



**2023 GROVER CONFERENCE on Precision Medicine for Pulmonary Vascular Disease: The Future is Now**

**COURSE SCHEDULE**

**Monday, October 16, 2023**

- 12:00 pm Arrivals**
- 6:00 pm Welcome Reception and Dinner**
- 7:00 pm Beyond Genotype and Phenotype: Has Omics Changed Pulmonary Medicine?**  
Naftali Kaminski, MD, ATSF, Yale School of Medicine

**Tuesday, October 17, 2023**

**Session I: Clinical Phenotypes of Pulmonary Vascular Disorders - What we Know and What we Don't Know**  
**Moderators: Katherine R. Clapham, MD University of Utah**  
**Olga Rafikova, MD, PhD, Indiana University**

**7:00-8:00 am Breakfast**

- 8:05 am Welcome and Introduction**  
Anna Hemnes, MD, ATSF, Vanderbilt University  
Vinicio de Jesus Perez, MD, ATSF, Stanford University  
Prof. Martin R. Wilkins, Imperial College of London
- 8:15 am Pulmonary Arterial Hypertension: One disease, Different Phenotypes**  
Bradley Maron, MD, BWH
- 8:45 am The Continuum of Vascular Remodeling in Heart Failure**  
Marc Simon, MD, MS, UCSF
- 9:15 am Comorbidity-Driven Taxonomy of Pediatric Pulmonary Hypertension**  
Rachel K. Hopper, MD, Stanford University
- 9:45 am Break (10 min)**
- 9:55 am Pulmonary Embolism and CTEPH: One Disease with Different Phenotypes?**  
Gustavo A. Heresi, MD, MSci, Cleveland Clinic
- 10:25 am ALL, ARDS, and Bronchopulmonary Dysplasia: A Spectrum of Phenotypes**  
Rebecca F. Hough, MD, PhD, Columbia University
- 10:55 am John T. Reeves Memorial Lecture: Pulmonary Vascular Disorders Related to Scleroderma and Connective Tissue Diseases: is Autoimmunity the Only Phenotype?**  
Paul M. Hassoun, MD, Johns Hopkins
- 11:25 am Open Discussion**
- 12:00 pm Lunch**

**Session II: Genetics of Pulmonary Vascular Disorders: From Family Studies to Population Studies**

**Moderators: Sasha Z. Prisco, MD, PhD, University of Minnesota  
Jair A. Tenorio, MSc, PhD, Institute of Medical and Molecular Geneticist**

- 3:00 pm**      **Diagnosis and Management of Genetic Diseases in the Era of Next Generation Sequencing**  
Jair Antonio Tenorio, MSc, PhD, Institute of Medical and Molecular Geneticist
- 3:30 pm**      **Overview of Genetics of PAH**  
Carrie Welch, PhD, Columbia University
- 4:00 pm**      **Next Steps for the UK Cohort Study**  
Allan Lawrie, PhD, Imperial College London
- 4:30 pm**      **Unlocking the Potential-Novel Insights in Smooth Muscle Cells and Fibroblasts Heterogeneity**  
Grazyna Kwapiszewska-Marsh, DrMed, Ludwig Boltzmann Institute for Lung Vascular Research
- 5:00 pm**      **Open Discussion**
- 5:15 pm**      **Abstract Presentation:**  
**ATP Citrate Lyase (ACLY): a Promising Target Against Vascular Remodeling Development**  
Yann Grobs, MSc, Laval University | ULAVAL, Department of Medicine
- 5:30 pm**      **Abstract Presentation:**  
**Hypusine Signaling: A Novel Pathway Driving Vascular Remodeling in Pulmonary Arterial Hypertension**  
Sarah-Eve Lemay, MSc, Laval University | ULAVAL, Department of Medicine
- 6:00 pm**      **Dinner**
- 8:00 pm**      **Career Development Session: How to Obtain your First Job in Academia or Industry**  
Julie A. Bastarache, MD, Vanderbilt University  
Olga Rafikova, MD, PhD, Indiana University

**Wednesday, October 18, 2023**

**Session III: Biomarker Discovery and Cell Therapy for Pulmonary Vascular Disorders in the Era of Precision Medicine**

**Moderators: James R. Klingler, MD, ATSF, Rhode Island Hospital  
William M. Oldham, MD, PhD, Harvard University**

**7:00-8:00 am Breakfast**

- 8:05 am**      **Epigenetics, Metabolomics and Proteomics As Tools For Precision Medicine In Pulmonary Vascular Medicine**  
Stefan Gräf, PhD, University of Cambridge Medicine
- 8:35 am**      **Using Platform Omic Technologies to Probe Blood in Pulmonary Vascular Disease**  
Christopher J. Rhodes, PhD, Imperial College London

- 9:05 am Proteomics and Machine Learning for Discovery of Biomarkers in Pulmonary Vascular Disorders**  
Andrew J. Sweatt, MD, Stanford University
- 9:35 am Exosomes and Microparticles: Biomarkers, Therapeutic Vectors or Both?**  
Natalie N. Bauer, PhD, University of South Alabama
- 10:05 am Break (10 min)**
- 10:15 am Single Cell ‘Omics, Circulating Cells and Genetic Engineering To Accelerate Biomarker Discovery And Cell Therapy**  
Duncan J. Stewart, MD, Ottawa Hospital Research Institute
- 10:45 am Novel Sub-populations of Lung Capillary Endothelial Cells and Their Functional Significance**  
Ruslan Rafikov, PhD, University of Arizona
- 11:05 am Robyn J. Barst Memorial Lecture: Bronchopulmonary Dysplasia and ALI/ARDS In Pediatrics: New Biomarkers and Role of Cell Therapy**  
Kara N. Goss, MD, University of Texas Southwestern Medicine
- 11:35 am Abstract Presentation: Association of Right Ventricular Diastolic Stiffness and RV Ejection Fraction with Mortality In Patients With Pulmonary Hypertension**  
Rebecca R. Vanderpool, PhD, Ohio State University
- 12:00 pm Lunch**

**Session IV: From Precision Biology to Clinical Trials: Examples for how Basic Research Accelerates Clinical Trials in Pulmonary Vascular Diseases**  
**Moderators: Ke Yuan, PhD, Boston Children’s Hospital**  
**Corey E. Ventetuolo, MD, MS, Brown**

- 3:00 pm Sotatercept for Treatment of PAH: The PULSAR and STELLAR Data (15’)**  
David B. Badesch, MD, University of Colorado
- 3:40 pm Biological Role of Tyrosine Kinase receptors in PAH (15’)**  
Bradley Maron, MD, BWH  
**Positioning Imatinib for PAH (PIPAH study) (15’)**  
Prof. Martin R. Wilkins, Imperial College London
- 4:20 pm Rituximab for Scleroderma-PAH Targeting B Cells in PAH**  
Mark R. Nicolls, MD, Stanford  
**Clinical Trial of Rituximab in PAH (15’)**  
Roham Zamanian, MD, FCCP, Stanford University
- 5:00 pm Targeting Bromodomain Proteins with Apabetalone**  
**Bromodomain Protein Biology and Rationale for Therapy (15’)**  
Sebastien Bonnet, PhD, MSc, Inst of Cardiology & Pulmonary of Quebec
- 6:00 pm Dinner**
- 8:00 pm After Dinner Talk: Estelle B. Grover Memorial Lecture**  
**The “Interactome” and the Repurposing of Medicines for Cardiopulmonary Diseases: Big Data in Precision Medicine**  
Stephen Y. Chan, MD, PhD, University of Pittsburgh

Thursday, October 19, 2023

**Session V: The Right Ventricle: A Phenotype of its Own**  
**Moderators: Rebecca R. Vanderpool, PhD, Ohio State**

**7:00-8:00 am Breakfast**

- 8:05 am Deep-Phenotyping the Heart**  
Kurt Prins, MD, PhD, University of Minnesota
- 8:35 am Genomic and Proteomic Studies in the RV: Therapeutic Possibilities**  
Tim Lahm, MD, ATSF, University of Colorado
- 9:05 am Metabolomics of the RV: What We Have Learned and What We Need to Know**  
Jane Leopold, MD, BWH
- 9:35 am The Transition from Acute to Chronic PE – Insights from Single Cell RNA Sequencing**  
Sudarshan Rajagopal, MD, PhD, Duke
- 10:05 am Break (10 min)**
- 10:15 am Cardiac Imaging, Radiometrics and their Role in Precision Medicine**  
Harm Bogaard, MD, PhD, Amsterdam UMC
- 10:45 am Intravascular Hidden Threats: Reshaping the Pulmonary Vasculature and the Right Ventricle**  
Suellen D'Arc Dos Santos Oliveira, PhD, MSci, University of Illinois at Chicago
- 11:15 am Cluster Analysis to Define Right Heart Failure Phenotypes in Pulmonary Vascular Diseases**  
Rebecca R. Vanderpool, PhD, Ohio State University
- 11:45 am Abstract Presentation:  
Pathogenic Role for RUNX1 in Pulmonary Arterial Hypertension**  
James R. Klinger, MD, ATSF, Rhode Island Hospital
- 12:00 pm Lunch**

**Session VI: Understanding Epigenetics and their Role in Precision Medicine: A New Frontier?**

**Moderators: Tatiana Kudryashova, PhD, UC Davis  
Grazyna Kwapiszewska - Marsh, DrMed, ILH of JLU**

- 3:00 pm Terry Wagner Memorial Lecture: Epigenetics for Gene Discovery and Phenotyping of Pulmonary Vascular Disorders**  
Kurt R. Stenmark, MD, University of Colorado Denver
- 3:30 pm HIF and Epigenetics in the Pathogenesis of PAH**  
Zhiyu Dai, PhD, University of Arizona

- 4:00 pm**      **Beyond the Coding Regions: Microna, Lncrna and Control of Non-Coding RNA Expression and Function**  
Ke Yuan, PhD, Harvard University
- 4:30 pm**      **Epigenetics and COVID in PVD**  
Harry Karmouty-Quintana, PhD, McGovern Medical School at UT Health
- 5:00 pm**      **Abstract Presentation:**  
**Lactobacillus Suppresses Glycoprotein-130-Mediated Microtubule Remodeling to Support Right Ventricular Function in Pulmonary Arterial Hypertension**  
Sasha Z. Prisco, MD, PhD, University of Minnesota
- 5:30 pm**      **Cancer, Epigenetics, and Pulmonary Hypertension: Translational Opportunities**  
Sebastien Bonnet, PhD, MSc, Inst of Cardiology & Pulmonary of Quebec
- 6:00 pm**      **Dinner**
- 7:00 pm**      **Poster Session chaired by Drs. Elena Goncharova, Andrew Bryant, and Suellen D'Arc Dos Santos Oliveira**  
*Poster presenters to give short summaries of their research followed by questions from the audience.*

**Friday, October 20, 2023**

**Session VII: Integrating Precision Medicine to Clinical Care**  
**Moderators: Peter Leary, MD, PhD, UW Medical Center**  
**Vineet Agrawal, MD, Vanderbilt**

**7:00-8:00 am Breakfast**

- 8:05 am**      **Risk Stratification for PAH, Acute PE and CTEPH: Role of Precision Medicine**  
Olivier Sitbon, MD, PhD, INSERM
- 8:35 am**      **Hemodynamics and Vasoreactivity - Can they Help us Phenotype PAH Patients?- YES** Roham Zamanian, MD, FCCP, Stanford University
- 8:45 am**      **Hemodynamics and Vasoreactivity - Can they Help us Phenotype PAH Patients?- NO** Brian Houston, MD
- 8:55 am**      **Rebuttals and discussion**
- 9:05 am**      **The Discovery of Sotatercept and the Future of Drug Discovery on PH**  
Paul B. Yu, MD, PhD, Harvard University
- 9:35 am**      **Break (10 min)**
- 9:45 am**      **Using Wearables to Monitor Patients with Pulmonary Vascular Diseases**  
Raymond L. Benza, MD, Ohio State Medical Center
- 10:15 am**      **Ethical Issues Surrounding Precision Medicine**  
Daphne O. Martschenko, BA, MPhil, PhD, Stanford University

**11:45 am**     **Role of a Comprehensive Electronic Medical Record in Precision Medicine - What is Needed**

Evan Brittain, MD, Vanderbilt University

**12:15 pm**     **Closing Summary**

Anna Hemnes, MD, ATSF, Vanderbilt University

Vinicio de Jesus Perez, MD, ATSF, Stanford University

Prof. Martin R. Wilkins, Imperial College of London

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