Table of Contents

- Message from the Director 3
- Faculty Accomplishments 4
- Publications 6
- Research Support 14
- Technology Transfer 20
- Education Highlights 21
- Center Lecture Series 23
- Faculty Profiles 27
Message from the Director

We are especially proud to present our Annual Report this year because we are celebrating our 20th year as the Center for Molecular Medicine and Genetics and thus our 20th year of standing for excellence in research and education. We have tried to remain true to our charter with an ongoing focus on basic and translational biomedical research. This continuing dedication to cutting-edge research is made possible by our amazing faculty and students. The breadth and depth of our research is seen on the individual faculty profiles in this Report. In education, we train PhD and MD-PhD students in molecular biology and genetics, including newly developed options in neurobiology and computational biology. We also have an outstanding MS program in genetic counseling and a residency program in medical genetics.

In our role as the de facto genetics department we have been building strength in computational biology and genomics. In support of this direction we have just completed a space renovation (photo) that makes over 1800 square feet available as new computational and conference space. In addition, we have started to think about our curriculum in terms of strengthening the Genetics part of Molecular Medicine and Genetics.

In the last year the Center welcomed new members: Dr. James Granneman, Professor of Molecular Medicine and Genetics and of Internal Medicine, and Dr. Karli Rosner, Assistant Professor of Dermatology and of Molecular Medicine and Genetics. Some losses have also taken place: over the last several years: we have said good-bye to Dr. Derek Wildman, Dr. Monica Uddin, Dr. Jeffrey Loeb, Dr. Michael Shy, Dr. Abdul Samra, and Dr. John Kamholz, who all left the University. Dr. Alexander Gow, Professor of Molecular Medicine and Genetics and of Neurology and of Pediatrics, was appointed Associate Director of the Center, positions previously held by Drs. Loeb and Kamholz.

Our Center continues to be a robust center for research and education – currently with 39 active external grants running – and we look forward to future exciting collaborations and partnerships in 2015.

- Lawrence I. Grossman, PhD
  Henry L. Brasza Professor
  and Director
Faculty Accomplishments

**Gerald Feldman**, MD, PhD, Professor of Molecular Medicine and Genetics is the President-elect of the American College of Medical Genetics.

**Alexander Gow**, PhD, Professor of Molecular Medicine and Genetics and of Neurology and of Pediatrics, and a member of the CMMG Faculty since 2000, was appointed Associate Director of the Center. Dr. Gow is an accomplished scientist who specializes in research related to neurodegenerative diseases.

**Francesca Luca**, PhD, Assistant Professor of Molecular Medicine and Genetics and of Obstetrics and Gynecology and **Roger Pique-Regi**, PhD, Assistant Professor of Molecular Medicine and Genetics and of Obstetrics and Gynecology have been combining their strengths to form an interdisciplinary research group to get a better molecular understanding of the genetic and environmental determinants of complex traits in humans. As a result of their collaborative philosophy, they were awarded a grant from the American Heart Association for “Functional genomics characterization of genetic variation associated with cardiovascular disease” and an R01 grant by the National Institutes of Health for “Functional Characterization of the Genetic and Environmental Determinants of Complex Traits.”

**Leonard Lipovich**, PhD, Associate Professor of Molecular Medicine and Genetics and of Neurology, presented a talk titled “Primate-specific long non-coding RNA genes regulate cellular states in human disease” at the Gordon Research Conference on Human Genetics and Genomics held at Bryant University, Smithfield, Rhode Island. The Gordon Conference, held from July 7-11, is a biannual, competitive conference, with attendance limited to those scientists emerging at the forefront of their fields. The conference brings together international leaders in the field of human genetics and genomics to discuss what has been learned and where the field is heading. Dr. Lipovich, presenting his work on non-coding ribonucleic acids, joined speakers from Yale University, Harvard Medical School, the Whitehead Institute at the Massachusetts Institute of Technology, the University of Oxford, England, and others who focus on advancing the study, organization and function of the genome.

The National Institutes of Health has selected **Leonard Lipovich**, PhD, Associate Professor of Molecular Medicine and Genetics and of Neurology, for its coveted Director’s New Innovator Award, a five-year, $2.3 million grant he will use from the National Cancer Institute to test a hypothesis that could lead to breakthrough methodologies to improve human health. The project will identify primate-specific long non-coding ribonucleic acids, or IncRNAs, that are functional in cell growth and cell death, within the framework of human estrogen receptor positive breast cancer. The goal of the project, which has broad relevance to other nuclear hormone receptor pathways in human disease, is to reveal the extent to which non-conserved RNA genes contribute to cancer pathogenesis in humans. Dr. Lipovich is the first researcher from Wayne State University to receive the competitive award.

**Lobelia Samavati**, MD, Associate Professor of Internal Medicine and of Molecular Medicine and Genetics was awarded the School of Medicine Research Excellence Award. Dr. Samavati’s major research focus is to understand the molecular pathways underlying inflammatory diseases including sarcoidosis. As a disease model, she studies both clinical and laboratory aspects of sarcoidosis and interstitial lung disease. She has been awarded several grants for this work; most recently she received a $400,000 award from the NIH to study “The Role and Regulation of MKP-1 in Sarcoidosis.”
Angela Trepanier, MS, Assistant Professor of Molecular Medicine and Genetics, was awarded the 2014 Wayne State University President’s Award in Teaching and the 2014 School of Medicine Teaching Award.

The research efforts of Kezhong Zhang, PhD, Associate Professor of Molecular Medicine and Genetics and of Immunology and Microbiology and his lab, led to a major discovery that real-world airborne pollutants induce unprecedented inflammatory stress responses to interrupt energy metabolism in the liver, leading to non-alcoholic fatty liver disease (NAFLD) and subsequent Type-2 diabetes.

Kezhong Zhang, PhD, Associate Professor of Molecular Medicine and Genetics and of Immunology and Microbiology was awarded the 2014 School of Medicine Teaching Award. Dr. Zhang studies inflammation and endoplasmic reticulum protein misfolding.

Recent work in the lab of Ren Zhang, PhD, Assistant Professor of Molecular Medicine and Genetics and of Internal Medicine, has identified a novel lipid regulator, named lipasin, which is a potential drug target for treating both dyslipidemia and diabetes. In a Scientific Reports paper, Dr. Zhang’s lab showed that circulating lipasin was increased in human type 2 diabetes and obesity. Dr. Zhang explained that because lipasin overexpression increases triglycerides, this result immediately suggests a potential mechanism for hypertriglyceridemia that is often associated with type 2 diabetes and obesity. In a recent paper published in Diabetologia, Dr. Zhang’s lab resolved a discrepancy among determined lipasin levels in different studies by pointing out that lipasin undergoes proteolytic regulation. Utilizing multiple ELISAs (a test that uses anti-bodies and color change to identify substances) his lab is able to detect different lipasin fragments.
Publications of the Center

Articles


Lee YH, Petkova AP, Konkar AA and Granneman JG. Cellular origins of cold-induced brown adipocytes in adult mice. *FASEB J*. PMID 25392270, in press


Zhang C, Luo H, Gao F, Zhang CT, **Zhang R**. A reduction in both visceral and subcutaneous fats contributes to increased adiponectin by lifestyle intervention in the Diabetes Prevention Program. *Acta Diabetol* 2014:in press

Fu Z, Abou-Samra AB, **Zhang R**. An explanation for recent discrepancies in levels of human circulating betatrophin. *Diabetologia* 2014, 57:2232-2234


Books, Chapters, Review Articles, Editorials


Horne SD and Heng HH. Genome chaos, chromothripsis and cancer evolution. *Journal of Cancer Studies and Therapy*, 2014


Selvaraju S, Jodar M and Krawetz SA. (IN PRESS) The influence of environmental contaminants and lifestyle on testicular damage and male fertility In Methods in Pharmacology and Toxicology: developmental Toxicity Springer Verlag, N.Y.


Research Support

Inborn Errors of Metabolism Collaborative (IBEMC), Sponsor: Michigan Public Health Institute. **Gerald Feldman**, Role: PI

Newborn Screening Management Program. Annual contract, awarded to Children’s Hospital of Michigan, Division of Genetic and Metabolic Disorders, for the management of all infants born in Michigan and diagnosed with an inborn error of metabolism through the Newborn Screening Program, Sponsor: Michigan Department of Community Health. **Gerald Feldman**, Role: PI

Special Supplemental Nutrition Program for Women, Infants and Children (WIC), contract, awarded to Children’s Hospital of Michigan, Division of Genetic and Metabolic Disorders, for the management of infants born in Michigan and diagnosed with an inborn error of metabolism through the Newborn Screening Program, Sponsor: Michigan Department of Community Health, **Gerald Feldman**, Role: PI

“Regulation of respiration and apoptosis by cytochrome c phosphorylation,” Sponsor: National Institutes of Health. **Russell L. Finley**, PhD Role: Co-I


“The Role of microRNAs in Epilepsy of Tuberous Sclerosis Complex,” Sponsor: R01 NIH. **Samiran Ghosh**, Role: Co-I


“Center for Urban Responses to Environmental Stressors (CURES),” Sponsor: NIEHS. **Samiran Ghosh**, Role: Co-director of the Integrative Health Sciences Facility Core (IHSFC)


“Pre-clinical trial of BG-12 in the rsh mouse model,” Source: Biogen Idec. **Alexander Gow**, Role: PI

“Akt signaling in stressed oligodendrocytes,” Source: MS Society. **Alexander Gow**, Role: PI

“Non-immune models of neurodegeneration,” Source: MS Society. **Alexander Gow**, Role: PI

“Regeneration of auditory synaptic contacts using stem cell based approaches,” Source: NIH, NIDCD. **Alexander Gow**, Role: Co-I

“Processing and Degradation of Proteolipid Protein,” Source: NIH, NINDS. **Alexander Gow**, Role: Co-I

Training Program in Endocrine and Diabetes Research, Sponsor: NIH, NIDDK T-32. **Alexander Gow**, Role: Co-I
“Analysis of cellular plasticity in white adipose tissue,” Sponsor: NIDDK. James Granneman, Role: PI

“Analysis of lipolytic trafficking in myocytes,” Source: Veterans Administration. James Granneman, Role: PI

"Analysis of lipolytic protein trafficking," Source: NIH NIDDK. James Granneman, Role: PI


"Training Program in Endocrine and Diabetes Research," Sponsor: NIH. James Granneman, Role: PD

"Sympathetic innervation of cold-activated brown and white fat in lean adults," Sponsor: NIH NIDDK. James Granneman, Role: PI

"Functional Role of Bone Marrow Adipocytes in Metastatic Prostate Cancer," Sponsor: NIH NCI. James Granneman, Role: Co-I

"Diabetes Obesity Team Science," Sponsor: Office of the Vice President for Research. James Granneman, Role: Co-PI

“Mita Varghese IPA Agreement” Source: Veterans Administration. James Granneman, Role: PI

"Novel Tools for the Analysis & Interpretation of Gene Signaling Pathways," Source: National Science Foundation. Lawrence Grossman, Role: Co-I


Link Gulf War Illness to genomic instability. Sponsor: Department of Defense. Henry Heng, Role: PI

“Processing and Degradation of Proteolipid Protein,” Sponsor: NIH. Maik Hüttemann, Role: Co-I

“Regulation of respiration and apoptosis by cytochrome c phosphorylation,” Sponsor: NIH. Maik Hüttemann, Role: PI


“Infrared Mitochondrial Therapy for Treatment of Reperfusion Injury,” Sponsor: Wayne State University-NEI Technology Development Incubator Grant. Maik Hüttemann, Role: Co-PI

“MRI Pathogenesis of PMD Caused by X-Chromosome Duplication” Source: ELA Foundation De Recherche. John Kamholz, Role: PI

“Effects of Xenazine (tetrabenazine) on swallowing function in patients with Huntington Disease (HD)” Source: Lundbeck. John Kamholz, Role: PI


Cooperative Reproductive Medicine Network Center, Source: NIH U10. Stephen Krawetz, Role: PI

“Crossover Study on Human Exposure to Phthalates and Male Fertility,” Source: NIH. Stephen Krawetz, Role: Co-I

"Epigenetic reprogramming of male germ cells and fertility by persistent organic pollutants and endocrine disrupting chemicals," Source: Russian Science Foundation. Stephen Krawetz, Role: Collaborator/Consultant

"Non-invasive Trophoblasts Retrieval to Identify Biomarkers of Placental Disorders," Source: WSU Perinatology Virtual Discovery Program. Stephen Krawetz, Role: Co-PI


"HERACell Incubators (equipment)," Source: Michigan Reproductive Medicine. Stephen Krawetz


Cancer Center Support Grant – Genetics/Genomics Core, Source: NIH/NCI. Susan Land, Role: Program Director

“Inflammation Pathways and COPD in the Development of Lung Cancer,” Source: NIH. Susan Land, Co-PI

“The Role of SM22 in the Pathogenesis of Aortic Aneurysms,” Source: NIH. Li Li, Role: PI

“Cytoskeleton regulated osteochondrogenesis in Atherosclerosis,” Source: Wayne State University Office for the Vice President for Research Bridge Fund. Li Li, Role: PI


“Epidemiology of Precursors to Type 2 Diabetes,” Source: Massachusetts General Hospital. Leonard Lipovich, Role: PI


“Regulation of Hepatic Steatosis by an ER Stress-Inducible Transcription Factor CREBH,” Source: NIH, NIDDK. **Leonard Lipovich**, Role: Co-I

“RaNA Therapeutics Research Agreement” Source: RaNA Therapeutics, Inc. **Leonard Lipovich**, Role: PI


“Regulation of Hepatic Steatosis by an ER stress-inducible transcription factor CREBH,” Source: NIH NIDDK. **Leonard Lipovich**, Role: Co-I

“Blocking Neuregulin1 Communication to Slow Disease Progression in ALS” Source: ALS Therapy Alliance. **Jeffrey Loeb**, Role: Co-I

“Soluble Neuregulins in Neuromuscular and Peripheral Nerve Development” Source: NIH/NINDS. **Jeffrey Loeb**, Role: PI

“Electrical, Molecular and Clinical Correlates of Human Interictal Spiking” Source: Jeffrey Loeb. **Jeffrey Loeb**, Role: PI


“Functional characterization of the genetic and environmental determinants of complex traits”, Source: NIH. **Francesca Luca**, Role: PI (Multiple)

“Risky family environments and childhood asthma”, Source: NIH. **Francesca Luca**, Role Co-I

“Gene-Environment Functional Analysis of Non-Coding Variants”, Source: Karmanos Cancer Institute/Wayne State Core Incentive Program (CIP). **Francesca Luca**, Role PI


“Functional characterization of the genetic and environmental determinants of complex traits,” Source: NIH. **Roger Pique-Regi**, Role: PI (Multiple)


Pinkus Research Fund, Pinkus Dermatopathology Laboratory, PC, Monroe, Michigan. **Karli Rosner**, Role: PI
“Role and Regulation of MKP-1 in Sarcoidosis,” Source: NIH. **Lobelia Samavati**, Role: PI

“Role of p38 MAP kinase in sarcoidosis,” Source: American Lung Association. **Lobelia Samavati**, Role: PI

“Validation of an Antibody Test for Early Diagnosis of Ovarian Cancer,” Source: NIH. **Michael Tainsky**, Role: PI


“Evolved Placental Response to Hypoxia” Source: Hackensack University Medical Center. **Derek Wildman**, Role: PI

“Preventing Coagulopathy in Pulmonary Xenotransplants: a Functional and Comparative Genomics Approach” Source: Lung, LLC. **Derek Wildman**, Role: PI

“Collaborative Research: Evolutionary Origins of the Brain Energetics and Adaptive Plasticity of Humans” Source: National Science Foundation. **Derek Wildman**, Role: PI


“Regulation of Hepatic Steatosis by an ER stress-inducible transcription factor CREBH,” Source: NIH NIDDK. **Kezhong Zhang**, Role: PI

“Simultaneous Targeting of IRE1a in B Cells and Macrophages for Lupus Therapy,” Source: NIH/Northwestern University. **Kezhong Zhang**, Role: PI (multiple)


“Training Program in Endocrine and Diabetes Research”, Source: NIH/NIDDK T-32, **Kezhong Zhang**, Role: Co-Investigator/Mentor

“Targeting ER stress sensor to modulate intraocular inflammation in Bacterial endophthalmitis”, Sponsor: Midwest Eye-Banks Vision Research Grant, **Kezhong Zhang**, Role: Co-I

Technology Transfer

In 2014, Center faculty have been active in technology transfer resulting in the following:


**Maik Hüttemann:** United States Patent 8,945,196; role: primary inventor; approved Nov. 2014; publication date: 02/03/2015; application nr. 12/771,137 title: Light therapy treatment (Device Patent). International Patent is pending; role: primary inventor; title: Light therapy treatment.

**Maik Hüttemann:** United States Provisional Patent US61/817,226 (submitted March 2014); role: primary inventor; title: (–)-Epicatechin as a Cancer Treatment Enhancing Compound

**Maik Hüttemann:** United States Patent Application; serial No 14/473,105; role: primary inventor. Title: Light Therapy Treatment (Method Patent). Filed 8/29/2014; pending


**Michael Tainsky:** Tainsky, M.A., primary inventor, Chatterjee, M. Draghici, S. Neoepitope detection of disease using protein arrays. United States Patent 8,753,822 Filed: June 20, 2011 Granted: June 17, 2014

**Kezhong Zhang:** Zhang, K., primary inventor. Title: Generation of an affinity-purified rabbit anti-CREBH polyclonal antibody, Tech ID: 15-1271. License agreement issued date: 11/25/2014, to Kerafast, Inc.
Education Highlights

Admissions

Two students began studies in the doctoral program in the Fall of 2014:

Jaime Stafford – University College London (MS); Oakland University (BS)
Zhao Wang – Wayne State University (MS); China Pharmaceutical University (BS)

Six students began studies in the M.S. of Genetic Counseling Program:

Courtney Attard – University of Michigan
Mitch Cunningham – Southern Illinois University, Edwardsville
Cassandra Latoni – Saginaw Valley State University
Lindsay Lipe – Michigan State University
Rachel McCauley – University of Michigan-Flint
Stefanie Turner – Central Michigan University

Degrees Conferred

MBG PhD Program:

Levent Sipahi
“Proximate and evolutionary insights into the epigenetics of posttraumatic stress disorder”
Dissertation Advisors: Monica Uddin, PhD and Derek Wildman, PhD
Currently a student in the Wayne State University School of Medicine

Shruti Bagla
“Linking Molecular, Electrical and Anatomical Properties of Human Epileptic Brain”
Dissertation Advisor: Jeffrey Loeb, MD, PhD
Currently a Postdoctoral Researcher at Wayne State University School of Medicine, Department of Pediatrics

Genetic Counseling MS Program:

Amanda Bartenbaker, MS
“Genetic Counseling Clients’ Views on Religious and Spiritual Assessment in Genetic Counseling”
Currently a Genetic Counselor at Spectrum Health Laboratories in Grand Rapids, Michigan
Kelly Burgess, MS
“What are the differences between telephone and in person genetic counseling from the genetic counselors’ perspective?”
Currently a Genetic Counselor at Rush University Medical Center in Chicago, Illinois

Sarah Campian, MS
“Universal Screening for Lynch Syndrome: One Center’s Experience”
Currently a Genetic Counselor at William Beaumont Hospital, Cancer Genetics Program in Royal Oak, Michigan

Lisa Gillis, MS
“Online information seeking behavior of prenatal genetic counseling patients”

Ashley Port, MS
“Jewish Women’s Health Project: Understanding Cancer Risk and Attitudes in the Orthodox Jewish Community”

Mary Schultz, MS
“Behavioral challenges faced by parents of children with cystic fibrosis: A needs assessment for an educational program”
Currently a Genetic Counselor at Spectrum Health Genetics in Grand Rapids, Michigan
Center Lecture Series

The Center hosts an on-going lecture series with presentations from current faculty and students as well as recognized leaders in research and education. The following lectures were hosted in 2014:

Christopher E. Mason, PhD, Assistant Professor of Physiology and Biophysics and the Institute for Computational Biomedicine, Weill Cornell Medical College of Cornell University, “Clinical and Research Discoveries in the Genome, Epigenome, Transcriptome, and Epitranscriptome,” January 9, 2014

Roberto Mendez, Graduate Research Assistant, Laboratory of Kezhong Zhang, PhD, "Regulation of Hepatic Energy Metabolism by CREBH under Metabolic Stress," January 16, 2014

Daniel Radecki, Graduate Research Assistant, Laboratory of Alexander Gow, PhD, "Degenerative consequences of oligodendrocyte metabolic stress," January 23, 2014

Year 1 Molecular Biology and Genetics, 2nd Rotation Seminar, Molly Estill, Laboratory of Roger Pique-Regi, PhD; Cynthia Kalita, Laboratory of Derek Wildman, PhD; Neeraja Purandare, Laboratory of Lawrence Grossman, PhD; Amara Sugalski, Laboratory of Leonard Lipovich, PhD, February 6, 2014

Jenny Tung, PhD, Assistant Professor of Evolutionary Anthropology, Duke University, “Social environmental effects on primate gene regulation and evolution,” February 20, 2014

Ben Brown, PhD, Staff Scientist, Life Sciences Division, Lawrence Berkeley National Laboratory, “Spatiotemporally resolved stranded RNA sequencing reveals the complexity of an animal transcriptome,” March 6, 2014

William Gundling, Graduate Research Assistant, Laboratory of Derek Wildman, PhD, “Genome-wide patterns of placental methylation are predicted by the proxies of maternal nutritional history in Cebu, Philippines” and Christopher Sinkler, Graduate Research Assistant, Laboratory of Maik Hüttemann, PhD “COX4I2 as a Cancer Biomarker and Oxygen Sensor in the Lung,” March 13, 2014

Carlos Moraes, PhD, Professor and Ester Lichtenstein Endowed Chair of Neurology, University of Miami, “Manipulating Mitochondrial DNA Heteroplasmy in Vivo to Treat Mitochondrial Diseases,” March 20, 2014


Whitney Lee, Graduate Research Assistant, Laboratory of Robert Skoff, PhD, “The Mia40/Tom40-Erv1 Pathway Transports Proteolipid Protein to the Mitochondria,” March 27, 2014

Luis Barreiro, PhD, Assistant Professor, Canadian Research Chair in Functional and Evolutionary Genomics of the Immune System, CHU Sainte-Justine/University of Montreal, “Deciphering the genetic and epigenetic factors controlling immune responses to infection,” April 3, 2014
7th Annual Henry L. Brasza Diabetes Lecture: Bradford Lowell, MD, PhD, Professor of Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, “The Neural Wiring Diagram for Hunger: Using Cre/Lox Tools to Discover its Basis,” April 9, 2014

Siddhesh Aras, PhD, Laboratory of Lawrence Grossman, PhD, “CHCHD2: a bi-organelar regulator of mitochondrial metabolism and stress response” and Gregory Moyebrailien, Laboratory of Roger Pique-Regi, PhD, “Empirical and computational survey of genetic variants that affect transcription factor binding,” April 10, 2014

Dennis Petersen, PhD, Professor and Vice-Chair, Department of Pharmaceutical Sciences, University of Colorado, “Ethanol-induced modifications of Hepatocellular Proteins: Implications and Interpretations,” April 17, 2014

Year 1 Molecular Biology and Genetics, 3rd Rotation Seminar: Molly Estill, Laboratory of Stephen Krawetz, PhD; Cynthia Kalita, Laboratory of Roger Pique-Regi, PhD; Neeraja Purandare, Laboratory of Maik Hütttemann, PhD; Amara Sugalski, Laboratory of Monica Uddin, PhD, April 24, 2014

Steven Horne, Graduate Research Assistant, Laboratory of Henry Heng, PhD, “Drug treatment fuels genome alteration mediated cancer evolution,” May 8, 2014

Lynne Maquat, PhD, Lowell Orbison Endowed Chair and Professor, Department of Biochemistry and Biophysics, School of Medicine and Dentistry, University of Rochester, “Alu’-strious effects on human mRNA metabolism,” May 15, 2014

Jack Degner, PhD, Postdoctoral Research Fellow, Genome Biology Unit, European Molecular Biology Laboratory, Heidelberg, Germany, “Genomic approaches for understanding the mechanisms underlying inter-individual gene expression variation,” May 20, 2014

Batoul Abdallah, Graduate Research Assistant, Laboratory of Henry Heng, PhD, “Inherited heterogeneity: a novel form of inheritance that regulates tumor cell populations” and Donovan Watza, MD/PhD Graduate Research Assistant, Laboratory of Roger Pique-Regi, PhD, "ATASeq reveals condition specific chromatin rearrangement and transcription factor binding," May 22, 2014

Donald Conrad, PhD, Assistant Professor, Departments of Genetics and Pathology & Immunology, Washington University School of Medicine, “Genetic and genomic analyses of spermatogenic function,” May 29, 2014

Brian A. Ference, MD, Clinical Chief of the Division of Cardiovascular Medicine, Director of the Cardiovascular Genomic Research Center, Chief of the Division of Translational Research and Clinical Epidemiology, Director of the Data Analytics and Research Unit, Department of Internal Medicine, Wayne State University, “Mendelian Randomization: translating GWAS data into clinically useful information,” June 5, 2014

Andrey Kozlov, PhD, Group Leader, Department of Experimental and Clinical Traumatology, Ludwig Boltzmann Institute, Austria, “Decreased ATP synthesis and increased ROS production are the major features of mitochondrial dysfunction in sepsis,” June 12, 2014

24
Tiffany Cook, PhD, Associate Professor, Division of Developmental Biology, Department of Pediatrics, University of Cincinnati, “Molecular Genetic Dissection of Photoreceptor Differentiation and Maintenance,” July 31, 2014

Yuchuan Ding, MD, PhD, Director of Cerebrovascular Research Labs, Associate Chair for Research, Department of Neurological Surgery, Wayne State University, “Regulating Cell Metabolism with Ethanol: A Potential Approach to Improving Stroke Outcome?,” September 4, 2014

Robert Lasley, PhD, Department of Physiology, Wayne State University, “Cardiac Adenosine Receptors: Subcellular and Cellular Compartmentation,” September 25, 2014

Andrea Geamanu, PhD, Postdoctoral Research Fellow, Laboratory of Lobelia Samavati, MD “Metabolomics Connects Aberrant Bioenergetic, Gut Microbiota, and Inflammation in Sarcoidosis” and Paul Albosta, Graduate Research Assistant, Laboratory of Russell Finley, Jr., PhD, ”Cyclin J and cell signaling during Drosophila oogenesis,” October 2, 2014

Sander Houten, PhD, Associate Professor of Genetics and Genomic Sciences, Icahn School of Medicine at Mt. Sinai, “Mitochondrial NADP(H) deficiency due to a mutation in NADK2 causes dienoyl-CoA reductase deficiency with hyperlysinemia,” October 9, 2014

Batoul Abdallah, Graduate Research Assistant, Laboratory of Henry Heng, PhD, “Inherent heterogeneity: a novel form of inheritance that regulates tumor heterogeneity” and Kathleen Maheras, Graduate Research Assistant, Laboratory of Alexander Gow, PhD, “Dysfunctional myelin alters neural processing in the mouse auditory brainstem,” October 16, 2014

Jinsheng Zhang, PhD, Professor and Research Director, Department of Otolaryngology – Head and Neck Surgery, Communication Sciences and Disorders, Wayne State University, “Noise- and Blast-Induced Tinnitus,” October 23, 2014

Joseph Maranville, PhD, Senior Scientist, Department of Genetics and Pharmacogenomics, Merck Research Laboratory, “Using human genetics to improve treatment of inflammatory diseases,” October 30, 2014

Roberto Mendez, Graduate Research Assistant, Laboratory of Kezhong Zhang, PhD, “CREBH mediates fasting-induced gene transcription” and Zhao Yang, Graduate Research Assistant, Laboratory of Ren Zhang, PhD (1st Rotation), “Identification of molecular mechanisms mediating the transcription of the lipid regulator lipasin,” November 13, 2014

Donald DeGracia, PhD, Associate Professor of Physiology, Wayne State University, “Nonlinear dynamics of acute cell injury,” November 20, 2014

Xuebao Zhang, PhD, Research Associate, Laboratory of Kezhong Zhang, PhD, “ERLIN2 is a potential candidate that regulates cell cycle” and Daniel Radecki, Graduate Research Assistant, Laboratory of Alexander Gow, “Neurodegenerative consequences of episodic oligodendrocyte metabolic stress,” December 4, 2014
Charles Burant, MD, PhD, Professor of Internal Medicine, Robert C. and Veronica Atkins Professor of Metabolism, Professor of Molecular and Integrative Physiology, University of Michigan Health System, “Oxidative capacity and its relationship to health and longevity,” December 11, 2014
Faculty Profiles

Siddhesh Aras, MBBS, PhD
Assistant Professor (Research)

Contact
Scott Hall, Rm 3240
540 E. Canfield Avenue
Detroit, MI 48201
313-577-5219
saras@wayne.edu

Education
M.B.B.S, University of Mumbai, 2001
Residency, University of Mumbai, 2004
PhD, LSU Health Sciences Center, 2009

Research Focus
Mitochondria are the powerhouse of a cell. Oxidative phosphorylation (OxPhos) generates ATP that is used in various cellular processes. We are currently focused on identifying and characterizing cellular regulators of OxPhos typically under conditions of cellular stress. We are also interested in understanding the signaling crosstalk between mitochondria and the nucleus where most of the mitochondrial proteins are transcribed.

A second project of interest is mitochondria in infectious diseases. We are currently focusing on viral infections. Viruses are obligatory intracellular microbes. Once in the cell, viral proteins either activate cell-signaling pathways (e.g. TLRs) or directly affect a specific function (e.g. E1B-55K protein of adenovirus degrades cellular p53). We are interested in understanding how viral proteins usurp mitochondrial oxidative phosphorylation towards its own benefit, in order to better understand viral pathology and identify novel therapeutic targets.

Recent Publications


Leon R. Carlock, PhD
Associate Professor of Molecular Medicine and Genetics
and of Anatomy and Cell Biology

Contact
Lande Building, Rm 452
550 E. Canfield Avenue
Detroit, MI 48201
313-577-1013
lcarlock@wayne.edu

Education
Purdue University, PhD, 1981

Research Focus
Molecular neurobiology; Huntington's disease; Biotechnology Research &
Discovery; Preclinical Assay Development; Oncology Drug Development.

Recent Publications
US Patent and Trademark Office; Provisional Patent Application #62/087,023; Filed 12/3/2014 "Compositions and

Subpopulation of Mammalian Cells with Distinctive Ribosome Translation Profiles" L. Carlock and M. Cypher,
Inventors.

Methods for Detecting and Modulating Cell Death by a Translation Regulated Gene Expression System" L. Carlock
and M. Cypher, Inventors.

GB2464888; Patent Issue Date 12/5/2012. Filing Date 8/7/2008. "Compositions and Methods for Detecting and
issued by the Intellectual Property Office Great Britain.

Mammalian Cells with Distinctive Ribosome Translation Profiles" L. Carlock and M. Cypher, Inventors. Patent
issued by the Intellectual Property Office Great Britain.

myelin proteolipid protein gene modulates apoptosis in neural and non-neural tissues. Cell Death Differ. 11: 1247-

Ghandour, M.S., Feutz, A.-C., Jalabi, W., Taleb, O., Bessert, D., Cypher*, M., Carlock, L., and Skoff, R.; Trafficking of

Boucher SE, Cypher MA, Carlock LR, Skoff RP. Proteolipid protein gene modulates viability and phenotype of

Fusco FR, Chen Q, Lamoreaux WJ, Figueredo-Cardenas G, Jiao Y, Coffman JA, Surmeier DJ, Honig MG, Carlock LR,
Reiner A. Cellular localization of huntington in striatal and cortical neurons in rats: lack of correlation with
Erin P. Carmany, MS, CGC
Assistant Professor of Molecular Medicine and Genetics and Associate Director of the Genetic Counseling Program

Contact
Scott Hall, Rm 2375
540 E. Canfield Avenue
Detroit, MI 48201
313-577-9138
ecarmany@med.wayne.edu

Education
University of Colorado Health Sciences Center, MS, 1997

Research Focus
Genetic counseling in the Spanish speaking population, alternative genetic counseling service models

Recent Publications


Gerald Feldman, MD, PhD

Professor of Molecular Medicine and Genetics
and of Pathology and of Pediatrics
Division Director of Clinical Genetics
Director, Clinical Genetics Services
Medical Director, Division of Laboratory Genetics and Molecular Pathology, Detroit Medical Center-University Laboratories

Contact
Scott Hall, Rm 2375
540 E. Canfield Avenue
Detroit, MI 48201
313-577-6298
gfeldman@med.wayne.edu

Education
Indiana University, BA, Biological Sciences, 1975
Indiana University, MS, Medical Genetics, 1977
Virginia Commonwealth University, PhD, 1982
Virginia Commonwealth University, MD, 1984

Research Focus
Use of molecular technologies in the diagnosis of genetic diseases, clinical genetics, and dysmorphology;
educational programs in medical genetics residency training, newborn screening and inborn errors of metabolism

Recent Publications


Russell L. Finley Jr., PhD
Professor of Molecular Medicine and Genetics
and of Biochemistry and Molecular Biology
Member, Karmanos Cancer Institute

Contact
Scott Hall, Rm 3212
540 E. Canfield Avenue
Detroit, MI 48201
313-577-7845
rfinley@wayne.edu

Education
SUNY Upstate Medical University, PhD, 1990

Research Focus
Research in our laboratory follows two main themes. One is directed at understanding how regulatory networks control biological processes. Our approach is to identify and characterize networks of interacting genes and proteins using high throughput technologies and data mining. The interaction maps that we generate from these studies form the foundation for discovering and understanding cellular regulatory pathways. A second theme of our research is directed at understanding the molecular mechanisms that control cell division. For these studies we are using the genetically tractable model organism, Drosophila (the fruit fly). We are studying gene networks centered on two novel conserved proteins, named Cyclin Y and Cyclin J. Cyclin proteins are regulators of cyclin-dependent kinases (Cdks), which are highly conserved S/T protein kinases that control the cell division cycle in all eukaryotes. For more information see www.proteome.wayne.edu.

Recent Publications


Samiran Ghosh, PhD
Assistant Professor of Family Medicine and Public Health Sciences and of Molecular Medicine and Genetics

Contact
Scott Hall, Rm 3325
540 E. Canfield Avenue
Detroit, MI 48201
313-577-5346
sghos@med.wayne.edu

Education
University of Connecticut, PhD, 2006

Research Focus
Dr. Ghosh’s methodological research focuses on clinical trial, survival analysis, generalized linear model, multilevel model, model selection in high dimensional data, machine learning and Bayesian paradigm. His special interest is in developing novel statistical methods for Adaptive and Pragmatic clinical trial. His research is recently funded from PCORI for 3 years on a project titled “Developing Bayesian Methods for Non-inferiority Trial in Comparative Effectiveness Research”. He is also associate director of Biostatistics core for CURES grant (a NIEHS funded P30) at Wayne State University. Apart from his methodological research in statistics, he collaborates with basic and clinical scientists across and beyond the Wayne State University.

Recent Publications
Ghosh S. and Townsend J. P. H-CLAP: Hierarchical Clustering within a Linear Array with an application in Genetics. Accepted for publication in Statistical Applications in Genetics and Molecular Biology.


Alexander Gow, PhD

Professor of Molecular Medicine and Genetics and Associate Director,
Professor of Pediatrics,
Professor of Neurology
Charles H. Gershenson Distinguished Fellow

Contact
Elliman Building, Rm 2148
421 E. Canfield Avenue
Detroit, MI 48201
313-577-9402
313 577-9401 (voice)
agow@med.wayne.edu

Education
Queensland University, PhD, 1990

Research Focus
Role of the unfolded protein response in neurodegenerative diseases; molecular characterization of the regulation of axoglial junction assembly in CNS myelin; molecular characterization of the claudin family of integral membrane tight junction proteins during development in brain, testes, and inner ear using transgenic and homologous recombination in embryonic stem cells, contribution of myelin dysfunction to behavioral disorders, novel neurodegenerative mouse models of multiple sclerosis.

Recent Publications


James G. Granneman, PhD
Professor of Molecular Medicine and Genetics
and of Internal Medicine

Contact
Lande Building, Rm 103
550 E. Canfield Avenue
Detroit, MI 48201
313-577-5629
james.granneman@wayne.edu

Education
University of Massachusetts, PhD, 1981

Research Focus
Adipose tissue cell and molecular biology, target identification and high through-put screening for novel obesity and diabetes therapeutics

Recent Publications


Lawrence I. Grossman, PhD

Henry L. Brasza Professor of Molecular Medicine and Genetics
Director, Center for Molecular Medicine and Genetics
Professor of Internal Medicine

Contact
Scott Hall, Rm 3129
540 E. Canfield Avenue
Detroit, MI 48201
313-577-5326
l.grossman@wayne.edu

Education
Albert Einstein College of Medicine, PhD, 1971

Research Focus
We work on mitochondrial molecular genetics. Mitochondria are semi-autonomous organelles because they have their own DNA and genetic machinery but must cooperate with the nucleus to function. Mitochondria contain about 1500 proteins, most nucleus encoded, and carry out a number of functions, most centrally to provide most of the energy in the cell. So important is proper energy function in that mitochondria turn out to be responsible for, or to be involved in, a growing array of diseases, including many common late onset diseases such as various peripheral neuropathies, cardiomyopathies, and type II diabetes. We are focusing increasingly on mitochondrial disease mechanisms, including genomic approaches to population disease susceptibilities. We are also interested in the evolutionary emergence of an enlarged neocortex, the most highly oxygen-utilizing tissue.

Recent Publications


Henry H.Q. Heng, PhD
Associate Professor of Molecular Medicine and Genetics and of Pathology

Contact
Scott Hall, Rm 3226
540 E. Canfield Avenue
Detroit, MI 48201
313-577-9544
hheng@med.wayne.edu

Education
University of Toronto, PhD, 1994

Research Focus
Molecular cytogenetics; genome structure and function; genomic instability and cancer progression

Recent Publications


Maik Hüttemann, PhD
Associate Professor of Molecular Medicine and Genetics
and of Biochemistry and Molecular Biology

Contact
Scott Hall, Rm 3214
540 E. Canfield Avenue
Detroit, MI 48201
313-577-9150
mhuttema@wayne.edu

Education
Philipps University of Marburg, PhD, 1999

Research Focus
Our team studies mitochondrial function using genetic and biochemical approaches. We focus on two key components of the mitochondrial oxidative phosphorylation machinery, cytochrome c oxidase (COX) and the small electron carrier cytochrome c (Cytc). COX is the terminal enzyme of the mitochondrial respiratory chain, “burns” the oxygen we breathe to water, and pumps protons across the inner mitochondrial membrane generating the mitochondrial membrane potential, which is utilized by ATP synthase to produce energy in the form of ATP. Cytc has two distinct functions: it delivers electrons to COX, but it also participates in programmed cell death (apoptosis).

The overall goal of our work is to understand the regulation of COX and Cytc in normal and disease conditions. This regulation in turn affects energy production, free radical generation, and apoptosis. Research topics of the Hüttemann group under investigation include 1) cell signaling pathways that act on COX and Cytc, which pathways are often dysregulated in human diseases; 2) lung cancer; 3) neurodegenerative diseases; 4) gene regulation of COX subunit isoforms; and 5) novel strategies to boost mitochondrial function as a future treatment for diseases that manifest themselves in a lack of energy and increased cell death.

Recent Publications


Gregory Kapatos, PhD
Professor of Molecular Medicine and Genetics
and of Pharmacology

Contact
Scott Hall, Rm 3353
540 E. Canfield Avenue
Detroit, MI 48201
313-577-5965
gkapato@med.wayne.edu

Education
University of Pittsburgh, PhD, 1978

Research Focus
Cellular and molecular biology of monoamine neurotransmitter secreting neurons

Recent Publications


Stephen A. Krawetz, PhD
Professor of Obstetrics and Gynecology
and of Molecular Medicine and Genetics
Charlotte B. Failing Professor of Fetal Therapy and Diagnosis
Associate Director,
C.S. Mott Center for Human Growth and Development

Contact
C.S. Mott, Rm 253
275 E. Hancock
Detroit, MI 48201
313-577-6770
steve@compbio.med.wayne.edu

Education
University of Toronto, PhD, 1983

Research Focus
The goal of my laboratory is to understand the genetic mechanisms that impact the selection of genes for development and differentiation and translate this knowledge to ensure the birth and long healthy life of a child.

Recent Publications (216 h-index 37)


Markku Kurkinen, PhD
Professor of Molecular Medicine and Genetics
and of Pathology

Contact
Scott Hall, Rm 3204
540 E. Canfield Avenue
Detroit, MI 48201
markku.kurkinen@wayne.edu

Education
University of Helsinki, PhD, 1979

Research Focus
Extracellular matrix; metalloproteinases; gene regulation; development

Recent Publications


Wayne D. Lancaster, PhD

Professor of Molecular Medicine and Genetics
and of Obstetrics and Gynecology

Contact
Scott Hall, Rm 3230
540 E. Canfield Avenue
Detroit, MI 48201
313-577-0028
lancaster@wayne.edu

Education
Wayne State University, PhD, 1973

Research Focus
Papillomaviruses: molecular biology, evolution, and role in human carcinogenesis; cancer cell genome instability; ovarian carcinogenesis

Recent Publications


Susan J. Land, PhD  
Associate Professor of Molecular Medicine and Genetics  
Director, Applied Genomics Technology Center

Contact  
C.S. Mott Center Bldg., Rm. 56  
275 E. Hancock  
Detroit, MI 48201  
313-577-9605  
sland@med.wayne.edu

Education  
Wayne State University, PhD, 1993

Recent Publications


Li Li, PhD
Associate Professor of Internal Medicine; Cardiovascular Research Institute and of Molecular Medicine and Genetics

Contact
Elliman Building, Rm 1107
421 E. Canfield Avenue
Detroit, MI 48201
313-577-8749
lili@med.wayne.edu

Education
University of Texas Health Science Center at Houston, PhD, 1991

Research Focus
We are studying the molecular mechanisms of smooth muscle phenotypic changes during development and diseases using tissue culture cells and transgenic/knockout mouse disease models. We have been using comprehensive cellular, molecular and genetic approaches to address these issues. Understanding the molecular mechanisms of cardiovascular development is critical for developing therapeutic strategies for human vascular diseases including atherosclerosis, aneurysms and Marfan syndrome.

Recent Publications


Leonard Lipovich, PhD
Associate Professor of Molecular Medicine and Genetics and of Neurology

Contact
Scott Hall, Rm 3208
540 E. Canfield Avenue
Detroit, MI 48201
313-577-9683
llipovich@med.wayne.edu

Education
University of Washington, PhD, 2003

Research Focus
A formidable conundrum of the post-genomic era is the abundance of eukaryotic transcripts which have limited interspecies conservation, do not encode proteins or small RNAs, and are devoid of known functional roles. My group integrates bioinformatics and experimentation to understand the evolutionary and functional genomics of these long non-protein-coding RNA (lncRNA) transcripts, with an emphasis on their roles in primate, and specifically human, phenotypic uniqueness.

Recent Publications


Francesca Luca, PhD
Assistant Professor of Molecular Medicine and Genetics and of Obstetrics and Gynecology

Contact
Scott Hall, Rm 3317
540 E. Canfield Avenue
Detroit, MI 48201
313-577-1152
fluca@wayne.edu
www.lucalab.wayne.edu

Education
University of Calabria, PhD, 2006

Research Focus
My lab is interested in understanding the genetic and molecular basis of inter-individual and inter-population differences in complex phenotypes. We combine evolutionary and functional genomics approaches to study intermediate phenotypes (e.g.: transcription factor binding, gene expression, protein secretion, etc.) and how they are affected by gene-environment interactions.

Recent Publications


Richard E. Miller, MD
Professor of Internal Medicine and of Molecular Medicine and Genetics

Contact
4H University Health Center
Detroit, MI 48201
313-745-4008
richard.miller@wayne.edu

Education
University of Michigan, MD, 1966

Recent Publications


Roger Pique-Regi, PhD
Assistant Professor of Molecular Medicine and Genetics
and of Obstetrics and Gynecology

Contact
Scott Hall, Rm 3309
540 E. Canfield Avenue
Detroit, MI 48201
313-577-0719
rpique@wayne.edu

Education
University of Southern California, PhD, 2009

Research Focus
My research group aims to further our understanding of the human genome by developing computational methods and statistical models that integrate large datasets. We tackle questions such as: Where are the DNA sequences that control gene expression in a given tissue or cell-type? What are the chromatin marks that characterize the state of the cell and are associated with these regulatory sequences? How can genetic variation disrupt the regulatory code and affect the molecular processes leading to a disease condition?

Much of our statistical work makes use of computationally intensive approaches that are designed to be effective for extracting subtle signals from large and complex data sets. This requires using or developing new advanced state-of-the-art methods in statistics, computer science and signal processing and applying them to comparative genomics, functional genomics and population genetics. In general, we aim to tackle problems where careful analysis seems likely to yield new biological insights.

Recent Publications
Karli Rosner, MD, PhD
Director of Dermatology Research, Department of Dermatology
and of Molecular Medicine and Genetics
Tenure-Track Assistant Professor

Contact
Prentis Building, Rm 2216
110 E. Warren Avenue
Detroit, MI 48201
313-578-4430
krosner@med.wayne.edu

Education
Ben-Gurion University of the Negev, MD, 1988
HaEmek Medical Center, Specializations in Dermatology, 1996
University of Copenhagen, PhD, 2001

Research Focus
Our laboratory works on developing a cure for multiple tumor types. As a prototype, I chose melanoma which is the fastest spreading and most aggressive form of cancer. No current treatment type is offering more than a temporary response of few months in a minority of metastatic melanoma patients. During the last few years, we developed a genetic-based therapeutic modality that overcomes melanoma resistance to current therapies. Recently, our therapy attained more than 75% regression in human melanoma xenografts after a single administration. This attainment follows previous demonstration of 97% to 100% killing efficiency in multiple human primary and metastatic melanoma cell types. We are also interested in investigating the role of Wnt/beta-catenin pathway in the development and progression of melanoma.

Recent Publications


Lobelia Samavati, MD
Associate Professor of Internal Medicine and of Molecular Medicine and Genetics
Director, Sarcoidosis/ILD Center

Contact
Scott Hall, Rm 3228
540 E. Canfield Avenue
Detroit, MI 48201
313-745-1718
lobi@wayne.edu

Education
Medical School at the University of Cologne, MD, 1992

Research Focus
Clinical and laboratory research in sarcoidosis and interstitial lung disease

Recent Publications


Michael A. Tainsky, PhD

Professor of Oncology; Karmanos Cancer Institute and of Molecular Medicine and Genetics

Contact
Karmanos Cancer Institute
4100 John R.
Mail Code: PR03GL
Detroit, MI 48201
313-578-4340
MAT@wayne.edu

Education
Cornell University, PhD, 1977

Research Focus
The overall theme of the research within my laboratory is the understanding of basic mechanisms of molecular and cellular biology that are altered as cells progress to become neoplastic. My approach has been to use in vitro human cell models of carcinogenesis and differentiation to identify critical molecular mechanisms. We have identified and studied spontaneous genomic instability immortalization in cells from familial cancer patients. In particular we are interested in mechanisms of transcription that cause changes in cell phenotype. We are developing novel cancer diagnostics methods for high risk populations who are genetically predisposed to cancer.

Recent Publications


Angela M. Trepanier, MS, CGC
Assistant Professor of Molecular Medicine and Genetics and Director of the Genetic Counseling Program

Contact
Scott Hall, Rm 2375
540 E. Canfield Avenue
Detroit, MI 48201
313-577-3425
atrepani@med.wayne.edu

Education
University of Minnesota, MS, 1994

Research Focus
Genetic risk assessment and counseling for cancer and other adult onset disorders; promoting medical genetics education and evaluating educational approaches; developing public policy related to medical genetics and genetic counseling; evaluating service delivery models

Recent Publications


Jeffrey Tseng, PhD

Assistant Professor of Molecular Medicine and Genetics
and of Biochemistry and Molecular Biology
Member of Karmanos Cancer Institute

Contact
Scott Hall, Rm 3220
540 E. Canfield Avenue
Detroit, MI 48201
313-577-0498
ytseng@wayne.edu

Education
University of Illinois at Chicago, PhD, 2006

Research Focus
In our lab, we study protein structure, function, evolution and human disease-causing mechanisms, using structure-based geometric approaches. Essentially, we develop algorithms, design geometric construction and perform large-scale calculations. We apply geometric calculations to structures in protein dynamics through simulations with GPU- accelerated Linux clusters.

Our research focuses on protein structure and function with shape analysis. We are also interested in the areas of surface identification, characterization, classification, geometric and evolutionary matching techniques, disease-associated non-synonymous single-nucleotide polymorphism (nsSNP), structural variations associated with gene duplication and Knot theory applied in RNA structures. Novel areas of research include the use of high-throughput computing technology for generating millions of surface patches to study protein-protein interactions and geometric modeling for drug discovery.

Recent Publications


Jiemei Wang, PhD
Assistant Professor (Research)
Center for Molecular Medicine and Genetics
Cardiovascular Research Institute

Contact
Scott Hall, Rm 3130
540 E. Canfield Avenue
Detroit, MI 48201
313-577-8522
jiwang@med.wayne.edu

Education
Sun Yat-Sen University, Guangzhou, China, MBD, 2004
Sun Yat-Sen University, Guangzhou, China, PhD, 2009

Research Focus
There are two major focuses in my research: 1) microRNA regulation of tissue regeneration. MicroRNAs are newly discovered short oligonucleotides that act as key regulators of gene expression. It is until recently that the importance of microRNA-directed gene regulation in vascular disorders has been recognized. Our project is to determine the biogenesis of miRNAs and their impact on tissue repair, in response to detrimental stress, such as diabetes, hyperlipidemia, hypertension, etc. 2) endothelial injury and repair in disease settings. The well-being of vascular endothelium is essential to normal vascular homeostasis. Its dysfunction is one of the first steps leading to atherosclerosis. Endothelial progenitor cells (EPCs) are vascular endothelial cell (EC) precursors that are capable of differentiating into mature endothelial cells and producing new vessels but their functions are impaired in various cardiovascular diseases. We are investigating the morphogenic activities of EPCs that might contribute to EPCs’ therapeutic potentials for wound healing.

Recent Publications
Wang J*, Chen AF, Zhang K. Isolation and primary culture of mouse aortic endothelial cells. Journal of visualized experiments: JoVE. 2015; In Press. (*Corresponding author)


Kezhong Zhang, PhD  
Associate Professor of Molecular Medicine and Genetics  
and of Immunology and Microbiology

Contact  
Scott Hall, Rm 3202  
540 E. Canfield Avenue  
Detroit, MI 48201  
313-577-2669  
kzhang@med.wayne.edu

Education  
Fudan University, PhD, 1998

Research Focus  
Research in this laboratory is focused on cellular stress responses originated from the endoplasmic reticulum (ER) and/or mitochondria that modulate inflammation and metabolism that are associated with metabolic disease, autoimmune disease, and cancer. The ER is an organelle that is primarily recognized as a compartment for protein folding and assembly, a pool of intracellular calcium, and a site for lipid and sterol biosynthesis. Physiological states that increase protein-folding demand, or stimuli that disrupt protein folding reactions, create an imbalance between the protein-folding load and capacity of the ER. This can cause accumulation of unfolded or misfolded proteins in the ER lumen - a condition referred to as "ER stress". To ensure the fidelity of protein folding and to handle the accumulation of unfolded or misfolded proteins, the ER has evolved a group of signal transduction pathways collectively termed "Unfolded Protein Response (UPR)" to alter transcriptional and translational programs. The UPR is a critical regulator in the initiation and progression of a variety of human diseases. Research projects in the Zhang laboratory include: 1) regulation of hepatic energy metabolism by ER stress-inducible transcriptional activators; 2) roles and mechanisms for the UPR transducer IRE1α in rheumatoid arthritis and lupus; 3) airborne particulate matter (PM2.5)-induced cellular stress responses and their effects on non-alcoholic steatohepatitis (NASH) and type-2 diabetes; and 4) roles of ER lipid-raft proteins in breast cancer malignancy maintenance and therapy resistance.

Recent Publications  


Ren Zhang, PhD
Assistant Professor of Molecular Medicine and Genetics
and of Internal Medicine

Contact
Scott Hall, Rm 3319
540 E. Canfield Avenue
Detroit, MI 48201
313-577-0027
rzhang@med.wayne.edu

Education
The University of Texas MD Anderson Cancer Center, PhD, 2005

Research Focus
The metabolic syndrome, a common disorder including glucose intolerance and dyslipidemia, poses a major public health issue. Patients with high blood lipids, such as triglycerides, are at high risk in developing atherosclerotic cardiovascular diseases. We recently identified a novel blood lipid regulator, lipasin, which is a liver-enriched nutritionally-regulated circulating factor that regulates triglyceride metabolism by inhibiting lipoprotein lipase activity. Lipasin is later known as betatrophin, which potently stimulates pancreatic beta-cell proliferation. We are characterizing lipasin/betatrophin functions by genomic and genetic approaches. Students in the lab will be exposed to techniques of molecular biology, cell culture and mouse genetics.

Recent Publications


