

# C.I.T.E.

*Collaboration, Innovation, Translation, and Equity*

## FY22 Annual Report

Dorothy M. Davis Heart and Lung Research Institute  
473 W 12th Avenue  
Columbus, OH 43210

January 26, 2023



THE OHIO STATE  
UNIVERSITY  

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COLLEGE OF MEDICINE



# DHLRI Executive Committee

## Executive Committee - Administrative Team

**Tom Hund, PhD**

Division of Cardiovascular Medicine  
Director, Dorothy M. Davis Heart and Lung Research Institute

**Kristin Stanford, PhD**

Associate Professor, Department of Physiology and Cell Biology  
Associate Director, Dorothy M. Davis Heart and Lung Research Institute  
Associate Director, Diabetes and Metabolism Research Center

**Penny Jones**

Administrator, 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 - DHLRI Membership

**Emily Bell**

Senior Director of Development

**Rama Mallampalli, MD**

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

**Isabelle Deschenes, PhD**

Professor, Department of Physiology and Cell Biology  
Chair, Department of Physiology and Cell Biology

**Michael Martin**

Associate Executive Director,  
Richard M. Ross Heart Hospital

**Dana Glenn**

Director, College of Medicine Grants Management Office

**Ernest Mazzaferri, MD**

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

**Deanna Golden-Kreutz, PhD**

Senior Director, Center for Clinical Research Management

**Nahush Mokadam, MD**

Professor, Division of Cardiac Surgery  
Director, Division of Cardiac Surgery

**Jennifer Hargett**

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

**Ana Mora, MD**

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

**Ayesha Hassan, MD**

Clinical Associate Professor,  
Division of Cardiovascular Medicine  
Interim Director, Division of Cardiovascular Medicine

**Matthew Ringel, MD**

Professor, Division of Endocrinology,  
Diabetes, and Metabolism  
Director, Division of Endocrinology,  
Diabetes, and Metabolism

**Natalia Higueta-Castro, PhD**

Assistant Professor, Department of  
Biomedical Engineering

**Timur Sarac, MD**

Professor, Division of Vascular Surgery  
Director, Division of Vascular Surgery

**Jeffrey Horowitz, MD**

Professor, Division of Pulmonary,  
Critical Care, and Sleep Medicine  
Director, Division of Pulmonary,  
Critical Care, and Sleep Medicine

**Bryan Whitson, MD, PhD**

Professor, Division of Cardiac Surgery  
Interim Co-Director, Heart and Vascular Center

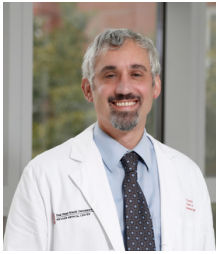
**Douglas Lewandowski, PhD**

Professor, Division of Cardiovascular Medicine  
Director of Translational Research, DHLRI

**Loren E. Wold, PhD**

Professor, Department of Physiology and Cell Biology  
Associate Dean for Research Operations and Compliance,  
College of Medicine

# DHLRI Administrative Team



**Thomas Hund, PhD**

Director  
Thomas.Hund@osumc.edu



**Penny Jones**

Administrator  
Penny.Jones@osumc.edu



**Izabelle Colvin**

Assistant to the Director  
Izabelle.Colvin@osumc.edu



**Jenifer Bennett**

Research Program Manager  
Jenifer.Bennett@osumc.edu



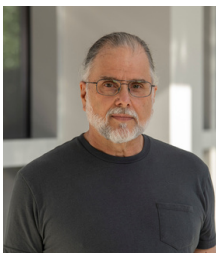
**Dennis Guess**

Building Coordinator  
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**DeeAnn Willis-Berry**

Fiscal Officer  
Deeann.Willis-Berry@osumc.edu



**Alan Bakaletz**

COMRTS  
DHLRI IT Service Liaison  
Alan.Bakaletz@osumc.edu



**Isabella Hohler**

Student Administrative Assistant



**Riece Rivera**

Student Administrative Assistant

## Coming Soon . . .

- Financial Analyst - Dan Maloney
- Front Desk Associate
- Sidney Lauffer - Student Administrative Assistant



# New Associate Director, DHLRI



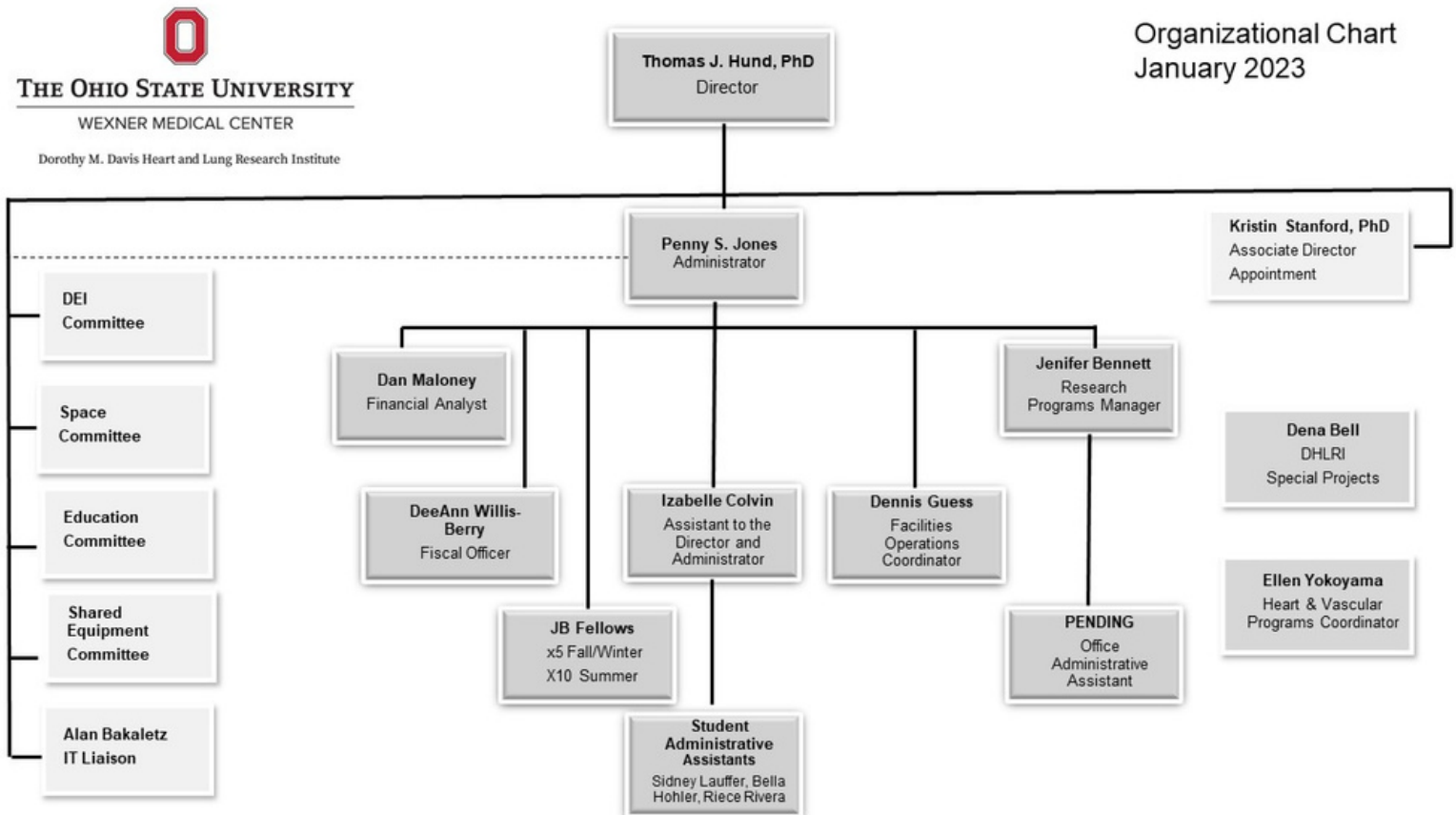
**Kristin Stanford, PhD**

Associate Director

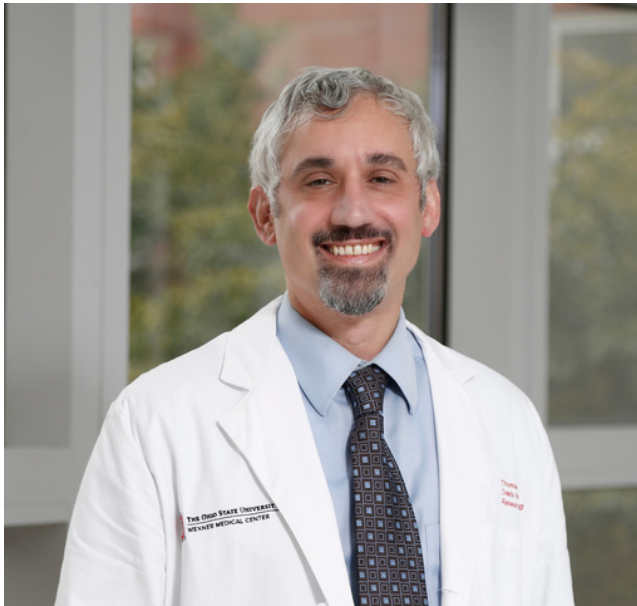
Kristin.Stanford@osumc.edu

Dr. Stanford received her Ph.D. from the University of California-San Diego followed by post-doctoral studies at Harvard Medical School/Joslin Diabetes Center. She started at The Ohio State University in the Department of Physiology and Cell Biology in 2015. Dr. Stanford's laboratory is focused on investigating the novel molecular mechanisms of exercise that improve metabolic and cardiovascular health. Exercise is a widely accepted modality to decrease blood glucose concentrations in patients with diabetes; even a single session of exercise can lower blood glucose concentrations by stimulating glucose uptake into the skeletal muscles. Exercise also has many additional health benefits, including lowering blood pressure, improving lipid levels and lowering the risk of heart disease. More recently, her lab has become interested in how exercise affects the lipidomic profile in humans and rodents, identifying signaling lipids that play a direct role to improve fatty acid oxidation and cardiac function. Given the profound clinical importance of the metabolic and cardiovascular effects of exercise, there is a great need to understand the underlying molecular mechanisms that mediate these metabolic improvements.

## Administrative Restructure



# Welcome



I am pleased to introduce the first of our revamped Fiscal Year (FY) Annual Reports from the Davis Heart and Lung Research Institute (DHLRI)! In the ensuing pages, you will find hard metrics and highlights of our success over the previous year (with a focus on FY22), ongoing projects about which we are particularly excited, and our strategic plan for the year and years ahead. In the steady state, we plan to release this report on an annual basis in the autumn shortly after close of the FY. At the outset, I'd like to express my gratitude to our faculty, trainees and staff that propelled our research portfolio to new heights in FY22. Your hard work, dedication, collegiality and brilliance are essential ingredients to DHLRI's stature as a premiere research institution in Columbus and beyond. I also want to thank the DHLRI Executive Committee, the Ohio State College of Medicine, and the Ross Heart Hospital for their invaluable guidance and support. Finally, a special thanks to our community partners without whom the DHLRI would not be possible.

As I hope will be apparent as you flip through the rest of this report, there was much to celebrate over the past year. We began FY22 by launching an outreach campaign to engage campus leaders as well as the broader community. In this spirit, we hosted several campus leaders over the past year including College of Medicine Dean Carol Bradford, MD, for tours so they could meet with some of our amazing teams and advance a dialogue about how to strengthen partnerships across campus. We also made a concerted effort to enhance our online and social media presence as a way of increasing visibility. In parallel, we initiated regular quarterly reports that are distributed by email and archived on the website. Aside from outreach, another major focus was defining a sustainable growth plan for DHLRI, with an emphasis on the planned opening of the Interdisciplinary Research Facility (IRF) in June 2023. The DHLRI administrative team engaged in countless meetings, pored over floor plans, donned hard hats and safety glasses for site tours, but at the end of the day the invested time has paid dividends in a solid plan for what I know will be an electric research environment on the 5th floor of IRF.

Along these lines, we were delighted to celebrate a transformational \$5.5M gift from the William H. Davis, Dorothy M. Davis and William C. Davis Foundation that includes support for a named DHLRI research neighborhood in the IRF.

Beyond the planned opening of DHLRI neighborhoods in the IRF, there is much to be excited about in the year ahead. We will build on outreach initiatives launched over the previous year to incorporate Diversity, Equity, and Inclusion as a pillar of the DHLRI mission. Our DEI campaign will begin with a 5-part monthly series in collaboration with the Office of Diversity and Inclusion from which we will pivot quickly to roll out a strategic plan to enhance DEI in DHLRI based on the premise that groundbreaking ideas are drawn from a deep pool of shared experience and perspectives. This conversation is especially important as we look to launch our next phase of growth through partnership with departments/divisions across the College and University.

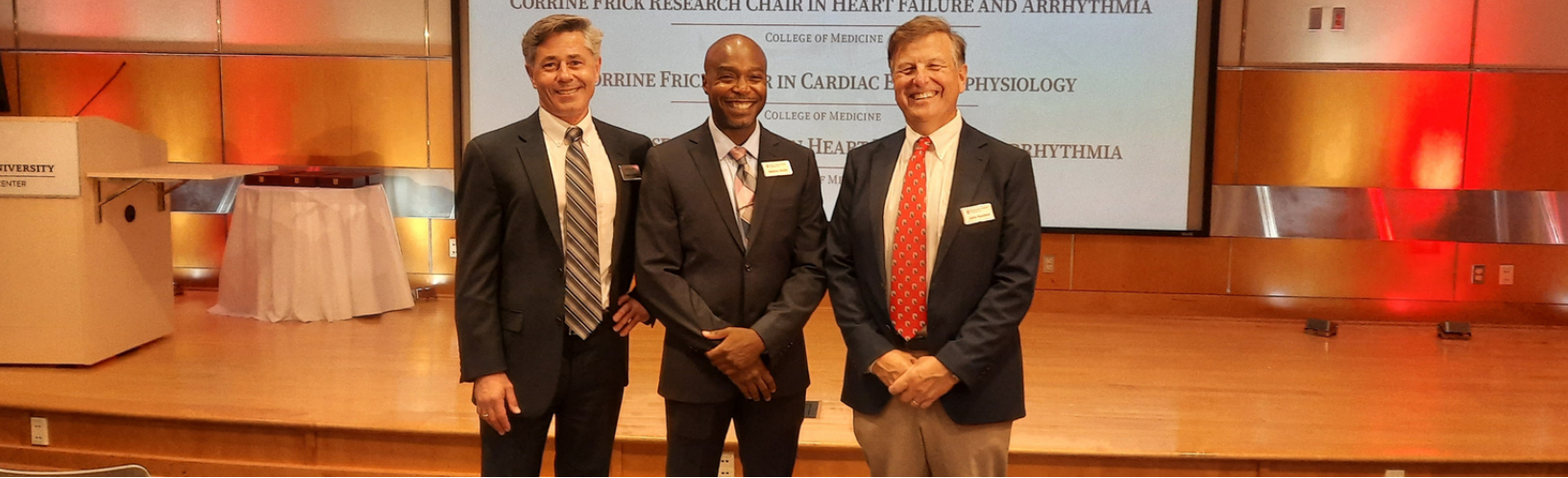
Areas that we hope to support through aggressive recruiting including foundational therapeutics & drug design, systems biology, stem cell biology, and tissue engineering. At the same time, a major goal for the next year is to expand support for our investigators to write competitive grants, especially large, collaborative grants that leverage our combined expertise.

For me, personally, this report holds special significance as it is the first in my official capacity as Director of the Davis Heart and Lung Research Institute. It was a highlight of my career to be chosen to lead this incredible group of investigators, trainees and staff and I look forward to finding new ways to support and grow heart and lung research and education at Ohio State. In his book "The Song of the Cell," the physician scientist Siddhartha Mukherjee describes the heart as comprised of "citizen cells" imbuing the organ with an unparalleled level of cooperativity and synchrony. This description serves as an apt analogy for the essence of what, in my view, makes the DHLRI such a vibrant and essential institution for the advancement of translational heart and lung research. In the DHLRI, we believe that impactful science is a team sport requiring a dynamic exchange of ideas, expertise and resources across individual labs and disciplines. The job of the DHLRI, then, is to identify opportunities, provide resources, and ensure the integrity of the infrastructure required to support team science. Of course, we celebrate the individual accomplishments of our investigators but our focus is on ways to leverage each researcher's skills and efforts into excellence at a larger scale. Returning to our heart analogy, we view each lab as a cell in a larger organ – By working together in a coordinated fashion, I know that we will make great strides in pushing the frontier of heart and lung research with implications for patients in Ohio and beyond!

Sincerely,

A handwritten signature in black ink that reads "Thomas J. Hund".

Thomas J. Hund, PhD  
Director and William D. and Jacquelyn L. Wells Chair  
Dorothy M. Davis Heart and Lung Research Institute  
Professor, Departments of Internal Medicine and  
Biomedical Engineering  
The Ohio State University



Vadim Fedorov, PhD, Sakima Smith, MD, and John Hummel, MD - Corrine Frick Chairs in Heart Failure and Arrhythmia

# In Review

By every measure, FY22 was a productive one in DHLRI. In this section, we review key metrics related to funding, publications, recruitment, development, education, and outreach. We also provide highlights broken into the following major program areas: Cardiovascular, Pulmonary, and Metabolism. Before we dive into the data, I'd like to draw your attention to one trend in particular. After a small dip in FY21, total NIH research dollars showed a dramatic rebound in FY22, surpassing pre-COVID levels. My interpretation of these numbers is that our investigators did not waste time during the slow down caused by COVID but rather were busy writing grants – and we are now witnessing the fruits of those labors. A round of applause to everyone who despite the stress of running a homeschooling program or caring for sick family members or dealing with illness themselves found the motivation to get that grant or paper out! The expectation is that, going forward, both funding and publications will show a steady upward trend as our lives slowly return to pre-COVID normalcy.

## Clinical Trials Management Organization (CTMO)

By the numbers (heart and lung related research):



### COVID-19 Clinical Studies 2020-22:

- Neutralization of the SARS-CoV-2 Omicron BA.4/5 and BA.2.12.1 Subvariants. Qu P, Faraone J, Evans JP, Zou X, Zheng YM, Carlin C, **Bednash JS**, Lozanski G, **Mallampalli RK**, Saif LJ, Oltz EM, **Mohler PJ**, **Gumina RJ**, Liu SL. N Engl J Med. 2022 Jun 30;386(26):2526-2528. doi: 10.1056/NEJMc2206725.
- Neutralization of the SARS-CoV-2 Deltacron and BA.3 Variants. Evans JP, Qu P, Zeng C, Zheng YM, Carlin C, **Bednash JS**, Lozanski G, **Mallampalli RK**, Saif LJ, Oltz EM, **Mohler PJ**, **Gumina RJ**, Liu SL. N Engl J Med. 2022 Jun 16;386(24):2340-2342. doi: 10.1056/NEJMc2205019.
- Neutralization of SARS-CoV-2 Omicron sub-lineages BA.1, BA.1.1, and BA.2. Evans JP, Zeng C, Qu P, Faraone J, Zheng YM, Carlin C, **Bednash JS**, Zhou T, Lozanski G, **Mallampalli R**, Saif LJ, Oltz EM, **Mohler PJ**, Xu K, **Gumina RJ**, Liu SL. Cell Host Microbe. 2022 Apr 25:S1931-3128(22)00220-7. doi:10.1016/j.chom.2022.04.014.
- Neutralizing antibody responses elicited by SARS-CoV-2 mRNA vaccination wane over time and are boosted by breakthrough infection. Evans JP, Zeng C, Carlin C, Lozanski G, Saif LJ, Oltz EM, **Gumina RJ**, Liu SL. Sci Transl Med. 2022 Mar 23;14(637):eabn8057. doi: 10.1126/scitranslmed.abn8057.
- Neutralization and Stability of SARS-CoV-2 Omicron Variant. Zeng C, Evans JP, Qu P, Faraone J, Zheng YM, Carlin C, **Bednash JS**, Zhou T, Lozanski G, **Mallampalli R**, Saif LJ, Oltz EM, **Mohler P**, Xu K, **Gumina RJ**, Liu SL. bioRxiv. 2021 Dec 20:2021.12.16.472934. doi: 10.1101/2021.12.16.472934.
- Loss of Neutralizing Antibody Response to mRNA Vaccination against SARS-CoV-2 Variants: Differing Kinetics and Strong Boosting by Breakthrough Infection. Evans JP, Zeng C, Carlin C, Lozanski G, Saif LJ, Oltz EM, **Gumina RJ**, Liu SL. bioRxiv. 2021 Dec 7:2021.12.06.471455. doi: 10.1101/2021.12.06.471455.

\* During FY 20-22, many factors impacted clinical research being done at OSU. The COVID-19 pandemic specifically had a major impact, as many studies had to be paused or canceled. Only essential studies were permitted to continue.



# Development

Notable major gifts to the DHLRI in FY22 include:

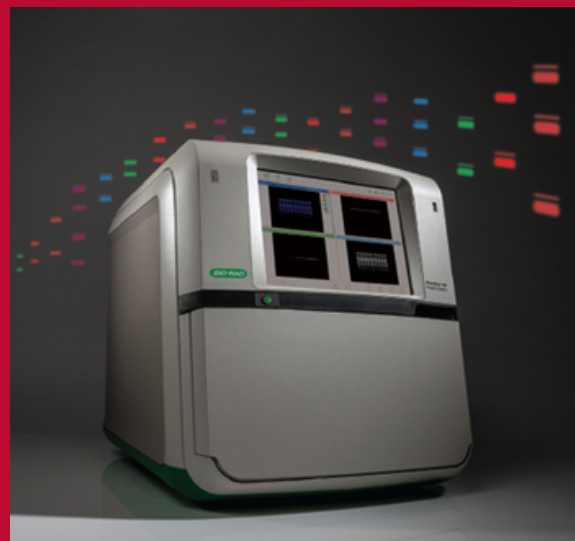
- Dorothy M. Davis Foundation - to create a new research chair and sponsor a floor at the new Interdisciplinary Research Facility
- Anonymous gift - to support research on the effects of a ketogenic diet on heart failure
- Anonymous gift - to support the JB Project
- Denny and Cathy DiDonato - to support cardiomyopathy with muscular dystrophy research and genetics research
- Tom and Theresa McGarity - to support IPF research
- The Webb Family - to purchase shared equipment



*DHLRI Faculty with Members of the Davis Foundation*

## Equipment Investment

DHLRI added a Flow Cytometer, Flow NanoAnalyzer, ChemiDoc Imaging System, and an additional Emergency Use -80 and -20 to the Shared Equipment List. In addition, in partnership with the College of Medicine, DHLRI purchased a 2-Photon Confocal. Over the past 2 years, an investment of almost \$700,000 was made to the DHLRI equipment portfolio.



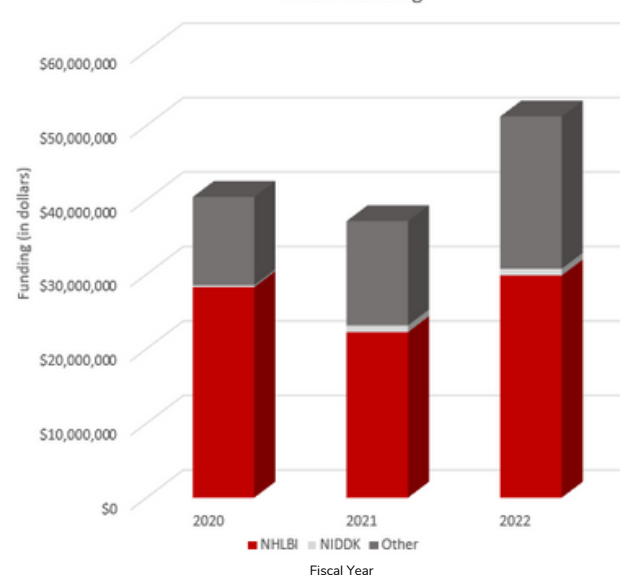
*ChemiDoc Imaging System*

# Funding

## Grants of note:

- **Sandor Gyorke, PhD** (Physiology & Cell Biology) and **Jon Davis, PhD** (PCB) with **Federica Accornero, PhD** (PCB), **Andriy Belevych, PhD** (PCB), **Paul Janssen, PhD** (PCB), **Prez Radwanski, PharmD** (Pharmacy), **Svetlana Tikunova, PhD** (PCB), **Sai Veeraraghavan, PhD** (Biomedical Engineering) – NIH NHLBI R01, “Regulation and dysregulation of cardiac EC coupling by calmodulin.” **\$3,834,504 over 5 years**
- **Vadim Fedorov, PhD** (Physiology & Cell Biology) with **John Hummel, MD** (Cardiovascular Medicine), **Lon Simonetti, PhD** (Cardiovascular Medicine), **Bryan Whitson, MD, PhD** (Cardiac Surgery), **Michael Knopp, MD, PhD** (Radiology), **Maciej Pietrzak, PhD** (Biomedical Informatics) – NIH NHLBI R01, “Targeting the arrhythmogenic sources of human atrial fibrillation.” **\$3,326,148 over 5 years**
- **Harpreet Singh, PhD** (PCB) and **Mahmood Khan, PhD** (Emergency Medicine) with **Dean Boudoulas, MD** (CVM) – NIH NHLBI R01, “Molecular identity of exosomal BK channels.”
- **Lon Simonetti, PhD** (Cardiovascular Medicine) with **Rizwan Ahmad, PhD** (Biomedical Engineering), **Juliet Varghese, PhD** (BME), **Matthew Tong, MD** (CVM), **Thura Harfi, MD** (CVM), **Saurabh Rajpal, MD** (CVM), **Sabrena Noria, MD** (Surgery), **Ayesha Hasan, MD** (CVM), **Vedat Yildiz, MS** (Biostatistics) – NIH NHLBI R01, “Development and validation of cardiovascular MRI techniques on low-field, ultra-wide bore system to assess patients with severe obesity.” **\$2,876,936 over 5 years**
- **Nicholas Funderburg, PhD** (Health and Rehabilitation Sciences) and **Mark Cameron, PhD** (Case Western Reserve University) with **Susan Koletar, PhD** (Infectious Diseases), **Chris Taylor, PhD** (Health and Rehabilitation Sciences), **Ken Riedl, PhD** (Food Science and Technology), **Thura Harfi, MD** (Cardiovascular Medicine), **Randy Wexler, MD** (Family Medicine) – NIH NHLBI R01, “Plaque and blood derived macrophages: a multi-omic assessment of CVD pathogenesis in PLWH.”

DHLRI Funding

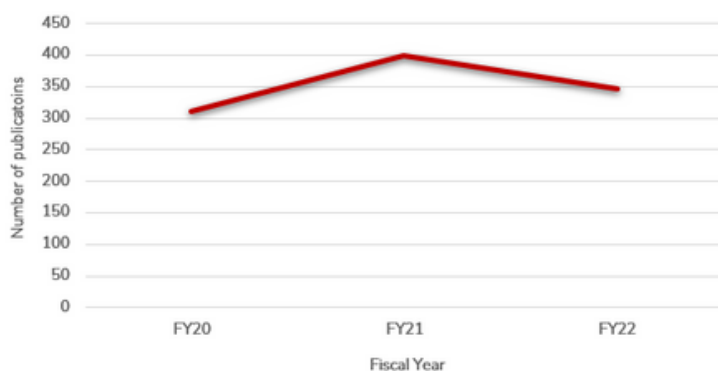


## Training Grants:

- **Jill Rafael-Fortney, PhD** (PCB) and **Brandon Biesiadecki, PhD** (PCB) – NIH NHLBI T32, “Training to provide the knowledge, skills, and culture to the next generation of cardiovascular scientists”
- **Willa Hsueh, MD** (Endocrinology) and **Sakima Smith, MD** (Cardiovascular Medicine) – NIH NHLBI T32, “Postdoctoral training in cardiometabolic science.”
- **Rama Mallampalli, MD** (Pulmonary, Critical Care and Sleep Medicine) and **Ginny Bumgardner, MD, PhD** – NIH GM T32 – “Medical Scientist Training Program - The Ohio State University.”

# Publications

DHLRI Publications



## Publications of Note:

- **Bogdanov V, Soltisz AM, Moise N, Sakuta G, Orenko BH, Janssen PML, Weinberg SH, Davis JP, Veeraraghavan R, Györke S.** Distributed synthesis of sarcolemmal and sarcoplasmic reticulum membrane proteins in cardiac myocytes. *Basic Res Cardiol.* 2021 Oct 28;116(1):63. doi: 10.1007/s00395-021-00895-3. PMID: 34713358; PMCID: PMC8553722.
- **Go C, Elsisy M, Frenz B, Moses JB, Tevar AD, Demetris AJ, Chun Y, Tillman BW.** A retrievable, dual-chamber stent protects against warm ischemia of donor organs in a model of donation after circulatory death. *Surgery.* 2022 Apr;171(4):1100-1107. doi: 10.1016/j.surg.2021.10.040. Epub 2021 Nov 25. PMID: 34839934; PMCID: PMC8960345.
- **Kalyanasundaram A, Li N, Gardner ML, Artiga EJ, Hansen BJ, Webb A, Freitas MA, Pietrzak M, Whitson BA, Mokadam NA, Janssen PML, Mohler PJ, Fedorov VV.** Fibroblast-Specific Proteotranscriptomes Reveal Distinct Fibrotic Signatures of Human Sinoatrial Node in Nonfailing and Failing Hearts. *Circulation.* 2021 Jul 13;144(2):126-143. doi: 10.1161/CIRCULATIONAHA.120.051583. Epub 2021 Apr 20. PMID: 33874740; PMCID: PMC8277727.
- **Koenig SN, Sucharski HC, Jose EM, Dudley EK, Madias F, Cavus O, Argall AD, Williams JL, Murphy NP, Keith CBR, El Refaey M, Gumina RJ, Boudoulas KD, Milks MW, Sofowora G, Smith SA, Hund TJ, Wright NT, Bradley EA, Zareba KM, Wold LE, Mazzaferri EL Jr, Mohler PJ.** Inherited Variants in *SCARB1* Cause Severe Early-Onset Coronary Artery Disease. *Circ Res.* 2021 Jul 9;129(2):296-307. doi: 10.1161/CIRCRESAHA.120.318793. Epub 2021 May 12. PMID: 33975440; PMCID: PMC8273129.
- **Lee H, Fei Q, Streicher A, Zhang W, Isabelle C, Patel P, Lam HC, Arciniegas-Rubio A, Pinilla-Vera M, Amador-Munoz DP, Barragan-Bradford D, Higuera-Moreno A, Putman RK, Sholl LM, Henske EP, Bobba CM, Higuera-Castro N, Shalosky EM, Hite RD, Christman JW, Ghadiali SN, Baron RM, Englert JA.** mTORC1 is a mechanosensor that regulates surfactant function and lung compliance during ventilator-induced lung injury. *JCI Insight.* 2021 Jul 22;6(14):e137708. doi: 10.1172/jci.insight.137708. PMID: 34138757; PMCID: PMC8410036.
- **Petrosino JM, Hinger SA, Golubeva VA, Barajas JM, Dorn LE, Iyer CC, Sun HL, Arnold WD, He C, Accornero F.** The methyltransferase METTL3 regulates muscle maintenance and growth in mice. *Nat Commun.* 2022 Jan 10;13(1):168. doi: 10.1038/s41467-021-27848-7. PMID: 35013323; PMCID: PMC8748755.
- **Neczypor EW, Saldaña TA, Mears MJ, Aslaner DM, Escobar YH, Gorr MW, Wold LE.** e-Cigarette Aerosol Reduces Left Ventricular Function in Adolescent Mice. *Circulation.* 2022 Mar 15;145(11):868-870. doi: 10.1161/CIRCULATIONAHA.121.057613. Epub 2022 Feb 21. PMID 35184570; PMCID: PMC8923958.



# New DHLRI Members

## Julia Coleman, MD

Surgery Fellow  
College of Medicine  
Department of Surgery,  
Trauma, Critical Care,  
and Burn

## Lauren Hassen, MD

Assistant Professor  
College of Medicine  
Division of  
Cardiovascular Medicine

## Ann McAlearney, ScD

Professor  
College of Medicine  
Department of  
Family and Community  
Medicine

## Zhengtao Zhang, PhD

Research Assistant Professor  
College of Medicine,  
Division of  
Cardiac Surgery

## Matthew Gorr, PhD

Research Assistant Professor  
College of Nursing

## Paco Herson, PhD

Professor  
College of Medicine  
Division of  
Neurological Surgery

## Isla McClelland, MD

Assistant Professor  
College of Medicine  
Division of  
Cardiovascular Medicine

## Rebecca Vanderpool, PhD

Assistant Professor  
College of Medicine,  
Division of  
Cardiovascular Medicine

## William Grobman, MD

Professor  
College of Medicine  
Department of  
Obstetrics and Gynecology

## Joshua Joseph, MD

Assistant Professor  
College of Medicine  
Division of  
Endocrinology, Diabetes, and  
Metabolism

## Yohannes Mebratu, DVM, PhD

Assistant Professor  
College of Medicine,  
Division of Pulmonary  
Critical Care, and Sleep Medicine

## Salvatore Savona, MD

Assistant Professor  
College of Medicine  
Division of  
Cardiovascular Medicine

## Tamar Gur, MD, PhD

Assistant Professor  
College of Medicine  
Department of  
Psychiatry and  
Behavioral Health

## Diaqiang Li, MD, PhD

Principle Investigator  
Nationwide Children's Hospital  
Center for  
Cardiovascular Research

## Adam Potter, MD, PhD

Assistant Professor  
College of Medicine  
Division of  
Cardiovascular Medicine

## Lufang Zhou, PhD

Professor  
College of Medicine,  
Division of Cardiac Surgery  
College of Engineering,  
Department of  
Biomedical Engineering

# Fellowships and Awards

The DHLRI awarded over \$200,000 in fellowships and awards in 2022 ranging from fellowships for high school, undergraduate, and graduate students, to grants for students and faculty.

### American Heart Association / DHLRI USFP Grant

- Undergraduate Student Research Program
- Awarded to: Lilyah Varghese, Abigail Richardson, Jordan Boyd, Natlie Kellon, and Zaina Kret

### JB Summer Fellowship

- Cardiovascular research training for undergraduate and high school students in translational cardiovascular science.
- Awarded to students from: Bowdoin College Case Western, Allegheny College, Ohio State University, Olentangy Liberty High School, Northmont High School, and Upper Arlington High School

### Synergy Award

- Spur large-scale collaborative research projects for DHLRI Faculty, Staff, and Trainees in one of the following key strategic growth areas: 1) Prevention research for cardiovascular/pulmonary health; 2) Novel mechanisms for heart failure; 3) Atrial fibrillation and stroke; 4) Women's cardiovascular/pulmonary health; and 5) Pulmonary fibrosis.
- Awarded to: Drs. Isabelle Deschenes, Prabhakara Nagareddy, and Mauricio Rojas / Ana Mora

### TriFit Pre-Doctoral Fellowship

- Post Candidacy fellowship to OSU cardiovascular or pulmonary researchers to enhance post-candidacy training during the academic year.
- Awarded to: Michael Yaeger and Yue Pan



Summer 2022 JB Fellows in front of Ohio Stadium

# Core Labs

## CLAMS

Columbus Instrument's Comprehensive Lab Animal Monitoring System (CLAMS) incorporates sub-systems for open circuit calorimetry and activity in an environmental chamber: Oxyman/CLAMS is the one-test solution for simultaneous multi parameter assessment of one to nine mice. Operation of Oxyman/CLAMS and data collection is performed by an integrated program. The resulting secure data sets can be exported to Comma Separated Value (CSV) files and provide the link between Oxyman/CLAMS and your existing data analysis tools.

The CLAMS core is managed by Kristin Stanford, PhD (Associate Professor, Physiology and Cell Biology) and Lisa Baer (Research Scientist). Please contact Lisa Baer (Lisa.Baer@osumc.edu) with any questions.

## Interventional Cardiology Cath

The Davis Heart and Lung Research Institute's Interventional Cath Core fosters the development of interventional devices, therapies, and techniques by providing a translational laboratory setting where basic research findings can be developed into clinically relevant treatments for cardiovascular diseases. The Non-GLP core is set up to accommodate a wide variety of interventional cardiac procedures using large animal models. Minimally invasive chronic procedures are permitted in this space. Non-cardiac studies can also benefit from the use of fluoroscopic guidance allowing real time x-ray confirmation during procedures. Orthopedic groups have found it useful for guiding injections into joints. The aide of a contrast agent makes it possible for surgeons to look for leaks following procedures in the GI tract.

The core is equipped with an OEC 9800 mobile C-arm with cardiac package and digitally archived images.

Support equipment include an anesthesia machine, ventilator, basic monitoring equipment (ECG, pressure, pulse Ox), cautery, IV pump and power injector.

The Interventional Cardiology Cath is managed by Matthew Joseph (Matthew.Joseph@osumc.edu).

## Small Animal Imaging

The Small Animal Imaging Core (SAIC) at the Davis Heart and Lung Research Institute is a comprehensive small animal imaging facility available to investigators at The Ohio State University and other academic and commercial institutions. This facility includes high resolution imaging equipment (MRI, ultrasound, microCT and optical), X-ray irradiator, 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, high resolution graphics and networking to the facility's server are also available.

## Comprehensive Transplant Center Biorepository

The Comprehensive Transplant Center (CTC) Biorepository provides high-quality, clinically annotated normal and diseased human biospecimens for current and future Ohio State University-affiliated research. Our ultimate goal is to enhance human tissue research and precipitate innovative scientific discovery that will result in improved patient treatments and outcomes.

The CTC Biorepository and its IRB protocols function to facilitate efficient specimen and data access to researchers, lower administrative burdens, increase the patient participation rates and ensure the protection of patients and their data, while serving to stimulate human tissue research at OSU. Our hope is this translates into researchers being more competitive for grants and high impact publications that further moves our research institute toward an era of great scientific growth.

# Research Day

*DHLRI hosted the 17th Annual Research Day on October 19th, 2022. Organized by Jenifer Bennett, Research Programs Manager, 2022 Research Day Featured 130 posters, talks from exceptional trainees, and a highly distinguished keynote speaker, Joseph Wu, MD, PhD.*

Joseph Wu, MD, PhD, the Simon H. Stertzer, MD, Professor of Medicine and Radiology at Stanford University, Director of the Stanford Cardiovascular Institute and President Elect of the American Heart Association. Dr. Wu is a member of the National Academy of Medicine and the American Association for the Advancement of Science among other societies and has pioneered the use of patient specific induced pluripotent stem cells to advance our understanding of cardiovascular disease mechanisms.



Joseph C. Wu, MD, PhD

## DHLRI Research Day Awards

### Undergraduate

Liyah Varghese  
Sahej Bindra  
Erica Dale

### Research Staff

Michael Wallace  
Jordan Boyd  
Karisa Meyer

### Pre-Doctoral

Casey Beard  
Mahmoud Shalaan  
Sarah Sturgill

### Distinguished Awards

Kymberly Gowdy, PhD  
Melissa G. Piper Mentor Award  
Dahlia Kenawy, MD  
Distinguished Clinical Fellow / Resident  
Roman Covarrubias, PhD  
Distinguished Basic Research Staff  
Sarah Karow  
Distinguished Clinical Research Staff  
Matt Joseph  
Distinguished Administrative Staff  
Kaitlyn Vitek  
Director's Award

### Post -Doctoral

Roland Veress, PhD  
D. Ryan King, PhD  
Drew Nassal, PhD

### Clinical Fellow

Ian Bentley, MD

### Of the Year Awards

Heather Struckman - Pre-Doctoral Scholar of the Year  
Paula Agudelo Garcia, PhD - Post-Doctoral Scholar of the Year



# Mentoring Programs

## DHLRI for Post-Docs

Dedicated Hearts to ensure academic Learning and Research Independence For Post-Docs

*The goal of the DHLRI for Post-Docs program is to provide 'Guidance and Advice' to DHLRI post-docs as they move towards academic independence.*

Associate post-docs with tenure-track Assistant / Associate Professors (different than their research mentors) to provide career and networking advice.

Advisors will provide academic career advice to post-docs as needed and will track their progress towards research independence as mentees achieve set milestones.

The mentor / mentee relationship will be on an as needed basis, and the post-doc will be able to reach out to their advisor whenever guidance is desired.

### Benefits of the program:





- Enhanced motivation
- Increased amenability to post-doctoral grants
- Additional networking opportunities
- Sense of community
- Postdoc recruitment tool (for PIs / DHLRI)



# Communication

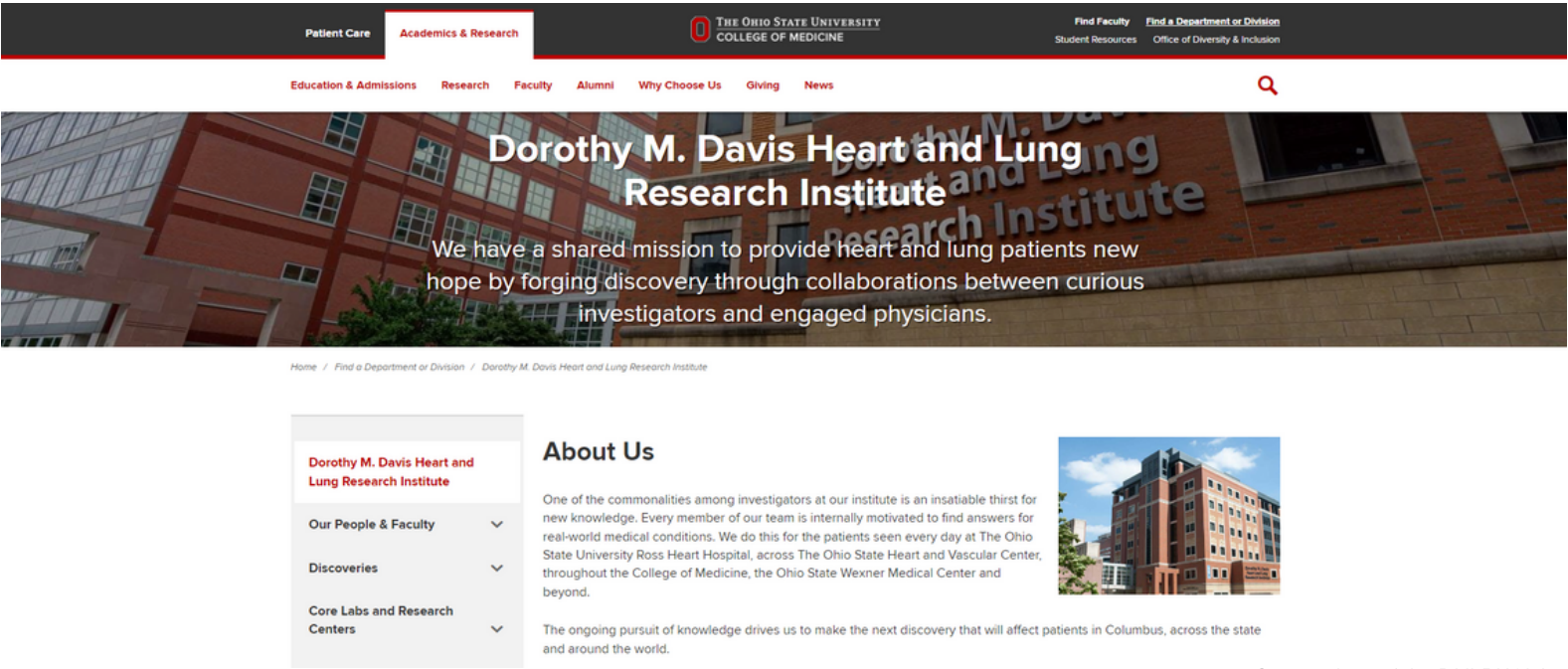
## Twitter

DHLRI launched its Twitter Account in July 2021. Since January 2022, a 70.7% increase in audience growth has been realized with almost 700 followers.

		
<i>Impressions</i>	<i>Engagements</i>	<i>Engagement Rate Per Impression</i>
The number of times content was displayed to users. Month over Month ~ 150,000	The number of times users engaged with content	The number of times users engaged with DHLRI content as a brand
 11.8%	 84.5%	 65.0%

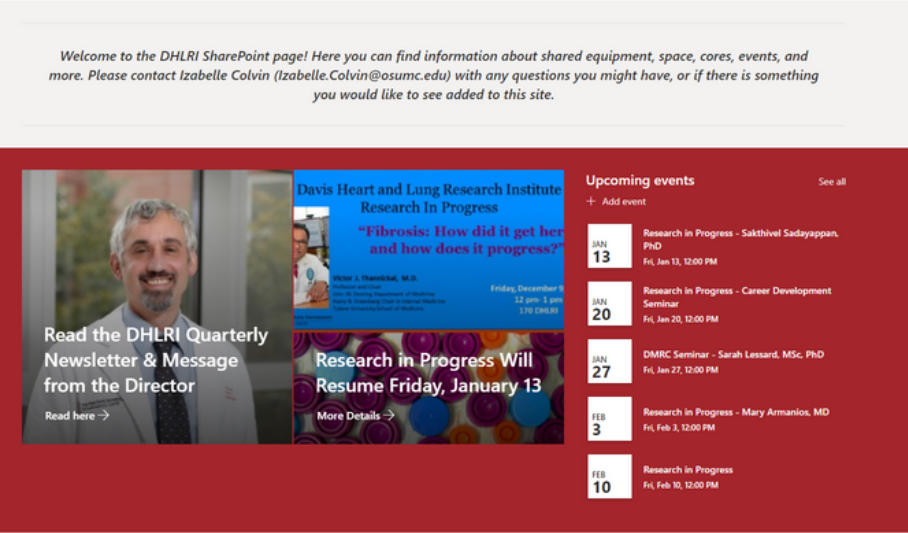
## Website

The newly revitalized DHLRI website is a great source of information for investigators, donors, and members of the general public who are interested in the current events of the DHLRI. Updated quarterly, the new DHLRI website includes membership lists, featured stories and publication, information on upcoming events, and much more.



## SharePoint

Screen shot of the DHLRI Website



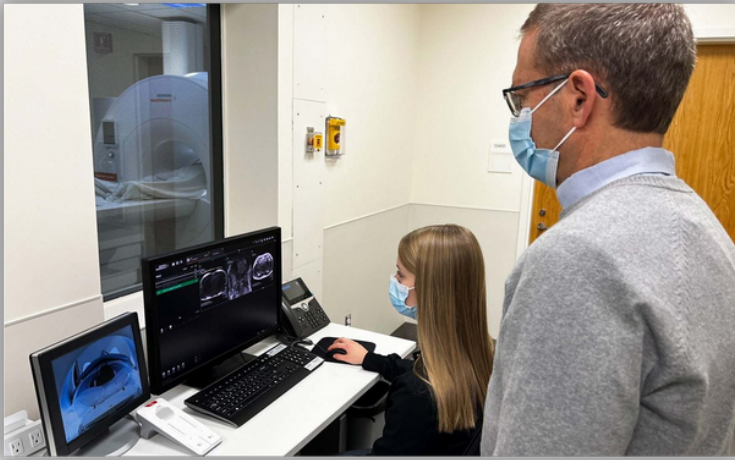
A new SharePoint site was released in 2022 for all DHLRI PIs. SharePoint is a one-stop shop for on demand administrative assistance. The site includes helpful forms, calendars, links, and more.

Screen shot of the DHLRI SharePoint Site

# Cardiovascular Medicine

## By the numbers:

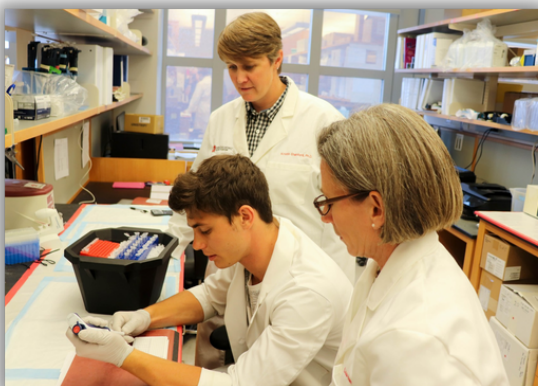
More than \$20 million in NHLBI funding for FY2022 for investigators in our Cardiovascular Program.



Orlando Simonetti, PhD

## Honors

- **Sakima Smith, MD** (Cardiovascular Medicine), **John Hummel, MD** (Cardiovascular Medicine), **Vadim Fedorov, PhD** were named endowed Chairs thanks to the generosity of the Frick Family.
- **Doug Lewandowski, PhD** (Endocrinology) was recognized with the 2022 Research Achievement Award from the International Society for Heart Research.
- **William Abraham, MD** (Cardiovascular Medicine) received the Pioneer Award from the Heart Failure Society of America.
- **Laxmi Mehta, MD** was inducted into the Mazzaferri-Ellison Society of Master Clinicians and also was named the inaugural faculty director of the Gabbe Health and Well-Being Program.
- **Richard Gumina, MD** (Cardiovascular Medicine) and **Loren Wold, PhD** (Surgery) were named Associate Directors of Research in the College of Medicine.
- **D. Ryan King, PhD** was recognized as the 2022 Postdoctoral Scholar Mentor of the Year from the OSU Office of Postdoctoral Affairs



Kristin Stanford, PhD

## Important Highlights



Training Program for Cardiovascular Science - **Jill Rafael-Fortney, PhD** and **Brandon Biesiadecki, PhD** successfully renewed the NIH NHLBI T32 program "Training to provide the knowledge, skills, and culture to the next generation of cardiovascular scientists." This exceptional program has already had a tremendous impact to enhance mentoring at OSU with innovative workshops and educational opportunities, including Leadership Skills and Advancement of Women workshops for both men and women, a Clinical Mentorship program, and Career Mentorship program to meet the individualized career goals of trainees.



Advanced Cardiac Imaging - The OSU Wexner Medical Center added a new MRI system to the Advanced Cardiac Imaging Center - The 0.55% MAGENTOM Free.Max - a large bore low magnetic field technology developed by Siemens in collaboration with DHLRI researchers **Orlando Simonetti, PhD** and **Rizwan Ahmad, PhD**. The new system will expand imaging access and allow for improved imaging of lungs and patients with implanted devices. In parallel, **Simonetti and Yuchi Han, MD** acquired funding for a study on the effects of a ketogenic diet on cardiac function in patients with type 2 diabetes and heart failure with preserved ejection fraction. This project is part of a \$10 million grant from a U.S Department of Defense program focused on improving the health of military service members, veterans, and the American public.



Maternal Outcomes and Health Disparities - From basic science to public health, maternal health was an important area of research over the past year. **Kristin Stanford, PhD** and colleagues published innovative studies in the journal Diabetes showing the effects of parental exercise on metabolic health of offspring. In parallel, **Laxmi Mehta, MD** led an important policy statement from the American Heart Association published in the journal Circulation highlighting the critical role that disparities in social factors like socioeconomic status and access to care play in determining maternal health outcomes. In alignment with the policy statement, Ohio State was part of a large national team that received \$20 million from the American Heart Association to form the Health Equity Research Network (HERN) on Disparities in Maternal-Infant Health Outcomes. This project seeks to address social determinants of health identified as factors in maternal outcomes. **Ann Scheck McAlearney, ScD** (Family Medicine) and **William Grobman, MD** (Obstetrics and Gynecology) serve as leaders for a project entitled "Better Birth Outcomes and Experiences Through Technology, Education and Reporting (BETTER)" that takes a multipronged approach including technology intervention to target social disparities that have a negative impact on maternal health and outcomes. Dr. Mehta also participates in the network as part of the coordinating team led by investigators at University of Alabama at Birmingham.

# Pulmonary Research



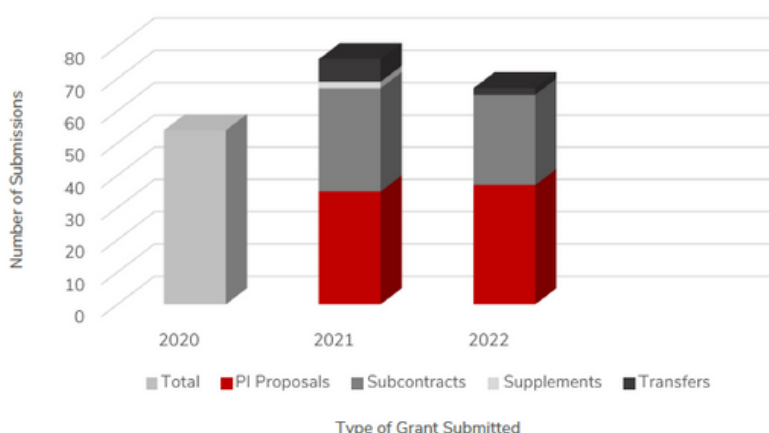
Mauricio Rojas, MD and Ana Mora, MD

*Collectively, the maturation of PCCS has invigorated the DHLRI and the DOIM with an outstanding core of independently funded investigators with diverse and complementary expertise that provides a strong foundation for growth and training opportunities focused on the lung.*

## PCCS Investigators Recruited in the Past 5 Years Include:

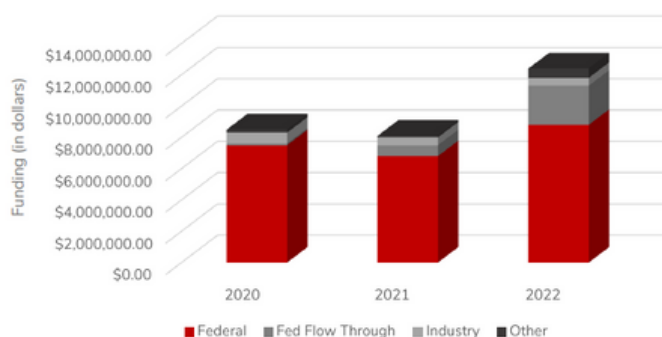
- **Rama Mallampalli** (Chair of Department of Internal Medicine) - acute lung injury, the ubiquitin proteasome and drug development
- **Jeffrey Horowitz** ( Division Director, PCCS) - fibroblast biology and lung fibrosis
- **Laszlo Farkas** - pulmonary endothelial biology, and pulmonary hypertension
- **Kymberly Gowdy** - environmental exposures and lipid mediators in lung immunology and inflammation
- **Ana L. Mora** (Associate Director of Lung Research, DHLRI - biology of aging, alveolar epithelial cell biology, autophagy, mitochondrial function, lung fibrosis and vascular disease
- **Mauricio Rojas** (Associate Vice Chair of Research, Internal Medicine) - senescence, senolytic drug development, mesenchymal stem/stromal cell biology, fibroblast biology, and ex vivo modeling of lung fibrosis
- **Yohannes Mebratu** - asthma and airway epithelial cell biology and the pathogenic mechanisms of respiratory viral infections

Grant Submissions by Fiscal Year

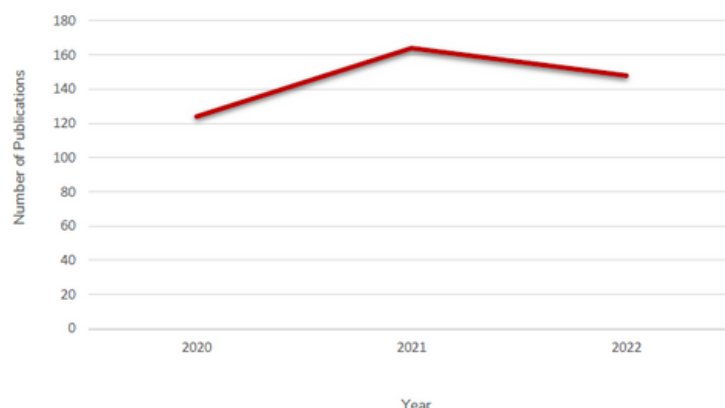


- PCCS grant submission numbers have increased and the research portfolio has grown from \$4.3 million in federal funding in 2016, to almost \$12 million in 2022
- Division faculty includes 14 investigators with independent NIH R01 (or equivalent) funding.
- These investigators are PI or MPI on 17 R grants, 1 DoD, 3 U grants and components or contact PI of 2 NHLBI Program Project Grants with total research funding of \$11.94 million in 2021.
- Additional evidence of maturation of the Division is evident through academic output, indicated by progressive growth in publications from 50 in 2018 to 148 through the end of August 2022. These include manuscripts in high impact journals such as Nature Communication, Nature Chemical, Biology, Science Translation Medicine, New England Journal of medicine, and premiere Journals in Pulmonary Medicine (American Journal of Respiratory Critical Care Medicine, Lancet Respiratory, etc.)

Research Funding by Fiscal Year



Number of Publications





# Metabolism

## Grants of note:

### Kristy Townsend - W.M Keck Foundation Award

Kristy Townsend was awarded a \$1.2 million grant from the W.M Keck Foundation for her project titled, "Uncovering the feedback loop between the central nervous system and adipose tissue."

This is the first medical Keck Award granted to the Ohio State University ever, and the first Keck Award overall granted to a researcher at OSU since 1986.

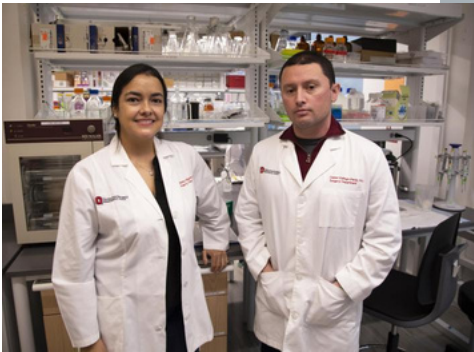


Kristy Townsend, PhD

### Natalia Higueta-Castro and Daniel Gallego Perez - Gilbert Family Foundation Award

Biomedical Engineering Assistant Professor Natalia Higueta-Castro, PhD along with he co-investigator, Daniel Gallego-Perez, PhD received a three-year, \$1.2 million grant from the Gilbert Family Foundation to develop next-generation gene therapies to treat neurofibromas.

This is the first Gilbert Family Foundation grant to support Ohio State research and is part of more than \$18 million in grants awarded recently as part of the organization's Gene Therapy Initiative. The private, non-profit foundation aims to accelerate the development of curative therapies that address the underlying genetic abnormalities in neurofibromatosis type 1 (NF1) patients.



Natalia Higueta-Castro, PhD and Daniel Gallego-Perez, PhD

## PHAT

In 2022, we launched the **Preventative Health of Adipose Tissue (PHAT) Conference**. Adipose tissue contributes to the development, and increases the risk of morbidity and mortality, in multiple diseases including obesity, cardiovascular disease, type 2 diabetes, Alzheimer's Disease, and certain cancers. The idea behind this conference is to bring together investigators from different backgrounds to focus on improving adipose tissue health as a central focus to combat disease and promote health.

## Publications of note:

- **Bradley D et al.**, Nat Comm, Interferon gamma mediates the reduction of adipose tissue regulatory T cells in human obesity. PMCID: PMC9509397
- **Hernandez-Saavedra et al.**, Diabetes, Maternal Exercise and Paternal Exercise Induce Distinct Metabolite Signatures in Offspring Tissues. PMCID: PMC9501651
- **Joseph JJ et al.**, Nutr Diab, The association of serum vitamin D with incident diabetes in an African American population. PMCID: PMC9562299
- **Joseph JJ et al.**, JAMA Netw Open, Associations of Cardiometabolic Multimorbidity With All-Cause and Coronary Heart Disease Mortality Among Black Adults in the Jackson Heart Study. PMCID: PMC9597394
- **Blaszkiwicz et al.**, Front Endo, Adipose Tissue Myeloid-Lineage Neuroimmune Cells Express Genes Important for Neural Plasticity and Regulate Adipose Innervation. PMCID: PMC9251313
- **Serrano J et al.**, Biomedicines, Saccharin Stimulates Insulin Secretion Dependent on Sweet Taste Receptor-Induced Activation of PLC Signaling Axis. PMCID: PMC8773316
- **Sreejit G et al.**, Circ, Retention of the NLRP3 Inflammasome-Primed Neutrophils in the Bone Marrow Is Essential for Myocardial Infarction-Induced Granulopoiesis. PMCID: PMC8716427

## Investigators Recruited in the Past 5 Years

- **Shyam Bansal** - studies elucidation of innate immune response during chronic heart failure
- **Kedryn Baskin** - studies molecular mechanisms that regulate cardiac function and metabolism
- **George Kyriazis** - studies chemosensory mechanisms involving novel nutrient-sensing G protein-coupled receptors (GPCRs), such as sweet taste receptors (STRs)
- **E. Douglas Lewandowski** - studies the metabolic basis of impaired contractile function in the diseased heart and the impact of altered cardiac metabolism on peripheral organs and systemic metabolism
- **Prabha Nagareddy** - studies cardiovascular risk factors in obesity and type 2 diabetes
- **Kristy Townsend** - studies brain-adipose neural communication and the innervation of adipose depots

The 1<sup>st</sup> Annual

# PHAT

Center for Preventative Health of Adipose Tissue

Regional Research Symposium

April 9, 2022  
Ohio State University Wexner Medical Center  
Davis Heart and Lung Research Institute (DHLRI)

**THE OHIO STATE UNIVERSITY**  
WEXNER MEDICAL CENTER

# In Progress

Although the state of the DHLRI is strong as reviewed in the previous section, we're always looking for ways to improve. Here, we highlight some of the new initiatives from FY22 that we are excited to come to fruition in FY23. Some of these efforts have been introduced earlier in this report – for example, our DEI initiative and planned DHLRI neighborhoods in the IRF. Read on for additional information on these important projects. I'd like to take a moment however to introduce a new initiative (with additional details below) that involves close collaboration with the College of Medicine Office of Research. Although we had a bumper crop of grants in FY22, securing funding for research project at NIH remains a daunting task with a payline at 15% for R01 research project grants at the National Heart Lung Blood Institute in FY2022. Although the payline is higher for early stage investigators (25% in FY22), they must compete for funding against more established researchers with larger labs, more resources, and name recognition. Critical for our long term success is making sure that our early career faculty have adequate mentoring and formal training in best practices for preparing and submitting their first NIH R01. Furthermore, even seasoned investigators could use a second set of eyes from time to time to improve a proposal. In 2023, keep an eye out for programs on grant writing and review for both early state and established investigators from the DHLRI in collaboration with the CoM Office of Research. These programs will be examples of the kind of partnership we hope to pursue to bolster the research and education infrastructure at OSU for researchers across stages.

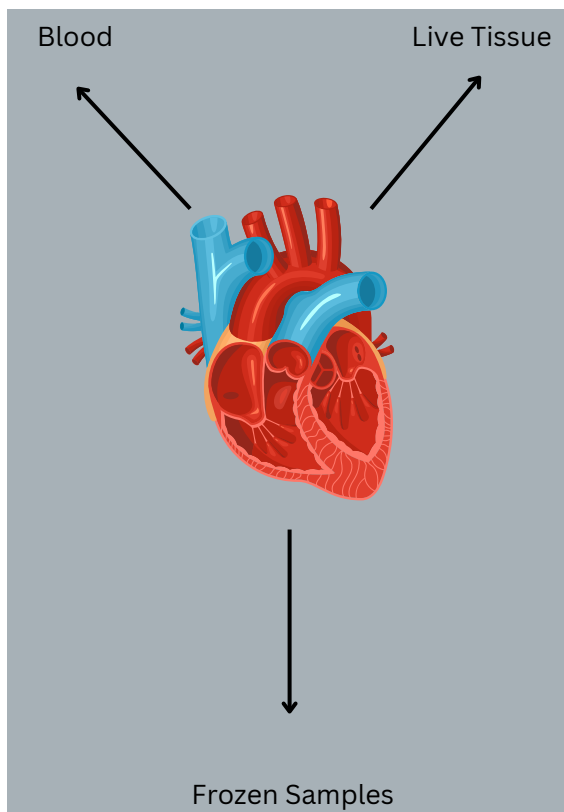
## Grant Review Committee

The COM/DHLRI Grant Writing Consortium will encompass a large group of offerings designed to assist in the writing of competitive grant applications with an emphasis on NIH. Cohorts will cross all levels, including K to R grants, as well as R01 grants for early, mid, and senior faculty.

A team of funded CoM/ DHLRI faculty, with extensive study section experience will facilitate monthly meetings during a 6-month period. These sessions will include:

- Formal lecture covering a specific section of the grant
- Peer mentor review of a specific section
- Grant reviewing and editing monthly
- Final session: mock study section with an external reviewer with expertise in the specific area of research

Samples available in the CCB:



## Heart Biorepository

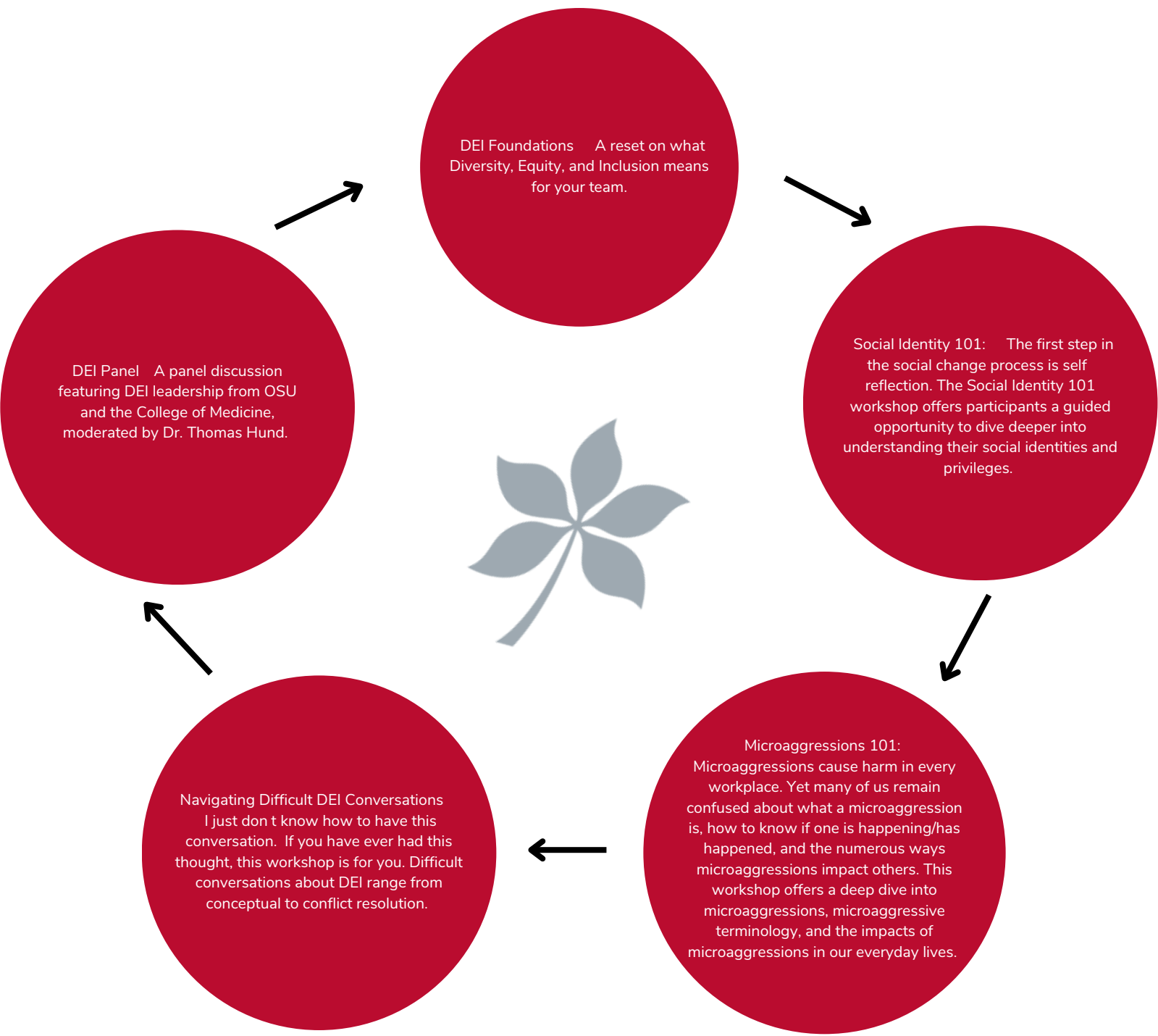
The Comprehensive Cardiovascular Biorepository (CCB) has been designed to create a centralized clinical data and biospecimen repository within The Ohio State University Wexner Medical Center, College of Medicine. The CCB will process, store, and distribute biospecimens for cardiovascular research. Housed in DHLRI space, the CCB allows investigators access to high quality and clinically annotated biospecimens, thus precipitating new translational research, new diagnostics, new therapeutics, quality improvement, and future opportunities for multi-institution collaborative research. Interdisciplinary research will be fueled through such a wealth of available samples, propelling OSU into next-generation research and improved patient outcomes.



**THE OHIO STATE UNIVERSITY**  
COLLEGE OF MEDICINE

# Diversity, Equity, and Inclusion

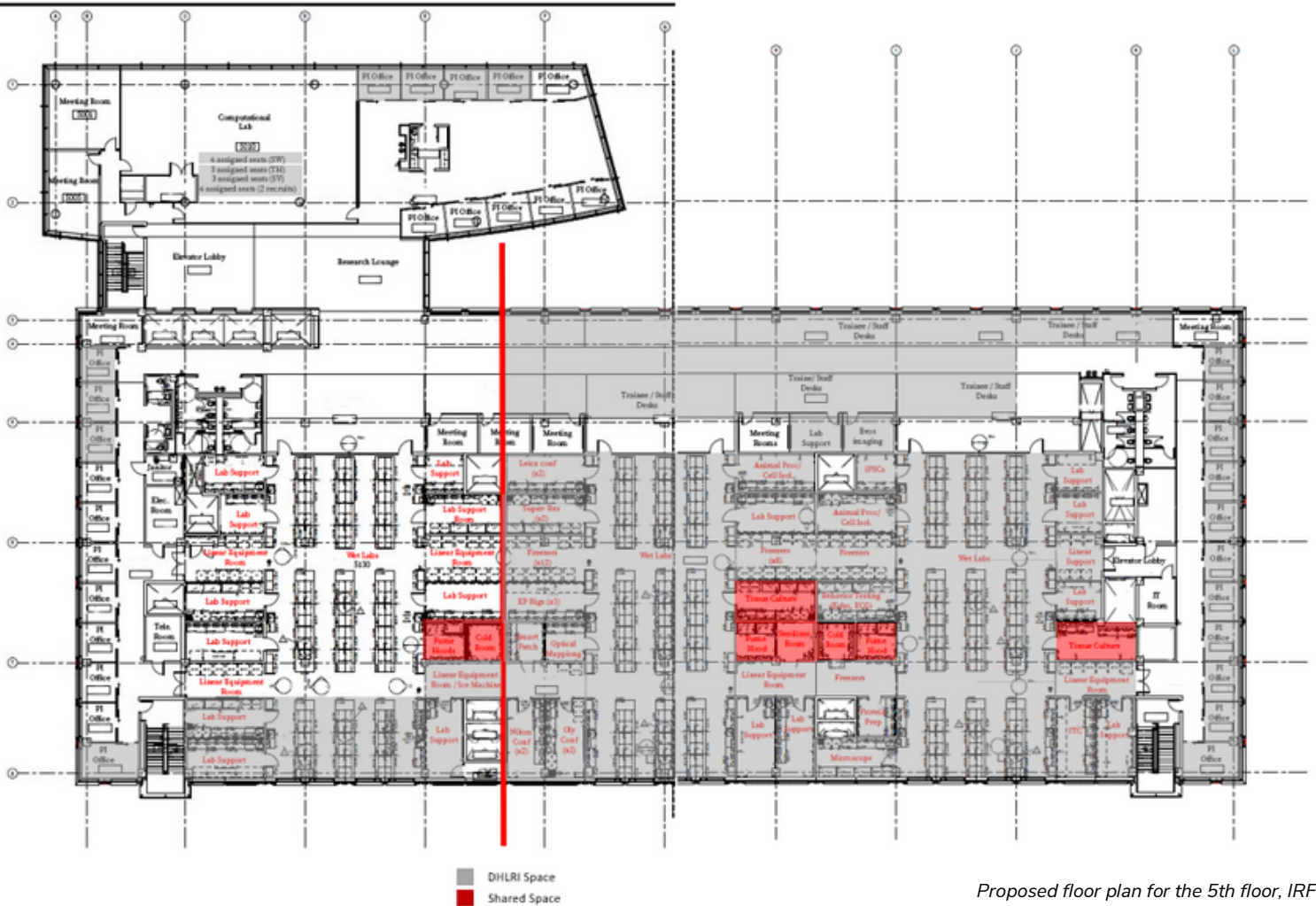
In seeking to lead and serve our faculty, staff, and learners, DHLRI's new strategic plan will include a leadership initiative dedicated to Diversity, Equity, and Inclusion. Committed to investing in those underserved in biomedical sciences, this new pillar is being kicked off with a 5-part series to further drive the success of our clinical research operations and training





# IRF

The Interdisciplinary Research Facility (IRF), located in the heart of the new Innovation District, namely Carmenton, is over 80% complete. The 305,000 square foot facility will serve multiple research disciplines working together, including biomedical, life sciences, engineering and environmental sciences, among others. DHLRI will expand their footprint in the College of Medicine by populating two of the three neighborhoods on the top floor.



Proposed floor plan for the 5th floor, IRF



Artist rendition of the completed IRF building

The Interdisciplinary Research Facility envisions an innovative and modern environment to serve multiple disciplines. The project is one of the first buildings at Carmenton and will house approximately 305,000 new square feet. The five-story laboratory building advances the university's strategic plan, and Framework 2.0, by serving multiple research disciplines, including biomedical, life sciences, engineering and environmental sciences, among others.

# C.I.T.E.-ing the Future

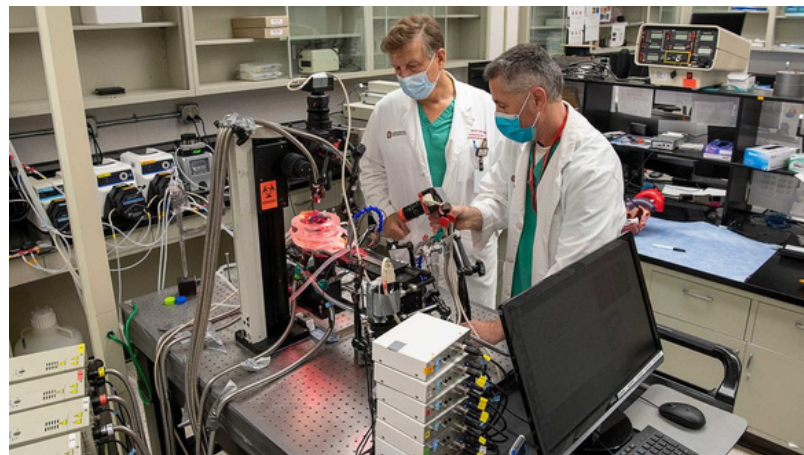
As we consider the path forward for the Davis Heart and Lung Research Institute, countless opportunities for advancement present themselves. The challenge then becomes how do we prioritize opportunities for investment of resources, namely time and money, to most effectively advance our mission? To guide our strategic planning, the DHLRI Administrative team has rolled out a new mantra, which was unveiled on the front page of this report: CITE, an acronym for our guiding principles of Collaboration, Innovation, Translation and Equity.

I've already alluded to the importance of **collaboration** for our mission in the introduction to this report. We will prioritize investment opportunities that enhance collaboration between groups. New neighborhoods in the Interdisciplinary Research Facility that we've referred to throughout this document represent a major opportunity for enhancing collaboration. At the same time, we will continue to invest in state-of-the-art research equipment and core facilities to bolster the research infrastructure for interdisciplinary team research. The ultimate goal with these efforts is to build and support a "Smart Grid" for science that maximizes efficiency and return on investment.



**Innovation** is the second pillar and highlights the importance of research at the forefront of discovery in generating breakthroughs that lead to the therapies of tomorrow. Over the next year, we plan to unveil a new program area in Advanced Therapeutics & Engineering. Details to come but our hope is that this new program will provide an engine for innovation and discovery within DHLRI and inform our next phase of growth.

Which brings us to our next pillar, **Translation**. The word translation gets thrown a lot as related to biomedical research – A quick internet search yields not one but many definitions for translational research. However, the description that best fits our vision is provided by the NIH as “the process of applying discoveries generated during research in the laboratory, and in preclinical studies, to the development of trials and studies in humans.” We seek to empower our investigators to translate foundational research with direct impact on human heart and lung health. Furthermore, we aim to create an environment that catalyzes bidirectional exchange of ideas and information between basic scientists, engineers and clinicians. Along these lines, we are fully committed to supporting the College of Medicine Office of Research with their launch of the Comprehensive Cardiovascular Biorepository, which will provide access to clinically annotated biospecimens.



Finally, at the DHLRI we firmly believe that we can't have CITE without **Equity**, which in this context is shorthand for Diversity, Equity and Inclusion (DEI). A safe environment for the open and constructive exchange of ideas is the foundation upon which success is built. As addressed in the introduction, our approach in this space will be to first take an inventory of our strengths, weaknesses and opportunities for growth. This exercise will inform the definition of an action plan with the emphasis on action and accountability. The inventory phase begins this month with our new monthly DEI workshop series, which will help define the marching orders for the DHLRI DEI Committee. My expectation is that, with guidance from the DEI committee, the DHLRI will lead innovation in this area just as we push the frontiers of biomedical research.

In closing, it's my distinct pleasure to welcome you to a new year in the DHLRI! We are at a unique juncture in our history with tremendous opportunity to reach our full potential in the pursuit of breakthroughs that we hope will ultimately improve patient care in Ohio and around the world. I invite you to join us on the journey!



# New Help for Heart Disease

Innovations in treatments and care are making it easier to live longer with this No. 1 killer.

By Deborah Skolnik



Times Magazine Cover & Excerpt from Article Featuring Shyam Bansal, PhD (Physiology and Cell Biology)

## TREATING PROBLEMS AT THE SOURCE

Between 1990 and 2017 the number of people with heart failure almost doubled, according to a study published in 2021 in the *European Journal of Cardiology*. Heart failure occurs when the organ can no longer sufficiently pump enough blood through the body. The heart doesn't stop—it just doesn't work as well as it should. New research is increasing an understanding of the immune system's role in heart failure. "The condition starts with an injury to the heart, which can be a blockage of the coronary artery," explains Shyam Bansal, PhD, an investigator and assistant professor of physiology and cell biology with the Davis Heart and Lung Research Institute at The Ohio State University. "When there is a blockage, immune

cells, including T cells, try to heal the heart. When they can't, because that tissue is essentially dead, they enter a 'frustrated' state where they cause more inflammation, which only does more damage," he explains.

Bansal has created a drug that targets a protein within those errant T cells and stops them from proliferating. "When we do that, we see an improvement in cardiac function," he says. "We might be able to remove some patients from the heart-transplant list altogether, or maybe we can keep them going long enough so that a heart becomes available for them." The medication may be ready for Food and Drug Administration review as an "investigational new drug" in the next two to three years.



Shyam Bansal, PhD

We were very excited that the heart failure therapy research of Shyam Bansal, PhD (Physiology & Cell Biology) and team was recently featured in the Time Magazine Future of Medicine Issue. Dr. Bansal and collaborators developed a novel drug that targets a specific population of T cells to modulate immune response and improve cardiac function in heart failure. Critical experiments in support of this innovative project were performed on shared equipment purchased by DHLRI and available for use by any of our investigators. The team has demonstrated efficacy in animal models of disease with the hope that this approach will ultimately prove efficacious in humans.

# DHLRI Membership

## Anesthesiology

Mark Gerhardt, PhD

## Biological Chemistry and Pharmacology

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

## Biomedical Engineering

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

## Biomedical Sciences | Microbial Infection and Immunity

Amal Amer, MD, PhD

## Center for Biostatistics

Stanley Lemeshow, PhD

## Chemical & Biomolecular Engineering

Jeffrey Chalmers, PhD  
Andre Palmer

## Chemistry and Biochemistry

Vicki Wysocki, PhD

## Dentistry

John Sheridan, PhD

## Electrical Engineering

Lee Potter, PhD

## Emergency Medicine

Srikanth Garikipati, PhD  
Mahmood Khan, MPharm., Ph

## Epidemiology

Amy Ferketich, PhD

## Family and Community Medicine

TM Adesanya, MD, PhD  
Randell Wexler, MD

## Food Science & Technology

Ahmed Yousef, PhD

## Health & Rehabilitation Services | Medical Sciences Division

Mireia Guerau, 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  
Baliga Ragavendra, MD  
Michelle Ballinger, MD  
Salman Bhatti, MD  
Philip Binkley, MD  
Indra Bole, MD  
Konstantinos Boudoulas  
Vincet Brinkman, MD  
Pricilla Correa-Jaque, 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  
Tapan Kundu, MD  
John Larry, MD  
Lauren Lastinger, MD  
Scott Lilly, MD  
Jim Liu, MD  
Doug Magorien, MD  
Raymond Magorien, MD  
Unni Marar, MD  
Ernest Mazzaferri, MD  
Isla McClelland, MD  
Laxmi Mehta, MD  
Wesley Milks, MD  
Toshimasa Okabe, MD  
David Orsineli, 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, MD  
Ascott Visovatti, MD  
Raul Weiss, MD  
Karolina Zareba, MD

## Internal Medicine | Endocrinology, Diabetes, & Metabolism

Andrew Carley, PhD  
Joshua Joseph, MD  
Willa Hsueh, MD  
Doug Lewandowski, PhD

## Internal Medicine | Human Genetics

Liz Jordan, MS, LGC  
Daniel Kinnamon, PhD  
Raymond Hershberger, MD

## Internal Medicine | Microbiology

Daniel Wozniak, PhD

## Internal Medicine | Nephrology

Daniel Birmingham, PhD  
Nicholas Ferrell, 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  
Nathan Brummel, MD  
Lawrence Chan, DO  
John Christman, MD  
Megan Conroy, MD  
Avraham Cooper, MD  
Sangwoon Chung, PhD  
Elliot Crouser, MD  
Phillip Diaz, MD  
Ryan Donald, MD  
Joshua Englert, MD  
Vincent Esguerra, MD  
Matthew Exline, MD  
Laszlo Farkas, MD  
Lynn Fussner, MD  
Christian Ghattas, MBCh  
Lauren Goodman, MD  
Kymberly Gowdy, PhD  
Derrick Herman, MD  
Kevin Ho, MD  
Steven Holfinger, MD  
Jeffrey Horowitz, MD  
Jennica Johns, MD  
Manjula Karpurapu, PhD  
Meena Khan, MD  
James Londino, PhD  
Matthew Long, PHD  
Ulysses Magalang, MD  
Rama Mallampalli, MD  
Yohannes Mebratu, PhD  
Ana Mora, MD  
Sindhu Mukku, MD  
Ali Naeem, MD  
Richard Nho, PhD  
David Nunley, MD  
Stella Ogake, MBCh  
Jasleen Pannu, MBBS  
Sonali 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  
Carleen Spitzer, MD  
Jerome Stasek, 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

## Neurological Surgery

Paco Herson, PhD  
Kristy Townsend, PhD

## Neuroscience

Phillip Popovich, PhD

## Nursing

Matthew Gorr, PhD  
Loren Wold, PhD

## Pediatrics | Nationwide Children's Hospital

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

## Pharmacy

Cynthia Carnes, PharmD, PhD  
Prezemyslaw Radwanski, PharmD, PhD

## Physiology & Cell Biology

Federica Accornero, PhD  
Xun Ai, MD  
Shyam Bansal, PhD  
Kedryn Baskin, PhD  
Brandon Biesiadecki, PhD  
Krishna Chinthalapudi, PhD  
Jonathan Davis, PhD  
Isabelle Deschenes, PhD  
Vadim Fedorov, PhD  
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Paul Janssen, PhD  
Sara Koenig, PhD  
Beth Lee, PhD  
Christoph Lepper, PhD  
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Harpreet Singh, PhD  
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Nuo Sun, PhD  
Dmitry Terentyev, PhD  
Noah Weisleder, PhD  
Jing Zhao, MD, PhD  
Yutong Zhao, MD, PhD  
Mark Ziolo, PhD

## Psychiatry and Behavioral Health

Tamar Gur, MD, PhD

## Radiology

Arunark Kolipaka, PhD  
Michael Knopp, MD, PhD

## Cardiac Surgery

Mona El Refaey, PhD  
Pei-Hui Lin, PhD  
Prabhakara Nagareddy, PhD  
Bryan Whitson, MD, PhD  
Lufang Zhou, PhD  
Hua Zhu, PhD

## Transplant Surgery

Ginny Bumgardner, MD, PhD

## Vascular Diseases and Surgery

Bryan Tillman, MD, PhD

## Veterinary Biosciences

Estelle Cormet-Boyaka, PhD

# Celebrating Over 20 Years of Research at the DHLRI

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 to create a new research chair and sponsor a floor in the new Interdisciplinary Research Facility

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 vaccinations for those 80 and older.

2020

- DHLRI celebrates their 20th Anniversary, virtually. With the increase in COVID positivity, the event was held through Zoom.

2019

- Joe and Linda Chlapaty make a \$15 million commitment to further A Fib research.

2018

- The 35,000 sf 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 and 26 departments/division. Over 680 grants are submitted – an increase of over 430% from 2010.
- 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 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 is also the John G. and Jeanne Bonnet McCoy Chair in Cardiovascular Medicine and holds 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 under one leader.

2005

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

2003

- A DHLRI 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 & 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



<https://medicine.osu.edu/departments/davis-heart-lung-research-institute>



@OhioStateDHLRI

With cooperation by contributors, brochure created and edited by Isabelle Colvin, DHLRI



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