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MOLECULAR MEDICINE
AND GENETICS

WAYNE STATE UNIVERSITY
DIVISION OF RESEARCH

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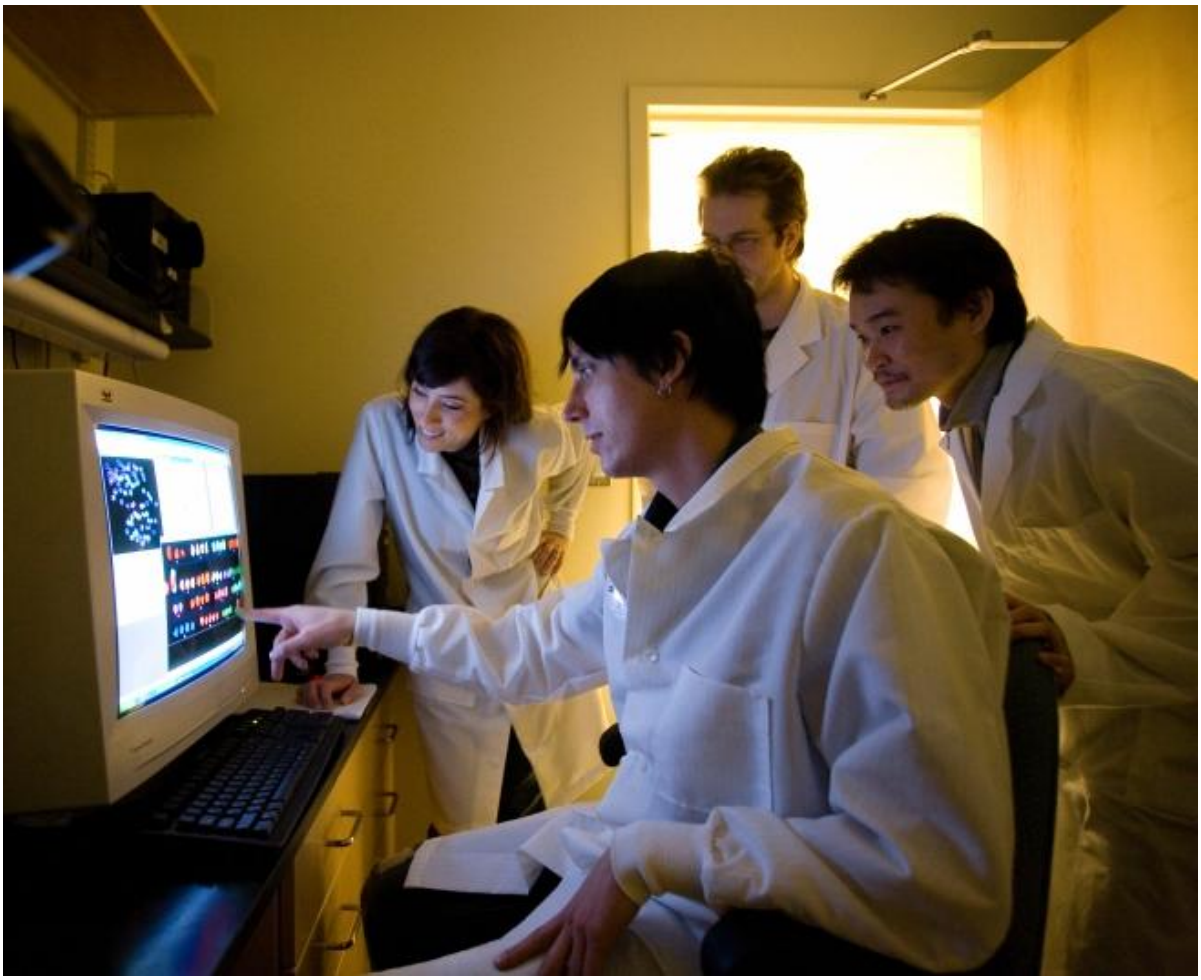

2014 Annual Report

20th anniversary • 1994–2014

540 East Canfield Avenue, 3127 Scott Hall, Detroit, Michigan 48201

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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 lncRNAs, 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 Re-ports* 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.

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Morris RJ, **Tainsky MA** (Co-editors). Clinical and Basic Science Aspects of Ovarian Cancer, seven articles. Cancer and Metastasis Reviews**.** Submitted 2014

Wicklund C and **Trepanier A** (2014). Adapting genetic counseling training to the genomic era: 19. More evolution than revolution. *Journal of Genet Counsel*, Jan 28. [Epub ahead of print]

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Zhang R, Ou HY, Gao F, Luo H. Identification of Horizontally-transferred Genomic Islands and Genome Segmentation Points by Using the GC Profile Method. Curr Genomics 2014, 15:113-121

Zhang R, Zhang CT. A Brief Review: The Z-curve Theory and its Application in Genome Analysis. Curr Genomics 2014, 15:78-94

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

"DroID, a comprehensive gene and protein interactions database," Sponsor: Wayne State University Office of the Vice President for Research, Grants Boost Program. **Russell L. Finley**, Role: PI

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

"The Role of 5-hydroxymethylcytosine in Gene Dysregulation of Epileptogenic Tubers in Tuberous Sclerosis Complex Patients," Sponsor: DOD/CDRM. **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)

"Neurodegeneration associated with metabolic stress in oligodendrocytes," Source: NMSS. **Alexander Gow**, Role: PI

"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, Source: 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

"Novel methods for the analysis of gene signaling pathways," Source: NIH NIDDK. **James Granneman**, Role: Investigator

"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

“Collaborative Research: Evolutionary Origins of the Brain Energetics and Adaptive Plasticity of Humans” 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

“A novel Non-invasive Infrared Light-based Therapy to Attenuate Neonatal Brain Injury,” Sponsor: Kellogg Foundation. **Maik Hüttemann**, Role: Co-I

“A new test for the early detection of lung cancer,” Sponsor: Karmanos Cancer Institute. **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

“Enroll-HD: A prospective registry study in a global huntington's disease cohort” Source: CHDI Foundation. **John Kamholz**, Role: Co-I

“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

“Adaptive Evolution of Cis-Regulatory Regions Implicated in Neuronal Plasticity and the Functional Impact of Over-Expression on Neuronal Proliferation, Apoptosis and Arborization in Cell Culture.” Source: American Association of Anatomists. **Monica Uddin**, Role: Co-I

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

"2014 Society for the Study of Reproduction Annual Meeting - Michigan," Source: WSU. **Stephen Krawetz**

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

"Collaborative Translational Research Project (CTRP) Targeted Markers of Sperm Potential," Source: EMD Serono. **Stephen Krawetz**, Role: PI

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

NIH Director’s New Innovator Award: “Life, Death, and Function: the primate-specific long non-coding RNA transcriptome,” Source: NIH NCI. **Leonard Lipovich**, Role: PI

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

“Long non-coding RNAs in multiple sclerosis,” Source: NMSS. **Leonard Lipovich**, Role: PI

"Removing statistical bottlenecks in data analysis for the ENCODE Consortium," Source: University of California Berkeley. **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

"Collaborative Research: Evolutionary Origins of the Brain Energetics and Adaptive Plasticity of Humans" Source: National Science Foundation. **Leonard Lipovich**, Role: Co-I

"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 genomics characterization of genetic variation associated with cardiovascular disease", Sponsor: American Heart Association. **Francesca Luca**, 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

"Adaptive Evolution of Cis-Regulatory Regions Implicated in Neuronal Plasticity and the Functional Impact of Over-Expression on Neuronal Proliferation, Apoptosis and Arborization in Cell Culture." Source: American Association of Anatomists. **Lisa Nevell**, Role: PI

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

"Functional genomics characterization of genetic variation associated with cardiovascular Disease", Source: American Heart Association. **Roger Pique-Regi**, Role: Co-I

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

"Risk and Clinical and Molecular Characteristics of Breast Cancer in Women with Neurofibromatosis Type I," Source: Department of Defense. **Michael Tainsky**, Role: Co-PI

"Chemical and Structural Optimization of Peptide Aptamer-Degron Therapeutics," Source: Wayne State University President's Research Enhancement Program. **Michael Tainsky**, Role: PI

Subcontract, Genomics Best Practices and Policies, Source: Michigan Department of Community Health. **Angela Trepanier**, Role: PI

"MicroRNA regulation of endothelial progenitor cell apoptosis and in diabetic wound healing," Source: American Heart Association. **Jiemei Wang**, 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

"Adaptive Evolution of Cis-Regulatory Regions Implicated in Neuronal Plasticity and the Functional Impact of Over-Expression on Neuronal Proliferation, Apoptosis and Arborization in Cell Culture." Source: American Association of Anatomists. **Derek Wildman**, Role: Co-I

"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)

"The Role of SM22 in the Pathogenesis of Aortic Aneurysms," Source: NIH, NHLBI. **Kezhong Zhang**, Role: Co-I

"Endoplasmic reticulum-associated degradation factor ERLIN2: oncogenic roles and molecular targeting of breast cancer", Sponsor: US Department of Defense, **Kezhong Zhang**, Role: PI

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

"Petcoke in an urban environment: A community-based participatory model", Sponsor: CURES Pilot Project Grant, **Kezhong Zhang**, Role: Co-I

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

"Examination of therapeutic potentials of lipasin monoclonal antibodies," Source: Michigan Diabetes Research Center. **Ren Zhang**, Role: PI

Technology Transfer

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

Leon Carlock: Patent Issue Date 11/25/2014. Filing Date 2/18/2009. "Method for Identifying a Subpopulation of Mammalian Cells with Distinctive Ribosome Translation Profiles" - L. Carlock and M. Cypher, Inventors. Patent issued by the Intellectual Property Office Great Britain.

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

Karli Rosner: Awarded U.S. Patent Allowance (11/20/2014); Patent Cooperation Treaty (PCT), Title: Anti-cancer therapeutic strategy to overcome cancer resistance and to enable tailoring treatment to patients, Inventor: Karli Rosner, M.D., Ph.D., Applicant: Wayne State University, Application No: PCT/US10/46588, Filing Date: August 25th, 2010, WSU ID#: 09-922.

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

Xiang Zhou, PhD, William H. Kruskal Instructor of Statistics, University of Chicago, “Bayesian computational methods for large-scale genetic and genomic studies,” March 25, 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-organellar regulator of mitochondrial metabolism and stress response" and **Gregory Moyerbrailean**, 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 Hüttemann, 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, " ATACseq 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

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, PhD

Assistant Professor (Research)

Contact

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Detroit, MI 48201
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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.

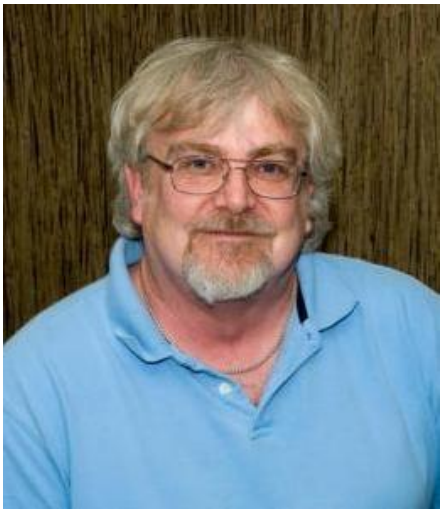
Recent Publications

Siddhesh Aras, Minbo Bai, Icksoo Lee, Roger Springett, Maik Hüttemann, Lawrence Grossman. MNRR1 (formerly CHCHD2) is a bi-organellar regulator of mitochondrial metabolism. **Mitochondrion**. 2014 Oct 11. pii: S1567-7249 (14) 00134-2. Doi: 10.1016/j.mito.2014.10.003.

Siddhesh Aras, Pak Oleg, Natascha Sommer, Russell Finley, Jr., Maik Hüttemann, Norbert Weissmann, Lawrence Grossman. Oxygen-dependent expression of cytochrome c oxidase subunit 4-2 gene expression is mediated by transcription factors RBPJ, CXXC5 and CHCHD2. ***Nucleic Acids Res.*** 2013 Feb 1; 41(4): 2255-66. Doi: 10.1093/nar/gks1454. Epub 2013 Jan 8.

Hüttemann M, Lee I, Gao X, Pecina P, Pecinova A, Liu J, **Aras S**, Sommer N, Sanderson TH, Tost M, Neff F, Aguilar-Pimentel JA, Becker L, Naton B, Rathkolb B, Rozman J, Favor J, Hans W, Prehn C, Puk O, Schrewe A, Sun M, Höfler H, Adamski J, Bekeredjian R, Graw J, Adler T, Busch DH, Klingenspor M, Klopstock T, Ollert M, Wolf E, Fuchs H, Gailus-Durner V, Hrabe de Angelis M, Weissmann N, Doan JW, Bassett DJ, Grossman LI. Cytochrome c oxidase subunit 4 isoform 2-knockout mice show reduced enzyme activity, airway hyporeactivity, and lung pathology. ***FASEB JOURNAL***. 2012 Jun 22.

Leon R. Carlock, PhD



Associate Professor of Molecular Medicine and Genetics
and of Anatomy and Cell Biology

Contact

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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 Methods Relating to Proliferative Disorders" L. Carlock, M. Cypher, and B. Gerard, Inventors.

PCT/US2010/024634; Publication date 8/26/2010. Priority Data 2/18/2009. "Method for Identifying a Subpopulation of Mammalian Cells with Distinctive Ribosome Translation Profiles" L. Carlock and M. Cypher, Inventors.

PCT/US2008/072465; Publication date 2/19/2009. Priority Date 8/10/2007, 10/18/2007. "Compositions and 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 Modulating Cell Death by a Translation Regulated Gene Expression System" L. Carlock and M. Cypher, Inventors. Patent issued by the Intellectual Property Office Great Britain.

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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

Kleyn MJ, Langbo C, Abdulhamid I, Adamski CR, Allan C, Carmany EP, Gregoire-Bottex MM, Homnick D, Schuen J, Nasr SZ. Evaluation of genetic counseling among cystic fibrosis carriers, Michigan Newborn Screening. Pediatr Pulmonol. 2013 Feb;48(2):123-9. doi: 10.1002/ppul.22703. Epub 2012 Nov 20. PubMed PMID: 23169573.

Girirajan S, Rosenfeld JA, Coe BP, Parikh S, Friedman N, Goldstein A, Filipink RA, McConnell JS, Angle B, Meschino WS, Nezarati MM, Asamoah A, Jackson KE, Gowans GC, Martin JA, Carmany EP, Stockton DW, Schnur RE, Penney LS, Martin DM, Raskin S, Leppig K, Thiese H, Smith R, Aberg E, Niyazov DM, Escobar LF, El-Khechen D, Johnson KD, Lebel RR, Siefkas K, Ball S, Shur N, McGuire M, Brasington CK, Spence JE, Martin LS, Clericuzio C, Ballif BC, Shaffer LG, Eichler EE. Phenotypic heterogeneity of genomic disorders and rare copy-number variants. N Engl J Med. 2012 Oct 4;367(14):1321-31. doi: 10.1056/NEJMoa1200395. Epub 2012 Sep 12. Erratum in: N Engl J Med. 2012 Dec 13;367(24):2362. PubMed PMID: 22970919; PubMed Central PMCID: PMC3494411.

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Carmany EP, Bawle EV. Microduplication of 4p16.3 due to an unbalanced translocation resulting in a mild phenotype. Am J Med Genet A. 2011 Apr;155A(4):819-24. doi: 10.1002/ajmg.a.33916. Epub 2011 Mar 15. PubMed PMID: 21412978.

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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

Edwards JG, Feldman, GL, Goldberg J, Gregg AR, Norton ME, Rose NC, Schneider A, Stoll K, Wapner R and Watson MS. Expanded Carrier Screening in Reproductive Medicine – Points to Consider. A joint statement of the American College of Medical Genetics and Genomics, American College of Obstetricians and Gynecologists, National Society of Genetic Counselors, Perinatal Quality Foundation and Society for Maternal Fetal Medicine. Obstet Gynecol 2015:125-1-11.

Jay AM, Conway, RL, Feldman, GL, Nahhas F, Spencer L and Wolf, B. Outcomes of individuals with profound and partial biotinidase deficiency ascertained by newborn screening in Michigan over 25 years. Genet Med epub advance publication 2014; doi:10.1038/gim.2014.104.

Li H, Spencer L, Nahhas F, Miller J, Fribley A, Feldman GL, Conway R and Wolf B. Novel mutations causing Biotinidase deficiency in individuals identified by newborn screening in Michigan including a unique intronic mutation that alters mRNA expression of the Biotinidase gene. Molecular Genetics and Metabolism 2014. 112:242-246.

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Feldman GL, Schrijver I, Lyon E, Palomaki GE. Results of the College of American Pathology/American College of Medical Genetics and Genomics external proficiency testing from 2006 to 2013 for three conditions prevalent in the Ashkenazi Jewish population. Genet Med. 2014 Feb 27. doi: 10.1038/gim.2014.14. [Epub ahead of print] PubMed PMID: 24577267.

Richards CS, Palomaki GE, Lacbawan FL, Lyon E, Feldman GL; CAP/ACMG Biochemical and Molecular Genetics Resource Committee. Three-year experience of a CAP/ACMG methods-based external proficiency testing program for laboratories offering DNA sequencing for rare inherited disorders. Genet Med. 2014 Jan;16(1):25-32. doi: 10.1038/gim.2013.65. Epub 2013 May 23. PubMed PMID: 23703682.

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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

Murali T, Pacifico S, Finley RL Jr. Integrating the interactome and the transcriptome of Drosophila. BMC Bioinformatics. 2014 Jun 10;15:177. PMID: 24913703

Atikukke G, Albosta P, Zhang H, Finley RL Jr. A role for Drosopihla Cyclin J in oogenesis revealed by genetic interactions with the piRNA pathway. Mech Dev. 2014 Aug;133:64-76. PMID: 24946235

Mairiang D, Zhang H, Sodja A, Murali T, Suriyaphol P, Malasit P, Limjindaporn T, Finley RL Jr. Identification of new protein interactions between dengue fever virus and its hosts, human and mosquito. PLoS One. 2013;8(1):e53535. doi: 10.1371/journal.pone.0053535. Epub 2013 Jan 11. PubMed PMID: 23326450; PubMed Central PMCID: PMC3543448.

Yu J, Murali T, Finley RL Jr. Assigning confidence scores to protein-protein interactions. Methods Mol Biol. 2012;812:161-74. doi: 10.1007/978-1-61779-455-1_9. PubMed PMID: 22218859.

Roberts GG 3rd, Parrish JR, Mangiola BA, Finley RL Jr. High-throughput yeast two-hybrid screening. Methods Mol Biol. 2012;812:39-61. doi: 10.1007/978-1-61779-455-1_3. PubMed PMID: 22218853.

Guest ST, Yu J, Liu D, Hines JA, Kashat MA, Finley RL Jr. A protein network-guided screen for cell cycle regulators. BMC Syst Biol. 2011 May 6;5:65.

Murali T, Pacifico S, Yu J, Guest S, Roberts GG 3rd, Finley RL Jr. DroID 2011: a comprehensive, integrated resource for protein, transcription factor, RNA and gene interactions for Drosophila. Nucleic Acids Res. 2011 Jan;39(Database issue):D736-43. PMID: 21036869.

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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”. Hi 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 collaborations 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.

Ghosh S. and Wang Y. Feature import vector machine: A general classifier with flexible feature selection. Published in Statistical Analysis and Data Mining, Volume 8, Issue 1, pages 49–63, February 2015.

Sentürk D, Ghosh S, Nguyen DV. Exploratory time varying lagged regression: modeling association of cognitive and functional trajectories with expected clinic visits in older adults. Comput Stat Data Anal. 2014 May 1;73:1-15. PubMed PMID: 24436504; PubMed Central PMCID: PMC3890149.

Pickett YR, Ghosh S, Rohs A, Kennedy GJ, Bruce ML, Lyness JM. Healthcare use among older primary care patients with minor depression. Am J Geriatr Psychiatry. 2014 Feb;22(2):207-10. doi: 10.1016/j.jagp.2012.08.018. Epub 2013 Apr 9. PubMed PMID: 23582748; PubMed Central PMCID: PMC3714375.

Boutros NN, Ghosh S, Khan A, Bowyer SM, Galloway MP. Anticonvulsant medications for panic disorder: a review and synthesis of the evidence. Int J Psychiatry Clin Pract. 2014 Jan;18(1):2-10. doi: 10.3109/13651501.2013.873053. Epub 2014 Jan 30. PubMed PMID: 24313739.

Bengt A. B., Broadbridge C. L., and Ghosh S. Longitudinal Determinants of Energy Levels in Knowledge Workers. Published in Journal of Occupational and Environmental Medicine. 2014 Jan; 56(1):79-85.

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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

Laukka JJ, Stanley JA, Garbern JY, Trepanier A, Hobson G, Lafleur T, Gow A, Kamholz J. Neuroradiologic correlates of clinical disability and progression in the X-linked leukodystrophy Pelizaeus-Merzbacher disease. J Neurol Sci. 2013 Dec 15;335(1-2):75-81. doi: 10.1016/j.jns.2013.08.030. Epub 2013 Aug 30. PubMed PMID: 24139698.

Southwood CM, Fykkolodziej B, Dachet F, Gow A. Potential For Cell-mediated Immune Responses In Mouse Models Of Pelizaeus-Merzbacher Disease. Brain Sci. 2013 Dec 1;3(4):1417-1444. PubMed PMID: 24575297; PubMed Central PMCID: PMC3932547.

Maheras KJ, Gow A. Increased anesthesia time using 2,2,2-tribromoethanol-chloral hydrate with low impact on mouse psychoacoustics. J Neurosci Methods. 2013 Sep 30;219(1):61-9. doi: 10.1016/j.jneumeth.2013.07.004. Epub 2013 Jul 12. PubMed PMID: 23856212; PubMed Central PMCID: PMC3818901.

Radecki D, Gow A (2013) Oligodendrocyte Metabolic Stress in Neurodegeneration. In: Neurodegenerative diseases - Processes, Prevention, Protection and Monitoring, (Kishore U, Ed), InTech, pp. 535-557, NIHMS:513246.

Southwood CM, Lipovich L, Gow A. Tissue-restricted transcription from a conserved intragenic CpG island in the Klf1 gene in mice. Biol Reprod. 2012 Nov 1;87(5):108. doi: 10.1095/biolreprod.112.099879. Print 2012 Nov. PubMed PMID: 22933519; PubMed Central PMCID: PMC3509778.

Saporta MA, Shy BR, Patzko A, Bai Y, Pennuto M, Ferri C, Tinelli E, Saveri P, Kirschner D, Crowther M, Southwood C, Wu X, Gow A, Feltri ML, Wrabetz L, Shy ME. MpzR98C arrests Schwann cell development in a mouse model of early-onset Charcot-Marie-Tooth disease type 1B. Brain. 2012 Jul;135(Pt 7):2032-47. doi: 10.1093/brain/aws140. Epub 2012 Jun 10. PubMed PMID: 22689911; PubMed Central PMCID: PMC3381724.

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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

Lee YH, Mottillo EP, Granneman JG. Adipose tissue plasticity from WAT to BAT and in between. Biochim Biophys Acta. 2014 Mar;1842(3):358-69. doi: 10.1016/j.bbadis.2013.05.011. Epub 2013 May 17. PubMed PMID: 23688783.

Lee YH, Thacker RI, Hall BE, Kong R, Granneman JG. Exploring the activated adipogenic niche: interactions of macrophages and adipocyte progenitors. Cell Cycle. 2014 Jan 15;13(2):184-90. doi: 10.4161/cc.27647. Epub 2014 Jan 6. PubMed PMID: 24394850; PubMed Central PMCID: PMC3906235.

Mottillo EP, Paul GM, Moore HP, Granneman JG. Use of fluorescence microscopy to probe intracellular lipolysis. Methods Enzymol. 2014;538:263-78. doi: 10.1016/B978-0-12-800280-3.00015-3. PubMed PMID: 24529444.

Donato M, Xu Z, Tomoiaga A, Granneman JG, Mackenzie RG, Bao R, Than NG, Westfall PH, Romero R, Draghici S. Analysis and correction of crosstalk effects in pathway analysis. Genome Res. 2013 Nov;23(11):1885-93. doi: 10.1101/gr.153551.112. Epub 2013 Aug 9. PubMed PMID: 23934932; PubMed Central PMCID: PMC3814888.

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Muzik O, Mangner TJ, Leonard WR, Kumar A, Janisse J, Granneman JG. 15O PET measurement of blood flow and oxygen consumption in cold-activated human brown fat. J Nucl Med. 2013 Apr;54(4):523-31. doi: 10.2967/jnumed.112.111336. Epub 2013 Jan 29. PubMed PMID: 23362317; PubMed Central PMCID: PMC3883579.

Lee YH, Granneman JG. Seeking the source of adipocytes in adult white adipose tissues. Adipocyte. 2012 Oct 1;1(4):230-236. PubMed PMID: 23700537; PubMed Central PMCID: PMC3609101.

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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

Aras S, Bai M, Lee I, Springett R, Hüttemann M, Grossman LI (2015). MNRR1 (formerly CHCHD2) is a bi-organellar regulator of mitochondrial metabolism. Mitochondrion 20: 43-51. PMID: 25315652.

Kuzawa CW, Chugani HT, Grossman LI, Lipovich L, Muzik O, Hof PR, Wildman DE, Sherwood CC, Leonard WR, Lange N (2014). Metabolic costs and evolutionary implications of human brain development. Proc Natl Acad Sci USA 111: 13010-13015. PMID: 25157149.

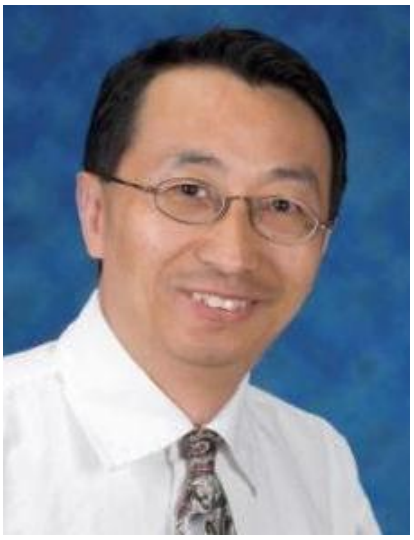
Pierron D, Razafindrazaka H, Rocher C, Letellier T, Grossman LI (2014). Human testis-specific genes are under relaxed negative selection. Mol Genet Genomics 289: 37-45. PMID: 24202551.

Bauernfeind AL, Barks SK, Duka T, Grossman LI, Hof PR, Sherwood CC (2014). Aerobic glycolysis in the primate brain: reconsidering the implications for growth and maintenance. Brain Struct Funct 219: 1149-67. PMID: 24185460.

Duka T, Anderson SM, Collins Z, Raghanti MA, Ely JJ, Hof PR, Wildman DE, Goodman M, Grossman LI, Sherwood CC (2014). Synaptosomal Lactate Dehydrogenase Isoenzyme Composition Is Shifted toward Aerobic Forms in Primate Brain Evolution. Brain Behav Evol 83, 216-230. PMID: 24686273.

Lipovich L, Tarca AL, Cai J, Jia H, Chugani HT, Sterner KN, Grossman LI, Uddin M, Hof PR, Sherwood CC, Kuzawa CW, Goodman M, Wildman DE (2014). Developmental Changes in the Transcriptome of Human Cerebral Cortex Tissue: Long Noncoding RNA Transcripts. Cereb Cortex 24: 1451-59. PMID: 23377288.

Henry H.Q. Heng, PhD



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Education

University of Toronto, PhD, 1994

Research Focus

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

Recent Publications

Horne SD, Pollick SA, Heng HH. (2015). Evolutionary mechanism unifies the hallmarks of cancer. Int J Cancer. 136:2012-21 (featured on cover).

Heng HH, Horne SD, Stevens JB, Abdallah BY, Liu G, Chowdhury SK, Bremer SB, Zhang K, Ye CJ. (2015). Horne SD, Pollick SA, Heng HH. (2015). Evolutionary mechanism unifies the hallmarks of cancer. Int J Cancer. 136:2012-21 (featured on cover).

Heng HH, Horne SD, Stevens JB, Abdallah BY, Liu G, Chowdhury SK, Bremer SB, Zhang K, Ye CJ. (2015). Heterogeneity mediated system complexity: the ultimate challenge for studying common and complex diseases. Proceeding of The first International Conference on Systems and Complexity in Health, Washington DC, Springer (in press).

Horne SD, Ye CJ, Abdallah BY, Liu G, Heng HH. (2015). Cancer genome evolution, Translational Cancer Research (in press).

Horne SD, Chowdhury SK, Heng HH. (2014). Stress, genomic adaptation, and the evolutionary trade-off. Front Genet. 5:92.

Heng HH. (2014). Distinguishing constitutional and acquired nonclonal aneuploidy. Proc Natl Acad Sci U S A. 111(11):E972.

Liu G, Stevens JB, Horne SD, Abdallah BY, Ye KJ, Bremer SW, Ye CJ, Chen DJ, Heng HH. (2014). Genome chaos: survival strategy during crisis. Cell Cycle. 13:528-37 (featured on cover).

Stevens JB, Liu G, Abdallah BY, Horne SD, Ye KJ, Bremer SW, Ye CJ, Krawetz SA, Heng HH. (2014). Unstable genomes elevate transcriptome dynamics. Int J Cancer. 134:2074-87 (featured on cover, featured by Genetic Engineering & Biotechnology News).

Horne, S. and Heng, H. (2014). Genome Chaos, Chromothripsis and Cancer Evolution, *Journal of Cancer Studies and Therapy*., 2014 Sep 22.

Abdallah BY, Horne SD, Stevens JB, Liu G, Ying AY, Vanderhyden B, Krawetz SA, Gorelick R, Heng HH. (2013). Single cell heterogeneity: why unstable genomes are incompatible with average profiles. Cell Cycle. 12(23):3640-9.

Heng HH. (2013). Genomics: HeLa genome versus donor's genome. Nature. 501 (7466):167

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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

Appikatla S, Bessert D, Lee I, Hüttemann M, Mullins C, Somayajulu-Nitu M, Yao F, Skoff RP. Insertion of proteolipid protein into oligodendrocyte mitochondria regulates extracellular pH and adenosine triphosphate. Glia. 2014 Mar;62(3):356-73. doi: 10.1002/glia.22591. Epub 2013 Dec 31. PubMed PMID: 24382809.

Lee H, Abe Y, Lee I, Shrivastav S, Crusan AP, Hüttemann M, Hopfer U, Felder RA, Asico LD, Armando I, Jose PA, Kopp JB. Increased mitochondrial activity in renal proximal tubule cells from young spontaneously hypertensive rats. Kidney Int. 2014 Mar;85(3):561-9. doi: 10.1038/ki.2013.397. Epub 2013 Oct 16. PubMed PMID: 24132210; PubMed Central PMCID: PMC3943540.

Przyklenk K, Sanderson TH, Hüttemann M. Clinical benefits of remote ischemic preconditioning: new insights...And new questions. Circ Res. 2014 Feb 28;114(5):748-50. doi: 10.1161/CIRCRESAHA.114.303331. PubMed PMID: 24577960.

Elbaz HA, Lee I, Antwih DA, Liu J, Hüttemann M, Zielske SP. Epicatechin stimulates mitochondrial activity and selectively sensitizes cancer cells to radiation. PLoS One. 2014 Feb 6;9(2):e88322. doi: 10.1371/journal.pone.0088322. eCollection 2014. PubMed PMID: 24516636; PubMed Central PMCID: PMC3916420.

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Education

University of Pittsburgh, PhD, 1978

Research Focus

Cellular and molecular biology of monoamine neurotransmitter secreting neurons

Recent Publications

Kapatos G. The neurobiology of tetrahydrobiopterin biosynthesis: a model for regulation of GTP cyclohydrolase I gene transcription within nigrostriatal dopamine neurons. IUBMB Life. 2013 Apr;65(4):323-33. doi: 10.1002/iub.1140. Epub 2013 Mar 4. Review. PubMed PMID: 23457032.

Beaumont TL, Yao B, Shah A, Kapatos G, Loeb JA. Layer-specific CREB target gene induction in human neocortical epilepsy. J Neurosci. 2012 Oct 10;32(41):14389-401. doi: 10.1523/JNEUROSCI.3408-12.2012. PubMed PMID: 23055509; PubMed Central PMCID: PMC3478758.

Michelhaugh SK, Lipovich L, Blythe J, Jia H, Kapatos G, Bannon MJ. Mining Affymetrix microarray data for long non-coding RNAs: altered expression in the nucleus accumbens of heroin abusers. J Neurochem. 2011 Feb;116(3):459-66. doi: 10.1111/j.1471-4159.2010.07126.x. Epub 2010 Dec 22. PubMed PMID: 21128942; PubMed Central PMCID: PMC3061462.

Cobb SA, Wider C, Ross OA, Mata IF, Adler CH, Rajput A, Rajput AH, Wu RM, Hauser R, Josephs KA, Carr J, Gwinn K, Heckman MG, Aasly JO, Lynch T, Uitti RJ, Wszolek ZK, Kapatos G, Farrer MJ. GCH1 in early-onset Parkinson's disease. Mov Disord. 2009 Oct 30;24(14):2070-5. doi: 10.1002/mds.22729. PubMed PMID: 19735094.

Wider C, Lincoln S, Dachsel JC, Kapatos G, Heckman MG, Diehl NN, Papapetropoulos S, Mash D, Rajput A, Rajput AH, Dickson DW, Wszolek ZK, Farrer MJ. GCH1 expression in human cerebellum from healthy individuals is not gender dependent. Neurosci Lett. 2009 Oct 2;462(1):73-5. doi: 10.1016/j.neulet.2009.06.082. Epub 2009 Jun 30. PubMed PMID: 19573577; PubMed Central PMCID: PMC2732187.

Kfoury N, Kapatos G. Identification of neuronal target genes for CCAAT/enhancer binding proteins. Mol Cell Neurosci. 2009 Mar;40(3):313-27. doi: 10.1016/j.mcn.2008.11.004. Epub 2008 Dec 6. PubMed PMID: 19103292; PubMed Central PMCID: PMC2703816.

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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)

Wahlqvist, M.L, Krawetz, S. A., Rizzo, N.S., Dominguez-Bello, M.G., Szymanski, L.M., Barkin, S., Yatkine, A., Waterland, R.A., Mennella, J.A., Desai, M., Ross, M.G., Krebs, N.F., Young, B.E., Wardle, J., Wrann, C.D. and Kral, J.G. (2015) Early-life influences on obesity: from preconception to adolescence Annals of the New York Academy of Sciences

Jodar, M., Selvaraju, S., Sendler, E., Diamond, M.P. and Krawetz, S.A. for the Reproductive Medicine Network (2013) The presence, roles and clinical use of spermatozoal RNAs Human Reproduction Update **19**:604-24. PMID: 23856356

Legro RS, Brzyski RG, Diamond MP, Coutifaris C, Schlaff WD, Casson P, Christman GM, Huang H Yan Q, Alvero R, Haisenleder DJ, Barnhart KT, Bates GW, Usadi R, Lucidi R, Baker V, Trussell JC, Krawetz SA, Snyder P, Ohl D, Santoro N, Eisenberg E, Zhang H; for the National Institute of Child Health and Human Development Reproductive Medicine Network. (2014) Letrozole versus Clomiphene for Infertility in Polycystic Ovary Syndrome. New England Journal of Medicine **371**:119-29 PMID: 25006718

Sendler, E., Johnson, G.D., Mao, S., Goodrich, R.J., Diamond, M.P., Hauser, R., and Krawetz, S.A. (2013) Stability, Delivery and Functions of Human Sperm RNAs at Fertilization. Nucleic Acids Research **41**:4104-4117. PMID: 23471003

Diego, O., Lever. E, Mao, S., Christova, R., Ogunkolade, B., Jones, T., Jarek, S., Aarum, J., Mumin, M., Pieri, C., Krawetz, S. and Sheer, D. (2012) CTCF binds to sites in the Major Histocompatibility Complex that are rapidly reconfigured in response to interferon-gamma. Nucleic Acids Res. **40**:5262-5270. PMID: 22367884

Markku Kurkinen, PhD

Professor of Molecular Medicine and Genetics
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Education

University of Helsinki, PhD, 1979

Research Focus

Extracellular matrix; metalloproteinases; gene regulation; development

Recent Publications

Abdallah BY, Horne SD, Kurkinen M, Stevens JB, Liu G, Ye CJ, Barbat J, Bremer SW, Heng HH. Ovarian cancer evolution through stochastic genome alterations: defining the genomic role in ovarian cancer. Syst Biol Reprod Med. 2014 Feb;60(1):2-13. doi: 10.3109/19396368.2013.837989. Epub 2013 Oct 22. PubMed PMID: 24147962.

Stevens JB, Abdallah BY, Liu G, Horne SD, Bremer SW, Ye KJ, Huang JY, Kurkinen M, Ye CJ, Heng HH. Heterogeneity of cell death. Cytogenet Genome Res. 2013;139(3):164-73. doi: 10.1159/000348679. Epub 2013 Apr 3. Review. PubMed PMID: 23548436.

Ye CJ, Stevens JB, Liu G, Bremer SW, Jaiswal AS, Ye KJ, Lin MF, Lawrenson L, Lancaster WD, Kurkinen M, Liao JD, Gairola CG, Shekhar MP, Narayan S, Miller FR, Heng HH. Genome based cell population heterogeneity promotes tumorigenicity: the evolutionary mechanism of cancer. J Cell Physiol. 2009 May;219(2):288-300. doi: 10.1002/jcp.21663. PubMed PMID: 19115235; PubMed Central PMCID: PMC2778062.

Wayne D. Lancaster, PhD

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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

Antwih DA, Gabbara KM, Lancaster WD, Ruden DM, Zielske SP. Radiation-induced epigenetic DNA methylation modification of radiation-response pathways. Epigenetics. 2013 Aug;8(8):839-48. doi: 10.4161/epi.25498. Epub 2013 Jun 27. PubMed PMID: 23880508; PubMed Central PMCID: PMC3883787.

Lillvis JH, Erdman R, Schworer CM, Golden A, Derr K, Gatalica Z, Cox LA, Shen J, Vander Heide RS, Lenk GM, Hlavaty L, Li L, Elmore JR, Franklin DP, Gray JL, Garvin RP, Carey DJ, Lancaster WD, Tromp G, Kuivaniemi H. Regional expression of HOXA4 along the aorta and its potential role in human abdominal aortic aneurysms. BMC Physiol. 2011 May 31;11:9. doi: 10.1186/1472-6793-11-9. PubMed PMID: 21627813; PubMed Central PMCID: PMC3125234.

Ye CJ, Stevens JB, Liu G, Bremer SW, Jaiswal AS, Ye KJ, Lin MF, Lawrenson L, Lancaster WD, Kurkinen M, Liao JD, Gairola CG, Shekhar MP, Narayan S, Miller FR, Heng HH. Genome based cell population heterogeneity promotes tumorigenicity: the evolutionary mechanism of cancer. J Cell Physiol. 2009 May;219(2):288-300. doi: 10.1002/jcp.21663. PubMed PMID: 19115235; PubMed Central PMCID: PMC2778062.

Stark A, Gregoire L, Pilarski R, Zarbo A, Gaba A, Lancaster WD. Human papillomavirus, cervical cancer and women's knowledge. Cancer Detect Prev. 2008;32(1):15-22. doi: 10.1016/j.cdp.2008.02.002. Epub 2008 Apr 10. PubMed PMID: 18406069; PubMed Central PMCID: PMC2481234.

Tromp G, Ogata T, Gregoire L, Goddard KA, Skunca M, Lancaster WD, Parrado AR, Lu Q, Shibamura H, Sakalihasan N, Limet R, Mackean GL, Arthur C, Sueda T, Kuivaniemi H. HLA-DQA is associated with abdominal aortic aneurysms in the Belgian population. Ann N Y Acad Sci. 2006 Nov;1085:392-5. PubMed PMID: 17182961.

Susan J. Land, PhD

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Director, Applied Genomics Technology Center

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Education

Wayne State University, PhD, 1993

Recent Publications

Raz N, Daugherty AM, Bender AR, Dahle CL, Land S. Volume of the hippocampal subfields in healthy adults: differential associations with age and a pro-inflammatory genetic variant. Brain Struct Funct. 2014 Jun 20. [Epub ahead of print] PubMed PMID: 24947882; PubMed Central PMCID: PMC4272678.

Senut MC, Sen A, Cingolani P, Shaik A, Land SJ, Ruden DM. Lead Exposure Disrupts Global DNA Methylation in Human Embryonic Stem Cells and Alters Their Neuronal Differentiation. Toxicol Sci. 2014 Feb 20. [Epub ahead of print] PubMed PMID: 24519525.

Pathak A, Wenzlaff AS, Hyland PL, Cote ML, Keele GR, Land S, Boulton ML, Schwartz AG. Apoptosis-Related Single Nucleotide Polymorphisms and the Risk of Non-Small Cell Lung Cancer in Women. J Cancer Ther Res. 2014 Apr 28 ;3(1). doi: 10.7243/2049-7962-3-1. PubMed PMID: 24790730; PubMed Central PMCID: PMC4002173.

Nowak NT, Diamond MP, Land SJ, Moffat SD. Contributions of sex, testosterone, and androgen receptor CAG repeat number to virtual Morris water maze performance. Psychoneuroendocrinology. 2014 Mar;41:13-22. doi: 10.1016/j.psyneuen.2013.12.003. Epub 2013 Dec 13. PubMed PMID: 24495604.

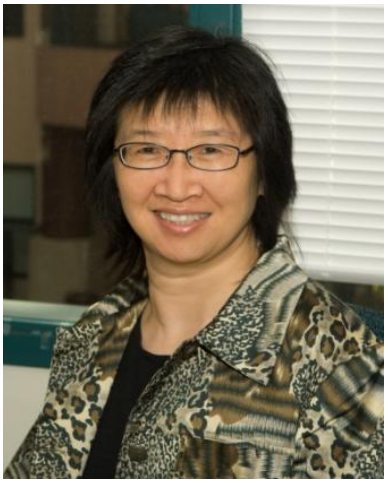
Gadgeel SM, Chen W, Cote ML, Bollig-Fischer A, Land S, Schwartz AG, Bepler G. Fibroblast growth factor receptor 1 amplification in non-small cell lung cancer by quantitative real-time PCR. PLoS One. 2013 Nov 8;8(11):e79820. doi: 10.1371/journal.pone.0079820. eCollection 2013. PubMed PMID: 24255716; PubMed Central PMCID: PMC3821849.

Cingolani P, Cao X, Khetani RS, Chen CC, Coon M, Sammak A, Bollig-Fischer A, Land S, Huang Y, Hudson ME, Garfinkel MD, Zhong S, Robinson GE, Ruden DM. Intronic non-CG DNA hydroxymethylation and alternative mRNA splicing in honey bees. BMC Genomics. 2013 Sep 30;14:666. doi: 10.1186/1471-2164-14-666. PubMed PMID: 24079845; PubMed Central PMCID: PMC3850688.

Powell IJ, Dyson G, Land S, Ruterbusch J, Bock CH, Lenk S, Herawi M, Everson R, Giroux CN, Schwartz AG, Bollig-Fischer A. Genes associated with prostate cancer are differentially expressed in African American and European American men. Cancer Epidemiol Biomarkers Prev. 2013 May;22(5):891-7. doi: 10.1158/1055-9965.EPI-12-1238. Epub 2013 Mar 20. PubMed PMID: 23515145; PubMed Central PMCID: PMC4097306.

Spitz MR, Amos CI, Land S, Wu X, Dong Q, Wenzlaff AS, Schwartz AG. Role of selected genetic variants in lung cancer risk in African Americans. J Thorac Oncol. 2013 Apr;8(4):391-7. doi: 10.1097/JTO.0b013e318283da29. PubMed PMID: 23454887; PubMed Central PMCID: PMC3623962.

Li Li, PhD



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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

Li W, Li L, Ge S, Song X, Ge L, Yan M, Yu J. Multiplex electrochemical origami immunodevice based on cuboid silver-paper electrode and metal ions tagged nanoporous silver-chitosan. Biosens Bioelectron. 2014 Jun 15;56:167-73. doi: 10.1016/j.bios.2014.01.011. Epub 2014 Jan 13. PubMed PMID: 24487104.

Gu S, Lu Y, Ding Y, Li L, Song H, Wang J, Wu Q. A droplet-based microfluidic electrochemical sensor using platinum-black microelectrode and its application in high sensitive glucose sensing. Biosens Bioelectron. 2014 May 15;55:106-12. doi: 10.1016/j.bios.2013.12.002. Epub 2013 Dec 10. PubMed PMID: 24368227.

Zhu C, Sun Z, Li C, Guo R, Li L, Jin L, Wan R, Li S. Urocortin affects migration of hepatic cancer cell lines via differential regulation of cPLA2 and iPLA2. Cell Signal. 2014 May;26(5):1125-34. doi: 10.1016/j.cellsig.2014.02.002. Epub 2014 Feb 8. PubMed PMID: 24518041.

Kumar R, Kukreja RV, Li L, Zhmurov A, Kononova O, Cai S, Ahmed SA, Barsegov V, Singh BR. Botulinum neurotoxin: unique folding of enzyme domain of the most-poisonous poison. J Biomol Struct Dyn. 2014 May;32(5):804-15. doi: 10.1080/07391102.2013.791878. Epub 2013 Jun 8. PubMed PMID: 23746226.

Xue K, Wang Y, Hou Y, Wang Y, Zhong T, Li L, Zhang H, Wang L. Molecular characterization and expression patterns of the actinin-associated LIM protein (ALP) subfamily genes in porcine skeletal muscle. Gene. 2014 Apr 10;539(1):111-6. doi: 10.1016/j.gene.2014.01.038. Epub 2014 Jan 23. PubMed PMID: 24462755.

Zhang BH, Cheng J, Li L, Zhang YG, Wang HF, Li HQ, Yang JY, Li WJ. Streptomyces jiujiangensis sp. nov., isolated from soil in South China. Antonie Van Leeuwenhoek. 2014 Apr;105(4):763-70. doi: 10.1007/s10482-014-0132-5. Epub 2014 Feb 11. PubMed PMID: 24515726.

Huang C, Li L, Yu X, Gu Z, Zhang X. The inhibitory effect of strontium-doped calcium polyphosphate particles on cytokines from macrophages and osteoblasts leading to aseptic loosening in vitro. Biomed Mater. 2014 Apr;9(2):025010. doi:

Leonard Lipovich, PhD

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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

Johnsson P, Lipovich L, Grandér D, Morris KV. Evolutionary conservation of long non-coding RNAs; sequence, structure, function. Biochim Biophys Acta. 2014 Mar;1840(3):1063-71. doi: 10.1016/j.bbagen.2013.10.035. Epub 2013 Oct 27. Review. PubMed PMID: 24184936; PubMed Central PMCID: PMC3909678.

Romero R, Tarca AL, Chaemsaithong P, Miranda J, Chaiworapongsa T, Jia H, Hassan SS, Kalita CA, Cai J, Yeo L, Lipovich L. Transcriptome interrogation of human myometrium identifies differentially expressed sense-antisense pairs of protein-coding and long non-coding RNA genes in spontaneous labor at term. J Matern Fetal Neonatal Med. 2014 Jan 13. [Epub ahead of print] PubMed PMID: 24168098.

Bianchi S, Stimpson CD, Duka T, Larsen MD, Janssen WG, Collins Z, Bauernfeind AL, Schapiro SJ, Baze WB, McArthur MJ, Hopkins WD, Wildman DE, Lipovich L, Kuzawa CW, Jacobs B, Hof PR, Sherwood CC. Synaptogenesis and development of pyramidal neuron dendritic morphology in the chimpanzee neocortex resembles humans. Proc Natl Acad Sci U S A. 2013 Jun 18;110 Suppl 2:10395-401. doi: 10.1073/pnas.1301224110. Epub 2013 Jun 10. PubMed PMID: 23754422; PubMed Central PMCID: PMC3690614.

Sterner KN, McGowen MR, Chugani HT, Tarca AL, Sherwood CC, Hof PR, Kuzawa CW, Boddy AM, Raaum RL, Weckle A, Lipovich L, Grossman LI, Uddin M, Goodman M, Wildman DE. Characterization of human cortical gene expression in relation to glucose utilization. Am J Hum Biol. 2013 May-Jun;25(3):418-30. doi: 10.1002/ajhb.22394. Epub 2013 Apr 4. PubMed PMID: 23559490.

Kraus P, Sivakamasundari V, Lim SL, Xing X, Lipovich L, Lufkin T. Making sense of Dlx1 antisense RNA. Dev Biol. 2013 Apr 15;376(2):224-35. doi: 10.1016/j.ydbio.2013.01.035. Epub 2013 Feb 8. PubMed PMID: 23415800.

Francesca Luca, PhD

Assistant Professor of Molecular Medicine and Genetics
and of Obstetrics and Gynecology

Contact

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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

X. Wen, F. Luca, R. Pique-Regi (2015) Cross-population Meta-analysis of eQTLs: Fine Mapping and Functional Study. PLoS Genet. Vol 11:e1005176. doi: 10.1371/journal.pgen.1005176.

Harvey, G. Moyerbrailean, O. Davis, X. Wen, F. Luca*, R. Pique-Regi* (2014) QuASAR: Quantitative Allele Specific Analysis of Reads. Bioinformatics. doi: 10.1093/bioinformatics/btu802. *Corresponding author

Luca F, Maranville JC, Richards AL, Witonsky DB, Stephens M, Di Rienzo A. Genetic, functional and molecular features of glucocorticoid receptor binding. PLoS One. 2013 Apr 30;8(4):e61654. doi: 10.1371/journal.pone.0061654. Print 2013. PubMed PMID: 23637875; PubMed Central PMCID: PMC3640037.

Luca F, Di Rienzo A. Allelic imbalance assays to quantify allele-specific gene expression and transcription factor binding. Methods Mol Biol. 2013;1015:201-11. doi: 10.1007/978-1-62703-435-7_13. PubMed PMID: 23824858.

Luca F, Hudson RR, Witonsky D, Di Rienzo A. (2011) A reduced representation approach to population genetic analyses and applications to human evolution. Genome Research. Vol. 21:1087-98

Maranville JC* , Luca F*, Richards A, Wen X, Witonsky D, Baxter S, Stephens M and Di Rienzo A (2011) Interactions between glucocorticoid treatment and cis-regulatory polymorphisms contribute to cellular response phenotypes. PLoS Genetics. Vol. 7: e1002162. doi:10.1371/journal.pgen.1002162. *These authors equally contributed to this work.

Luca F, Perry GH, Di Rienzo A (2010) Evolutionary Adaptations to Dietary Changes. Ann. Rev. Nutrition. Vol. 30: 291-314

Luca F, Kashyap S, Southard C, Zou M, Witonsky D, Di Rienzo A, Conzen SD (2009) Adaptive variation regulates the expression of the human SGK1 gene in response to stress. PLoS Genet. 5:e1000489

Richard E. Miller, MD

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Education

University of Michigan, MD, 1966

Recent Publications

Eserman LA, Tiley GP, Jarret RL, Leebens-Mack JH, Miller RE. Phylogenetics and diversification of morning glories (tribe Ipomoeeae, Convolvulaceae) based on whole plastome sequences. Am J Bot. 2014 Jan;101(1):92-103. doi: 10.3732/ajb.1300207. Epub 2013 Dec 26. PubMed PMID: 24375828.

Ji Y, Ying H, Dews P, Mansour A, Tran J, Miller RE, Massanari RM. A potential causal association mining algorithm for screening adverse drug reactions in postmarketing surveillance. IEEE Trans Inf Technol Biomed. 2011 May;15(3):428-37. doi: 10.1109/TITB.2011.2131669. Epub 2011 Mar 24. PubMed PMID: 21435986.

Ji Y, Ying H, Farber MS, Yen J, Dews P, Miller RE, Massanari RM. A distributed, collaborative intelligent agent system approach for proactive postmarketing drug safety surveillance. IEEE Trans Inf Technol Biomed. 2010 May;14(3):826-37. doi: 10.1109/TITB.2009.2037007. Epub 2009 Dec 11. PubMed PMID: 20007038; PubMed Central PMCID: PMC3919656.

Lau JA, Miller RE, Rausher MD. Selection through male function favors smaller floral display size in the common morning glory Ipomoea purpurea (Convolvulaceae). Am Nat. 2008 Jul;172(1):63-74. doi: 10.1086/588080. PubMed PMID: 18507519.

Schweitzer K, Decker E, Zhu L, Miller RE, Mirra SS, Spina S, Ghetti B, Wang M, Murrell J. Aberrantly regulated proteins in frontotemporal dementia. Biochem Biophys Res Commun. 2006 Sep 22;348(2):465-72. Epub 2006 Jul 28. PubMed PMID: 16890190.

Miller RE. Eco-epidemiology as anti-terrorism. Int Q Community Health Educ. 2006-2007;26(3):307-17. PubMed PMID: 17827097.

Li H, Télémaque S, Miller RE, Marsh JD. High glucose inhibits apoptosis induced by serum deprivation in vascular smooth muscle cells via upregulation of Bcl-2 and Bcl-xl. Diabetes. 2005 Feb;54(2):540-5. PubMed PMID: 15677513.

Miller RE, McDonald JA, Manos PS. Systematics of Ipomoea subgenus Quamoclit (Convolvulaceae) based on ITS sequence data and a Bayesian phylogenetic analysis. Am J Bot. 2004 Aug;91(8):1208-18. doi: 10.3732/ajb.91.8.1208. PubMed PMID: 21653478.

Roger Pique-Regi, PhD

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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

Harvey CT, Moyerbrailean GA, Davis GO, Wen X, Luca F and Pique-Regi R QuASAR: quantitative allele-specific analysis of reads. Bioinformatics. 2015 Apr 15;31(8):1235-42. PubMed PMID: 25480375; PubMed Central PMCID: PMC4393517

Pronold M, Vali M, Pique-Regi R, Asgharzadeh S. Copy number variation signature to predict human ancestry. BMC Bioinformatics. 2012 Dec 27;13:336. doi: 10.1186/1471-2105-13-336. PubMed PMID: 23270563; PubMed Central PMCID: PMC3598683.

X. Wen, F. Luca, R. Pique-Regi (2015) Cross-population Meta-analysis of eQTLs: Fine Mapping and Functional Study. PLoS Genet. 2015 Apr 23;11(4):e1005176. doi: 10.1371/journal.pgen.1005176. eCollection 2015 Apr. PMID

Asgharzadeh S, Salo JA, Ji L, Oberthuer A, Fischer M, Berthold F, Hadjidaniel M, Liu CW, Metelitsa LS, Pique-Regi R, Wakamatsu P, Villablanca JG, Kreissman SG, Matthay KK, Shimada H, London WB, Sposto R, Seeger RC. Clinical significance of tumor-associated inflammatory cells in metastatic neuroblastoma. J Clin Oncol. 2012 Oct 1;30(28):3525-32. Epub 2012 Aug 27. PubMed PMID: 22927533; PubMed Central PMCID: PMC3675667.

Zullo JM, Demarco IA, Piqué-Regi R, Gaffney DJ, Epstein CB, Spooner CJ, Luperchio TR, Bernstein BE, Pritchard JK, Reddy KL, Singh H. DNA sequence-dependent compartmentalization and silencing of chromatin at the nuclear lamina. Cell. 2012 Jun 22;149(7):1474-87. doi: 10.1016/j.cell.2012.04.035. PubMed PMID: 22726435.

Degner JF, Pai AA, Pique-Regi R, Veyrieras JB, Gaffney DJ, Pickrell JK, De Leon S, Michelini K, Lewellen N, Crawford GE, Stephens M, Gilad Y, Pritchard JK. DNase I sensitivity QTLs are a major determinant of human expression variation. Nature. 2012 Feb 5;482(7385):390-4. doi: 10.1038/nature10808. PubMed PMID: 22307276; PubMed Central PMCID: PMC3501342.

Karli Rosner, MD, PhD

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Tenure-Track Assistant Professor

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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

Rosner K, Kirou E, Mehregan DR, Abrams J, Kim S, Rosner T. Eradication of Multiple Primary and Metastatic Melanoma Types In Vitro by Human Recombinant DNase1. *J Expt Derm Clin Res* 1:004, 2014.

Rosner K, Adsule S, Haynes B, Kirou E, Kato I, Mehregan DR, Shekhar MPV. Rad6 is a Potential Early Marker of Melanoma Development. Submitted, *Translational Oncology* 2014, May 12. pii: S1936-5233(14)00044-8. [Epub ahead of print]. PMID: 24831578.

Rosner K, Mehregan DR, Kirou E, Abrams J, Kim S, Campbell M, Frieder J, Lawrence K, Haynes B, Shekhar MPV. Melanoma Development and Progression are Associated with Rad6 Upregulation and β-catenin Relocation to the Cell Membrane. Submitted, *J Skin Cancer* 439205, 2014, 2014. PMID: 24891954.

Rosner K. DNase1: A New Personalized Therapy for Cancer? *Expert Rev Anticancer Ther* 11: 981-4, 2011. PMID: 24831578.

Rosner K, Kasprzak MF, Horenstein ACJ, Thurston HL, Abrams J, Kerwin LY, Mehregan DA, Mehregan DR. Engineering a Waste Management Enzyme to Overcome Cancer Resistance to Apoptosis: Adding DNase1 to the Anti-Cancer Toolbox. *Cancer Gene Ther* 18: 346-57, 2011. PMID: 21233855.

Lobelia Samavati, MD

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

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Education

Medical School at the University of Cologne, MD, 1992

Research Focus

Clinical and laboratory research in sarcoidosis and interstitial lung disease

Recent Publications

Rastogi R, Jiang Z, Ahmad N, Rosati R, Liu Y, Beuret L, Monks R, Charron J, Birnbaum MJ, Samavati L. Rapamycin induces mitogen-activated protein (MAP) kinase phosphatase-1 (MKP-1) expression through activation of protein kinase B and mitogen-activated protein kinase kinase pathways. J Biol Chem. 2013 Nov 22;288(47):33966-77. doi: 10.1074/jbc.M113.492702. Epub 2013 Oct 14. PubMed PMID: 24126911; PubMed Central PMCID: PMC3837136.

Krell W, Bourbonnais JM, Kapoor R, Samavati L. Effect of smoking and gender on pulmonary function and clinical features in sarcoidosis. Lung. 2012 Oct;190(5):529-36. Epub 2012 Jul 8. PubMed PMID: 22773249.

Bourbonnais JM, Malaisamy S, Dalal BD, Samarakoon PC, Parikh SR, Samavati L. Distance saturation product predicts health-related quality of life among sarcoidosis patients. Health Qual Life Outcomes. 2012 Jun 13;10:67. doi: 10.1186/1477-7525-10-67. PubMed PMID: 22694853; PubMed Central PMCID: PMC3409072.

Hüttemann M, Helling S, Sanderson TH, Sinkler C, Samavati L, Mahapatra G, Varughese A, Lu G, Liu J, Ramzan R, Vogt S, Grossman LI, Doan JW, Marcus K, Lee Regulation of mitochondrial respiration and apoptosis through cell signaling: cytochrome c oxidase and cytochrome c in ischemia/reperfusion injury and inflammation. Biochim Biophys Acta. 2012 Apr;1817(4):598-609. doi: 10.1016/j.bbabio.2011.07.001. Epub 2011 Jul 13. Review. PubMed PMID: 21771582; PubMed Central PMCID: PMC3229836.

Bauerfeld CP, Rastogi R, Pirockinaite G, Lee I, Hüttemann M, Monks B, Birnbaum MJ, Franchi L, Nuñez G, Samavati L. TLR4-mediated AKT activation is MyD88/TRIF dependent and critical for induction of oxidative phosphorylation and mitochondrial transcription factor A in murine macrophages. J Immunol. 2012 Mar 15;188(6):2847-57. doi: 10.4049/jimmunol.1102157. Epub 2012 Feb 6. PubMed PMID: 22312125; PubMed Central PMCID: PMC3294201.

Cumbo-Nacheli G, Samavati L, Guzman JA. Bioavailability of fondaparinux to critically ill patients. J Crit Care. 2011 Aug;26(4):342-6. doi: 10.1016/j.jcrc.2010.08.004. Epub 2010 Oct 2. PubMed PMID: 20889286.

Michael A. Tainsky, PhD

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

Contact

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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 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

Purcell M, Kruger A, Tainsky MA. Gene expression profiling of replicative and induced senescence. Cell Cycle, 13(24):3927-37, 2014, PMID: 25483067.

Lin HS, Siddiq F, Talwar HS, Chen W, Voichita C, Draghici S, Jeyapalan G, Chatterjee M, Fribley A, Yoo GH, Sethi S, Kim H, Sukari A, Folbe AJ, Tainsky MA. Serum prognostic biomarkers in head and neck cancer patients. Laryngoscope. 2013 Dec 17. doi: 10.1002/lary.24567. [Epub ahead of print] PubMed PMID: 24347532.

Sun D, Haddad R, Kraniak JM, Horne SD, Tainsky MA. RAS/MEK-independent gene expression reveals BMP2-related malignant phenotypes in the Nf1-deficient MPNST. Mol Cancer Res. 2013 Jun;11(6):616-27. doi: 10.1158/1541-7786.MCR-12-0593. Epub 2013 Feb 19. PubMed PMID: 23423222.

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Chatterjee M, Dyson G, Levin NK, Shah JP, Morris R, Munkarah A, Tainsky MA. Tumor autoantibodies as biomarkers for predicting ovarian cancer recurrence. Cancer Biomark. 2012;11(2-3):59-73. PubMed PMID: 23011153; PubMed Central PMCID: PMC3819456.

Angela M. Trepanier, MS, CGC

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and Director of the Genetic Counseling Program

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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

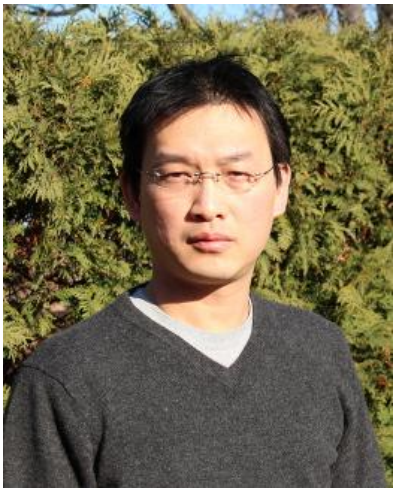
Trepanier AM, Allain DC. Models of Service Delivery for Cancer Genetic Risk Assessment and Counseling. J Genet Couns. 2013 Oct 26. [Epub ahead of print] PubMed PMID: 24158360.

Trepanier AM. Losing sight. J Genet Couns. 2012 Apr;21(2):232-4. doi: 10.1007/s10897-011-9455-9. Epub 2011 Dec 3. PubMed PMID: 22138886.

Riley BD, Culver JO, Skrzynia C, Senter LA, Peters JA, Costalas JW, Callif-Daley F, Grumet SC, Hunt KS, Nagy RS, McKinnon WC, Petrucelli NM, Bennett RL, Trepanier AM. Essential elements of genetic cancer risk assessment, counseling, and testing: updated recommendations of the National Society of Genetic Counselors. J Genet Couns. 2012 Apr;21(2):151-61. doi: 10.1007/s10897-011-9462-x. Epub 2011 Dec 2. PubMed PMID: 22134580.

Mester JL, Trepanier AM, Harper CE, Rozek LS, Yashar BM, Uhlmann WR. Perceptions of licensure: a survey of Michigan genetic counselors. J Genet Couns. 2009 Aug;18(4):357-65. doi: 10.1007/s10897-009-9225-0. Epub 2009 May 19. PubMed PMID: 19452266.

Jeffrey Tseng, PhD



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

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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-throughout computing technology for generating millions of surface patches to study protein-protein interactions and geometric modeling for drug discovery.

Recent Publications

Tseng YY, Li WH. PSC: protein surface classification. Nucleic Acids Res. 2012 Jul;40(Web Server issue):W435-9. doi: 10.1093/nar/gks495. Epub 2012 Jun 4. PubMed PMID: 22669905; PubMed Central PMCID: PMC3394246.

Tseng YY, Li WH. Classification of protein functional surfaces using structural characteristics. Proc Natl Acad Sci U S A. 2012 Jan 24;109(4):1170-5. doi: 10.1073/pnas.1119684109. Epub 2012 Jan 11. PubMed PMID: 22238424; PubMed Central PMCID: PMC3268291.

Tseng YY, Li WH. Evolutionary approach to predicting the binding site residues of a protein from its primary sequence. Proc Natl Acad Sci U S A. 2011 Mar 29;108(13):5313-8. doi: 10.1073/pnas.1102210108. Epub 2011 Mar 14. PubMed PMID: 21402946; PubMed Central PMCID: PMC3069214.

Tseng YY, Chen ZJ, Li WH. fPOP: footprinting functional pockets of proteins by comparative spatial patterns. Nucleic Acids Res. 2010 Jan;38(Database issue):D288-95. doi: 10.1093/nar/gkp900. Epub 2009 Oct 30. PubMed PMID: 19880384; PubMed Central PMCID: PMC2808891.

Jiemei Wang, PhD

Assistant Professor (Research)
Center for Molecular Medicine and Genetics
Cardiovascular Research Institute

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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)

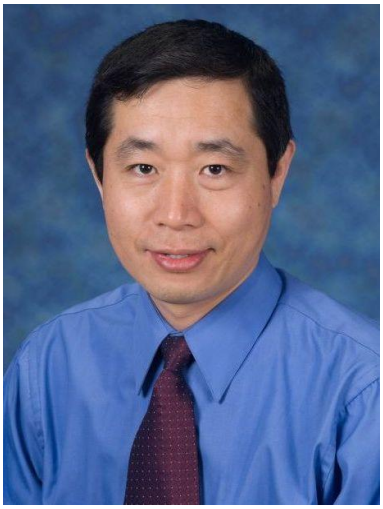
Jiang R, Cai J, Zhu Z, Chen D, Wang JM, Wang Q, Teng Y, Huang Y, Tao M, Xia A, et al. Hypoxic trophoblast HMGB1 induces endothelial cell hyperpermeability via the TRL-4/caveolin-1 pathway. J Immunol. 2014 Nov 15;193(10):5000-12. doi: 10.4049/jimmunol.1303445. Epub 2014 Oct 22. PubMed PMID: 25339669.

Wang JM, Tao J, Chen DD, Cai JJ, Irani K, Wang Q, Yuan H, Chen AF. MicroRNA miR-27b rescues bone marrow-derived angiogenic cell function and accelerates wound healing in type 2 diabetes mellitus. Arterioscler Thromb Vasc Biol. 2014 Jan;34(1):99-109. doi: 10.1161/ATVBAHA.113.302104. Epub 2013 Oct 31. PubMed PMID: 24177325.

Wang JM, Isenberg JS, Billiar TR, Chen AF. Thrombospondin-1/CD36 pathway contributes to bone marrow-derived angiogenic cell dysfunction in type 1 diabetes via Sonic hedgehog pathway suppression. Am J Physiol Endocrinol Metab. 2013 Dec;305(12):E1464-72. doi: 10.1152/ajpendo.00516.2013. Epub 2013 Oct 22. PubMed PMID: 24148348; PubMed Central PMCID: PMC3882377.

Bae ON, Wang JM, Baek SH, Wang Q, Yuan H, Chen AF. Oxidative stress-mediated thrombospondin-2 upregulation impairs bone marrow-derived angiogenic cell function in diabetes mellitus. Arterioscler Thromb Vasc Biol. 2013 Aug;33(8):1920-7. doi: 10.1161/ATVBAHA.113.301609. Epub 2013 May 30. PubMed PMID: 23723366; PubMed Central PMCID: PMC3757565.

Kezhong Zhang, PhD



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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 "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 IRE1a in rheumatoid arthritis and lupus; 3) airborne particulate matter ($PM_{2.5}$)-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

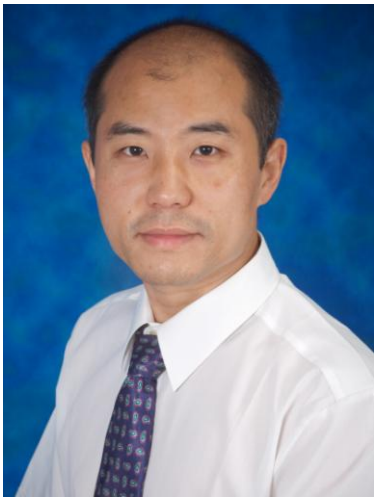
Kim H, Mendez R, Zheng Z, Chang L, Cai J, Zhang R, Zhang K. Liver-Enriched Transcription Factor CREBH Interacts With Peroxisome Proliferator-Activated Receptor α to Regulate Metabolic Hormone FGF21. Endocrinology. 2014 Mar;155(3):769-82. doi: 10.1210/en.2013-1490. Epub 2014 Jan 1. PubMed PMID: 24424044; PubMed Central PMCID: PMC3929740.

Zheng Z, Xu X, Zhang X, Wang A, Zhang C, Hüttemann M, Grossman LI, Chen LH, Rajagopalan S, Sun S, Zhang, K. 2013. Exposure to Ambient Particulate Matter Induces a NASH-like Phenotype and Impairs Hepatic Glucose Metabolism in an Animal Model. J. Hepatol. 2013 58: 148-154. PubMed PMID: 22902548; PubMed Central PMCID: PMC3527686.

Qiu Q, Zheng Z, Chang L, Zhao YS, Tan C, Dandekar A, Zhang Z, Lin Z, Gui M, Li X, Zhang T, Kong Q, Li H, Chen S, Chen A, Kaufman RJ, Yang WL, Lin HK, Zhang D, Perlman H, Thorp E, Zhang K, Fang D. Toll-like receptor-mediated IRE1α activation as a therapeutic target for inflammatory arthritis. EMBO J. 2013 Sep 11;32(18):2477-90. doi: 10.1038/emboj.2013.183. Epub 2013 Aug 13. PubMed PMID: 23942232; PubMed Central PMCID: PMC3770952.

Zhang C, Wang G, Zheng Z, Maddipati KR, Zhang X, Dyson G, Williams P, Duncan SA, Kaufman RJ, Zhang K. ER-tethered Transcription Factor CREBH Regulates Hepatic Lipogenesis, Fatty Acid Oxidation, and Lipolysis upon Metabolic Stress. Hepatology 2012, 55 (4): 1070-1082. PubMed PMID: 22095841; PubMed Central PMCID: PMC3319338.

Ren Zhang, PhD



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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

Gao F, Luo H, Fu Z, Zhang CT, Zhang R., Exome sequencing identifies novel ApoB loss-of-function mutations causing hypobetalipoproteinemia in type 1 diabetes. Acta Diabetol. 2015, in press.

Zhang R, MNADK, a Long-Awaited Human Mitochondrion-Localized NAD Kinase. J Cell Physiol. 2015, 230:1697-701.

Fu Z, Abou-Samra AB and Zhang R, An explanation for recent discrepancies in human circulating betatrophin, Diabetologia, 2014, 57:2232-4.

Fu Z, Berhane F, Fite A, Seyoum B, Abou-Samra AB and Zhang R, Elevated circulating lipasin/betatrophin in human type 2 diabetes and obesity, Sci Rep. 2014, 4, 5013.

Zhang, R., Ou HY, Gao, F and Luo H. (2014) Review: Identification of Horizontally-transferred Genomic Islands and Genome Segmentation Points by Using the GC Profile Method. Current Genomics, 15: 113-121.

Zhang R, Abou-Samra AB, Review: Emerging roles of Lipasin as a critical lipid regulator, Biochem Biophys Res Commun. 2013, 432, 401-5.

Fu, Z, Yao, F, Abou-Samra, AB and Zhang, R, Lipasin, thermoregulated in brown fat, is a novel but atypical member of the angiopoietin-like protein family. Biochem Biophys Res Commun., 2012, 430, 1126-31.

Zhang, R., Yao, F, Gao, F and Abou-Samra, AB, Nrac, a novel nutritionally-regulated adipose and cardiac-enriched gene. PLoS ONE, 2012, 7: e46254.

Zhang, R., Lipasin, a novel nutritionally-regulated liver-enriched factor that regulates serum triglyceride levels. Biochem Biophys Res Commun., 2012, 424: 786-792.