Introduction

In 2005, a Division of Pediatric Pulmonary and Vascular Biology (PVB) was established to provide a programmatic research home for pediatric faculty and trainees pursuing basic research in pulmonary biology and vascular biology. It was an exclusively research-driven division in the Department of Pediatrics, one of but a handful of research divisions in pediatrics departments nationwide, thereby representing a novel concept that amplifies the efforts and effectiveness of pediatric faculty and trainees alike.

In March 2014, the Division of Pediatric Pulmonary and Vascular Biology became the Center for Pulmonary and Vascular Biology. The Center’s mission is to expand basic understanding of lung and vascular diseases, striving to gain new knowledge that will ultimately lead to new diagnostic, prophylactic, and therapeutic strategies. Within the context of lung and vascular diseases, the Center focuses on lung and vascular development and responses to inflammation and injury.

Under the direction of Philip Shaul, M.D., Professor and Vice Chair for Research, the Center provides a valuable resource for campus-wide investigative endeavors. This is represented by active collaborations between PVB faculty and other UT Southwestern faculty in the departments of Internal Medicine, Cell Biology, Physiology, Pharmacology and Biophysics, and by participation of PVB faculty in numerous training and center grants across the campus.

Notably, in 2009 a shared effort by PVB and the Division of Pulmonary and Critical Care Medicine in the Department of Internal Medicine resulted in procurement of a coveted T-32 training grant from the National Institutes of Health to support postdoctoral research training in lung biology and disease at UT Southwestern. The T-32 award was successfully renewed in 2014.

Faculty

The Pediatric PVB faculty are basic scientists and physician-scientists from four pediatric divisions working in partnership.

Philip W. Shaul, M.D.
Professor, Vice Chair of Research Director, Center for Pulmonary and Vascular Biology
Associates First Capital Corporation
Distinguished Chair in Pediatrics

Michelle Gill, M.D., Ph.D.
Assistant Professor of Pediatric, Immunology and Internal Medicine
Division of Pediatric Infectious Disease

Rashmin C. Savani, M.B.Ch.B.
Professor and Division Director, Neonatal and Perinatal
Associate Division Director, Pediatric Pulmonary and Vascular Biology
The William Buchanan Chair in Pediatrics

Chieko Mineo, Ph.D.
Associate Professor, Center for Pulmonary and Vascular Biology

Jessica Moreland, M.D.
Professor of Pediatrics and Microbiology
Division Chief, Pediatric Critical Care Medicine
Thomas Fariss Marsh, Jr. Chair in Pediatrics

Renee Potera, M.D.
Instructor, Pediatric Critical Care Medicine
Honors / Awards

Jessica Moreland

- Best Pediatric Specialists in Dallas, *D Magazine*

Rashmin Savani

- Texas Super Doctor, *Texas Monthly Magazine*

Invited Lectures

Philip Shaul

- Estrogens, SERMs, and TSECs Scientific Meeting, Clearwater, FL, April 2015
  - “Non-nuclear Estrogen Receptor Modulation by Bazedoxifene Acetate Alters Breast Cancer and Endothelial Cell Phenotype”

Chieko Mineo

- University of Kentucky, Lexington, KY, April 2015
  - “Non-nuclear Estrogen Receptor Modulation by Bazedoxifene Acetate Alters Breast Cancer and Endothelial Cell Phenotype”

Jessica Moreland

- Annual Pediatric Critical Care Visiting Professor, University of Colorado - Denver Anschutz Medical Campus, Denver, Colorado, April 2015
  - “Anti-inflammatory functions of the NADPH oxidase 2: critical for immune homeostasis”

Rashmin Savani

- Invited Speaker, 9th International Conference on Hyaluronan, Florence, Italy, June 2015
  - “HA in Inflammation and Signaling”
- Invited Speaker, XXIV Biennial Meeting, International Perinatal Collegium, Napa, CA, July 2015
  - “CD44 is Necessary for Increased Lung IL1B/TGFβ and Decreased Alveolarization of Mice Exposed to Neonatal Hypoxia and is Elevated in Preterm Infants with BPD”
- Invited Speaker, Federation of European Biochemistry Societies, 5th Advanced Lecture Course, Rhodes, Greece, September 2015
  - “Molecular Mechanism of RHAMM Activation of Src Kinase and the Signaling Pathway for Nitric Oxide Production in the Endothelium”
- Invited Speaker, Grand Rounds, Department of Laboratory Medicine and Pathology, University of Minnesota, Minneapolis, MN, November 2015
  - “Hyaluronan and its Receptor RHAMM in Acute Lung Injury”
- Visiting Professor, Department of Pediatrics, Division of Neonatal-Perinatal Medicine, University of Alabama, Birmingham, AL, December 2015
  - “The NLFP3 Inflammasome and Bronchopulmonary Dysplasia”

Poster Presentation

Rashmin Savani

- Delivery Room (DR) Resuscitation Using 2011 Neonatal Resuscitation Program (NRP) Oxygen Guidelines and Neurodevelopmental Outcomes in Preterm Neonates
  - Pediatric Academic Society (PAS), San Diego, CA, April 2015
Education and Training

The primary teaching activities of the PVB faculty occur at the laboratory bench where residents, clinical pediatric subspecialty fellows, graduate students, and Ph.D. postdoctoral fellows are trained in pulmonary biology research and vascular biology research.

Research Activities

The overall goal of the Shaul-Mineo laboratory is to identify the molecular components, the protein-protein interactions, and the regulatory events occurring within signaling modules on the plasma membrane which dictate endothelial cell phenotype and the propensity for vascular disease. Investigations are performed in cell culture models and in both in vitro and in vivo reconstitution systems, with the ultimate goal of identifying new targets for therapies to combat cardiometabolic disorders.

Dr. Michelle Gill, whose research centers on evaluating the role of dendritic cells in pediatric respiratory viral infections, partners with Dr. Rebecca Gruchalla and the Division of Pediatric Allergy and Immunology to study asthma pathogenesis. By defining how dendritic cell function is affected in patients with asthma, they hope to better understand how to interrupt, and eventually design strategies to prevent the deleterious immune responses associated with the clinical symptoms of asthma.

Dr. Jessica Moreland focuses her research on better understanding the cell biology of inflammation with a specific interest in neutrophil biology. Her laboratory studies neutrophil priming by infectious and inflammatory stimuli and the role of NADPH oxidase in pro- and anti-inflammatory signaling. In addition, the laboratory utilizes a murine model of the systemic inflammatory response syndrome (SIRS) and multi-organ dysfunction syndrome (MODS). Dr. Renee Potera’s current research focuses on the role of alveolar macrophage signaling during acute inflammatory lung injury using a murine model of SIRS.

Dr. Rashmin Savani’s laboratory studies the pathogenesis of bronchopulmonary dysplasia and development of novel therapies for this devastating disorder of preterm infants. With over 20 years’ experience in the biology of the glycosaminoglycan hyaluronan and its receptors, they have developed the expertise and tools, including techniques, antibodies, peptides, cDNAs, knockout and transgenic mice, that allow examination of this system in angiogenesis, inflammation and lung development, as well as in responses to injury.

Current Grant Support

Michelle Gill

Grantor: NIH / University of Wisconsin
Title of Project: Mechanistic Study Development for ICAC3 MUPPITS and CoNAC Protocols
Role: Co-Investigator
Chieko Mineo

Grantor: NIH 1R01HL109604  
**Title of Project:** Discovery of Novel Interventions of the Antiphospholipid Syndrome  
**Role:** Principle Investigator  
**Dates:** 09/2011 – 06/2016

Grantor: American Heart Association 13GRNT1608000  
**Title of Project:** Novel Function of FcgammaRIIB as a Mediator of Obesity-induced Insulin Resistance  
**Role:** Principle Investigator  
**Dates:** 07/2013 – 06/30/2015

Jessica Moreland

Grantor: NIH R21AI109127  
**Title of Project:** A Novel Anti-inflammatory Role for the Neutrophil NADPH Oxidase  
**Role:** Principal Investigator  
**Dates:** 08/2015 – 07/2016

Renee Potera

Grantor: NIH 5K12HD68363  
**Title of Project:** Child Health Research Career Development Award  
**Role:** Trainee  
**Dates:** 10/2015 – 09/2016

Philip Shaul

Grantor: NIH 2R01HL087564  
**Title of Project:** Oxysterols, Estrogen Receptor Modulation and Vascular Disease  
**Role:** Principle Investigator  
**Dates:** 6/2010 – 5/2016

Grantor: NIH 5K12HD68363  
**Title of Project:** Antecedents and Sequelae of Childhood Onset Disease  
**Role:** Training Director (PI: Pérez Fontán)  
**Dates:** 12/2010 – 11/2015

Grantor: The Hartwell Foundation  
**Title of Project:** Novel Strategies for Fetal Protection during the Antiphospholipid Syndrome  
**Role:** Principle Investigator  
**Dates:** 4/2013 – 3/2016

Grantor: NIH 5R01-HL115122  
**Title of Project:** FcgammaRIIB and Inflammation-Related Vascular Disease  
**Role:** Principle Investigator (Co-Investigator: Chieko Mineo)  
**Dates:** 8/2013 – 6/2017

Grantor: NIH 5NIH R01-DK015556  
**Title of Project:** Novel Ligands and Mechanisms to Achieve Selective Nuclear Receptor Activity  
**Role:** Co-Investigator (PI: Katzenellenbogen)  
**Dates:** 9/2013 – 8/2017
Grantor: NIH 2R01-HL118001  
Title of Project: Role of Endothelial and Macrophage ApoER2 in Atherosclerosis Modulation  
Role: Principle Investigator (Multi-PI with David Hui, Univ. of Cincinnati) (Co-Investigator: Chieko Mineo)  
Dates: 2/2014 – 1/2018

Grantor: NIH 2T32HL098040  
Title of Project: Training Program in Lung Biology and Disease  
Role: Project Director/Principle Investigator (Co-PD/PI with Lance Terada)  
Dates: 7/2014 – 6/2019

Grantor: Pfizer, Inc. Investigator Initiated Research Program  
Title of Project: Bazedoxifene and Estrogen Receptor-negative Breast Cancer  
Role: Principle Investigator  
Dates: 9/2014 – 8/2015

Peer-Reviewed Publications


12. Shaul PW. Role of the endothelium in the metabolic syndrome: IIB or not IIB. *The American Journal of the Medical Sciences* 2015;349:3-5.


**Book Sections**