



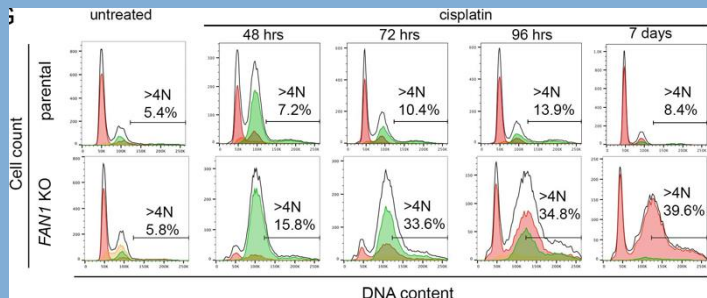
Rannar Airik, PhD
Assistant Professor of Pediatrics
Division of Nephrology

Current Projects

Project #1

The role of DNA damage response in acute kidney injury

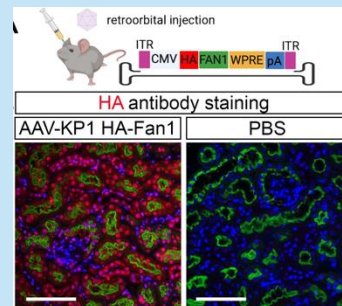
- DNA repair pathways in AKI
- Cell cycle regulation in AKI
- Biomarker studies in pediatric and adult AKI patients



Project #2

Developing therapeutic strategies for karyomegalic interstitial nephritis and related abnormalities

- AAV-based gene therapy studies in mouse models
- Metabolic studies in patient-derived cells and transgenic mouse models



Lab Focus

- 1 Mechanisms of acute kidney injury (AKI)
- 2 Peptide therapy for AKI
- 3 Gene therapy for genetic kidney disease

Specialized Resources/Equipment

- Unique transgenic mice orthologous to human kidney disease
- Patient derived fibroblasts for disease modeling
- BioID-based proteomics studies

Opportunities

- Basic Research – Mechanisms of acute kidney injury
- Gene therapy – Developing strategies for tubular gene replacement
- Peptide therapy – Applying peptide therapy to target AKI

UPMC CHP – Rangos Research Building
Lab Founded in 2015
Lab Team 1-2 people
Previously trained 2 GSR & 3 Post-docs

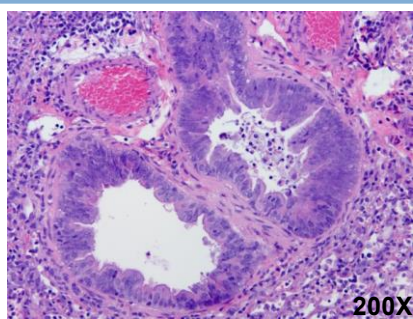


John F. Alcorn, PhD
 Vice Chair of Basic Research
 Professor of Pediatrics & Immunology
 Associate Director, RK Mellon Institute Pediatric Research
 Fun Fact – I now get paid to coach baseball!

Project #1

Immunopathogenesis of Infection with Bacterial and/or Viral Pathogens

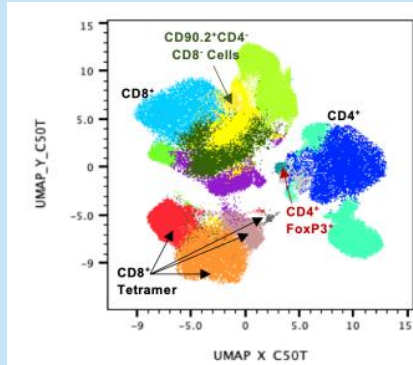
- Influenza, MRSA immunity in the lung
- MRSA virulence factors in the lung
- Biomarker studies in pediatric and adult pneumonia patients



Project #2

Human Immunology of Memory Formation to Vaccines and Disease

- Influenza vaccine studies in children & older adults
- Studies of Influenza B and T cell memory in humans and mice



Lab Focus



Respiratory Pathogens



Pediatric & Adult Pneumonia



Vaccine Immunology

Specialized Resources/Equipment

- Lung Specific Transgenic Mice
- CDC Option D Vaccine Trials
- CDC FluVE Network
- Spectral Flow Cytometry
- Multiple R01 Funding for Host Pathogen

Opportunities

- Basic Research – Mechanisms of viral, bacterial super-infections
- Immune Memory – Heterotypic strain influenza memory
- Influenza Vaccine Trial – Older adults & impact of obesity

UPMC CHP – Rangos Research Building
Lab Founded in 2009

Lab Team about 10-12 people

Previously trained 8 GSR & 10 Post-docs



Ira Bergman, MD, PhD

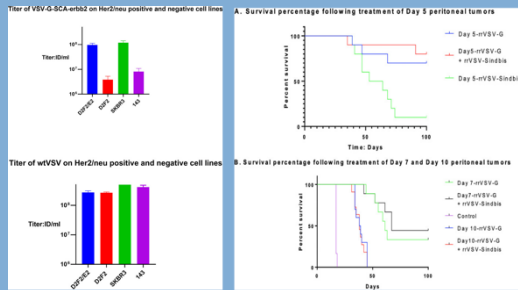
Chief, Division of Child Neurology and Child Development
 Ronald L. and Patricia M. Violi Endowed Chair in Child Development
 Professor of Pediatrics, Neurology and Immunology

Current Projects

Project #1

Targeted Oncolytic Therapy and Tumor Models

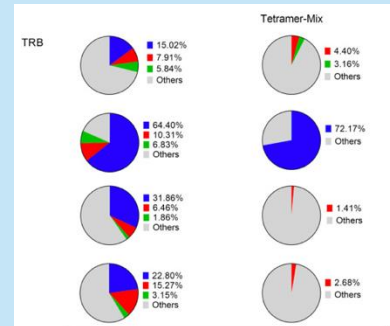
- Develop recombinant VSV targeting HER2 (breast cancer) and PSMA (prostate cancer)
- Treat implanted, spontaneous, and metastatic tumor models



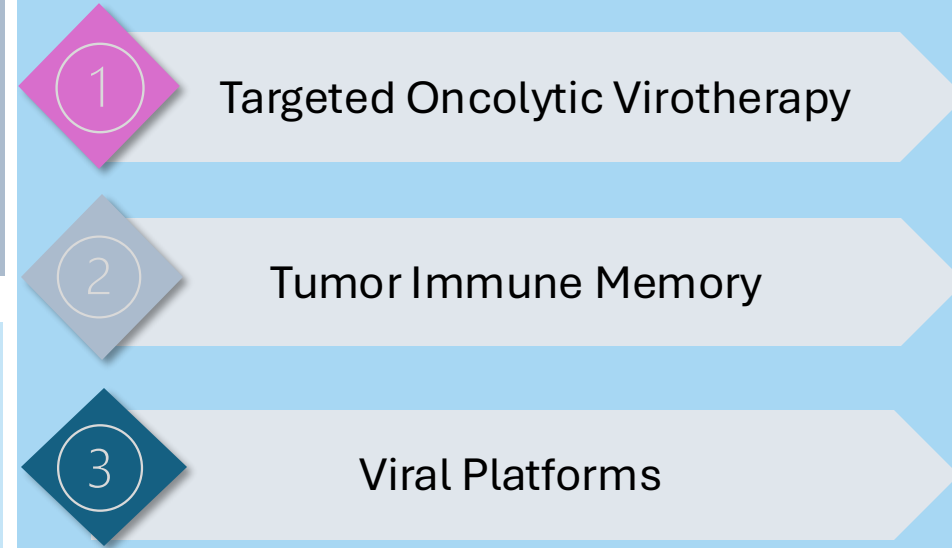
Project #2

Tumor Immune Memory and Vaccine Response

- Study memory T cell responses after virus-based vaccination
- Use RNA-seq and immunologic methods to profile tumor-specific memory



Lab Focus



Specialized Resources/Equipment

- Recombinant VSV platform for targeted oncolytic therapy
- Spontaneous animal models of breast and prostate cancer

Opportunities

- **Basic Research** – Targeted oncolytic tumor treatment and tumor vaccination strategies
- **Tumor Immune Memory** – Mechanisms of memory T cell generation using implanted and spontaneous tumor models
- **Therapeutic Platforms** – Recombinant VSV-based therapies across multiple cancer types

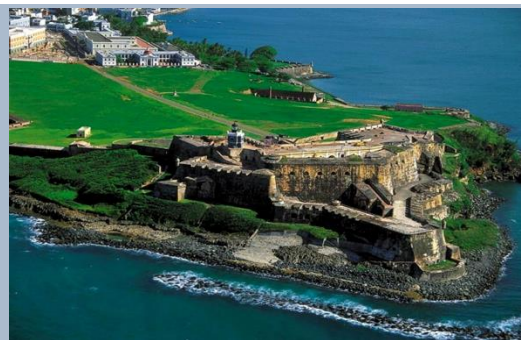
UPMC CHP – Rangos Research Building

Lab Founded: 1991

Lab Team: 2 people



Juan C. Celedón, MD, DrPH, ATSF
 Division Chief , Pulmonary Medicine
 UPMC Children's Hospital of
 Pittsburgh
 Niels K. Jerne Professor of Pediatrics
 University of Pittsburgh



Current Projects

Project 1: Nasal epithelial epigenomics and transcriptomics and asthma in Hispanic adults (funded by grant HL152475)

The goal of this project is to identify nasal epithelial biomarkers of asthma and asthma severity/control (e.g., severe exacerbations) in 750 Puerto Rican and Dominican adults 40 and older in the Bronx (NY)



Project 2: Exposure to violence (ETV) in childhood and T2-high asthma in young Puerto Rican adults (funded by grant HL168539)

The goal of this project is to examine whether ETV and related distress in childhood are linked to persistent T2-high asthma in young adulthood, and whether this is mediated by MDD or GAD



Opportunities

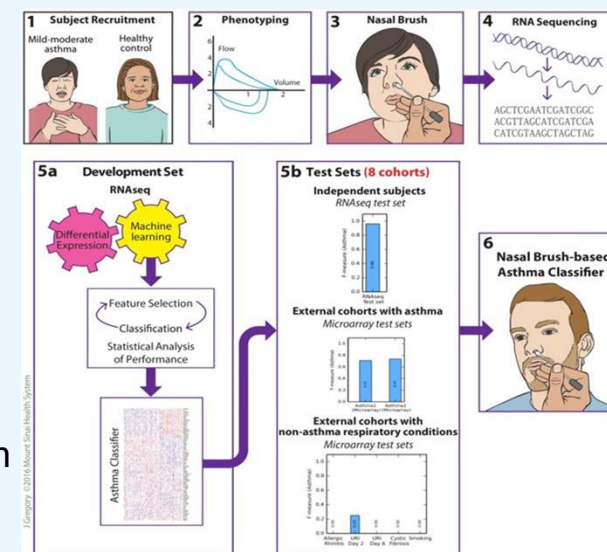
1. Develop knowledge and skills in study design and data analysis in studies of omics (genomics/epigenomics/transcriptomics/proteomics)
2. Formal education/training in integrative studies of health disparities

Lab Focus

- 1 Asthma omics
- 2 SDOH and environment in asthma
- 3 Health disparities in asthma

Project 3: *Transcript/Omics* for *Precision Medicine* in *ASthma* (TOPMAS, funded by Pitt's Institute for Precision Medicine)

The goal of this project is to identify transcriptomic biomarkers of severe asthma exacerbations and lung function in youth





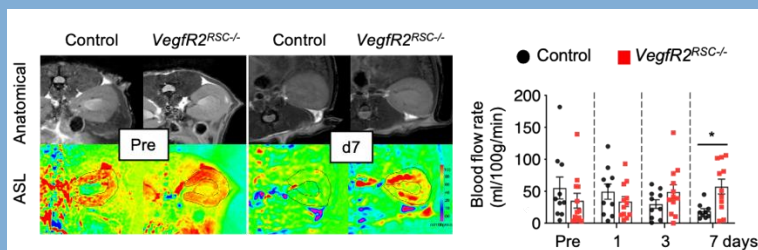
Takuto Chiba, PhD
Research Assistant Professor of Pediatrics
Fun Fact – My 3 month old daughter finally started sleeping at night!

Current Projects

Project #1

The role of VEGF-R2 in pericyte during acute kidney injury (AKI) to chronic kidney disease (CKD) transition

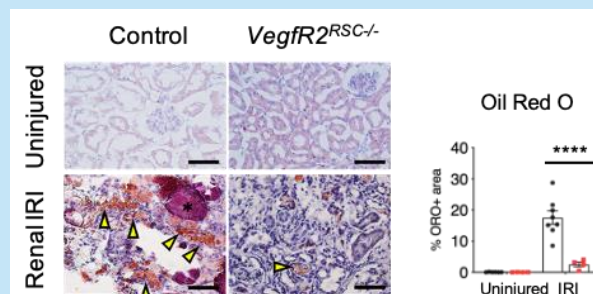
- MRI during AKI-to-CKD Transition
- Persistent inflammation in CKD
- Oxidative stress in microvasculature



Project #2

Lipid metabolism in renal pericytes during AKI-to-CKD Transition

- RNA-seq analysis of renal pericytes in CKD
- Maladaptive lipid metabolism in renal pericytes for CKD



Lab Focus

- 1 Chronic Kidney Disease
- 2 Kidney microvascular injury
- 3 Pericyte biology in kidney injury

Specialized Resources/Equipment

- Renal stroma/ pericytes specific VEGF-R2 KO mice
- Platform for Surgically Induced Kidney Injury in Mice
- K01 Funding for AKI-to-CKD transition

Opportunities

- Vascular biology: role of renal pericytes in CKD
- Kidney injury modeling: surgically- or nephrotoxin induced AKI/CKD models in mice
- Drug discovery: renal pericyte targeted vector for CKD therapeutics

UPMC CHP – Rangos Research Building
Lab Founded in 2023
Lab Team about 3-4 people
Current and past trainees: 3 research interns & 1 Post-doc

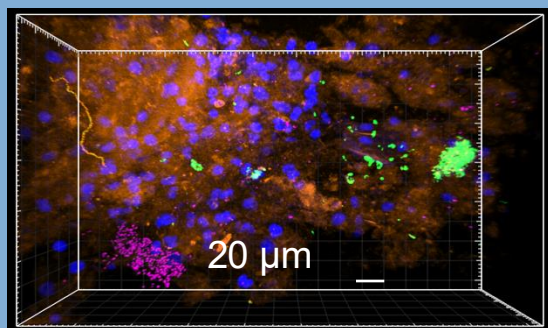


Will DePas, PhD
Assistant Professor of Pediatrics

Current Projects

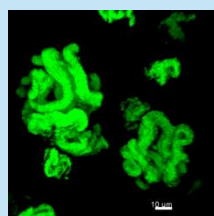
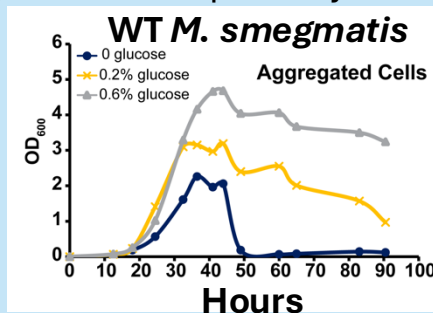
Project #1 – *In situ* characterization

- omics technologies return bulk information about infection sites, but can't be used to assess spatial interactions
- Confocal microscopy on cleared tissue allows quantification of infection-relevant spatial phenotypes such as biofilm formation



Project #2 – Biofilm Regulation

- Nontuberculous mycobacteria such as *Mycobacterium abscessus* are problematic lung pathogens that form biofilms and are tolerant to many drugs
- Microbial genetics alongside *in vitro* aggregation and dispersal assays reveal mechanistic insight into these pathways



Lab Focus

- 1 Bacterial Biofilm Formation
- 2 *in situ* Imaging
- 3 Nontuberculous mycobacteria pathogenesis and metabolism

Specialized Resources/Equipment:

- Tissue clearing reagents and setup
- Fluorescent microscope
- Imaging platereader
- Bacterial culturing and electroporation equipment

Opportunities

- Basic Research – Mechanisms of biofilm formation and antibiotic tolerance
- *In situ* imaging – Tissue-clearing, RNA labeling, and confocal microscopy
- Model systems – Direct information from *in situ* imaging used to create accurate *in vitro* model systems that mimic the infection environment

UPMC CHP – Rangos Research Building
Lab Founded in 2019
Lab Team about ~5 people



Terence S. Dermody, MD
Vira I. Heinz Distinguished Professor
Chair of Pediatrics
Professor of Microbiology and Molecular Genetics

Lab Focus

1

Cell Biology of Viral Replication

2

Protein Structure and Function

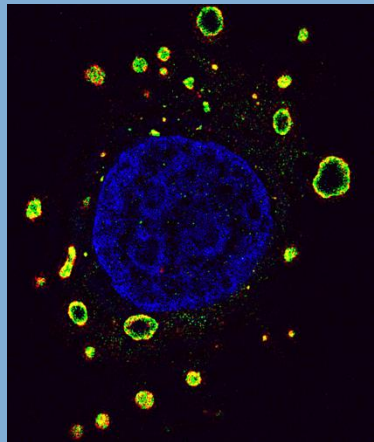
3

Viral Neuropathogenesis

Current Projects

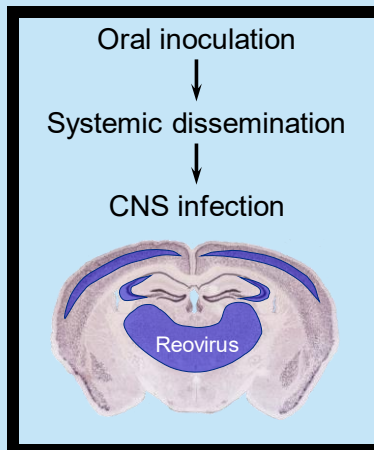
Project #1

How does reovirus form replication factories and produce new viruses?



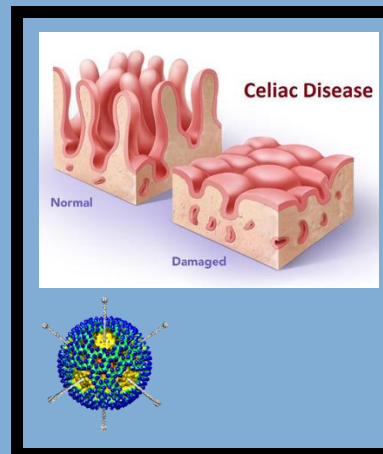
Project #2

How does reovirus disseminate to the CNS and cause lethal encephalitis?



Project #3

How does reovirus block tolerance to gluten and trigger celiac disease?



Specialized Resources/Equipment

- Cell imaging and biochemistry
- Forward and reverse genetics
- Cell-based screens
- Mouse models of disease

UPMC CHP – Rangos Research Building
Lab Founded in 1990

Lab Team about 10-12 people

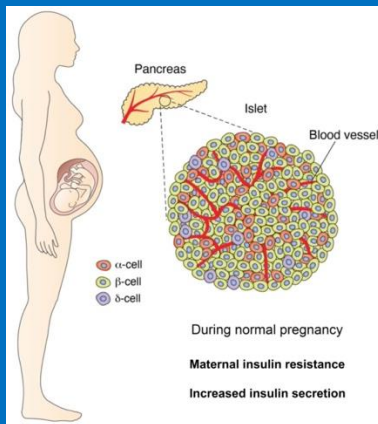
*Previously trained 39 GSR & 24 Post-docs
NIH R01 and training grants*



H. Henry Dong, PhD
Professor of Pediatrics
Associate Vice Chair of Basic Research
Division of Endocrinology
UPMC Children's Hospital of Pittsburgh

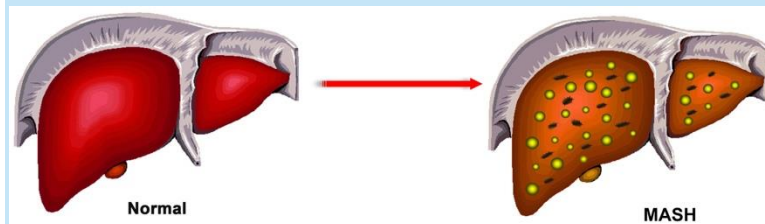
Project #1

To understand the mechanism of pancreatic beta-cell compensation for pregnancy. Defective beta-cell compensation contributes to insulin insufficiency and gestational diabetes mellitus.



Project #2

To characterize the mechanism that is culpable for instigating hepatic inflammation and catalyzing the transition of steatosis to metabolic dysfunction-associated fatty liver disease.



Lab Focus

1

Gestational diabetes

2

Obesity and Type 2 diabetes

3

Insulin and prolactin signaling

Specialized Resources:

- Mouse models with gestational diabetes
- Mouse models with hepatic inflammation
- Mouse models with dietary obesity
- NIH funding

Opportunities

- Mechanism of insulin action in Kuffer cells and hepatic stellate cells.
- Mechanism of insulin and prolactin signaling in pancreatic beta-cells.
- Pathophysiology of gestational diabetes and type 2 diabetes.

UPMC CHP – Rangos Research Building:
Lab Founded in 2004

Bay 1 on 6th Floor

[Email: Dongh@pitt.edu](mailto:Dongh@pitt.edu)

Tel: 412-692-6324



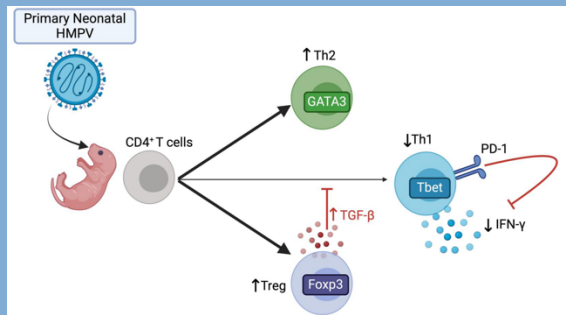
Taylor Eddens, M.D., Ph.D.
 Assistant Professor, Department of Pediatrics
 Division of Pediatric Allergy/Immunology
 Fun Fact – Our lab had a Taylor Swift Eras-themed Halloween party last year

Current Projects

Project #1

Examining the differences between neonatal and adult immune systems in response to human metapneumovirus (HMPV) infection:

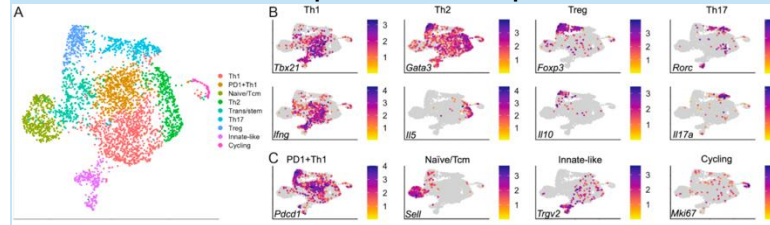
- CD4 T cell responses to HMPV in neonates vs. adults (see below)
- Innate immune responses to HMPV in neonates vs. adults



Project #2

Immunologic mechanisms connecting early life respiratory viral infection and asthma pathogenesis:

- Reinfection of mice that had been exposed to HMPV as neonates leads to asthma
- Examination of tissue resident memory cells (see below)
- Role of eosinophils/neutrophils in



Lab Focus

- 1 Neonatal Immunology
- 2 Respiratory Viral Infections
- 3 Origins of Asthma

Specialized Resources/Equipment

- Neonatal mouse model of HMPV disease
- Viral-induced asthma model
- Multispectral flow cytometry
- Single cell RNA sequencing
- RNAScope equipment
- Viral growth and purification

Opportunities

- Basic Research – Mechanisms of T cell immunity in neonatal mouse model
- Basic Research – Modeling the development of asthma after viral infections and assessing therapeutic targets for asthma prevention.

UPMC CHP – Rangos Research Building
Lab Founded in 2024
Lab Team of 4 people
K08 and foundational support



Megan Culler Freeman, MD, PhD
Assistant Professor of Pediatrics
Division of Infectious Diseases
Director, PGH Assembloid (www.pghassembloid.org)
Fun Fact: ice cream, musical theatre, and felt tip pen enthusiast

Current Projects

Project #1

EV-D68 genetic determinants of neurotropism

Project #2

Host driving factors of EV-D68 mediated paralysis

Project #3

EV-D68 mechanism of MHC-I downregulation

Project #4

Open to discussing your ideas!

Opportunities

- Basic Research –Viral CNS pathogenesis (focus on paralysis)
- Clinical Research – Pediatric viral CNS disease, acute respiratory infections, acute gastroenteritis

Lab Focus

1

Enteroviruses

2

Pediatric CNS viruses

3

CNS host pathogen interaction

Specialized Resources/Equipment

- CNS Organoids
- Organoid/immune cell coculture
- Patient derived iPSC lines
- Patient viral specimens
- EV-D68 reverse genetics platform
- CDC NVSN, FluVE Network

UPMC CHP – Rangos Research Building
Lab Founded in 2022
Lab Team ~5 people
Member of PMI, MSTP, CVR, and i4Kids
www.mcfreelab.org



George Gittes, MD
Mark M. Ravitch MD Endowed Professor of Surgery
University of Pittsburgh School of Medicine
Professor of Pediatric Surgery and Pediatrics
Surgeon-in-Chief Emeritus at UPMC Children's Hospital of Pittsburgh
Director, Richard King Mellon Foundation Institute for Pediatric Research and

Director of Surgical Research and Scientific Co-Director of all Research

Lab Focus



AAV Gene Therapy for Diabetes



Chemical Pancreatectomy



Pancreas Transplant

Specialized Resources/Equipment

- Mouse and Non-Human Primate diabetic models
- AAV viral package and purification
- Surgical Procedure in Mouse and Non-Human Primate

UPMC CHP – Rangos Research Building
Lab Founded in 2005 September
Lab Team about 14-16 people
Previously trained more than 20 Post-docs and over 14 MD fellows

Current Projects

Broader Project #1

Our lab develops gene therapy strategies for type 1 and type 2 diabetes by reprogramming alpha cells into insulin-producing beta cells, and in type 2 diabetes, also targeting beta cell rejuvenation or conversion from non-beta cells. Using AAV vectors to deliver Pdx1 and MafA via the pancreatic duct, we restored glucose control in diabetic mice and human islet transplant models. This approach is now being tested in non-human primates, and we are also exploring TGF- β /Smad2 pathway inhibition to enhance beta cell function in type 2 diabetes.

Broader Project #2

Our lab has developed a novel procedure called chemical pancreatectomy, using dilute acetic acid infusion into the pancreatic duct to ablate exocrine tissue while preserving islets. Validated in mice and non-human primates, this approach relieves chronic pancreatitis-associated inflammation and pain, enhances beta-cell function, and is now advancing to human trials. It also holds potential as a treatment for pancreatic cancer and may enable improved pancreas transplantation by eliminating the need to reconnect exocrine ducts and reducing immune complications.

Opportunities

- Basic Research – Diabetic Physiology, Pancreatitis, and Pancreatic Cancer
- Surgical Skills – Pancreatic Retro-Ductal Infusion
- Translational Research– AAV Gene Therapy, Chemical Pancreatitis, and



Radha Gopal, PhD
Research Assistant Professor
Department of Pediatrics
Scientific Director, Flow cytometry core, Rangos
Research Center.

Current Projects

Project #1

- Immunopathogenesis of influenza-induced exacerbation of atherosclerosis
- Mouse model of influenza infection in the lung
- Atherosclerosis lesion measurement in aorta
- Systemic responses during influenza infection

Project #2

- Pathogenesis of influenza-induced myocarditis
- Mouse model of influenza infection in the lung
- Measurement of inflammatory cytokines and chemokines in the heart.
- Micro-MRI imaging of the heart.
- Cardiomyocyte culture

Opportunities

Cell culture methods
Basic Science Research –

Project 1: Immune mechanisms of influenza-induced exacerbation of atherosclerosis

Project 2: Pathogenesis of Influenza-induced myocarditis

Lab Focus

- Influenza infection
- Atherosclerosis
- Myocarditis

Specialized Resources/Equipment

- Global gene deficient mice
- Site-specific gene deficient mice
- Spectral Flow Cytometry

UPMC CHP – Rangos Research Building

Lab Founded in 2020

Lab Team about 2-3 people

Previously trained 8 Undergraduate

students 2 visiting scholars and 1 Post-doc

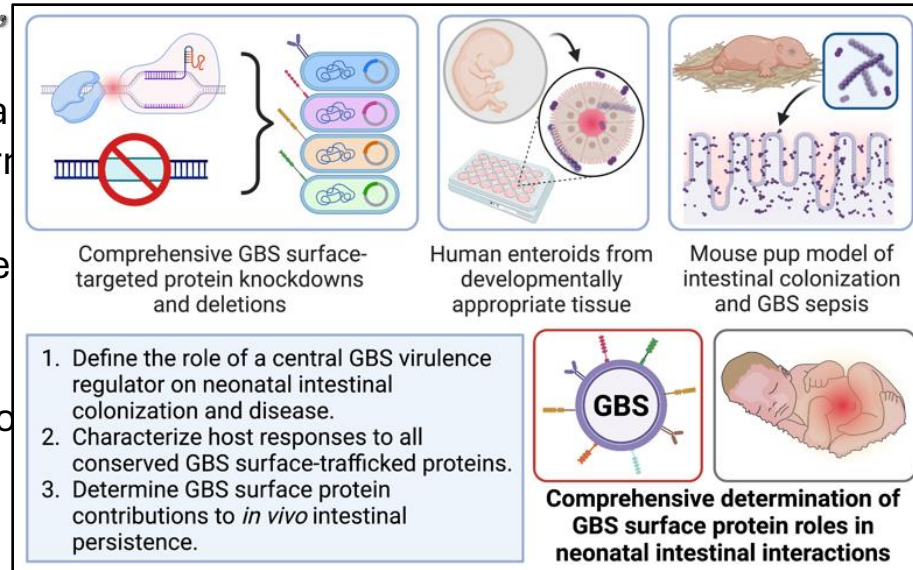
Hooven Lab

Location Rangos Research Building, Children's Hospital of Pittsburgh, 8th floor
P.I. Tom Hooven, MD (pediatrician/neonatologist)

Specialized resources and equipment

- Primary human tissue and mouse models of perinatal bacterial-host interactions
- Genetic bioengineering
- Novel bioinformatic approaches to multiplex genetic library screening
- High-throughput molecular purification with robotic liquid handling/magnetic bead system

Project 1: Study of GBS colonization and invasion of neonatal intestinal barriers



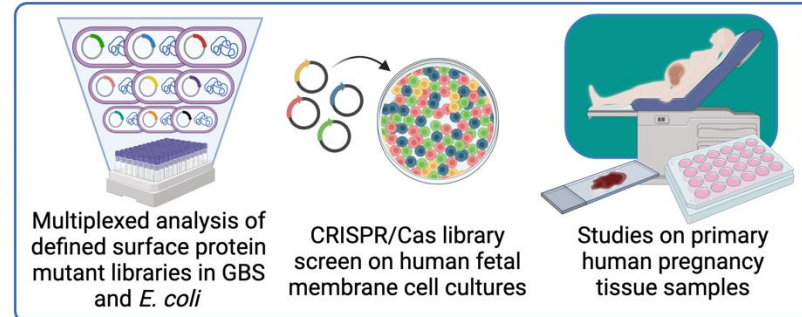
Project 2: Study of GBS invasion of human fetal membranes during pregnancy

Human **fetal membranes have innate immune barrier capabilities** that block and clear bacterial infiltrates.

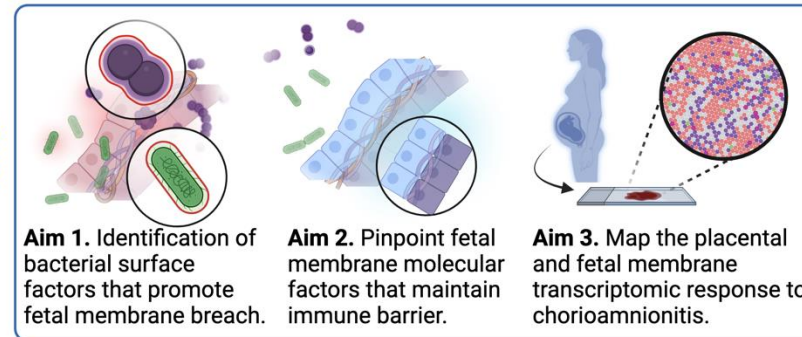
When bacteria overcome fetal membrane barrier capabilities, **chorioamnionitis** threatens the mother and fetus.



INNOVATION



AIMS



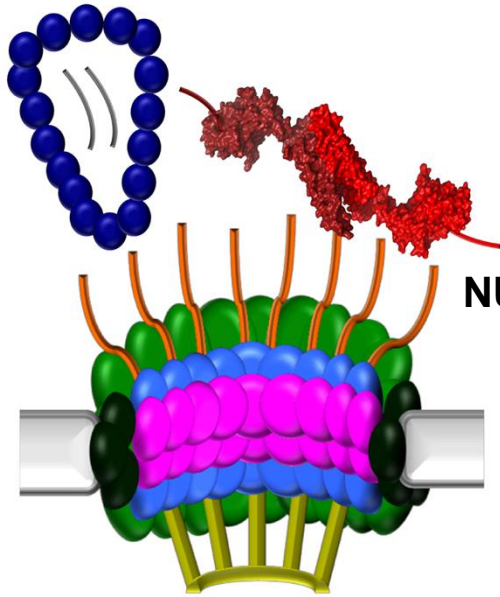
Learn more and find our publication history at: www.hoovenlab.com

Interests (align with neonatology, ID, pediatric ID, OB/Gyn, genetics)

- Commensal and invasive bacteria that affect pregnancy and newborn outcomes
- Group B *Streptococcus* (GBS), the most common cause of neonatal sepsis
- CRISPR/Cas-based approaches to understanding bacterial-host interactions during the perinatal period

MELISSA KANE LABORATORY

Immunity to retroviral infections



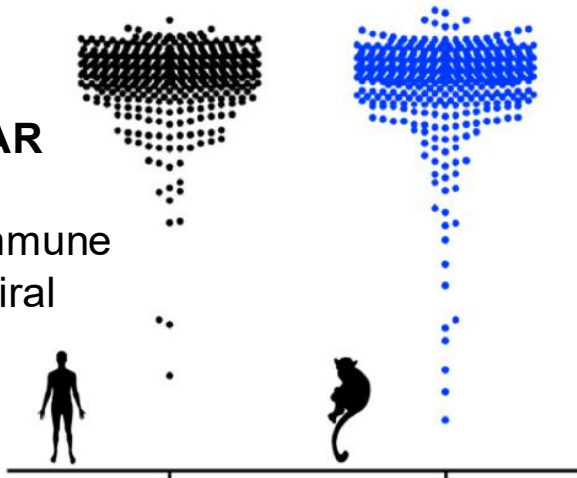
HIV-1, MX2, AND THE NUCLEAR PORE COMPLEX

How does nuclear pore heterogeneity affect the antiviral activity of Mx2?



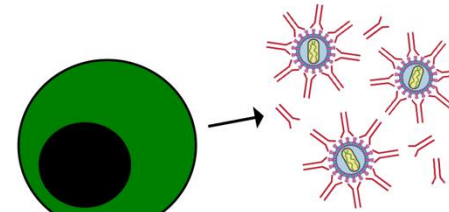
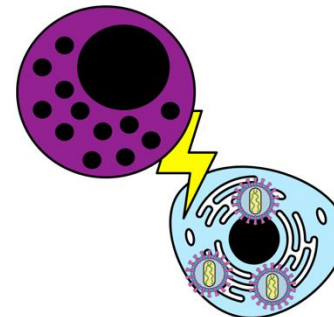
INTRINSIC CELLULAR DEFENSES

How do intrinsic innate immune effectors restrict retroviral replication?



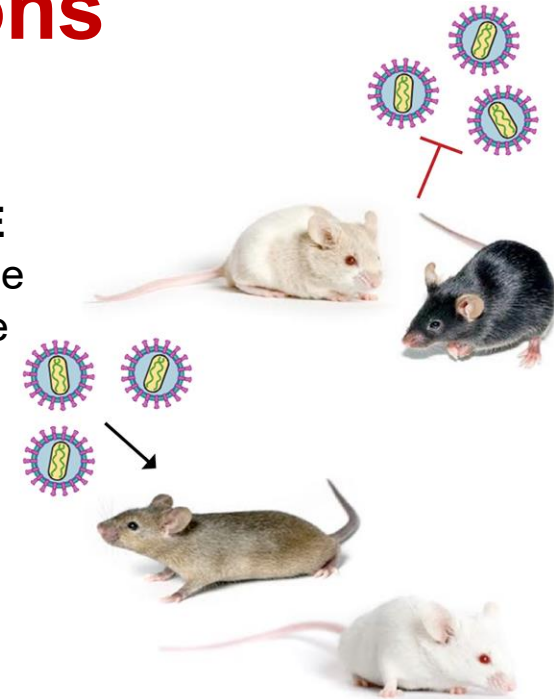
GENETIC BASIS FOR RETROVIRUS RESISTANCE

What are the genes responsible for protective antiviral immune responses in resistant individuals?



ANTIRETROVIRAL IMMUNE RESPONSES

What are the signaling pathways underlying neutralizing immune responses in resistant individuals?





Traci M. Kazmerski, MD, MS
Associate Professor of Pediatrics

www.KazmerskiLab.com



Current Projects



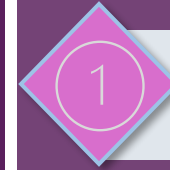
Health Outcomes
of Parents with CF

- Investigate health impact of parenthood on people with Cystic Fibrosis
- Epidemiologic data collection on interplay between becoming a parent and having a chronic disease

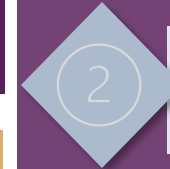


- A CF Foundation-funded Health Equity Team Science initiative seeking to understand the interplay and impact of being LGBTQIA+ and having a chronic condition such as CF

Lab Focus



Cystic Fibrosis



Sexual and reproductive health and family-building experiences of those with pediatric-onset chronic disease



Sex- and gender-related health concerns and outcomes of people with pediatric-onset chronic disease

Expertise:

- Community-engaged research
- Qualitative methodologies
- Implementation science

Opportunities

- Robust mentoring experience of all levels of trainees (medical students, graduate students, residents, fellows, and junior faculty)
- CF Foundation Student and Trainee funding opportunities and mentorship

UPMC University Center – 120 Lytton Ave
Lab Founded in 2018

Lab Team: Olivia Stransky – Lead RC

Asher Prangle – Clinical RC

Ishaan Jathal – Clinical RC

Cera Robb – Administrative Assistant



Patrick M. Kochanek, MD, MCCM

Distinguished Professor of Critical Care Medicine

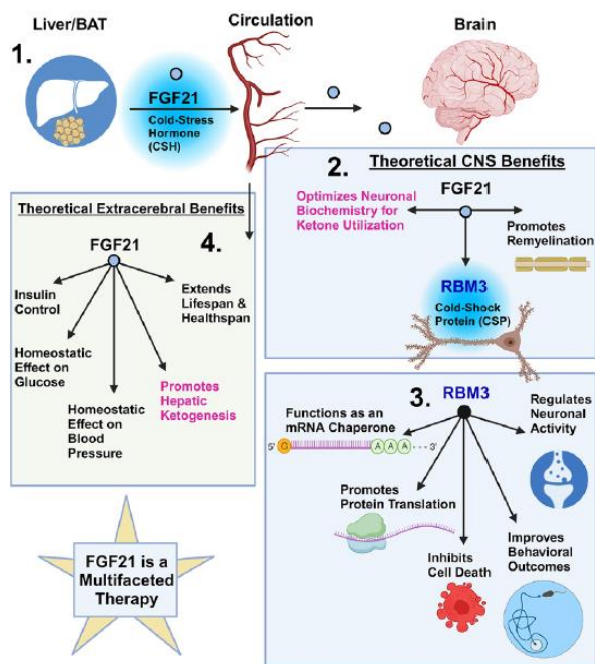
Professor of Pediatrics, Anesthesiology & Perioperative Medicine and Clinical & Translational Science

Fun Fact—I have one of the top comic art collections in the world

CURRENT PROJECTS

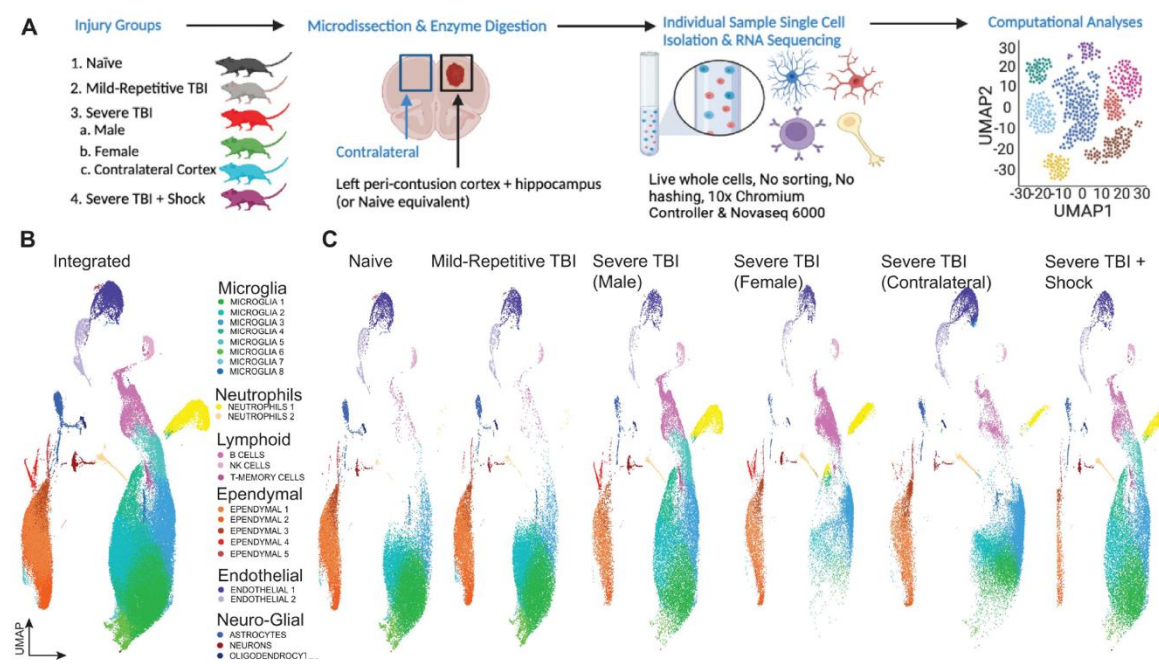
1

Use of cold shock proteins to improve the efficacy of therapeutic hypothermia in cerebral resuscitation



2

Precision drug and biomarker discovery and development for traumatic brain injury and other pediatric neurocritical – care related conditions



Lab Focus

- **Traumatic Brain Injury**
- **Cardiac Arrest**
- **Hypoxic-ischemic Brain Injury**
- **Pediatric Neurocritical Care**

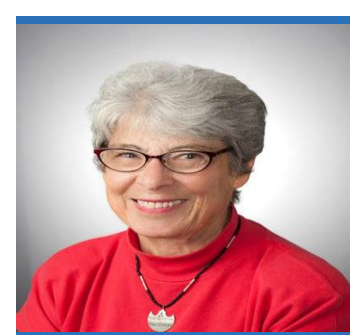
Specialized Resources at the Safar Center and UPMC CHP

- **Internationally recognized pre-clinical modeling of both traumatic brain injury and cardiac arrest**
- **A world class rodent behavioral outcome facility**
- **UPMC CHP is arguably the top training program in the world for research in Pediatric Neurocritical Care**

The Safar Center for Resuscitation Research, located in the Rangos Research Center, is a multi-departmental translational research center founded in 1980 by the late CPR pioneer Peter Safar, MD

Opportunities

Pre-clinical and clinical investigations to develop new therapies and monitoring tools to treat infants and children with acute brain injury from trauma, hypoxia, or ischemia



Dorothy Becker and Ingrid Libman
Emeritus Professor and Professor of Pediatrics
Dr Libman—Director of Diabetes

Lab Focus

2

Type 1 diabetes ---insulin secretion,
c peptide measurements

Current Projects

Project #1

Prediction of type 1 diabetes

Collaborative studies of longitudinal stores serum , T cells and DNA of prospectively followed cohort of first degree relatives of T1D patients --goal to understand metabolic and immunologic risk markers of T1D

Project #2

Prevention of type 1 diabetes

**National collaborative intervention trials to preserve C peptide and delay clinical T1D
Funded by NIDDK and foundations**

Lab prepares samples for central mechanistic assays

Radioimmunoassay expertise

Opportunities

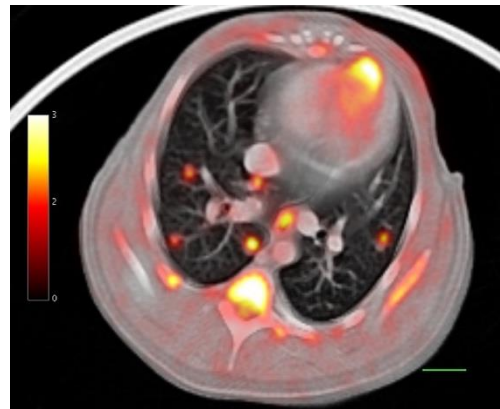
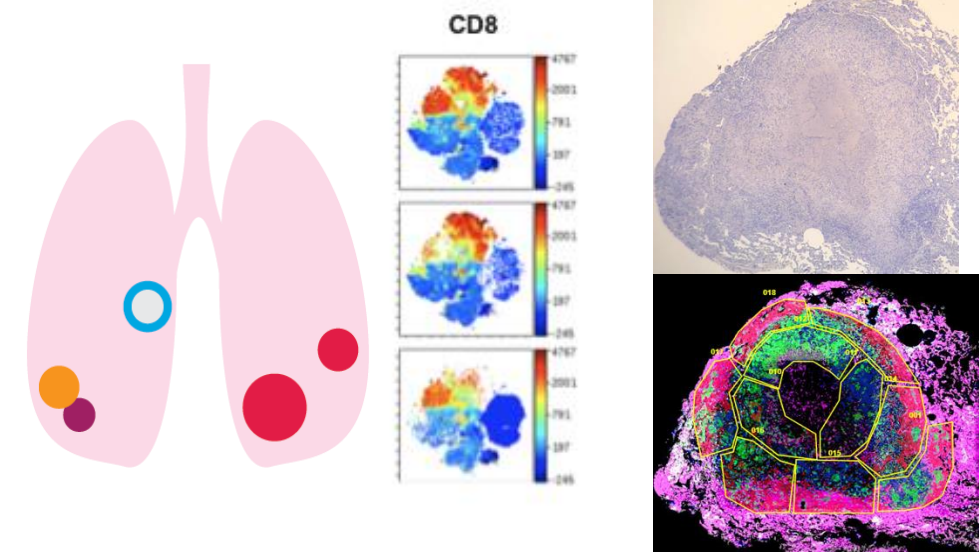
➤ **Unique sample library**

UPMC CHP – Rangos Research Building
Lab Founded in 1976 NIH funded since 1979
Lab Team about 3 people



P. Ling Lin, MD
 Assoc Professor
 Infectious Diseases
 K12 Training Director
linpl@chp.edu

Lab: BST3 /CVR (Oakland)



Immunopathogenesis in Tuberculosis

- Tracking bacterial dissemination
- Immunologic mechanisms of Mtb control during early and late infection
- Compartmental (airway, lung granulomas, lymph node) focus on immune responses and outcome
- Vaccine induced mechanisms of protection
- Transcriptional signatures of outcome

HIV– TB COINFECTION

- Impact of infection order and impact on Mtb control
- Mechanisms of SIV-induced Mtb dissemination and compartmental
- Understanding the synergistic interaction with SIV and Mtb



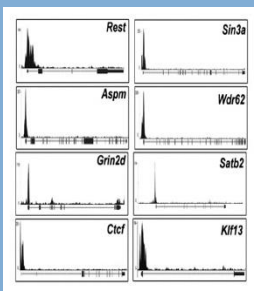
Cecilia W. Lo, PhD
 Professor of Pediatrics
 Distinguished Professor of Developmental Biology
 F Sargent Cheever Chair
 Division of Genetics and Genomic Medicine

Current Projects

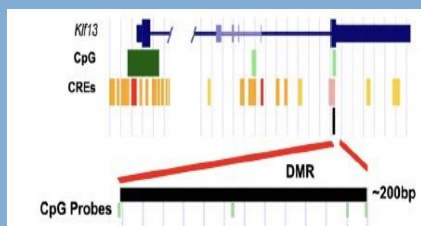
Project #1

Epigenetic signature for prediction and early detection of heart failure and liver disease in single ventricle CHD patients

CHIP

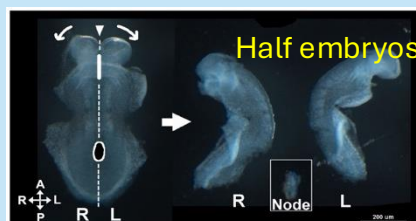
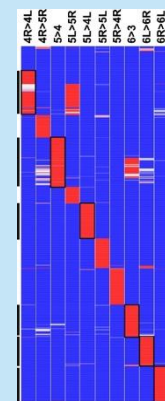


DNA methylation

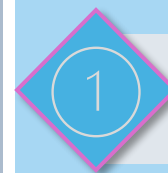


Project #2

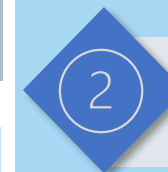
Metabolic regulation of left-right patterning in cardiovascular development and the pathogenesis of complex CHD



Lab Focus



Genetics and Epigenetics of Congenital Heart Disease (CHD)



Developmental Mechanisms of Complex Congenital Heart Disease



Disease Mechanisms of Adverse Clinical Outcomes in CHD

Specialized Resources/Equipment

- Mutant and CRISPR gene edited mouse models
- Mouse fetal ultrasound imaging in CHD diagnosis
- Episcopic confocal 3D imaging for CHD diagnosis
- 10X single cell and spatial transcriptomics of the early mouse embryo
- Human iPSC models of CHD

Opportunities

- Basic Research: genetic architecture of complex CHD, developmental mechanisms for severe LV hypoplasia in HLHS, developmental regulation of left-right patterning in heart development and complex CHD
- Translational Research: epigenetic signatures for diagnosis and prediction of adverse clinical outcome in CHD (heart failure, liver failure)

UPMC CHP – Rangos Research Building
 Lab at CHP since 2009, previously at NIH, U Penn
 Lab Team about 5 people
 Previously trained many GSR and Post-docs



Judith M. Martin, MD
Director, General Academic Pediatrics (GAP) Clinical Trials Unit
Professor of Pediatrics, Pediatric Infectious Diseases
Fun Fact – Dedicated fan of Sci-Fi, “Jedi in-training”

Select Projects of Pittsburgh Vaccine and Clinical Trials Unit (PVCTU)

PROMISE (*PRO*spective study of *Maternal and Infant immunization, alone or in SE*quence)

The purpose of this study is to better understand the safety and immune responses when both RSV prevention products are provided in combination to a pregnant person and their baby, compared to using either prevention product alone. The results from this study could help pregnant people in the future make choices about how they want to protect their babies from getting RSV.

Biomarkers for Urinary Tract Infection and Pyelonephritis

The purpose of this study is to determine if a urinary tract infection (UTI) is in the bladder or the kidneys by looking at biomarkers in the urine.

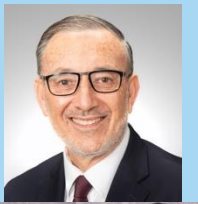


Dr. Nader Shaikh

This information will help doctors reduce unnecessary use of antibiotics and imaging tests. This is an observational study and the participant’s UTI will be treated by their own doctor per standard of care.

Additional Investigators:

Alejandro Hoberman, Division Director,
Vice Chair Clinical Research



Kumaravel Rajakumar
Gysella Pujalt-Muniz



Anjani Ravindra
Timothy Shope



OUR MISSION:

Evaluate frequently performed pediatric treatments, vaccines and procedures that entail substantial use of health care resources but whose value has not been substantiated



Pittsburgh Vaccine and Clinical Trials Unit

Division of General Academic Pediatrics
UPMC Children’s Hospital of Pittsburgh
University of Pittsburgh

- ☑ Established in 1998: long history of NIH, CDC and industry-funded trials; site for Vaccine Trials and Evaluation Unit, All of Us Pennsylvania
- ☑ Actively engaged in multiple vaccine studies: SARS-CoV2, CMV, MPox, Men ABCWY, PCV31, RSV prophylaxis
- ☑ Close collaborations with Family Medicine and Division of Pediatric Infectious Diseases
- ☑ Registry over 11,000+ participants; partnership with Pittsburgh Community Vitality Collaborative



Anita McElroy, MD PhD
Associate Professor
Pediatric Infectious Disease
Fun Fact – I've spent a lot of time working in Africa

Current Projects

Project #1

Neuropathogenesis of Rift Valley fever virus

- Defining how RVFV traffics to the CNS

Project #2

Vaccines and monoclonal antibodies for pandemic preparedness

- Immunogenicity of various vaccine platform for relevant pathogens
- Development of standardized platforms for measuring immune responses

Project #3

Immune correlates of RVFV vaccine mediated protection

- Mechanistic studies of humoral immune correlates
- Long term follow up of vaccine recipients



<https://fabvirology.com>

Lab Focus

1

Emerging Viruses

2

Host Pathogen Interactions

3

Vaccine Immunology

Specialized Resources/Equipment

- Collaborative Cross mice
- Spectral Flow Cytometry
- Reverse genetics
- BSL-3/ABSL-3 Containment Unit

Opportunities

- Basic Research – Viral pathogenesis
- Translational work – Viral Immunology
- Clinical Trials– Human Phase I/II RVFV Vaccine Immune Correlates

UPITT Oakland– BST3

Lab Founded in 2017

Lab Team: 8 people

Previously trained 1 GSR, 1 clinical fellow and 1 post-doc

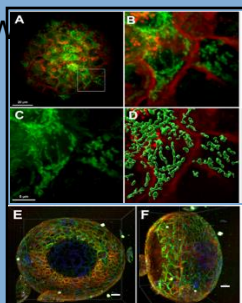


Kevin P. Mollen, M.D.
Associate Professor of Surgery
Chief, Division of Pediatric Surgery
University of Pittsburgh School of Medicine
Surgeon-in-Chief, UPMC Children's Hospital of Pittsburgh

Project #1

The Mitochondriopathy of Inflammatory Bowel Disease

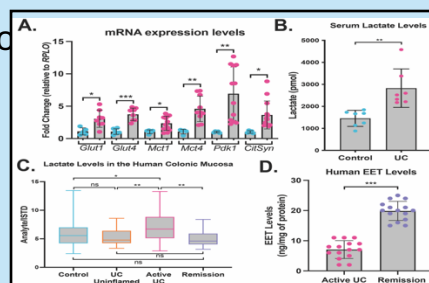
- Mitochondrial dysfunction during IBD
- Focus on changes in mitochondrial biogenesis and mitophagy within the intestinal epithelium
- Stem cell biology/organoid growth and development



Project #2

Metabolic Flux in the Intestinal Epithelium during Inflammation

- Metabolomic analysis of human and murine tissue
- Mechanistic studies into the intersection of metabolism, inflammation and the microbiome.
- Identification of biomarkers in adult IBD patients.



Lab Focus

- 1 Inflammatory Bowel Disease (IBD)
- 2 Intestinal Epithelial Biology
- 3 Mitochondrial Dysfunction

Specialized Resources/Equipment

- Human tissue from IBD patients and controls
- Intestinal Epithelium-Specific Transgenic Mice
- Oroboros Oxygraphy-2K and Seahorse XF technology
- Metabolomics
- 2D and 3D intestinal organoid cultures from humans and mice
- High-resolution imaging of mitochondria

Opportunities

- Basic Research – Murine models of colitis, mitochondrial function, epithelial stem cell fate
- Translational Studies – Work closely with human tissue/organoids to help target disease in patients
- Pilot Clinical Trial – Nicotinamide Riboside in pediatric-onset ulcerative colitis

UPMC CHP – Rangos Research Building, 6th Floor

Lab Founded in 2011

Lab Team about 5-7 people



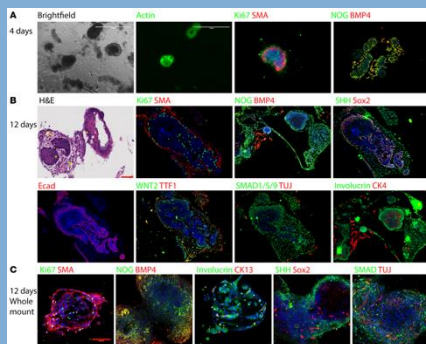
Carolina Pinzon-Guzman, MD/PhD
Assistant Professor of Surgery
Attending Surgeon Pediatric General and Thoracic Surgery
Fun Fact – I speak four languages

Current Projects

Project #1

Genetic and molecular mechanisms that contribute to esophageal atresia (EA) and its morbidity post surgical correction

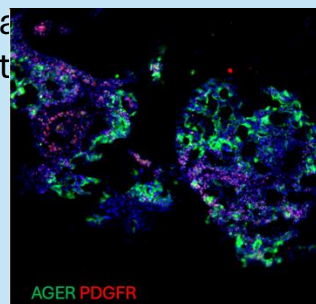
- We grow esophageal Organoid Units (EOU) from mouse and humans to use as models of esophageal development
- Impregnation of suture with Noggin to stimulate proper progenitor differentiation at the time of surgical correction.



Project #2

Genetic and molecular mechanisms that contribute to congenital diaphragmatic hernia (CDH) and its morbidity post surgical correction

- We grow lung organoid units to use as model of lung development
- Studying mesenchymal-epithelial interactions and development



Lab Focus



Foregut Development



Organoid cultures



Surgical innovation

Specialized Resources/Equipment

- Organoid/Cell culture
- Animal models of foregut congenital anomalies
- Surgical correction of foregut congenital anomalies

Opportunities

- Basic Research – Mechanisms of foregut development (esophagus, trachea, lungs) and its relationship to congenital anomalies such as EA, CDH, laryngeal clefts and others.
- Surgical innovation– Using new materials combined with molecular biology knowledge to advance current surgical treatment of foregut congenital

UPMC CHP – Rangos Research Building
Sixth floor
Expanding new lab Founded in 2024



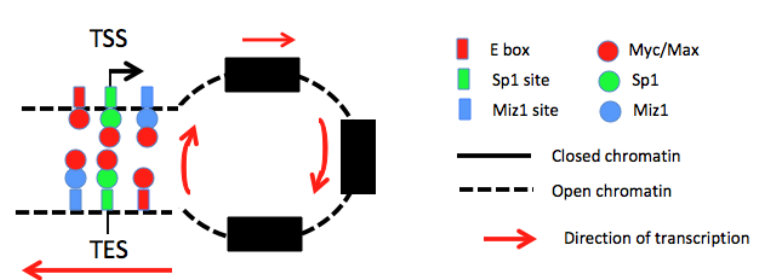
Edward V. Prochownik, M.D., Ph.D.

The Paul C. Gaffney Professor of Pediatrics.
Professor of Microbiology & Molecular Genetics, and
Professor of Clinical & Translational Medicine
Fun fact: I used to be a professional magician!

Current Projects

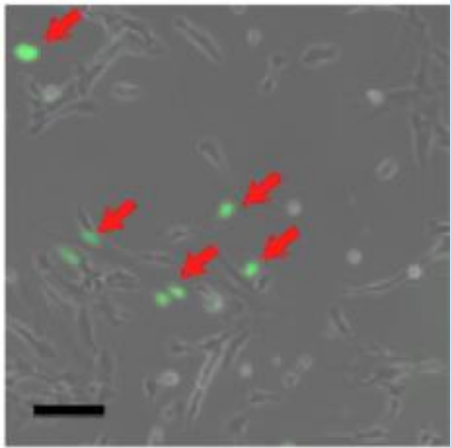
Project #1

Myc binds to transcriptional end sites (TES), facilitates contacts with transcriptional start sites (TSS) and regulates read-through transcription



Project #2

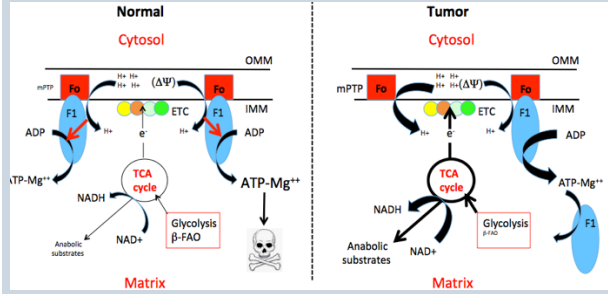
Hepatoblastoma cells “transdifferentiate” into endothelium to provide a tumor neovasculature and reverse hypoxia



Lab Focus

- 1 Myc Oncoprotein Gene Regulation
- 2 Hepatoblastoma
- 3 Cancer Metabolism

Project #3



Dissociation of mitochondrial Complex V increases balances tumor metabolism without incurring excessive ATP and its associated toxicity

Recent Publications

1. Wang H, et al. Body-Wide Inactivation of the Myc-Like Mlx Transcription Factor Network Accelerates Aging and Increases the Lifetime Cancer Incidence. Adv Sci. 2024 Sep;11(34):e2401593.
2. Wang H. et al. Premature aging and reduced cancer incidence associated with near-complete body-wide Myc inactivation. Cell Rep. 2023 Aug 29;42(8):112830.
3. Wang H, et al. MYC Binding Near Transcriptional End Sites Regulates Basal Gene Expression, Read-Through Transcription and Intragenic Contacts. bioRxiv [Preprint]. 2024 Jul 16:2024.07.11.603118

Education and Training

B.A.: The Johns Hopkins University
M.D.: The University of Chicago Pritzker School of Medicine
Ph.D.: The University of Chicago
Internship & Residency: Boston Children’s Hospital
Fellowship (Hematology Oncology): Boston Children’s Hospital and The Dana-Farber Cancer Institute



Maya Ragavan, MD, MPH, MS
Associate Professor of Pediatrics, Public Health, and Clinical and Translational Science
Co-Core Director, CTSI Community Engagement Core

Current Projects of Community-Partnered Research

Engaging Together for Healthy Relationships

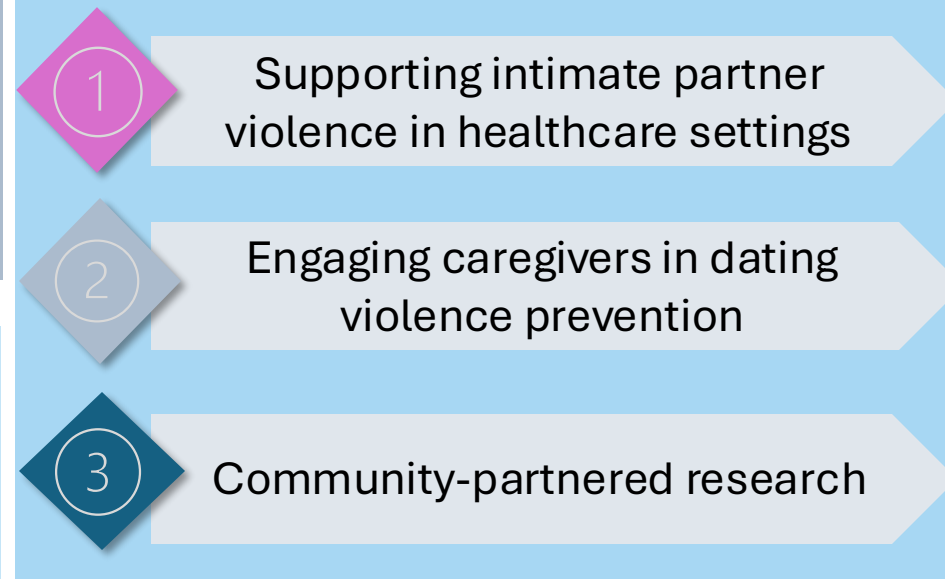
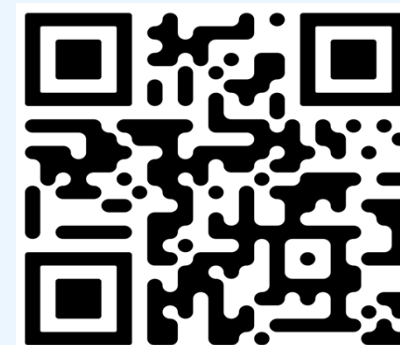
Developing and testing a primary-care based dating violence intervention for caregivers and adolescents



Doula Thrive

Comparative effectiveness trial testing how doulas can reduce perinatal intimate partner violence

FLARE: Developing and testing a dating violence intervention for LGBTQ+ youth and their caregivers



Opportunities

- Learn about intervention development, human-centered design
- Learn about community-partnered research
- Support qualitative research, clinical trials, and intervention development

Children's Hospital Office Building
Lab founded in 2019
Lab team about 10 people

<https://www.ragavancircle.com/>



Kristin Ray, MD, MS
Kelsey Schweiberger, MD, MS
Department of Pediatrics
Division of General Academic Pediatrics

Current Projects of Pediatric Health Systems Research

Current Grant Funding

- ✓ CACTUS R01 (Children & Colds Telemedicine Use Study) - Ray PI
- ✓ TIPPC R01 (Telehealth integrated in peds primary care) - Ray MPI
- ✓ Tele-MILC R01 (Siteless tele-lactation RCT) – Ray Co-I
- ✓ NCATS KL2 (Patient Portal Use) - Schweiberger
- ✓ CTSI Implementation Lab pilot award (Interpreter Use)- Ragavan PI, Schweiberger co-I

Clinical/QI

- ✓ Director, PCC Caregiver Collaborative, GAP (Schweiberger)
- ✓ Director, Health Systems Improvement, CCP (Ray)
- ✓ Director, Population Health, PPHN (Ray)

Research Education/Mentoring

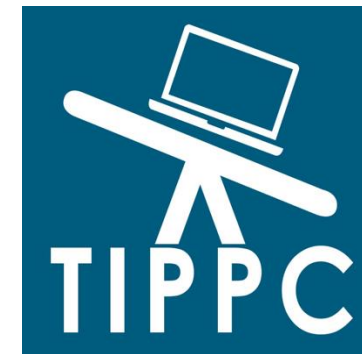
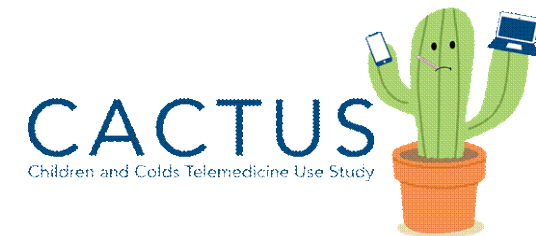
- ✓ CHATTER Seminar (Co-director, Schweiberger)
- ✓ HRSA NRSA T32 for Primary Care Research (PD, Ray; APD, Guyon-Harris)
- ✓ NCATS KL2 (ICRE/CTSA) (Co-PD, Ray)

Lab opportunities for students, residents, and fellows

- ✓ Learn about the ways technology is currently being used in pediatric healthcare by analyzing mixed method data on telemedicine, e-consults, and patient portals---focusing on access, outcomes, communication, and equity.
- ✓ Collaboration through DSRP and LRP programs
- ✓ Primary Care Research Fellowship (HRSA NRSA T32)

Pediatric Health Systems Research Goals

- 1 Communication through pediatric patient portals
- 2 Use of technology in pediatrics (e.g., telemedicine, e-consults, AI)
- 3 Enhancing transitions from primary to subspecialty care in pediatrics



OUR MISSION:

Improve access, outcomes, and equity of pediatric health care delivery



Anne-Marie Rick, MD, PhD
Assistant Professor of Pediatrics and Clinical and Translational Science
Co-Director, Newborn Research Support Services, Clinical and Translational Science Institute, University of Pittsburgh School of Medicine

MII MII Laboratory

Maternal Infant Immunity through Maternal Immunizations and Infection

RSV Maternal Vaccine and Pediatric Monoclonal Antibody

The purpose of this study is to determine the individual and combined vaccine effectiveness of infant exposure to maternal and pediatric RSV prevention against laboratory-confirmed RSV over two consecutive RSV seasons using a test-negative design of children identified through a large integrated health network (UPMC) with linked pediatric and maternal electronic health records (EHR).

MATVAX- RSV

The goal of this study is to better understand the long-term protection women receive against RSV when they receive the RSV vaccine during pregnancy and the implications of that protection for future pregnancies/infants against RSV infection.

Infant Influenza, SARS-CoV2, and RSV Protection through Maternal Immunization

The goal of this research is to investigate the immunologic protection provided to infants against influenza, SARS-CoV2, RSV through immunization during pregnancy or postnatally with a focus on breastmilk-mediated protection.

Collaborations:

- QI project with clinical medicine and public health to increase testing for perinatally exposed infants
- Qualitative interview project with MWH to understand HCV+ mothers' perceptions of treatment
- MWH research infrastructure (MOMI Biobank/OSPU)
- CHP CRSS program for research across MWH and CHP (NICU)

Research efforts are focused on infectious diseases related to maternal-infant health including:

- 1 Infant protection from maternal immunization
- 2 Newborn sepsis
- 3 Perinatal transmission of hepatitis C
- 4 Immune protection from maternal immunization during pregnancy, including COVID-19 influenza and RSV vaccines



MII MII Laboratory
founded in 2024
Lab team about 10 people

<https://www.pediatrics.pitt.edu/people/anne-marie-rick-md-mph-phd>

OUR MISSION:

The MII MII Laboratory is committed to protecting the health of mothers and infants by conducting infectious disease clinical and public health research to advance clinical knowledge.

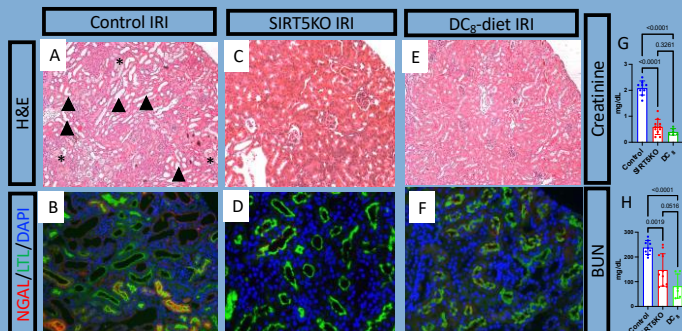


Sunder Sims-Lucas, PhD
Associate Vice Chair of Education
Director of Research for Pediatric Nephrology
Associate Professor of Pediatrics
Fun Fact – I was born in Australia.

Current Projects

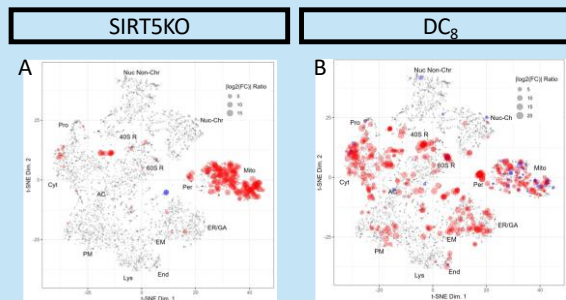
Project #1

- Therapeutics related to acute kidney injury
- Reprogramming metabolism to protect the kidney
 - Dicarboxylic acids as therapeutic agents
 - In vivo and in vitro models of kidney injury

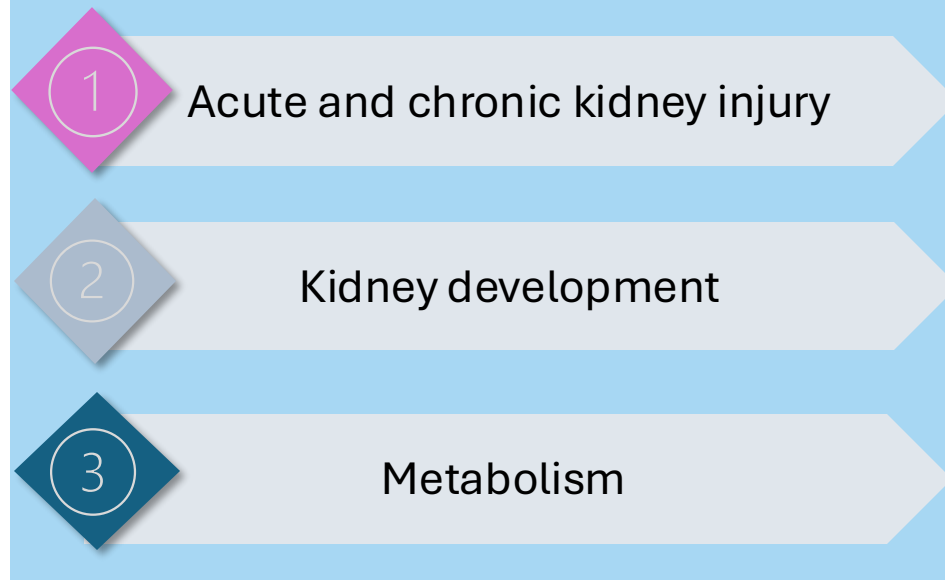


Project #2

- Succinylation and kidney injury
- Multiple compartments outside of the mitochondria are protective against progression to chronic kidney disease
 - Targeted mass spectrometry and post-translational modification assessment, particularly of succinylation



Lab Focus



Specialized Resources/Equipment

- Kidney Specific Transgenic Mice
- Large animal models of kidney injury
- Targeted Mass Spec
- Histology and fluorescence microscopy
- Multiple R01 Funding related to kidney injury

Opportunities

- Basic Research – Mechanisms of kidney injury, fatty acid oxidation
- Translational research– Large animal models of kidney injury
- Team based science-large collaborative network related to chronic injury

UPMC CHP – Rangos Research Building
Lab Founded in 2013
Lab Team about 5-6 people
Previously trained 20 pre-docs & 6 Post-docs



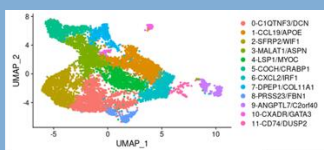
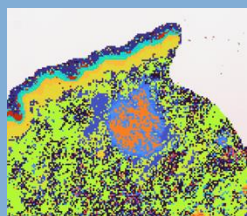
Kathryn S. Torok, MD
Associate Professor of Pediatrics
Director, Scleroderma Clinic
Co-Director, Pediatric Craniofacial Scleroderma Clinic

Current Projects

Project #1

Defining Molecular Endotypes in Pediatric Scleroderma

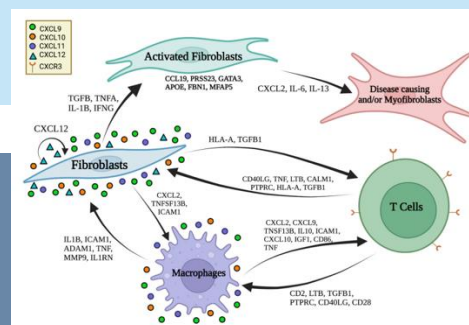
- Single-cell RNA sequencing and spatial transcriptomics of skin (pair with blood)
- Immunophenotyping, methylation, and multi-omics correlation with clinical severity and progression



Project #2

Biomarker Discovery and Therapeutic Response in jSSc-Associated Organ Involvement

- Longitudinal cohort studies (NRCOS, SCORE)
- Integration of serum markers, transcriptomics, and clinical outcomes (Interstitial lung disease, vascular disease)
- Investigator in ASCT trial for severe jSSc (NCT03630211)



Lab Focus

- 1 Juvenile Systemic Sclerosis (jSSc)
- 2 Localized Scleroderma (LS)
- 3 Clinical and Translational Research

Specialized Resources/Equipment

- **National Registry Childhood Onset Scleroderma (NRCOS) Biorepository**
- REDCap-linked clinical database
- Spatial transcriptomics and single-cell RNA sequencing
- Central biobank for multicenter trials

Opportunities

- Clinical research electives and mentorship
- Abstracts & first-author publications for trainees
- Involvement in **international trials** and consensus guideline development
- Training in **multi-omics**, immunology, pediatric rare disease trial design

UPMC CHP – Rangos Research Building
Lab Founded in 2009
Lab Team about 10 people
Collaborations across pulmonology, BMT, immunology, dermatology, and biostatistics



Mary Ellen Vajravelu, MD MSHP
Assistant Professor of Pediatrics & Epidemiology
Pediatric Endocrinology Attending
Email: vajravelume@upmc.edu
Lab website: <https://www.vajravelu.com/mary-ellen>



ORBIT Lab includes (or has included):

- Clinical research coordinators
- Trainees (postdoc; fellows; medical, undergrad, and high school students)
- Collaborations with: computer scientists, psychologists, data scientists, community-based participatory researchers

Valued Skills:

- Human subjects research knowledge (clinical trials, associated regulatory procedures)
- Qualitative research experience
- Familiarity with Stata, R
- Scientific writing background or interest

If interested in joining, contact Dr. Vajravelu with:

1. CV/resume
2. Topic area of interest
3. Goals and timeline for involvement

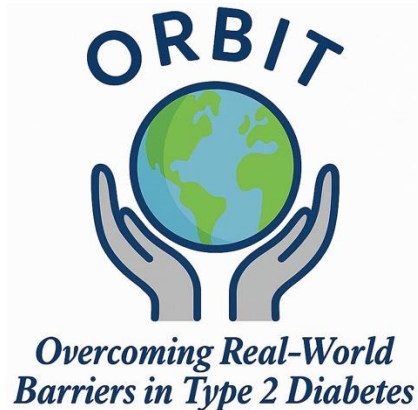
Projects focus on:

Health Behavior Change

- Physical activity
- Nutrition
- Sleep

Technology

- Continuous glucose monitoring
- Fitbit
- eConsults



Pharmacotherapy

- GLP1RA
- Shifting treatment approach for T2D

Social Determinants of Health

- Food Insecurity
- Transportation Barriers
- Loneliness, Adverse Childhood Experiences



Jerry Vockley, M.D., Ph.D.

University of Pittsburgh

Cleveland Family Endowed Chair in Pediatric Research

Professor of Human Genetics

UPMC Children's Hospital of Pittsburgh

Chief of Genetic and Genomic Medicine

Director of the Center for Rare Disease Therapy

Current Projects

Project #1

VLCAD deficiency pathogenesis and therapy:

- Significance of VUS in newborn screening
- Gene therapy
- Anaplerotic Therapy
- Chaperone therapy

Project #2

Trifunctional Protein deficiency pathogenesis and therapy:

- Lipidomics/metabolomics
- Cardiolipin binding protein
- Gene therapy

Project #3

Novel anaplerotic compounds for the treatment of mitochondrial energy dysfunction:

- Propionic acidemia and methylmalonic acidurias
- Fatty acid oxidation disorders

Project #4

Ongoing clinical trials for fatty acid oxidation disorders:

- Triheptanoin for MCAD deficiency
- Phenylbutyrate for MCAD deficiency

Lab Focus

1

Fatty Acid Oxidation Inherited Defects
Pathogenesis and Therapeutics

2

Branched Chain AA Metabolism Defects
Pathogenesis and Therapeutics

3

Propionic Acidemia and MMA Acidurias
Pathogenesis and Therapeutics

Specialized Resources/Equipment

- Seahorse Cellular Oximetry
- AKTA Protein Purification System
- Metabolic Mass Spectroscopy
- Waters HPLC, with UV/Vis, Fluorescence, and Electrochemical Detectors
- Spectrophotometry, Fluorometry, CD Polarimeter
- Reactive Oxygen Species Assays

- Basic Research – Enzymology, protein structure/function relationships, protein structure modeling
- Cellular Studies – Exploring the pathophysiology of inherited metabolic disorders
- Innovative drug design for metabolic disorders and translational preclinical research to investigate drug efficacy in mouse models

UPMC CHP – Rangos Research Building

Lab Founded in 1991 at the Mayo Clinic

moved to CHP, Pittsburgh, 2004

Diverse Lab Team of about 10 people including:

*3 Faculty members, 3 PhD level Researchers,
1 Lab manager, and 3 Graduate Students*



Xiangwei Xiao, MD, PhD
Assistant Professor of Department of Surgery
Pediatric Division, Rango's Research Building
UPMC

Lab Focus



Cell interaction in
microenvironment



Diabetes Research

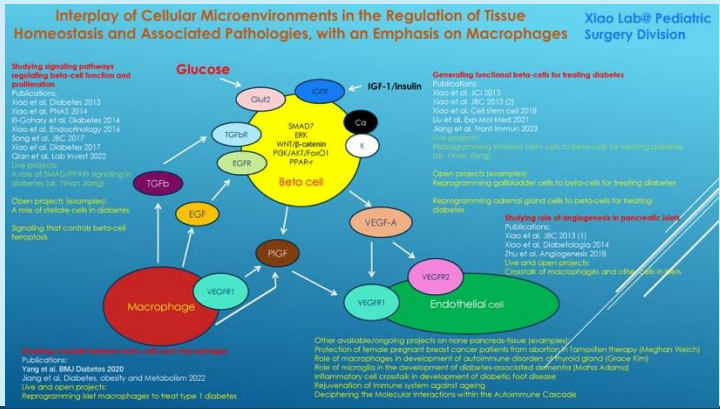


Macrophages in human diseases

Current Projects

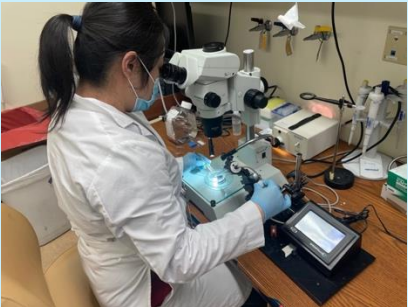
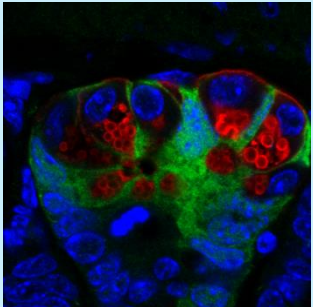
Project #1

Signaling pathway crosstalk in regulating
beta-cell function and identity in diabetes



Project #2

Generating beta-cells from non-beta cells to
treat diabetes
Triggering beta-cell regeneration



Project #3

Impact of diabetes on other diseases
& Alzheimer's disease
& Grave's disease and Hashimoto's thyroiditis
& Duchenne Muscular Dystrophy



Specialized Techs/Resources/Equipment

- Mouse models by (micro)surgeries
- Gene therapy in pancreas
- Adeno-associated vectors targeting specific cell types
- Flow Cytometry-based cell purification
- Specific tools studying macrophages

UPMC CHP – Rangos Research Building
Lab Founded in 2018
Lab Team about 3-5 people
Previously trained 7 undergraduate students
& 5 visiting scholars