



Fiscal Year 2023 Annual Report

Dorothy M. Davis Heart and Lung Research Institute
473 West 12th Avenue



**THE OHIO STATE
UNIVERSITY**

COLLEGE OF MEDICINE

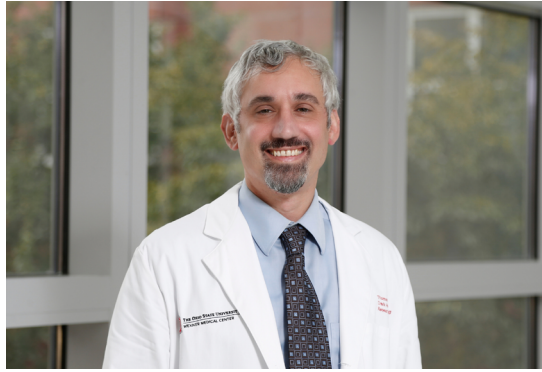
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Welcome

Thomas Hund, PhD - DHLRI Director



Welcome to the Fiscal Year (FY) 2023 Annual Report from the Davis Heart and Lung Research Institute (DHLRI)! On behalf of the DHLRI Leadership Team, I offer my sincere thanks to our faculty, staff and trainees whose combined effort elevated funding and overall impact to new levels in FY23. We don't have enough pages to document every one of their accomplishments in this report but hope to provide just a glimpse into some of the exciting developments and goals for the year ahead. Of course, none of this success would be possible without support from key members of the OSU community, especially the **DHLRI Executive Committee**, **Carol Bradford, MD**, Dean of the College of Medicine, and **John Warner, MD**, CEO of the Wexner Medical Center. Finally, I'd like to acknowledge our community partners and donors, whose dedication and generosity enable a shared vision to advance the understanding, prevention, diagnosis and treatment of heart and lung diseases through interdisciplinary collaboration and innovation.

I'm pleased to report that we made great progress on our FY23 goals to advance Collaboration, Innovation, Translation and Equity (CITE). In general, our research enterprise showed remarkable growth with new people, programs and awards. In the area of **collaboration**, we expanded shared equipment and core facilities to bolster a sustainable and efficient infrastructure that unlocks research potential broadly across the Institute. In a similar vein, we celebrated the inauguration of 2 new DHLRI interdisciplinary research neighborhoods as part of the Chlapaty Labs on the 5th floor of the Pelotonia Research Center, a state-of-the-art 305,000 square foot research building on West Campus. Thanks to generous gifts from **Joe and Linda Chlapaty** and the **Davis Foundation**, this space will host diverse teams of scientists, clinicians, and engineers who collaborate to develop innovative solutions for diagnosis, treatment, and prevention. The new environment will also provide training and education opportunities for students and postdocs who aspire to become leaders in their fields. If you haven't had a chance to see the new space, reach out and we'll set up a tour!

In the areas of **innovation** and **translation**, we established Advanced Therapeutics & Engineering as a new program area in the DHLRI led by **Natalia Higuita-Castro, PhD** (Biomedical Engineering/Neurosurgery). In her role as DHLRI Associate Director of Advanced Therapeutics & Engineering, Dr. Higuita-Castro will help define and execute our strategy to support innovation and technology transfer with the overall goal of translating basic discoveries into new products and services that can benefit patients and society. We also partnered with the College of Medicine to support their successful launch of the Comprehensive Cardiovascular Biorepository, which provides clinically annotated biospecimens, including cardiac tissue and blood to investigators. Our hope for this resource is that it will not only facilitate translation of findings from animal models to human patients but will also foster collaborations between basic scientists and clinicians to broadly elevate impact.

Finally, in the area of equity, I want to highlight our 5-month **Diversity, Equity and Inclusion** (DEI) workshop series in partnership with the **University Office of Diversity and Inclusion** and support from Dean Bradford who participated in the concluding session. Attendance across sessions was outstanding and I was impressed by the vibrant discussion and thoughtful questions. Out of this work, we have launched a new DHLRI DEI Committee with **Rebecca Vanderpool, PhD** (Cardiovascular Medicine) as Chair.

In summary, I'm proud to share the DHLRI FY23 Annual Report, which reflects the dedication, brilliance, and sheer grit of the 1000+ faculty, staff and trainees who comprise the Institute and make it the leading center for cardiovascular and pulmonary research and training. It's an honor to share in their journey to advance the understanding, prevention, diagnosis and treatment of heart and lung diseases through interdisciplinary collaboration and innovation!

Sincerely,



Thomas Hund, PhD
Director
Dorothy M. Davis Heart and Lung Research Institute

DHLRI Executive Committee

Executive Committee - Administrative Team

Thomas Hund, PhD
Professor, Division of Cardiovascular Medicine
Director, Dorothy M. Davis Heart and Lung Research Institute

Kristin Stanford, PhD
Professor, Department of Surgery, General
Associate Director, Dorothy M. Davis Heart and Lung Research Institute
Associate Director, Diabetes and Metabolism Research Center

Penny Jones
Administrative Director, Davis Heart and Lung Research Institute

Izabelle Colvin
Assistant to the Director, Davis Heart and Lung Research Institute

Alan Bakaletz
COM-RTS Liaison, Davis Heart and Lung Research Institute



Executive Committee

Isabelle Deschenes, PhD
Professor and Chair,
Department of Physiology and Cell Biology

Dana Glenn
Director, College of Medicine Grants Management Office

Deanna Golden-Kreutz, PhD
Senior Director, Center for Clinical Research Management

Richard Gumina, MD, PhD
Associate Professor, Division of Cardiovascular Medicine
Associate Dean for Convergent Research,
College of Medicine

Jennifer Hargett
Director, Marketing Communications
Cancer, Heart, Surgery, & Networks
Comprehensive Cancer Center
Wexner Medical Center

Ayesha Hasan, MD
Professor and Interim Director
Division of Cardiovascular Medicine

Natalia Higuita-Castro, PhD
Assistant Professor, Department of Biomedical Engineering
Director of Advanced Therapeutics and Engineering, DHLRI

Jeffrey Horowitz, MD
Professor and Director,
Division of Pulmonary, Critical Care, and Sleep Medicine

Douglas Lewandowski, PhD
Professor, Division of Endocrinology
Director of Translational Research, DHLRI

Dana Mack
Senior Director of Development
Heart and Vascular Center

Rama Mallampalli, MD
Professor, Division of Pulmonary,
Critical Care, and Sleep Medicine
Chair, Department of Internal Medicine

Michael Martin
Associate Executive Director,
Richard M. Ross Heart Hospital

Ernest Mazzaferri, MD
Professor, Division of Cardiovascular Medicine
Medical Director, Richard M. Ross Heart Hospital
Interim Co-Director, Heart and Vascular Center

Nahush Mokadam, MD
Professor and Director,
Division of Cardiac Surgery

Ana Mora, MD
Professor, Division of Pulmonary,
Critical Care, and Sleep Medicine
Director of Lung Research, DHLRI

Matthew Ringel, MD
Professor and Chair,
Department of Molecular Medicine and Therapeutics

Kristine Orion, MD
Associate Professor and Acting Director,
Division of Vascular Surgery

Bryan Whitson, MD, PhD
Professor, Division of Cardiac Surgery
Interim Co-Director, Heart and Vascular Center

Loren E. Wold, PhD
Professor, Division of Cardiac Surgery
Associate Dean for Research Operations and Compliance,
College of Medicine

DHLRI Administrative Team



Thomas Hund, PhD
Director



Penny Jones
Administrative Director



Izabelle Colvin
Assistant to the Director



Jenifer Bennett
Senior Business Analyst



Dan Maloney
Financial Analyst



Dennis Guess
Building Coordinator



DeeAnn Willis-Berry
Fiscal Officer



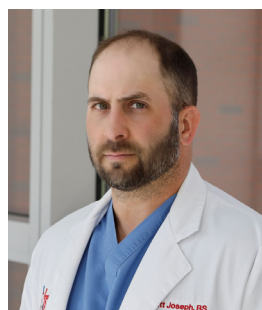
Latisha Roland
Office Coordinator



Alan Bakaletz
COMRTS - DHLRI IT
Service Liaison



Rachel Rosenzweig
Research Associate,
FLOW Core Coordinator



Matt Joseph
Sr. Research Associate,
Interventional Cardiology
Cath Core

Student Administrative Assistants

Andrew Bernhard -
Exercise Science

Bella Hohler -
Health Sciences

Ella Olberding -
Respiratory Therapy

Riece Rivera -
Health Sciences

Associate Directors



Kristin Stanford, PhD
Associate Director
Metabolism Lead

The general focus of Dr. Stanford's research is to investigate how various stressors, including exercise, cause adaptations to adipose tissue which effect overall metabolic health and glucose homeostasis. Her lab uses various omics analyses (metabolomics, structural lipidomics, and signaling lipidomics) to determine how adipose tissue adaptations contribute to whole-body metabolic and cardiac health. Current projects include investigating 1) the role of signaling lipids released from brown and white adipose tissue to mediate whole-body metabolic health and cardiac function; 2) the role of exercise-induced adaptations to adipose tissue and how these changes alter whole-body, skeletal muscle, and cardiac health; and 3) determining the effects of parental exercise on the metabolic and cardiovascular health of the offspring. Ultimately, she hopes the combined knowledge from these projects will allow us to integrate cellular and molecular aspects of adipocyte biology with energy metabolism and provide new therapeutic targets to aid in the fight against cardiovascular disease, obesity, metabolic disease, cancer and aging.



E. Douglas Lewandowski, PhD
Director of Translational Research
Cardiovascular Lead

Dr. Lewandowski pioneered quantifying metabolic flux, enzyme activity, and metabolite transport within cardiomyocytes of beating hearts with novel methodologies for NMR spectroscopy and mass spectrometry detection of stable isotope kinetics. Research focuses on genomic, transcriptional, and proteomic/post-translational regulation of metabolic flux and explores the metabolic basis and consequences of heart failure. He has elucidated numerous adaptive and maladaptive metabolic mechanisms in the pathogenesis of heart failure, and implemented novel, cardiac-specific gene therapies in models of heart disease. A recipient of the NIH R37 MERIT Award, he has received continuous NIH funding for over 30 years. He has been recognized with Distinguished Investigator Awards from the International Society for Heart Research and the British Society for Cardiovascular Research, named a University Scholar by the University of Illinois, and is an elected Fellow of the AAAS, ISHR, APS Cardiovascular Section, and AHA.



Ana Mora, MD
Director of Lung Research
Pulmonary Lead

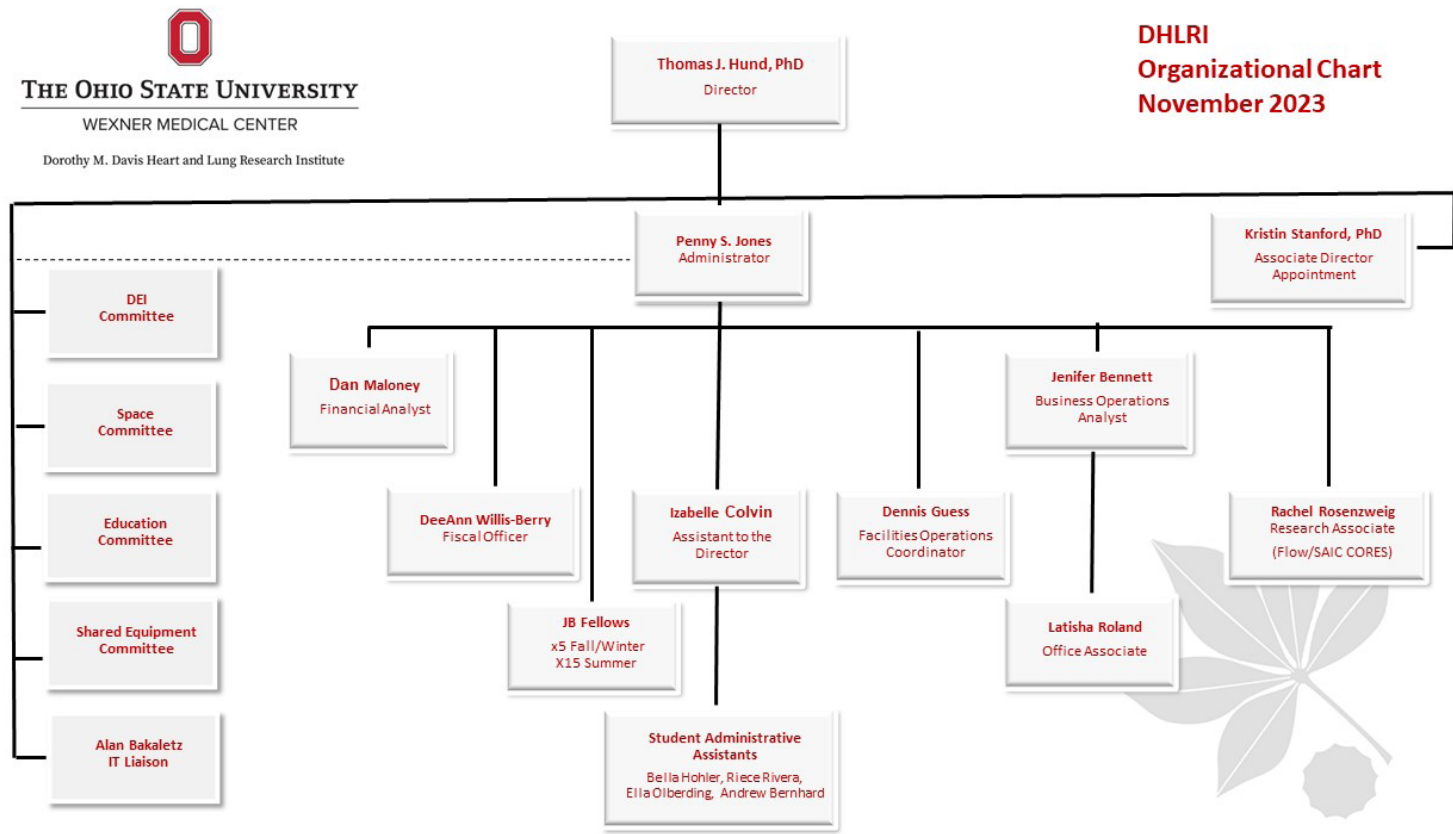
Dr. Mora received her MD degree from Universidad Nacional de Colombia. She did postdoctoral training at Vanderbilt University and moved in 2002 as independent investigator to Emory University. In 2010, she joined the Division of Pulmonary at the University of Pittsburgh, where she was member of the Vascular Medicine Institute and Director of Education of the Aging Institute. Dr. Mora is one of the pioneers of the study of the molecular aspects of the aging lung and the pathogenesis of age-related lung diseases, such as IPF. Her studies have elucidated a critical role of mitochondrial homeostasis in the vulnerability to lung injury and activation of fibrotic responses and senescence. She received in 2023 the ATS Recognition Award for Scientific Accomplishments. She is currently chair of the ATS RCMB Assembly Program Committee, and permanent member of the Lung Injury Repair and Remodeling (LIRR) NIH study section. Dr. Mora has received support for her research from ALA, AHA, and the NIH. Her work has been published in more than 100 peer reviewed publications, several book chapters, and editorial comments.



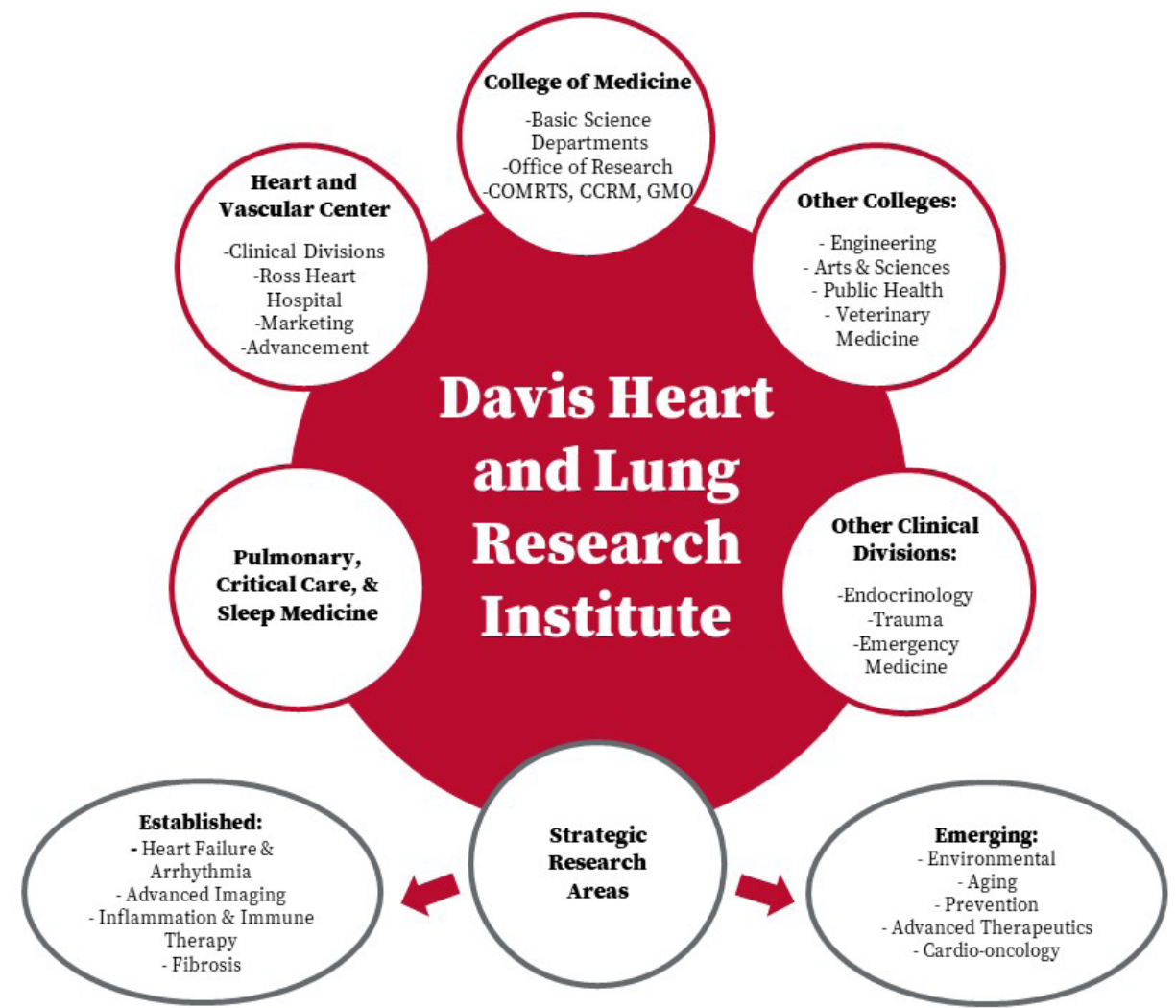
Natalia Higueta-Castro, PhD
Director of Advanced Therapeutics &
Engineering

Dr. Higueta-Castro is an Associate Professor in the Departments of Biomedical Engineering and Neurosurgery at The Ohio State University (OSU). Dr. Higueta-Castro's research is at the forefront of several unique niches linking extracellular vesicles (EVs), gene and cell therapies, and nanomedicine fields, where she is pioneering the development of novel nanocarriers based on engineered EVs for far-reaching therapeutic applications, including neurofibromatosis type 1 (NF1), chronic low back pain, and acute respiratory distress syndrome (ARDS). This work has led to publications in high-ranking journals and over 15 patent filings, 11 of which were licensed to industry. She was recently recognized with the Cellular and Molecular Bioengineering (CMBE) Young Innovator Award (2023), and was named an OSU College of Engineering Innovation Scholar. The contributions of Dr. Higueta-Castro have been instrumental to advance the field of EV-based nanocarriers for non-viral gene and cell therapy applications.

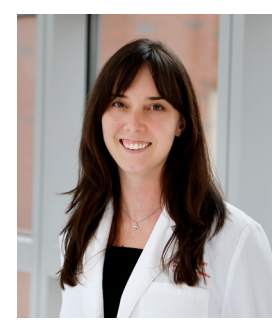
DHLRI Administrative Structure



**DHLRI
Organizational Chart
November 2023**



New Members



Kelsey Black, MD
Assistant Professor,
PCCS



Julia Coleman, MD
Assistant Professor,
Trauma & Critical Care



Gregory Eisinger, MD
Assistant Professor,
PCCS



Nkechi Ijioma, MD
Assistant Professor,
CVM



James Londino, PhD
Assistant Professor,
PCCS



William Marshall, MD
Assistant Professor,
CVM



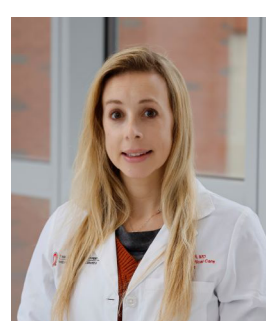
Paul Moodispaw, MD
Associate Professor,
CVM



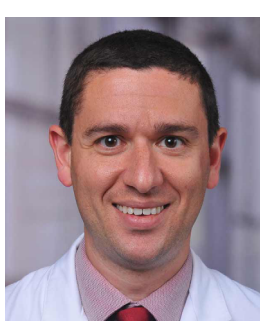
Yuta Nihongaki, PhD
Assistant Professor,
PCB



John Odackal, MD
Assistant Professor,
PCCS



Bronwyn Small, MD
Assistant Professor,
PCCS



Kyle Stinehart, MD
Assistant Professor,
PCCS



Blair Suter, MD
Assistant Professor,
CVM



Michael Tranter, PhD
Associate Professor,
MMT

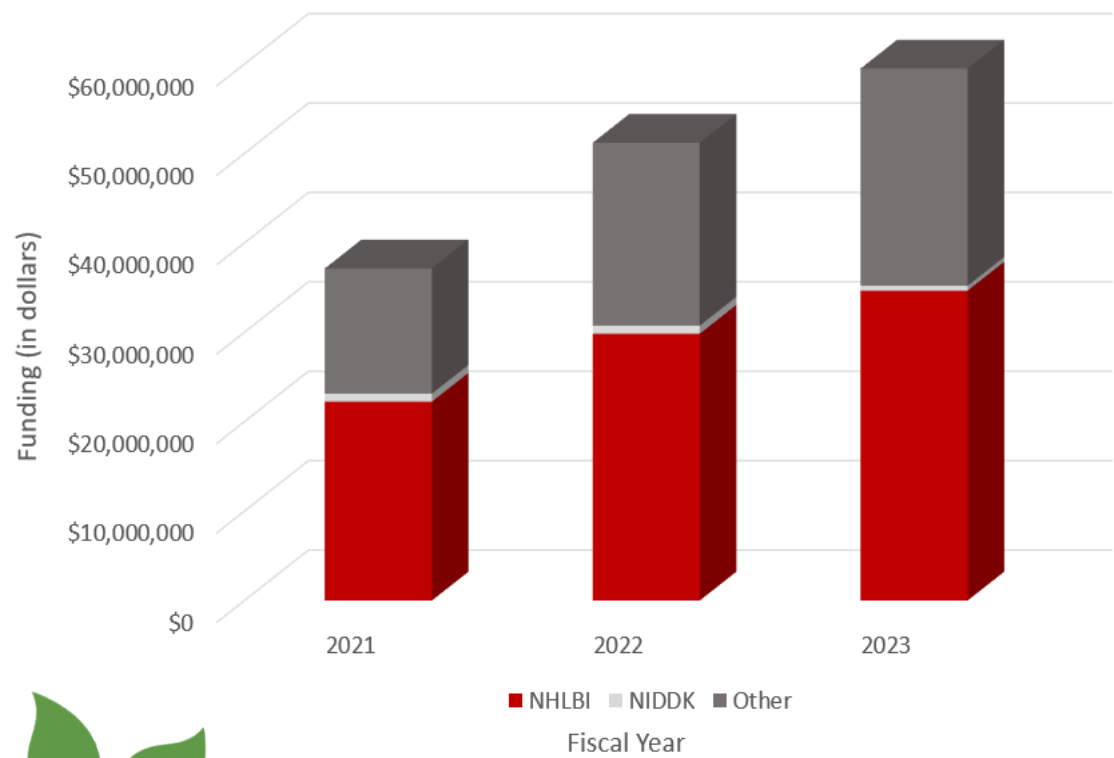


- Department Abbreviation Key**
- CVM** - Cardiovascular Medicine
 - PCCS** - Pulmonary, Critical Care, & Sleep Medicine
 - PCB** - Physiology & Cell Biology
 - MMT** - Molecular Medicine & Therapeutics

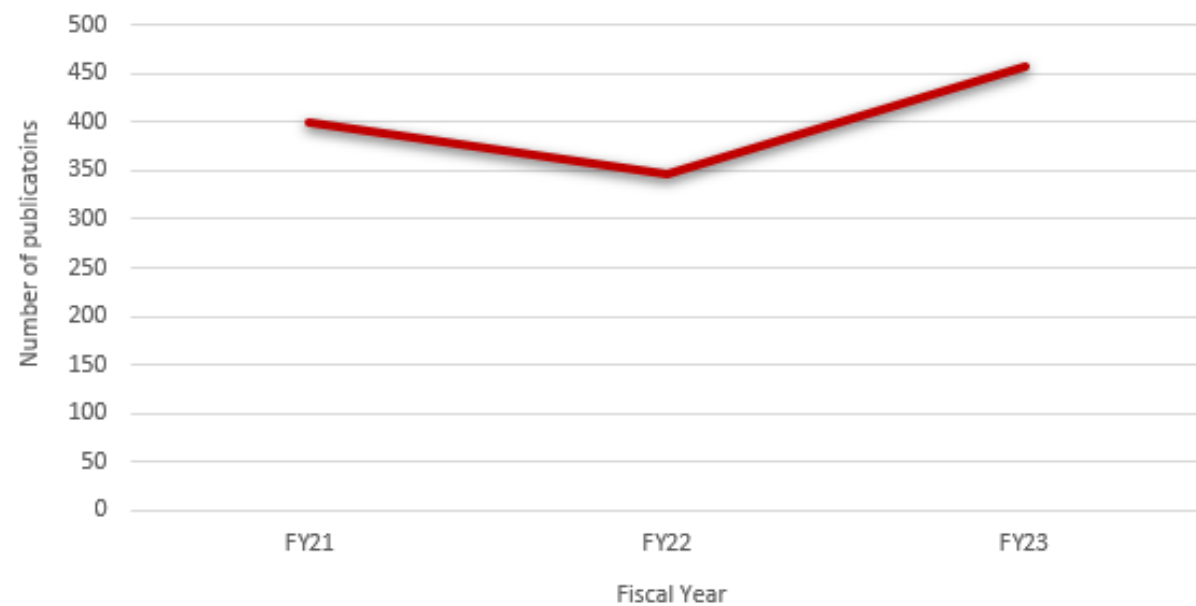
Funding & Publications

FY23 was a phenomenal year for DHLRI members in terms of scholarship. Please refer to the sections covering specific research areas for noteworthy publications, grants and honors. In general, we saw a remarkable increase in annual funding from the NIH National Heart and Lung Blood Institute (NHLBI), total funding, and number of publications in FY23 compared to FY22 with record highs in all categories. In parallel, DHLRI members participated in 507 clinical trials in FY23, an increase of 37% from FY22. This growth reflects tremendous effort from our faculty, staff and trainees who submitted 339 grants in FY23, including 80 grants with a total budget >\$3M. Thank you to all of our members for their dedication and hard work!

Total DHLRI Extramural Funding FY 2020-23



DHLRI Publications



Development



Dr. Hund with members of the Davis Foundation at the Dorothy M. Davis Heart and Lung Research Institute Neighborhood at the Pelotonia Research Center

Notable Gifts

- Anonymous gift in support of the Cardiovascular Interventional Research Fund
- Gift from The Dulick-Scott Foundation of National Philanthropic Trust in support of the Thomas J. Ryan, MD Fund for Rising Faculty
- Gift from Deneen DiDonato Schamer & David Schamer in support of Genetics and Regenerative Medicine Research

Equipment Investment

In our efforts to support our discovery mission, DHLRI continued to invest in the shared equipment program. Recognizing the essential tools for our research work, we replaced basic outdated equipment with new models. In addition, we added new cutting-edge equipment, such as a cell sorter, that would otherwise be too costly or impractical to acquire individually. With purchases of over \$500,000 in shared equipment, researchers have been afforded the opportunity to collaborate more easily, reduce duplication and waste, and enhance the quality and impact of research. DHLRI has continued to engage in partnership with our vendor community in unique ways through which to acquire state-of-the-art equipment in the most economical means possible.



Clinical Trials



The Heart Clinical Trials team became the first in the world to randomize a patient in a clinical trial evaluating the effectiveness of the Apture transcatheter shunt system.

OSU is among top enrollers for several clinical trials related to heart failure and/or structural heart disease (ALT-FLOW II, RESPONDER, Rest, Janus, APOLLO), electrophysiology (JEWEL, RESTART, MODULAR ATP, SOLVE CRT, MARVEN), chronic obstructive pulmonary disease (LINQ COPD), ventilation (INSPIRE-ICU2), and cardiac surgery (PROTECT).

Cardiovascular Research

Honors

Harpreet Singh, PhD (Physiology & Cell Biology) was elected as the Chair of the Bioenergetics, Mitochondria, and Metabolism subgroup of the Biophysical Society. **Sarah Heissler, PhD** (PCB) was elected as the Chair of the Motility and Cytoskeleton subgroup. **Seth Weinberg, PhD** (Biomedical Engineering) was elected as the Chair of the Bioengineering Subgroup.

Loren Wold, PhD (Cardiac Surgery) was named Editor-in-Chief of the FASEB Journal.

Daniel Addison, MD (Cardiovascular Medicine) was appointed as a regular standing member of the NIH Basic Biology of Blood, Heart, and Vasculature Study Section.

Julia Coleman, MD (Critical Care Medicine) received the American Association for the Surgery of Trauma Research and Educational Fund Trauma Critical Care Scholarship.

Ana Laura Lopez Serrano, PhD (Deschenes Lab) received the Wilton Wells Webster Fellowship in Electrophysiology at the 2023 Heart Rhythm Society Scientific Session in New Orleans.

Shanna Hamilton, PhD (Terentyev Lab) was named the BPS 2023 Young Bioenergeticist Award Winner.

Louisa Mezache (Veeraraghavan Lab) was awarded best student speaker award at the Microscopy Society of Northern Ohio annual conference

Featured Publications

Buck B, et al. (Hund Lab) Cardiovascular Magnetic Resonance Imaging in Patients With Ibrutinib-Associated Cardiotoxicity. *JAMA Onc.* 2023; 9(4):552-555. <https://pubmed.ncbi.nlm.nih.gov/36729480/>

Tarasov M, et al. (Radwanski Lab) NaV1.6 dysregulation within myocardial T-tubules by D96V calmodulin enhances proarrhythmic sodium and calcium mishandling. *J Clin Invest.* 2023; 133(7):e152071. <https://pubmed.ncbi.nlm.nih.gov/36821382/>

Ye S, et al. (Mingtao Zhao Lab) Impaired Human Cardiac Cell Development due to NOTCH1 Deficiency. *Circ Res.* 2023; 132(2):187-204. <https://pubmed.ncbi.nlm.nih.gov/36583388/>



DHLRI Researchers at the Gordon Research Conference on Cardiac Arrhythmia Mechanisms

Major Grants

American Heart Association Strategically Focused Research Network on Biologic Pathways of Chronic Psychosocial Stressors on Cardiovascular Health: *Physical Activity Reduces Effects of psychosocial stress And improves Cardiovascular Health (PREACH)*

Kristin Stanford, PhD (General Surgery), **Joshua Joseph, MD** (Endocrinology), **Loren Wold, PhD** (Cardiac Surgery), **Merry Lindsey, PhD** (Meharry Medical College) This project will test whether exercise can protect against stress-induced heart disease by modulating the gut bacteria. The work will include basic science research using mouse models as well as a 24-week diet, education and exercise program called Black Impact for Black men with less-than-ideal heart health. The researchers will seek to determine if the Black Impact intervention improves heart health, how it affects stress and if it changes the gut bacteria in study participants.

NIH NHLBI R01: *Distinct Ion Channel Pools and Intercalated Disk Nanoscale Structure Regulate Cardiac Conduction*

Seth Weinberg, PhD (Biomedical Engineering), **Thomas Hund, PhD** (Cardiovascular Medicine), **Rengasayee Veeraraghavan, PhD** (Biomedical Engineering) The first-ever comprehensive quantification of intercalated disk structure and molecular organization using cutting-edge light and electron microscopy and computational analysis for a theoretical underpinning of ion channel pools and intercalated disk nanoscale structure confer global/local control of cardiac conduction for new therapeutic approaches.

NIH NHLBI R01: *Influence of T cell genotype/phenotype in atherosclerotic cardiovascular disease*

Richard Gumina, MD, PhD (Cardiovascular Medicine) Work explores the role of regulatory T cells (Tregs), expression of the immunosuppressive ectonucleotidase, CD39, and altered purinergic responses in atherosclerotic cardiovascular disease.

Pulmonary Research

Honors

Ana Mora, MD was recognized with the 2023 Scientific Achievement Award from the American Thoracic Society (ATS); she was elected Chair of the Program Committee of the ATS Respiratory Cell Molecular Biology Assembly. In addition, she was named program coordinator of the 2024 European Respiratory Society Lung Conference and received the Women in Medicine and Science Recognition from OSU College of Medicine.

Mauricio Rojas, MD was promoted to the Vice Chair of Research in the Department of Internal Medicine.

Anesa Das, MD (Horowitz Lab) received the 2022 CHEST Distinguished Service Award.

Christian Ghasttas, MD received the American Association of Bronchology and Intervention Pulmonary Distinguished Service Award.

Our trainees were exceptional and received various awards for their presentations. **Sourabh Soni, PhD** (Mebratu Lab) received the OSU OK-PROS Award from OPA -W.K.Kellogg Foundation. The ATS Underrepresented Trainee development scholarship Award went to **Paula Agudelo, PhD** (Mora / Rojas Lab). **Jose Ovando Ricardez, BS** (Mora Lab), received the Public Advisory Roundtable(PAR) Abstract scholarship from the ATS PAR and the Pulmonary Fibrosis Foundation. **Erica Dale** received first place at the annual Denman Undergraduate Research forum. **Pat Sylvester, MD** was awarded the Robert J. Fass award for Outstanding Clinical Fellow in the Department of Internal Medicine for the second consecutive year. **Lorena Rosas, PhD** (Rojas Lab) and **Natalia Vanegas, PhD** (Rojas Lab) received Best Oral Presentation Award at the European Respiratory Society conference. **Paula Agudelo Garcia, PhD** was an invited speaker at the Midwestern Aging Consortium.

American Thoracic Society 2023

The DHLRI team had diverse and impactful representation at the American Thoracic Society 2023 International Conference in Washington, D.C. Our faculty, staff and trainees were involved in more than 60 programmed sessions with activities ranging from presentations at thematic poster sessions and scientific symposia, to serving as organizers and presenters in postgraduate courses, and serving as Chairs and Moderators of poster sessions and scientific symposia. The conference was also marked by a special reception hosted by the pulmonary division, with more than 300 attendees including colleagues, research collaborators, invited guests and leaders of academic pulmonary, critical care and sleep medicine departments from across the nation and from international medical centers.

Featured Publications

Bueno M, et al. (Mora Lab) CYB5R3 in type II alveolar epithelial cells protects against lung fibrosis by suppressing TGF-beta1 signaling. *JCI Ins.* 2023; 8(5):e161487. <https://pubmed.ncbi.nlm.nih.gov/36749633/>

Jia M, et al. (Rojas Lab) Transcription changes of the aging lung. *Aging Cell.* 2023; 22 (10): e13969. <https://pubmed.ncbi.nlm.nih.gov/37706427/>

Sarkar A et al. Regulation of Mesenchymal Cell Fate by Transfer of Active Gasdermin-D via Monocyte-Derived Extracellular Vesicles. *J Immunol.* 2023; 210(6):832-841. <https://pubmed.ncbi.nlm.nih.gov/36688687/>

Mora AL. Spatial mapping of cellular senescence: emerging challenges and opportunities. *Nat Aging.* 2023; 3(7):776-790. <https://pubmed.ncbi.nlm.nih.gov/37400722/>

Major Grants

Our faculty received several major federal grant awards. **Ana Sarkar, PhD** received an R01 for a grant titled “GasderminD regulation of Acute Lung Injury”. **James Londino, PhD** received his first R01 for a grant titled “Examining the role of TRMT1 and tRNA methylation in acute lung injury and ARDS”. **Elliot Crouser, MD** received an R21 for research focused on sarcoidosis titled “Role of Renin-Angiotensin-Aldosterone System during sarcoidosis granuloma formation”. **Sonal Pannu, MBBs** received a K-23 award for her project titled “Leveraging Automated Optimization of Inspired Oxygen and Oxidized Biomarker Lipidomics for Targeted Oxygenation during Mechanical Ventilation: a Pragmatic Clinical Trial”.



Paula Agudelo, PhD along with mentors Mauricio Rojas, MD and Ana Mora, MD at the 2023 ATS Conference

Metabolism Research

Honors

Joshua J. Joseph, PhD (Endocrinology) was awarded the Richard E. Weitzman Outstanding Early Career Investigator Award. He was also elected to the American Society of Clinical Investigators.

E. Douglas Lewandowski, PhD (Endocrinology, Cardiovascular Medicine), received the 2023 Bernard and Joan Marshall Distinguished Investigator Award and Lectureship of the British Society for Cardiovascular Research.



Joshua Joseph, MD

Featured Publications

Belany et al. (Joseph Lab) Effects of Hypocaloric Low-Fat, Ketogenic, and Ketogenic and Ketone Supplement Diets on Aldosterone and Renin. *J Clin Endo Metab.* 2023; 108(7):1727-1739. <https://pubmed.ncbi.nlm.nih.gov/36629058/>

Willows et al. (Townsend Lab) Schwann cells contribute to demyelinating diabetic neuropathy and nerve terminal structures in white adipose tissue. *iScience.* 2023;26(3):106189. <https://pubmed.ncbi.nlm.nih.gov/36895649/>

Kluwe et al. (Joseph Lab) The role of aldosterone and ideal cardiovascular health in incident cardiovascular disease: The Jackson heart study. *Am J Prev Cardiol.* 2023;14:100494. <https://pubmed.ncbi.nlm.nih.gov/37114212/>

Event

The second annual **Preventative Health of Adipose Tissue (PHAT) Symposium** took place on Friday, April 14, 2023 in the DHLRI. A keynote talk was given by **Dr. Jacqueline Stephens, PhD** from Pennington Biomedical Sciences.

This interdisciplinary regional event was open to researchers whose work intersects with the study of adipose tissue, with the goal of bringing together new research teams and collaborations and stimulating discussions around the future of adipose tissue research across the basic, translational, and clinical spectrum.

Major Grants

NIH NHLBI R01: *Adipose tissue mediates cardiac metabolic remodeling in the pathologically stressed heart in the absence of primary metabolic stress*
E. Douglas Lewandowski, PhD (Endocrinology & Cardiovascular Medicine) and **Kristin Stanford, PhD** (General Surgery)
 This research will determine how pathological stress on the heart induces metabolic adjustments to both the heart and adipose tissue, and how these reciprocal responses mediate both cardiac metabolic remodeling and the development of decompensated cardiac hypertrophy with potential consequences to systemic metabolism.

NIH NIDDK R01: *Functional and histological changes to peripheral innervation following spinal cord stimulation in patients with painful diabetic neuropathy*
Kristy Townsend, PhD (Neurosurgery) and **Brian Dalm, MD** (Neurosurgery)
 Spinal cord stimulation (SCS) is a validated treatment for pain, including with painful diabetic peripheral neuropathy (PDPN), the most common form of small fiber neuropathy that impacts more than half of patients with diabetes. The mechanisms by which SCS improves pain are not known, but may include the promotion of small fiber nerve plasticity and regeneration, which this research will test in PDPN patients across 3 groups: conventional medical management, SCS, and SCS with a delayed start of stimulation.



2023 PHAT Symposium speakers and organizers

Advanced Therapeutics & Engineering

Honors

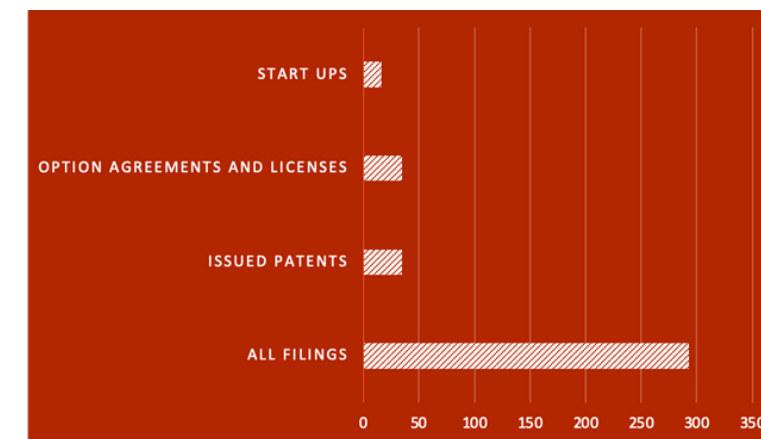
Natalia Higueta-Castro, PhD (Biomedical Engineering and Neurosurgery) was recognized with the cellular and Molecular Bioengineering (CMBE) 2023 Young Innovator Award. This award recognizes rising stars in the field of bioengineering, whose innovative and impactful research has contributed to notably advance their field.

Major Grants

Daniel Gallego-Perez, PhD (Biomedical Engineering and Surgery) was awarded a \$3.1 million grant from the DOD (Army Medical Research Acquisition Activity) to study Non-Viral Gene and Reprogramming-Based Cell Therapies for Peripheral Nerve Injury.

Kristin Stanford, PhD (General Surgery) and **Daniel Gallego-Perez, PhD** (Biomedical Engineering and Surgery) were awarded a \$1.9 million award by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) to pursue Engineering the release of oxylipins through the skin.

IP by the Numbers (FY19 - FY23)



Event

There was strong DHLRI representation at the 2023 Annual Biomedical Engineering Society Meeting where trainees at different levels and PIs showcased their research in Gene and Cell Therapy Applications.

Publications

Salazar-Puerta, AI, et al. (Gallego-Perez Lab) Engineered Extracellular Vesicles Derived from Dermal Fibroblasts Attenuate Inflammation in a Murine Model of Acute Lung Injury. *Adv Mater.* 2023; 35(28):e2210579. <https://pubmed.ncbi.nlm.nih.gov/37119468/>

Salazar-Puerta AI, et al. (Gallego-Perez Lab) Engineered Extracellular Vesicle-Based Therapies for Valvular Heart Disease. *Cell Mol Bioeng.* 2023; 16(4):309-324. <https://pubmed.ncbi.nlm.nih.gov/37810997/>

Das D, et al. (Gallego-Perez Lab) Injectable pulverized electrospun poly(lactic-co-glycolic acid) fibers improve human adipose tissue engraftment and volume retention. *J Biomed Mater Res A.* 2023; 111(11):1722-1733. <https://pubmed.ncbi.nlm.nih.gov/37326365/>

Duarte-Sanmiguel S, et al. (Gallego-Perez Lab) ICAM-1-decorated extracellular vesicles loaded with miR-146a and Glut1 drive immunomodulation and hinder tumor progression in a murine model of breast cancer. *Biomater Sci.* 2023; 11(20):6834-6847. <https://pubmed.ncbi.nlm.nih.gov/37646133/>

Elsisy M, et al. (Tillman) In vitro and In vivo assessment of a novel organ perfusion stent for successful flow separation in donation after cardiac death. *J Biomater Appl.* 2022; 37(3):389-401. <https://pubmed.ncbi.nlm.nih.gov/35466766/>

Alvi SB, et al. (Khan Lab) Modulation of Mitochondrial Bioenergetics by Polydopamine Nanoparticles in Human iPSC-Derived Cardiomyocytes. *ACS Appl Mater Interfaces.* 2022; 14(48): 53451-53461. <https://pubmed.ncbi.nlm.nih.gov/36399764/>

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Members of the Gallego-Perez and Higueta Castro labs at the 2023 BMES Meeting.

Core Labs

New Cores

Cardiovascular Imaging Research Center (CIRC)

The mission of the Cardiovascular Imaging Research Center (CIRC) is to provide high quality human and large animal cardiovascular imaging and image analysis services. The CIRC team helps to identify the optimal imaging modality, and to design appropriate imaging experiments and data analysis strategies through whole-body magnetic resonance imaging (MRI) scanners, whole-body X-ray computed tomography (CT) scanners, image post-processing hardware and software. CIRC has access to CT and MRI (1.5T) equipment located in the Ross Heart Hospital, and to MRI (0.55T and 3T) equipment located at the Martha Morehouse Outpatient Center. *Managers: Drs. Yuchi Han and Orlando Simonetti*

Flow Core (Coming Soon)

This state-of-the-art Flow Cytometry Core is capable of cell analysis and sorting at the single cell level. It includes a spectral high-resolution cell analysis flow sorter (Cytek® Northern Lights) equipped with 3-lasers (BVR), a flow nanoanalyzer from NanoFCM capable of measuring fluorescence in small particles (such as exosomes) and organelles (such as mitochondria), and a flow cell sorter (Cytek® Aurora) equipped with 3-lasers (BVR) and technical support personnel expert in using these machines for various scientific applications. *Manager: Rachel Rosensweig*

Existing Cores

Comprehensive Lab Animal Monitoring System (CLAMS)

Columbus Instrument's Comprehensive Lab Animal Monitoring System (CLAMS) incorporates sub-systems for open circuit calorimetry and activity in an environmental chamber: Oxymax/CLAMS is the one-test solution for simultaneous multi parameter assessment of one to nine mice.

Manager: Lisa Baer

Interventional Cardiology Cath Core Lab

The Cath Core is a fully equipped interventional Cath/EP suite with an OEC 9800 Plus fluoroscopic C-arm. This imaging system has cine, digital spot, and digital subtraction angiography (DSA) capabilities as well as a dedicated cardiac review station for post imaging processing. In addition to the equipment, the Cath Core also provides the experienced interventional and surgical support personnel needed to complete your large animal preclinical experiments.

Manager: Matthew Joseph

Small Animal Imaging Core

The Small Animal Imaging Core (SAIC) is a comprehensive small animal imaging facility. This facility includes high resolution imaging equipment (MRI, ultrasound, microCT and optical), X-ray irradiators (SARRP, RS-2000, GammaCell), body composition analyzer, and personnel trained in the operation of each imaging modality and small animal handling procedures, as well as analytical software support for quantitative image analysis. In addition to providing interim animal housing for serial imaging studies, the SAIC also offers on-site suites for surgical procedures, and animal care provided by the University Laboratory Animal Resources. Image reconstruction, multi-modality fusion, quantitative image analysis. *Manager: Anna Bratasz, PhD*

Human Tissue Biorepository

The Human Tissue Biorepository (HTB) provides Ohio State researchers with a streamlined, IRB-approved process to access high quality, clinically annotated human-sourced biospecimens. It includes "normal" organs from authorized donors that are not suitable for transplant but suitable for research and diseased organs and longitudinal samples from consented transplant patients. *Manager: Sean Stacey, PhD*

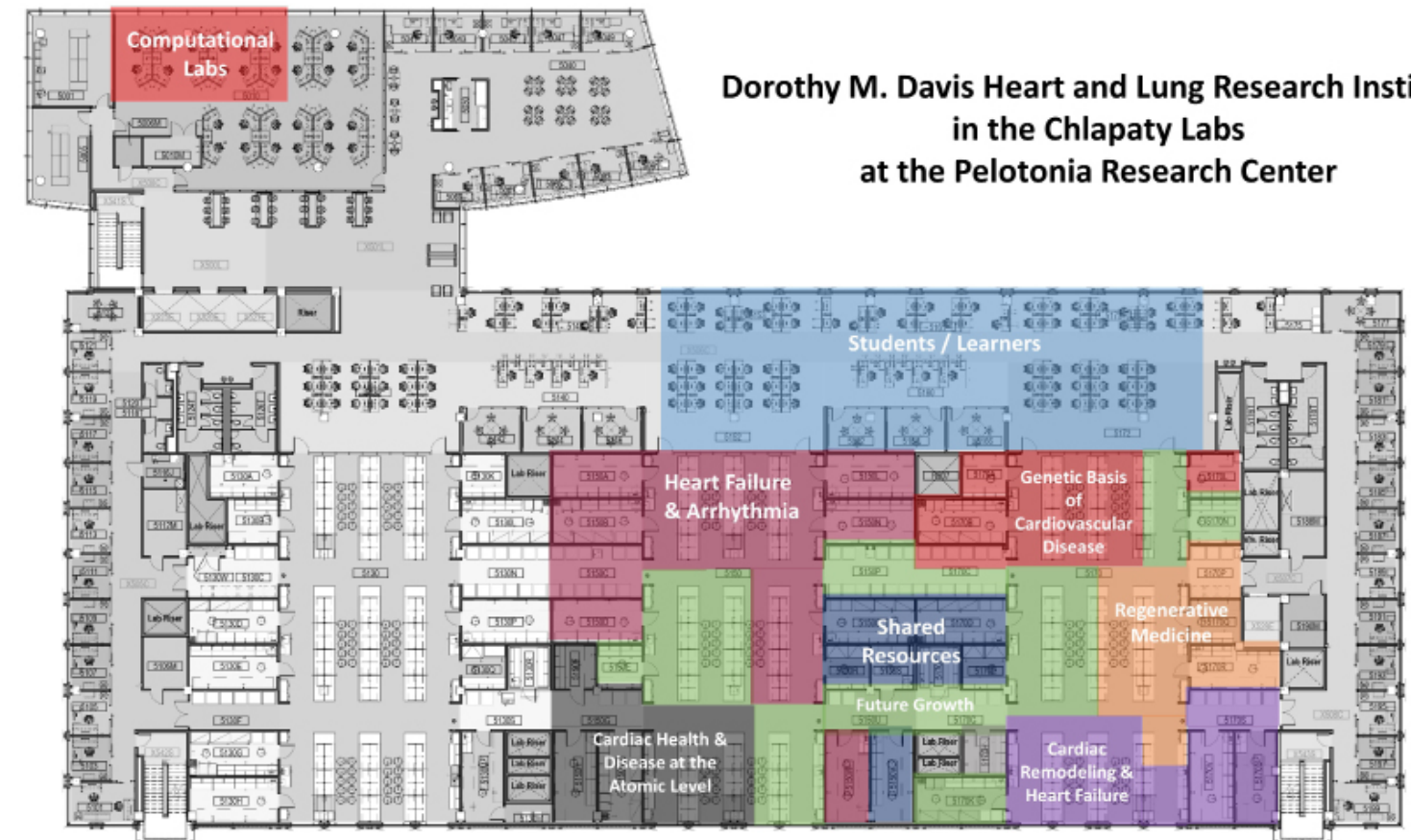
Comprehensive Cardiovascular Biorepository

Housed within DHLRI space, the College of Medicine office of Research in partnership with the DHLRI launched the Comprehensive Cardiovascular Biorepository (CCB), establishing a centralized clinical biospecimen repository (tissue and blood) and data registry within The Ohio State University Wexner Medical Center (OSUWMC). The CCB processes, stores and distributes biospecimens and tissues from subjects with cardiovascular disease. Providing investigators access to high quality and clinically annotated tissue biospecimens, interdisciplinary research will be fueled through such a wealth of available samples, propelling OSU into next-generation research and improved patient outcomes. Led by College of Medicine Associate Dean for Convergent Research Richard Gumina, MD, PhD, the CCB provides for efficiencies in operational practices covering consent, procurement, processing, storage, distribution, fiscal oversight and regulatory compliance allowing for access to valuable resources facilitating the discovery of novel biomarkers, mechanisms, and therapies for cardiovascular diseases.



Hannah Lindsay, Oscar Bermeo Blanco, and Francesca Madiari, PhD in the Comprehensive Cardiovascular Biorepository

Pelotonia Research Center



**Dorothy M. Davis Heart and Lung Research Institute
in the Chlapaty Labs
at the Pelotonia Research Center**

Research Areas at the Pelotonia Research Center

DHLRI Research Day

Research Day Recap

On October 10, 2023, the Dorothy M. Davis Heart and Lung Research Institute hosted its 18th Annual Research Day, showcasing the latest projects and achievements of its faculty and students. The event featured ~130 poster presentations and talks by researchers from various areas of cardiovascular and lung disease. **Dr. John Warner**, CEO of the Wexner Medical Center and Executive Vice President of The Ohio State University, gave remarks and the introduction to keynote speaker **Anthony Rosenzweig, MD**, a renowned expert identifying novel mechanism and therapeutic targets in heart failure, using the exercised heart to understand heart health.

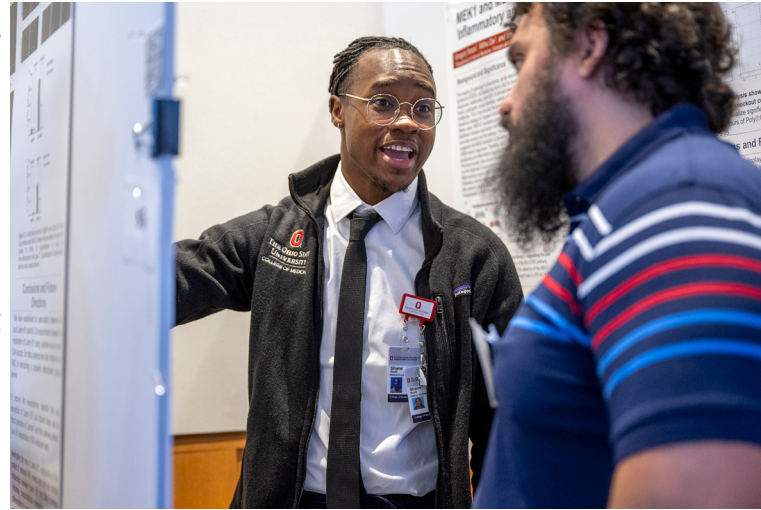
Over the past many years, the DHLRI Research Day successes were due, in part, to the unwavering philanthropic support of our friend **Charles (Chuck) Webb**. Losing a strong advocate of the Institute in June, we pay tribute to his memory and his continuing legacy for his passion of research and social responsibility. His support provided the platform from which to celebrate our best and brightest.

Awards

The day concluded with an awards ceremony where we recognized the outstanding achievements of the DHLRI family, recognizing their efforts to advance science and innovation. Recipients honored were:



Thomas Hund, PhD, Anthony Rosenzweig, MD, Kristin Stanford, PhD, and Seth Weinberg, PhD at the 2023 DHLRI Research Day Awards Ceremony



Shane Scott, OSU Medical Student, presenting his poster at 2023 DHLRI Research Day

- Lorri Fowler** - DHLRI Director's Award
- Orlando Simonetti, PhD** - Melissa G. Piper Distinguished Mentor Award
- Yingman Liu, PhD** - Distinguished Basic Research Staff Award
- Akash Goyal, MD** - Distinguished Clinical Fellow Award
- DeeAnn Willis-Berry** - Distinguished Administrative Staff Award
- Tatiana Cuellar Gaviria, PhD** - Post-Doctoral Scholar of the Year Award
- Vrishti Phadumdeo** - Graduate Student of the Year Award



Mentorship Programs

In partnership with the College of Medicine, DHLRI launched "R01-101", an intense, accelerated grant writing workshop series geared toward the successful submission of a first-time R01. Through an application review, selected mentees were paired with a coach who met monthly covering areas of a successful aims page, budget preparation, the role of the OSP and peer group critiques. The cumulation of the 6-month series will result in a final submission in CY 24. Mentees and coaches in Cohort 1 consist of Drs. Nate Bates (Orthopedics)/Loren Wold and Kristin Stanford, Nicholas Ferrell (Nephrology)/Navjot Pabla, Asvin Ganapathi (Cardiac Surgery)/Richard Gumina, Matthew Long (Pulmonary)/Kymberly Gowdy, Andrew Sas (Nephrology)/Stephen Kolb, and Rebecca Vanderpool (CVM)/Thomas Hund. A second cohort is planned for CY 2024.

Fellowships, Awards, & Outreach

DHLRI launched yet another successful JB Cardiovascular Summer Fellowship, offering 15 fellowships to local underrepresented high school STEM seniors and undergraduates from both inside and outside of OSU. Previous fellowship awardees went on to be published as well as to receive the OSU Aspire award.

In addition, DHLRI supported the Division of Pulmonary's participation in the American Thoracic Society 2023 session and the TriState SenNet Conference, the OSU Diabetes and Metabolism Research Center Dining for Diabetes Annual Dinner, the 2nd Annual PHAT (Preventative Health of Adipose Tissue) Conference and the 36th annual meeting of the Ohio Chapter of the American Physiology Society.

Community events included, the Central Ohio Heart Walk, the Dublin Farmer's Market as well as various local community field trip tours.



JB Fellows End of Year Luncheon at the Pelotonia Research Center

Diversity, Equity, and Inclusion



Dean Bradford speaking at the DHLRI DEI Workshop Wrap-Up

DHLRI successfully wrapped its 5-part foundational DEI series, led by **Sophia Antoun** of the Office of Diversity and Inclusion. The series concluded with a Q&A discussion consisting of panelists **Dr. Leon McDougle**, **Sakima Smith**, and **Jennifer Sipos**, with opening remarks by **Dean Carol Bradford**. The DHLRI DEI Committee, chaired by **Dr. Rebecca Vanderpool**, is now leading the charge to further drive the success of our clinical research operations and training.

C.I.T.E - ing the Future

DHLRI Strategic Plan

As we look to the year ahead, it's important to reflect on specific goals that will help us achieve our overall mission of accelerating breakthroughs in the understanding, diagnosis and treatment of heart and lung disease by advancing **collaboration, innovation, translation and equity**. The DHLRI Leadership Team is in the process of revising the DHLRI Patterns of Administration and 5-year Strategic Plan, which we plan to complete in early 2024. These core documents will be shared broadly to receive input from our key constituents, including the DHLRI Executive Committee and Investigators before going to the College of Medicine and ultimately University for approval. Of course, these larger initiatives are advanced through our annual goals, which we've divided into 5 priority areas: 1) Research excellence; 2) Education and mentoring; 3) Resource stewardship; 4) Outreach and communication; and 5) Technology transfer. Elaborating briefly on planned activity in each area:



Matthew Ringel, MD

Research Excellence

Research Excellence: We are thrilled about the launch of the **Department of Molecular Medicine & Therapeutics** (MMT) in the College of Medicine earlier this year. **Matt Ringel, MD** is the Chair of this new basic science department and has defined a compelling vision that intersects nicely with strategic priorities in the DHLRI. We have already partnered with MMT to jointly recruit **Mike Tranter, PhD**, previously an Associate Professor in the Department of Cardiovascular Medicine at the University of Cincinnati. Dr. Tranter's lab is in the Chlapaty Labs on the 5th floor of the Pelotonia Research Center (PaRC) and will pursue collaborative research in the area of transcriptional regulation of heart failure. Our plan is to recruit 1 more DHLRI faculty in FY24 in partnership with MMT, and 1-2 additional faculty in other units. In parallel, we will continue our effort to bolster shared facilities and core resources across the Institute. Specifically, we are looking forward to the expansion of the Small Animal Imaging Core into the PaRC and establishment of new cores for Flow Cytometry and Cell Sorting, and Small Animal Surgery.

Education & Mentoring

We will continue to deliver high quality educational content through our Research in Progress (RIP), Discovery Series and Annual Research Day under the leadership of DHLRI Education Committee Chair, **Seth Weinberg, PhD** (Biomedical Engineering). New this year, we have also introduced a monthly "Working Wednesdays" series that addresses practical issues related to conducting high impact science at OSU. We also plan to expand the reach of our programming by hosting symposia that provide an opportunity for on campus interactions in areas of strategic importance while also showcasing OSU and the DHLRI to the community outside of Columbus. In particular, we look forward to celebrating the 2023 Schottenstein Prize laureate, **Richard Kitsis, MD**, The Dr. Gerald and Myra Dorros Chair in Cardiovascular Disease and Director of the Wilf Family Cardiovascular Research Institute at Albert Einstein College of Medicine. We are also excited for the "Connor Senn Symposium: Sudden Cardiac Death in the Athlete" to be held December 2, 2023 in partnership with the Heart & Vascular Center, Cardiovascular Medicine, Sports Medicine, and Nationwide Children's Hospital. This event will bring together faculty, trainees, health professionals and athletic trainers from around the region to share latest advances in clinical care and research.



Seth Weinberg, PhD

Resource Stewardship

We welcomed **Dana Mack** as the new Senior Director of Development for the Heart and Vascular Center and DHLRI. Dana has been with the OSU Office of Advancement for 7 years as a major gift fundraiser and will be a fantastic addition to the team. We look forward to working with Dana and her team over the next year to expand philanthropic efforts in DHLRI.

Outreach & Communication

Over the past year, we've unveiled a new website, intranet and social media presence. If you don't already, follow us on X/Twitter @OhioStateDHLRI! Going forward, we will continue our push to raise awareness of the many achievements of our faculty, staff and trainees. In particular, we plan to work with Marketing and Communications to increase DHLRI presence at national meetings, while organizing 1-2 symposia a year that showcase OSU and Columbus.



John Warner, MD, CEO of The Ohio State University Wexner Medical Center with members of the Ana Mora, MD and Mauricio Rojas, MD labs

Technology Transfer

At the DHLRI, we are committed to enhancing the capacity of scientific research, fostering collaboration and innovation, and creating new opportunities for helping heart and lung disease patients. Technology transfer is an important aspect of this process, which we plan to integrate into the culture at DHLRI. As a first step over the next year, we plan to perform benchmarking analysis for level of current activity within the Institute to help identify the best strategy to support and expand growth.

In-Closing...

Thank you for joining us on our mission to drive discovery that will improve the quality of life for people with heart and lung disease. We are very proud of our accomplishments to date and equally exhilarated about the prospects for the year ahead through a culture of collaboration, innovation, translation and equity.



DHLRI Membership List

Biological Chemistry & Pharmacology

Arthur Burghes, PhD
Nicholas Funderburg, PhD
George Kyriazis, PhD
Kamal Mehta, PhD
Kirk Mykytyn, PhD

Biomedical Engineering

Rizwan Ahmad, PhD
Daniel Conway, PhD
Daniel Gallego-Perez, PhD
Samir Ghadiali, PhD
Keith Gooch, PhD
Natalia Higuaita-Castro, PhD
Mark Ruegsegger, PhD
Rengasayee Veeraraghavan, PhD
Seth Weinberg, PhD

Biomedical Sciences |

Microbial Infection & Immunity

Amal Amer, MD, PhD

Center for Biostatistics

Stanley Lemeshow, PhD

Chemical & Biomolecular Engineering

Jeffrey Chalmers, PhD
Andre Palmer, PhD

Chemistry & Biochemistry

Vicki Wysocki, PhD

Dentistry

John Sheridan, PhD

Electrical Engineering

Lee Potter, PhD

Emergency Medicine

Mahmood Khan, MPharm, PhD

Epidemiology

Amy Ferketich, PhD

Family & Community Medicine

TM Adesanya, MD, PhD
Randell Wexler, MD

Food Science & Technology

Ahmed Yousef, PhD

Health & Rehabilitation Services |

Medical Sciences Division

Mireia Gurerau, PharmD, PhD

Human Nutrition

Martha Belury, PhD
Ouliana Ziouzenkova, MD

Internal Medicine |

Cardiovascular Medicine

William Abraham, MD
Umair Ahmad, MD
Talal Attar, MD
Ralph Augostini, MD
Cindy Baker, MD
Ragavendra Baliga, MD
Michelle Ballinger, MD
Philip Binkley, MD
Indra Bole, MD
Konstantinos Boudoulas, MD
Vincent Brinkman, MD
Curt Daniels, MD
Emile Daoud, MD
Steven Dean, MD
Michael Donnally, MD
Beth Foreman, MD
Veronica Franco, MD
Katarzyna Gil, MD
Arnold Good, MD
Richard Gumina, MD, PhD
Garrie Haas, MD
Yuchi Han, MD
Thura Harfi, MD
Ayesha Hasan, MD
Lauren Hassen, MD
Mahmoud Houmsse, MD
William Houser, MD
John Hummel, MD
Thomas Hund PhD
Rami Kahwash, MD
Steven Kalbfleisch, MD
Arsad Karcic, MD
Sara Koenig, PhD
Tapan Kundu, MD
John Larry, MD
Lauren Lastinger, MD
Scott Lilly, MD, PhD
Jim Liu, MD
Doug Magorien, MD
Raymond Magorien, MD

Unni Marar, MD
Ernest Mazzafferri, MD
Isla McClelland, MD
Laxmi Mehta, MD
Wesley Milks, MD
David Orsinelli, MD
Vaiibhav Patel, MD
Adam Potter, MD
Ben Romer, MD
James Ryan, MD
Salvatore Savona, MD
Orlando Simonetti, PhD
Sakima Smith, MD
Gbemiga Sofowora, MD
Matthew Tong, MD
Ajay Vallakati, MD
Rebecca Vanderpool, PhD
Scott Visovatti, MD
Karolina Zareba, MD

Internal Medicine |

Endocrinology, Diabetes, & Metabolism

Andrew Carley, PhD
Joshua Joseph, MD
Willa Hsueh, MD
E. Douglas Lewandowski, PhD

Internal Medicine | Human Genetics

Jason Cowan, PhD
Elizabeth Jordan, MS, LGC
Daniel Kinnamon, PhD
Ray Hershberger, MD

Internal Medicine |

Microbiology

Daniel Wozniak, PhD

Internal Medicine | Nephrology

Daniel Birmingham, PhD
Nicholas Ferrell, PhD
Pei-Hui Lin, PhD
Todd Pesavento, MD
Brad Rovin, MD

Internal Medicine | Pulmonary, Critical Care & Sleep Medicine

Emily Amin, MD
Megan Ballinger, PhD

Joseph Bednash, MD
Nitin Bhatt, MD
Kelsey Black, MD
Nathan Brummel, MD
Lawrence Chan, DO
John Christman, MD
Julia Coleman, MD
Megan Conroy, MD
Avraham Cooper, MD
Sangwoon Chung, PhD
Elliot Crouser, MD
Philip Diaz, MD
Ryan Donald, MD
Gregory Eisinger, MD
Joshua Englert, MD
Vincent Esguerra, MD
Matthew Exline, MD
Laszlo Farkas, MD
Lynn Fussner, MD
Christian Ghattas, MBChB
Lauren Goodman, MD
Kymberly Gowdy, PhD
Derrick Herman, MD
Kevin Ho, MD
Steven Holfinger, MD
Jeffrey Horowitz, MD
Jennica Johns, MD
Nkechi Ijioma, MD
Manjula Karpurapu, PhD
Meena Khan, MD
James Londino, PhD
Matthew Long, PhD
Ulysses Magalang, MD
Rama Mallampalli, MD
William Marshall, MD
Yohannes Mebratu, PhD
Paul Moodispaw, MD
Ana Mora, MD
Sindu Mukku, MD
Ali Naeem, MD
Richard Nho, PhD
David Nunley, MD
John Odackal, MD
Stella Ogake, MBChB
Jasleen Pannu, MBBS
Sonal Pannu, MD
Narasimham Parinandi, PhD

Johnathan Parsons, MD
Nicholas Pastis, MD
Alberto Revelo, MD
Mauricio Rojas, MD
Justin Rosenheck, DO
Anasuya Sarkar, PhD
Troy Schaffernocker, MD
Bronwyn Small, MD
Carleen Spitzer, MD
Jerome Stasek, MD
Kyle Stinehart, MD
Blair Suter, MD
Sarah Tapyrik, MD
Joanna Tsai, MD
Jing Wang, MD
Michael Wert, MD

Internal Medicine | Rheumatology and Immunology

Latha Ganesan, PhD

Microbial Infection and Immunity

Adriana Forero, PhD
Emily Hemann, PhD
Murugesan Rajaram, PhD

Molecular Medicine & Therapeutics

Michael Tranter, PhD

Neurological Surgery

Paco Herson, PhD
Kristy Townsend, PhD

Neuroscience

Phillip Popovich, PhD

Obstetrics & Gynecology

William Grobman, MD
Douglas Kniss, PhD

Pediatrics | Nationwide Children's Hospital

Benjamin Blais, MD
Vidu Garg, MD
John Gunn, PhD
Mark Hall, MD
Deqiang Li, MD, PhD
Brenda Lilly, PhD
Leif Nelin, MD
Mingtao Zhao, DVM, PhD

Pharmacy

Cynthia Carnes, PharmD, PhD
Terry Elton, PhD

Przemyslaw Radwanski, PharmD, PhD

Physiology and Cell Biology

Xun Ai, MD
Kedryn Baskin, PhD
Brandon Biesiadecki, PhD
Krishna Chinthalapudi, PhD
Jonathan Davis, PhD
Isabelle Deschenes, PhD
Vadim Fedorov, PhD
Jidong Fu, MD, PhD
Sandor Gyorke, PhD
Sarah Heissler, PhD
Paul Janssen, PhD
Beth Lee, PhD
Christoph Lepper, PhD
Peter Mohler, PhD
Yuta Nihongaki, PhD
Jill Rafael-Fortney, PhD
Harpreet Singh, PhD
Matthew Stratton, PhD
Nuo Sun, PhD
Dmitry Terentyev, PhD
Noah Wiesleder, PhD
Jing Zhao, MD, PhD
Yutong Zhao, MD, PhD
Mark Ziolo, PhD

Psychiatry and Behavioral Health

Tamar Gur, MD, PhD

Radiology

Arunark Kolipaka, PhD

Surgery | Cardiac

Mona El Refaey, PhD
Matthew Gorr, PhD
Bryan Whitson, MD, PhD
Loren Wold, PhD
Lufang Zhou, PhD
Hua Zhu, PhD

Surgery | General

Carrie Sims, MD, PhD
Kristin Stanford, PhD

Surgery | Transplant

Ginny Bumgardner, MD, PhD

Vascular Disease and Surgery

Bryan Tillman, MD, PhD

Veterinary Biosciences

Estelle Cormet-Boyaka, PhD

Celebrating Over 20 Years of Research at the DHLRI

2023
Kristin Stanford, PhD named Associate Director of DHLRI.

DHLRI expands its footprint as an anchor on the 5th floor of the Pelotonia Research Center with the addition of several labs.

Research funding at The Ohio State University College of Medicine experienced double-digit growth during the 2023 fiscal year, setting a new record at \$421.4 million.

2022
Thomas J. Hund, PhD is named Director of DHLRI

DHLRI received a \$5.5 million gift from the Dorothy M. Davis Foundation to support a new research chair and sponsor a floor in the new Pelotonia Research Center

2021
At the forefront of the global COVID-19 response, DHLRI continued to play an active role in fighting COVID-19. Repurposing lab space for COVID testing, countless numbers of samples from around the State were processed.

Personnel volunteered to create almost 400,000 virus transport media (VTM) tubes which were used throughout Ohio and nationwide.

DHLRI administration assists in the herculean effort to help process public vaccination for those 80 and older.

2020
DHLRI celebrates their 20th Anniversary, virtually. Due to the COVID-19 pandemic, the event was held through Zoom.

2019
Joe and Linda Chalpaty make a \$15 million commitment to further Atrial Fibrillation research.

2018
The 35,000 square foot Bob and Corrine Frick Center for Heart Failure and Arrhythmia is opened; the first-of-its-kind center in the nation.

2017
The DHLRI expands adding 6 additional sites with a total space footprint of >200,000 square feet.

Philanthropic support grows 90% since 2013.

Thomas J. Hund, PhD named Associate Director of DHLRI.

2016
DHLRI encompasses over 700 faculty, staff, and trainees from nine different colleges of 26 departments and divisions.

500 articles on basic and translational research appear in top-tier journals, spanning subjects from molecules to humans resulting in more than 200 clinical research trials in cardiovascular and pulmonary medicine.

2013
TriFit challenge begins with event proceeds going directly to DHLRI for research into early detection of heart disease.

2012
DHLRI expands to over 600 faculty, staff, and trainees.

Connor Senn Memorial Soccer Match and Symposium on Sudden Cardiac Death; proceeds benefitting DHLRI (raised over a quarter million dollars over past 2 decades).

2011
Peter J. Mohler, PhD is hired as Director

2010
The Ohio State cardiac research tissue program is started, providing diseased and healthy human heart tissue for researchers, with over 200 human hearts procured to date.

2007
Dr. Thomas Ryan joined the Ohio State University Heart Center on July 1, 2007 as director. He was also the John G. and Jeanne Bonnet McCoy Chair in Cardiovascular Medicine and held appointments as professor of internal medicine and physician-scientist leader for the Medical Center's heart signature program - which unites the Davis Heart and Lung Research Institute and the Ross Heart Hospital.

2005
For the first time, OSU heart and lung programs are ranked among "America's Best" by U.S. News and World Report's Hospitals list.

2003
An OSURF satellite office is established in the DHLRI.

2002
The OSU Department of Surgery and the Davis Heart and Lung Research Institute host the first conference in the United States to address the potential role of oxygen in wound care. This international conference focuses on oxygen sensing, oxidant signaling, oxygen therapeutics, gene therapy, angiogenesis, inflammation, and clinical care.

Jay Zweier, MD, PhD is hired as Director.

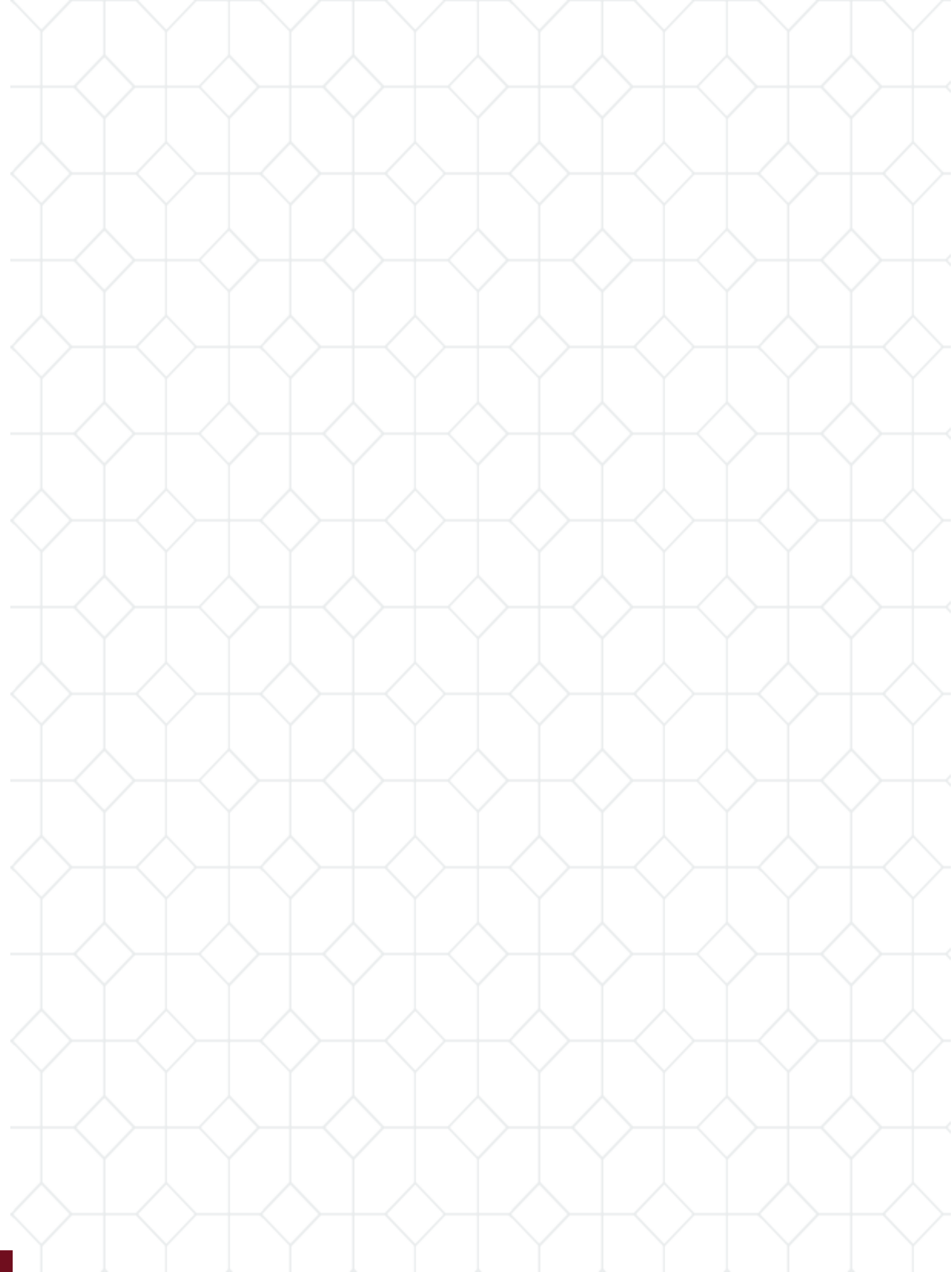
Broke ground on the Richard M. Ross Heart Hospital, clinical arm of the HVC and direct partner in DHLRI research and translational care.

2001
The OSU Heart & Lung Research Institute is renamed Dorothy M. Davis Heart and Lung Research Institute, as approved by the Board of Trustees upon receiving a \$1,000,000 endowment and \$10 million gift.

2000
The OSU Heart and Lung Research Institute opens its doors to a 96,000 square foot free-standing building, one of the largest and most comprehensive Institutes/Centers at The Ohio State University and dedicated institutes in the country devoted to cardiovascular, pulmonary, renal, and metabolic disease.



Notes



**With cooperation by contributors, this annual report was created
and edited by Isabelle Colvin, DHLRI.**



THE OHIO STATE UNIVERSITY

WEXNER MEDICAL CENTER

Dorothy M. Davis Heart and Lung Research Institute