

UT Southwestern
Medical Center
Department of Pediatrics

**Pediatric Center for Pulmonary
and Vascular Biology**
2023 Annual Report

Expanding our basic understanding of lung and vascular health and diseases.

Pediatric Center for Pulmonary & Vascular Biology – 2023 Annual Report

The Pediatric Center for [Pulmonary and Vascular Biology](#) (PVB) provides a programmatic research home for pediatric faculty and trainees pursuing basic research in pulmonary biology and vascular biology. The Center’s mission is to expand the basic understanding of lung and vascular diseases, striving to gain new knowledge that will ultimately lead to new diagnostic, prophylactic, and therapeutic strategies.







The Center provides a valuable resource for investigative endeavors in pulmonary biology and vascular biology across the UT Southwestern campus. This is represented by active collaborations between PVB faculty and UT Southwestern faculty in the Departments of Internal Medicine, Molecular Genetics and Cell Biology, and in the O’Donnell School of Public Health, and by the participation of PVB faculty in numerous training grants across the campus. PVB researchers also collaborate with faculty in the Department of Biomedical Engineering at the University of Texas at Dallas and other institutions.

Dr. Shaul and Lance Terada, M.D., Professor in the Department of Internal Medicine and Chief of the Division of Pulmonary and Critical Care Medicine, co-direct a National Institutes of Health T32 program to support postdoctoral research training in lung biology and disease at UT Southwestern.



Philip Shaul, M.D.
 Professor, Pediatrics
 Director, Pediatric Center for
 Pulmonary and Vascular
 Biology

Numbers at a Glance

 <p>Faculty: 4 New Faculty: N/A Promotions: N/A</p>	 <p>Clinical Fellows: N/A* Clinical Sites: N/A*</p>	 <p>Inpatient Encounters: N/A* Outpatient Encounters: N/A*</p>
 <p>Research Funding Total* Grants: \$1,925,885 Contracts: N/A Total # Proposals Awarded: 1 Public Federal (# K Awards): N/A Public State of Texas: N/A Other: 1 Revenue from Active Clinical Trials as of 12/31/2023: N/A</p>	 <p>Active Clinical Trials: N/A*</p>	 <p>Conferences/Lectures: 2* Publications: 31* Citations: 1,225*</p>

*Sources: Orbit report of RHi032 Organizational Research Dashboard, UTSW Office of Research and Grants Support, Faculty Affairs, Education Alumni Affairs, Clinical Business Operations-invoice creation period for 2023, CVs

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Honors/Awards

Best Pediatric Specialists in Dallas, *D Magazine*

- Jessica Moreland, M.D.

Chieko Mineo, Ph.D.

- Appointed to *Arteriosclerosis, Thrombosis, and Vascular Biology* (ATVB) Editorial Board
- Appointed to ATVB Early Career Editorial Mentoring Program

Jessica Moreland, M.D.

- Promoted to Associate Dean for Faculty Development

Shaul-Mineo Lab

- Published work demonstrating a previously unappreciated crosstalk between macrophages and endothelial cells in the development of atherosclerosis.
- Published work revealing that a major component of the anti-diabetic actions of estrogen involves the promotion of insulin delivery to the skeletal muscle.

Top Conference Locations

Brain Nanomedicine Workshop, Dallas, May 2023

46th Annual Scientific Meeting of the European Lipoprotein Club (ELC), Tutzing, Germany, September 2023

University of Houston, Houston, November 2023

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. Dr. Mineo and Dr. Shaul are active in the Genes, Development, and Disease Ph.D. Program, participating in qualifying exam and thesis committees. Dr. Shaul gives lectures in the Molecular Metabolism and Metabolic Diseases Graduate Track. Dr. Moreland is a member of the Molecular Microbiology Ph.D. Program.

Research Activities

The research in the Moreland Lab is focused on better understanding the cell biology of inflammation, with a specific interest in neutrophil biology. The laboratory studies neutrophil priming by infectious and inflammatory stimuli, with a specific interest in Toll-like receptor signaling and the role of NADPH oxidase in pro- and anti-inflammatory signaling. The Moreland Lab studies primary human neutrophils from healthy donors and from patients and also utilizes a murine model of the systemic inflammatory response syndrome and multiple organ dysfunction syndrome.

Cardiovascular disease is responsible for 18 million deaths each year worldwide, and across the globe, the lives of over 460 million are threatened by Type 2 diabetes. Endothelial cells make up the single cell lining of larger blood vessels and are the sole cell type found in capillaries, dictating vascular function and macromolecule exchange between the blood and the tissues. The overall goal of the Shaul-Mineo Lab is to discover the processes in endothelial cells that govern cardiovascular and metabolic health and disease. Striving to have a transformative impact on our understanding of conditions threatening the well-being of millions, the laboratory investigates molecules associated with the endothelial cell plasma membrane and how they dictate the responses of the endothelium to extracellular cues. The mission is to identify novel targets for new preventive and treatment strategies against cardiovascular disease and Type 2 diabetes. To meet that mission, the laboratory employs state-of-the-art techniques in human and mouse genetics, cell and molecular biology, and disease models in mice.

Top Peer-Reviewed Publications and Book Chapters

1. Crossley JL, Ostashevskaya-Gohstand S, Comazzetto S, Hook JS, Guo L, Vishlaghi N, Juan C, Xu L, Horswill AR, Hoxhaj G, **Moreland JG**, Tower RJ, Levi B. [Itaconate-producing neutrophils regulate local and systemic inflammation following trauma](#). JCI Insight. 2023 Oct 23;8(20):e169208. PMID: 37707952
2. Li Y, Hook JS, Ding Q, Xiao X, Chung SS, Mettlen M, Xu L, **Moreland JG**, Agathocleous M. [Neutrophil metabolomics in severe COVID-19 reveal GAPDH as a suppressor of neutrophil extracellular trap formation](#). Nat Commun, 2023;14(1): 2610. PMID: 37147288
3. Peng J, Yu L, Huang L, Paschoal VA, Chu H, de Souza CO, Varre JV, Oh DY, Kohler JJ, Xiao X, Xu L, Holland WL, **Shaul PW**, **Mineo C**. [Hepatic sialic acid synthesis modulates glucose homeostasis in both liver and skeletal muscle](#). Mol Metab. 2023 Dec;78:101812. PMID: 37777009
4. Sacharidou A, **Chambliss K**, Peng J, Barrera J, Tanigaki K, Luby-Phelps K, Özdemir İ, Khan S, Sirsi SR, Kim SH, Katzenellenbogen BS, Katzenellenbogen JA, Kanchwala M, Sathe AA, Lemoff A, Xing C, Hoyt K, **Mineo C**, **Shaul PW**. [Endothelial ER \$\alpha\$ promotes glucose tolerance by enhancing endothelial insulin transport to skeletal muscle](#). Nat Commun. 2023 Aug 17;14(1):4989. PMID: 37591837
5. Yu L, Xu L, Chu H, Peng J, Sacharidou A, Hsieh HH, Weinstock A, Khan S, Ma L, Durán JGB, McDonald J, Nelson ER, Park S, McDonnell DP, Moore KJ, Huang LJ, Fisher EA, **Mineo C**, Huang L, **Shaul PW**. [Macrophage-to-endothelial cell crosstalk by the cholesterol metabolite 27HC promotes atherosclerosis in male mice](#). Nat Commun. 2023 Jul 25;14(1):4101. PMID: 37491347