients and research participants annually with a budget of over \$3M. The CRU not only serves as the research home for

experienced clinical investigators, but also as a resource for the outstanding intramural scientists at NIEHS interested in the translational applicability of their work. The Clinical Research Branch is interested in candidates with expertise in areas such as endocrinology, neuroendocrinology, metabolism, exercise, sleep, immune-mediated diseases, pulmonology, and human genetics, among others. Applicants should have an M.D. or equivalent doctoral degree with an outstanding track record in conducting and publishing clinical research. Dr. Michael Fessler, Chief of the Immunity, Inflammation and Disease Laboratory serves as chair of the search committee which was launched on May 25, 2021.

Recruitment of NIH Earl Stadtman Investigators

In addition to targeted recruitment, DIR is actively seeking outstanding scientists through the central NIH Stadtman recruitment mechanism. DIR Principal Investigators have volunteered to serve on 19 of 26 Stadtman subcommittees in 2021-22 representing a range of disciplines central to the NIEHS mission. Applications will be reviewed in October 2021 and outstanding candidates will be identified for interviews at NIEHS starting in November 2021.

DIR STAFF UPDATES

Samuel H. Wilson, M.D., Senior Investigator, Genome Integrity and Structural Biology Laboratory died on April 23, 2021. Dr. Wilson was the head of the DNA Repair and Nucleic Acid Enzymology Group with a secondary appointment in the Epigenetics and Stem Cell Biology Laboratory. Dr. Wilson received his graduate and postgraduate training in medicine and biochemistry at Harvard Medical School (with Dr. Mahlon Hoagland) and at the National Institutes of Health (with Dr. Marshall Nirenberg). He began his career as a Principal Investigator in 1970 at the National Cancer Institute and was named chief of the Nucleic Acid Enzymology Section of the Laboratory of Biochemistry in 1986. In 1991, Wilson founded the Sealy Center for Molecular Science at the University of Texas Medical Branch (Galveston, TX). The center focused on genetic toxicology, structural biology, and functional genomics. He moved to NIEHS in 1996 to serve as Deputy Director of the Institute and the National Toxicology Program (NTP) and directed his research group in the Laboratory of Structural Biology. He served as Acting Director of NIEHS and NTP from 2007 to 2009. Sam has published extensively, authoring many research and environmental health policy publications, and has been editor of several reference volumes. Starting in 2011, he served as Editor-in-Chief of *DNA Repair*. The Wilson laboratory made numerous scientific contributions over the years towards the understanding of mechanisms of faithful replication and repair of DNA, and how abnormalities in the genome are corrected by a process named base excision repair (BER). His group has utilized a multi-disciplinary approach to analyze these essential biological activities at the molecular, cellular, and higher organism levels. Dr. Wilson was also dedicated mentor and was acknowledged with the 2014 NIEHS Mentor of the Year award and the 2015 NIH Ruth L. Kirschstein Mentoring Award.

Frederick Miller, M.D., Ph.D., Senior Investigator, Clinical Research Branch, was unanimously approved by the Board of Scientific Directors as an NIH Scientist Emeritus and he assumed the position after his retirement on March 31, 2021. Dr. Miller has distinguished himself and the NIEHS with his pioneering work on the environmental and genetic risk factors, mechanisms, assessments, and treatments of systemic autoimmune diseases. His elucidation of the nature and complexity of the myositis phenotypes has revolutionized the field of the autoimmune muscle diseases. Dr. Miller served the Federal Government for over 40 years, more than 20 of which were at NIEHS.

Robin Stanley, Ph.D., was unanimously recommended for tenure by the NIH Central Tenure Committee on April 5, 2021 and promoted to Senior Investigator. Dr. Stanley will continue to lead the Nucleolar Integrity Group within the Signal Transduction Laboratory. Her interdisciplinary research program utilizes structural biology (X-ray Crystallography, Single Particle Cryo-EM, Small Angle X-ray Scattering, and NMR), biochemistry and cell biology to uncover the structure, function, and regulation of essential RNA processing machines.

Lisa Rider, M.D. was appointed as a Senior Clinician in the Clinical Research Branch and will serve as the Head of the Environmental Autoimmunity Group starting June 1, 2021. She will lead the group located in the NIH Clinical Center located in Bethesda, MD. Dr. Rider is a Pediatric Rheumatologist and is widely acknowledged as an international leader in the field of autoimmune myositis.

New Tenure-Track Investigators

Dr. Stavros Garantziotis, Medical Director of the NIEHS Clinical Research Unit and head of the Matrix Biology Group, has accepted an offer to join the Immunity, Inflammation and Disease Laboratory as a Tenure Track Investigator. Dr. Garantziotis will continue and expand his independent research program focused on extracellular matrix biology, innate immunity, lung inflammatory diseases, and airway remodeling triggered by the environment. He is expected to start as a Tenure Track Investigator in Winter 2021.

Dr. Carlos Guardia from the Eunice Kennedy Shriver National Institute of Child Health and Human Development has accepted an offer to join the Reproductive and Developmental Biology Laboratory as an Earl Stadtman Tenure Track Investigator.

Dr. Guardia will initiate an independent program focused on developing and applying innovative cell biological and model systems to understand placental development and protective functions during pregnancy. He has also been selected as a member of the NIH Distinguished Scholars Program. Dr. Guardia is scheduled to start at NIEHS in November 2021.

New Independent Research Scholar

Dr. Elizabeth Martin is currently an NIGMS-funded Postdoctoral Research Associate Training (PRAT) Fellow working with Dr. Paul Wade in the Epigenetics and Stem Cell Biology Laboratory (ESCBL) at NIEHS. Dr. Martin was selected as an NIH Independent Research Scholar (IRS). Her independent research program will integrate data from humans, mice, and *in vitro* model systems to address how toxicant exposure impacts the epigenome and will focus on prenatal exposure and developmental origins of health and disease. Dr. Martin is scheduled to start her independent program at NIEHS in September 2021.

SCIENTIFIC UPDATE BY A DIR PRINCIPAL INVESTIGATOR

The Noradrenergic System and Environmental Health Science

Patricia Jensen, Ph.D.
Developmental Neurobiology Group
Neurobiology Laboratory
DIR, NIEHS

Brainstem noradrenergic neurons comprise a small population of cells that project to virtually all areas of the central nervous system. Through the release of norepinephrine, these neurons modulate functions as diverse as attention, emotion, appetite, memory, and response to stress. Consistent with this functional diversity, norepinephrine signaling is disrupted in a spectrum of neurodegenerative and neurodevelopmental disorders and following exposure to a number of environmental toxicants and stressors. Interestingly, it has been observed that subpopulations of noradrenergic neurons are differentially vulnerable to disease-related cell death and environmental insult. Given these observations, we suspect that the key to understanding noradrenergic system dysfunction will not be found by focusing on the noradrenergic system as a whole. Rather, this phenotypic complexity will only be understood by uncovering the developmental and genetic factors that define unique functional subtypes of noradrenergic neurons.

The long-term goal of our research is to understand the mechanistic relationship between perturbation of distinct noradrenergic neuron subtypes during development and increased susceptibility to emotional and cognitive deficits in adulthood. In pursuit of this goal, we use the mouse as a model system to: 1) define subtypes of noradrenergic neurons based on differences in developmental gene expression; 2) determine their circuitry and function in the adult brain; and 3) perturb their function during development to uncover critical windows of susceptibility and the long-term effect of these perturbations on adult behavior. Results from our studies promise insight into the basic biological mechanisms underlying noradrenergic neuron subtype function and their differential response to disease and environmental insult. Together, these studies are in line with Themes One and Three of the NIEHS Strategic Plan. Theme One: Advancing Environmental Health Sciences (EHS) through basic biological research designed to, understand the pathways that are disrupted by environmental exposures, and to assess the impact of developmental exposures on the risk of disease later in life. Theme Three: Enhancing EHS through Stewardship and Support by training of the next generation environmental health scientists, and the implementation of cutting-edge, collaborative research.

BSC REVIEW OF THE BIOSTATISTICS AND COMPUTATIONAL BIOLOGY BRANCH

The NIEHS DIR Board of Scientific Counselors reviewed the Biostatistics and Computational Biology Branch and Dr. Kyle Messier from the Division of the National Toxicology Program on March 28-30, 2021

Members of the Board of Scientific Counselors that Attended:

- Kathleen M. Caron, Ph.D., BSC Chair, Professor and Chair, Department of Cell Biology and Physiology, University of North Carolina at Chapel Hill, Chapel Hill, NC
- Christopher I. Amos, Ph.D., Director, Institute for Clinical and Translational Research, Baylor College of Medicine, Houston, TX
- Sylvie Doublé, Ph.D., Professor, Department of Microbiology and Molecular Genetics, University of Vermont, Burlington, VT
- Sarah K. England, Ph. D., Professor, Department of Obstetrics and Gynecology at the Washington University School of Medicine, St. Louis, MO
- Jeffrey J. Hayes, Ph.D., Professor and Chair, Department of Biochemistry and Biophysics, Shohei Koide Professor in Biochemistry and Biophysics, University of Rochester School of Medicine, Rochester, NY
- Deanna Kroetz, Ph.D., Professor, Department of Bioengineering and Therapeutic Sciences, University of California, San Francisco School of Pharmacy, San Francisco, CA
- Ivan Rusyn, M.D., Ph.D., Professor, Department of Veterinary Integrative Biosciences, Texas A&M University College of Veterinary Medicine and Biomedical Sciences, College Station, TX
- Daniel Stram, Ph.D., Professor, Department of Preventative Medicine and the Division of Biostatistics and Genetic Epidemiology, Keck School of Medicine, University of Southern California, Los Angeles, CA
- Roland A. Owens, Ph.D., Ex-Officio BSC Member, Assistant Director, Office of Intramural Research, NIH, Bethesda, MD

Ad Hoc Reviewers that Attended:

- Paul S. Albert, Ph.D. Chief, Biostatistics Branch, Senior Investigator, Division of Cancer Epidemiology and Genetics, National Cancer Institute, Bethesda,
- Ziv Bar-Joseph, Ph.D. FORE Systems Professor of Computer Science Machine Learning, School of Computer Science, Carnegie Mellon University, Pittsburgh, PA
- Zhen Chen, Ph.D., Senior Investigator, Biostatistics and Bioinformatics Branch, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, Bethesda, MD
- Katherine B. Ensor, Ph.D., Noah G. Harding Professor of Statistics George R. Brown School of Engineering Director, Center for Computational Finance and Economic Systems, Rice University, Houston, TX
- Michael P. Epstein, Ph.D., Professor, Department of Human Genetics Director, Center for Computational and Quantitative Genetics, Emory University School of Medicine, Atlanta, GA

- Joe W. Gray, Ph.D., Professor and Gordon Moore Endowed Chair Biomedical Engineering Department and Associate Director for Biophysical Oncology, Knight Cancer Institute, Oregon Health and Science University, Portland, OR
- Marianne Hatzopoulou, Ph.D., Professor and Chair, Transportation and Air Quality Research Group, Department of Civil and Mineral Engineering, University of Toronto, Toronto, Ontario Canada
- Rafael Irizarry, Ph.D. Professor of Biostatistics, Harvard T.H. Chan School of Public Health and Chair, Department of Data Sciences, Dana-Farber Cancer Institute, Boston, MA 02115
- Michael Jerrett, Ph.D., Professor and Chair, Department of Environmental Health Sciences Fielding School of Public Health University of California, Los Angeles, Los Angeles, CA
- Yi-Ju Li, Ph.D., Professor, Department of Biostatistics and Bioinformatics, Duke Molecular Physiology Institute, Director, Biostatistics and Clinical Outcome Group, Department of Anesthesiology Duke University School of Medicine, Durham, NC
- Lisa Meier McShane, Ph.D. Associate Director, Division of Cancer Treatment and Diagnosis, Biometric Research Program National Cancer Institute, National Institutes of Health, Rockville, MD
- William S. Noble, Ph.D., Professor, Department of Genome Sciences Paul G. Allen School of Computer Science and Engineering, University of Washington, Seattle, WA
- Limin Peng, Ph.D., Professor, Department of Biostatistics and Bioinformatics, Rollins School of Public Health Emory University, Atlanta, GA
- Mary D. Sammel, ScD Professor, Associate Director, Center for Innovative Design and Analysis Department of Biostatistics and Informatics, Colorado School of Public Health, Aurora, CO
- Jaya M. Satagopan, Ph.D., Professor, Interim Associate for Faculty Affairs Department of Biostatistics and Epidemiology, Rutgers University School of Public Health, Piscataway NJ
- Wei Sun, Ph.D., Professor, Biostatistics Program Public Health Sciences Division, Fred Hutchinson Cancer Research Center and Affiliated Professor of Biostatistics, University of Washington, Seattle, WA
- Donatello Telesca, Ph.D., Associate Professor, Department of Biostatistics, University of California, Los Angeles, Fielding School of Public Health, Los Angeles, CA
- Jeffrey L. Thorne, Ph.D., Professor, Biological Sciences and Statistics Bioinformatics Research Center, North Carolina State, Raleigh, NC
- Fred Wright, Ph.D., Professor, Biological Sciences and Statistics Chancellor's Faculty Excellence Program Director, Bioinformatics Research Center North Carolina State University, Raleigh, NC
- John F. Wambaugh, Ph.D. Physical Scientist, Center for Computational Toxicology Environmental Protection Agency, Durham, NC

Agenda

Sunday, March 28 – Zoom meeting

Closed Evening Session

- 4:00 - 4:30 p.m. Welcome and Discussion of Past Board Reviews, Drs. Rick Woychik, Darryl Zeldin, Brian Berridge, and Alison Motsinger-Reif
- 4:30 – 6:00 p.m. BSC Discussion of Review, Dr. Kathleen Caron and panel

Monday, March 29 - Zoom meeting

Morning Session

- 9:30 - 9:45. Welcome, Drs. Kathleen Caron and Richard Woychik
- 9:45 - 10:15 Overview, Biostatistics and Computational Biology Branch, Alison Motsinger-Reif, Ph.D.
- 10:15 – 11:30 Open Q&A Session:
Statistical Omics, Alison Motsinger-Reif, Ph.D.
Bioinformatics, Leping Li, Ph.D.
Computational Systems Biology, Benedict Anchang, Ph.D.
- 11:30 – 11:45 Break
- 11:45 – 12:15 Closed 1:1 Sessions with Investigators, Drs. Motsinger-Reif, Li and Anchang

Afternoon Session

- 12:20 – 1:50 Closed Working Lunch
- 2:00 – 3:55 Poster Session
- 4:00 – 5:00 Closed Sessions with Fellows and Staff Scientists

Tuesday March 30 - Zoom Meeting

Morning Session

- 10:00 – 11:15 Open Q&A Session:
Statistical Methods and Applications in Epidemiology, Clarice Weinberg, Ph.D.
Applied Statistics, Shanshan Zhao, Ph.D.
Spatiotemporal Health Analytics, Kyle Messier, Ph.D.
- 11:15 – 11:30 Coffee Break
- 11:30 - 12:00 Closed 1:1 Sessions with Investigators, Drs. Weinberg, Zhao and Messier
- 12:00 - 12:45 Lunch
- 12:45 - 1:35 Closed: Sessions with Programmatic Staff Scientists:
Pierre Bushel, Ph.D. David Umbach, Ph.D.
Min Shi, M.D., Ph.D. Keith Shockley, Ph.D.
Matthew Wheeler, Ph.D.
- 1:45 - 3:10 Closed BSC Discussion and completion of individual review assignments by each member
- 3:10 – 4:00 Break
- 4:00 – 5:00 Closed Session and Debriefing to NIEHS/DIR Leadership
- 5:15 Adjourn

TRAINING AND MENTORING

NIH Matilda White Riley Early-Stage Investigator Award

Kaitlyn Lawrence, Ph.D., an IRTA Postdoctoral Fellow in the Chronic Disease Epidemiology Group within the Epidemiology Branch was recognized with the Matilda White Riley Early-Stage Investigator Award by the NIH. Dr. Lawrence is currently focused on assessing the interplay among climate, environmental contaminants, social factors, and genomics and how these relate to respiratory and other chronic disease endpoints.

Intramural AIDS Research Fellowship

Alexander Foo, Ph.D., a Visiting Postdoctoral Fellow in the Nuclear Magnetic Resonance Group within the Genome Integrity and Structural Biology Laboratory was selected to receive an Intramural AIDS Research Fellowship.

American Society for Biochemistry and Molecular Biology Award

Seda Kocaman, Ph.D., a Visiting Postdoctoral Fellow in the Nucleolar Integrity Group within the Signal Transduction Laboratory was awarded the top poster prize at the ASBMB Symposium celebrating the 50th Anniversary of the Protein Data Bank in February 2021.

2021 NIH Summer Internship Program

NIEHS will host 57 summer interns from May thru August 2021. The 2021 program will be entirely virtual. NIEHS Program will include a Welcome Event on June 7, 2021, Career Panel on June 18, 2021, Zoom Poster Session on July 29, 2021. The NIH Office of Intramural Training and Education (OITE) will be offering scientific bootcamps, journal clubs and workshops throughout the summer and the NIH Summer Presentation Days during the first week of August.

2021 NIEHS Biomedical Career Symposium

The Twenty Fourth Annual NIEHS Biomedical Career Symposium will be held August 26-31, 2021. The symposium will consist of career panels, workshops, and exhibitors as well as CV/Resume Review sessions.

INTERNATIONAL ACTIVITIES IN DIR FOR FY 2020

Collaborative Research Projects

- Dr. William Copeland (Chief, Genome Integrity and Structural Biology Laboratory) is leading a collaboration with Dr. Robert Taylor at Newcastle upon Tyne University, UK on the ultrasensitive detection of mitochondrial DNA deletions in POLG disease patients and normal individuals. The signatures of these mtDNA deletions link disease to aging and provide insight to the mode of DNA replication. These collaborations were supported in part by 1ZIAES065078 and 1ZIAES065080.
- Dr. Guohong Cui (Neurobiology Laboratory) collaborates with Dr. Yulong Li at Peking University, Beijing, China, and Dr. Dayu Lin at New York University to develop next-generation GRAB sensors for monitoring dopaminergic activity *in vivo*. He also collaborates with Dr. Ying Zhang at First Hospital of Jilin University, Changchun, China to study neural mechanisms of therapeutic deep brain stimulation in Parkinson's disease. These collaborations were supported in part by 1ZIAES103310.
- Dr. Serena Dudek Sommer (Neurobiology Laboratory) collaborates with Dr. Mathias V. Schmidt at Max Planck Institute of Psychiatry, Munich, Germany to study how mineralocorticoid receptors dampen glucocorticoid receptor sensitivity to stress via regulation of FKBP5. Additional collaborators on this project include Dr. Kerry Ressler (Harvard Medical School, McLean Hospital), Dr. Nils Gassen (University of Bonn, Bonn, Germany), and Dr. Torsten Klengel (University Medical Center Göttingen, Göttingen, Germany and Harvard Medical School, McLean Hospital). This collaboration was supported in part by 1ZIAES100221.
- Dr. Stavros Garantziotis (Immunity, Inflammation and Disease Laboratory) collaborates with investigators at the University of Rome Campus Bio-medico, Rome, Italy to study the clinical utility of inhaled hyaluronan in acute exacerbations of COPD. This collaboration was supported in part by 1ZIAES102605.
- Dr. Kelly Ferguson (Epidemiology Branch) collaborates with Dr. Vincent Jaddoe at Erasmus Medical Center, Rotterdam, Netherlands on Generation R, a prospective, population-based cohort study. This collaboration was supported in part by 1ZIAES101575.
- Dr. Dmitry Gordenin (Genome Integrity and Structural Biology Laboratory) collaborates with Dr. Michael A. Stratton at Wellcome Sanger Institute, Hinxton, UK and Dr. Gad Getz at Broad Institute on characterizing mutational signatures in human cancer. This collaboration was supported in part by 1ZIAES103266.
- Dr. Steven Kleeberger (Senior Investigator in the Immunity, Inflammation and Disease Laboratory) and Dr. Daniel Menendez (Staff Scientist in Immunity, Inflammation and Disease Laboratory) collaborated with Dr. Fernando Polack and Dr. Damian Alvarez at the Fundación INFANT, Buenos Aires Argentina to study the effects of human and bovine lactoferrin in human cells and in mice. Dr. Kleeberger and Dr. Menendez also collaborated with Dr. Fernando Polack, Dr. Damian Paggi and Dr. Mauricio Caballero at the Fundación INFANT, Buenos Aires Argentina to determine whole genome single nucleotide polymorphisms landscape and gene expression profiles of different tissues of patients with COVID-19. Dr. Kleeberger collaborates with scientists at Tohoku

- University in Sendai, Japan on the role of Nrf2 in susceptibility to oxidant-induced lung injury. He also collaborates with scientists at the Pontifical Universidade Catolica do Rio Grande do Sul (PUCRS) in Porto Alegre, Brazil on evaluation of environmental aspects, life habits and pathological conditions in child development. These collaborations were supported in part by 1ZIAES100557, 1ZIAES103356, and 1ZIAES100513.
- Dr. Patricia Jensen and Dr. Nicholas Plummer (Neurobiology Laboratory) collaborate with Dr. Luciane H. Gargaglioni Batalhão at São Paulo State University-UNESP/FCAV, Jaboticabal, Brazil to study the role of locus coeruleus noradrenergic neurons in developmental regulation of breathing patterns and thermoregulation. This collaboration was supported in part by 1ZIAES102805.
- Dr. Xiaoling Li (Signal Transduction Laboratory) collaborates with Dr. Shuang Tang at Cancer Institute and Department of Nuclear Medicine, Fudan University Shanghai Cancer Center, Shanghai, China to study the role of the intestinal epithelial glucocorticoid receptor in regulation of intestinal tissue homeostasis and tumorigenesis. Dr. Li also collaborates with Dr. Xuemei Tong from the Department of Biochemistry and Molecular Cell Biology at Shanghai Jiao Tong University School of Medicine, Shanghai, China to study the role of HNF4alpha in regulation of sulfur amino acid metabolism in liver cancer. Additionally, Dr. Li collaborates with Dr. Zefeng Wang at CAS-MPG Partner Institute for Computational Biology, Chinese Academy of Sciences, Shanghai, China to study the role of SIRT1 in regulation of sphingolipid metabolism and neural differentiation of mouse embryonic stem cells. These collaborations are supported in part by 1ZIAES102205.
- Dr. Geoffrey Mueller (Genome Integrity and Structural Biology Laboratory) collaborates with Dr. Rob Aalberse at University of Amsterdam, Amsterdam, Netherlands on structural characterization of peanut allergens. Dr. Mueller also collaborates with Dr. Jeroen T. Buters at Technical University of Munich, Munich, Germany on a study examining air-sampled pollen by NMR. These collaborations were supported in part by 1ZIAES102906.
- Dr. Lisa Rider (Clinical Research Branch) collaborates with Dr. Adriana Sallum at Pediatric Rheumatology Unit, Children's Institute, School of Medicine, University of Sao Paulo, Brazil, to study environmental risk factors for juvenile dermatomyositis. She also collaborates with Dr. Lucy Wedderburn at the University College of London on an exome chip analysis of genetic risk factors for juvenile dermatomyositis. Additionally, Dr. Rider collaborates with Dr. Rie Karasawa at St. Marianna University School of Medicine, Kawasaki, Japan on anti-endothelial autoantibodies in juvenile dermatomyositis. These collaborations were supported in part by 1ZIAES101074 and 1ZIAES101081.
- Dr. Roel M. Schaaper (Genome Integrity and Structural Biology Laboratory) collaborates with Dr. Iwona Fijalkowska 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 Dr. Alejandro Hochkoeppler at the Department of Industrial Chemistry, University of Bologna, Bologna, Italy, to study the function of *E. coli* dGTP triphosphohydrolase. These collaborations were supported in part by 1ZIAES065086 and 1ZIAES101905.

- Dr. Stephen Shears (Signal Transduction Laboratory) collaborates with Dr. Henning Jessen at Centre for Integrative Biological Signalling Studies, University of Freiburg, Freiburg, Germany on understanding epitranscriptomic regulation of gene expression by inositol pyrophosphate. Dr. Shears also collaborates with Dr. Dorothea Fiedler at Chemical Biology Department, Leibniz-Forschungsinstitut für Molekulare Pharmakologie, Berlin, Germany on the supervision of phosphate homeostasis and bone calcification by inositol pyrophosphates. The collaborations were supported in part by 1ZIAES80046.
- Dr. Paul Wade (Epigenetics and Stem Cell Biology Laboratory) collaborates with Dr. Hitoshi Kurumizaka at University of Tokyo, Tokyo, Japan, on the interaction of transcription factors with nucleosomes. This collaboration was supported in part by 1ZIAES101965.
- Dr. Douglas Bell and Dr. Xuting Wang (Immunity, Inflammation and Disease Laboratory) collaborate with Dr. Gareth Bond at Ludwig Institute for Cancer Research, University of Oxford, Oxford, United Kingdom to study how germline and somatic genetic variants in the p53 pathway interact to affect cancer risk, progression, and drug response. This collaboration was supported in part by 1ZIAES100475.
- Dr. Carmen Williams (Reproductive and Developmental Biology Laboratory) collaborates with Dr. Masahito Ikawa at Osaka University, Osaka, Japan on a project to generate a ZP3-cre transgenic mouse line. This collaboration was supported in part by 1ZIAES102985.
- Dr. R. Scott Williams (Genome Integrity and Structural Biology Laboratory) collaborates with Dr. Daniel Durocher at Lunenfeld-Tanenbaum Research Institute (University of Toronto), Toronto, Canada on studying the mechanism of APE2 DNA repair nuclease functions. Dr. Williams also collaborates with Dr. Felipe Cortes at Spanish National Cancer Research Centre (CNIO), Madrid, Spain on the mechanism by which TDP2 processes Topoisomerase 2 DNA-protein crosslinks. This collaboration was supported in part by 1ZIAES102765.
- Dr. Darryl Zeldin (Scientific Director and Senior Investigator in the Immunity, Inflammation and Disease Laboratory) and Dr. Matthew Edin (Staff Scientist in Immunity, Inflammation and Disease Laboratory) collaborated with Dr. Tim Warner and Dr. Jane Mitchell at the William Harvey Research Institute, Queen Mary University of London, London, UK, to measure eicosanoids in mice and humans with cyclooxygenase deficiency. They also collaborated with Dr. Jacques Behmoaras at Imperial College London, London, UK, to measure the difference in eicosanoids in inflammatory exudates from young and aged humans. Additionally, they collaborated with Dr. Daowen Wang at Huazhong University of Science and Technology, Wuhan, China, to investigate ACE2 regulation during SARS-CoV2. Other collaborations include work with Dr. Hui Huang at Sun Yat-Sen University in Guangzhou, China to understand the role of sEH in cardiomyopathy and work with Dr. John Seubert at the University of Alberta, Edmonton, Canada, to measure eicosanoids in plasma to examine the role of sEH in cardiac responses to inflammation. Finally, Dr. Zeldin and Dr. Edin collaborated with Dr. Hans Bisgaard at the University of Copenhagen, Copenhagen, Denmark to measure eicosanoids in plasma from a cohort of mothers treated with omega-3 supplements during pregnancy. The goal is to understand how lipid mediators may regulate asthma or inflammatory disease progression in the newborn children. These collaborations were supported in part by 1ZIAES025034.

International Meetings Organized

Dr. Lisa Rider (Clinical Research Branch) helped organize the annual meeting of the International Myositis Assessment and Clinical Studies Group. This meeting was held virtually on November 18th, 2020.

Dr. Dale Sandler (Chief, Epidemiology Branch) helped organize the annual meeting of the Premenopausal Breast Cancer Collaborative Group. This meeting was held virtually on October 30th, 2020.

Dr. Darryl Zeldin (Scientific Director and the Immunity, Inflammation and Disease Laboratory) served on the Organizing Committee for the 18th International Winter Eicosanoid Conference and as a Scientific Program Advisor for the 16th International Conference on Bioactive Lipids in Cancer, Inflammation and Related Disease in St. Petersburg, FL.

Work with International, Multinational or Regional Foreign Organizations

Dr. Dmitry Gordenin (Genome Integrity and Structural Biology Laboratory) is a member of the International Cancer Genome Consortium. Dr. Gordenin is part of the Pan-Cancer Analysis of Whole Genomes (PCAWG), an international collaboration to identify common patterns of mutation in more than 2,600 cancer whole genomes from the International Cancer Genome Consortium.

Dr. Steven Kleeberger (Epidemiology Branch) is a member of the Fundación Infant (INFANT) a nonprofit organization founded by Argentine physicians in 2003, whose mission is to investigate the causes of respiratory diseases that severely affect children, such as asthma, bronchiolitis, pneumonia, and influenza.

Dr. Geoffrey Mueller (Genome Integrity and Structural Biology Laboratory) served as a member of the World Health Organization / International Union of Immunological Societies (WHO/IUIS) Allergen Nomenclature Sub-Committee. This multi-national organization consists of experts from 5 continents and aims to maintain a consistent list of existing and new allergens with references to the exact sequences and publications. This activity was supported in part by 1ZIAES102906.

Dr. Lisa Rider (Clinical Research Branch) is a member of the International Myositis Genetics Consortium (MYOGEN) that defines genetic risk and protective factors for myositis; is a member of The International Myositis Assessment and Clinical Study (IMACS) Group to standardize the conduct and reporting of myositis clinical studies; and is a member of The International Myositis Classification Criteria Project (IMCCP) to develop new classification criteria for myositis and its subgroups. This work is supported in part by 1ZIAES101074 and 1ZIAES101081.

Dr. Dale Sandler (Chief, Epidemiology Branch) is one of 4 investigators leading the Premenopausal Breast Cancer Collaborative Group. Other PIs are Hazel Nichols (University of North Carolina), and Anthony Swerdlow and Minouk Schoemaker (The

Institute of Cancer Research, London, UK). This is an international consortium of more than twenty prospective cohort studies investigating factors associated with risk for breast cancer diagnosed among women under age 50. This work is supported in part by 1ZIAES044005.

Dr. Robin Stanley (Signal Transduction Laboratory) served as an Ad hoc reviewer for the University of Strasbourg Institute for Advanced Study, Strasbourg, France.

Dr. Paul Wade (Epigenetics and Stem Cell Biology Laboratory) was on a brief sabbatical (abbreviated by Covid-19) at the University of Tokyo in Tokyo, Japan.

Dr. Steve Wu (Reproductive and Developmental Biology Laboratory) served on the editorial board of Chinese Journal of Physiology, the official publication of Chinese Physiological Society (TAIWAN).

Foreign Delegations Hosted

No Activities to Report

International Capacity Building

No Activities to Report