Wake Forest University
School of Medicine

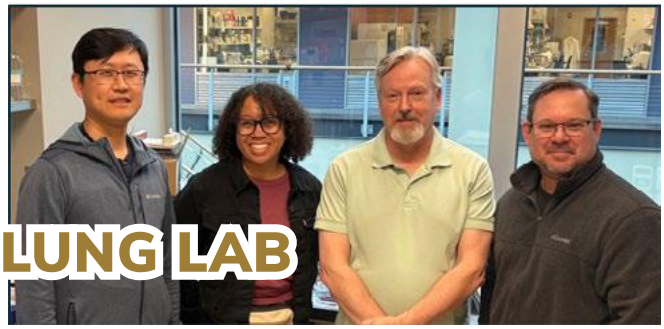
GOOD NEWS!

Wake Forest University School of Medicine Cardiovascular Sciences Center

Spring 2025

WHAT'S INSIDE

WELCOME to THE MCCLUNG LAB



Left-right: Feifei Li, Zoe Terwilliger, Tom Green, and Joseph McClung

The McClung Lab joined Wake Forest University School of Medicine in August 2024. The lab previously called the Brody School of Medicine in Greenville, NC home – as a member of the Diabetes and Obesity Institute and adjunct in the Department of Cardiovascular Sciences. The lab has been continuously NIH funded for over 15 years and brings experience in both pre-clinical modeling of vascular disease and clinical research to Molecular Medicine, Internal Medicine, and Vascular and Endovascular Surgery.

From Dr. McClung:

"Over the last 15 years, we have diligently worked to uncover the genetic and bioenergetic complications of PAD and how these complications drive each of the unique characteristics of the clinical presentations. We have been very fortunate to work with incredible clinical faculty and are excited to continue this work here at Wake Forest University School of Medicine."

The lab is focused on the genetics and bioenergetics that drive clinical presentations and outcomes in vascular diseases, including identifying biology and biomarkers that link patients to poor outcomes. By studying the limb tissues of patients with peripheral artery disease (PAD), the lab has identified unique signatures of those that present with chronic limb threatening ischemia (CLTI), including population variants that interfere with cellular metabolism and tissue survival. These variants alter biology across multiple cell types in unique ways and provide opportunities for novel

Continued on page 3

FUNDING

During the months of January to April, CVSC members were awarded 19 grants including 3 from federal agencies for a sum of ~$5.7M and 16 from other sources for a sum of ~$2.6. Below we highlight awards from the CVSC and SHVI.


Tomar


Jadiya


Xu

Drs. Jadiya (PI), **Tomar** (Co-I), **Xu** (Co-I), and **Cheng** (Co-I) received a fundable score for their NHLBI-R01 grant titled "Cellular heterogeneity in mitochondrial calcium dynamics in heart failure" with a project period of 04/01/2025-03/31/2030 and total cost of $2,520,860.

Dr. Rajeev Dhupar was awarded an extramural DoD grant as co-Investigator titled "The Pulmonary Immune Response to Respiratory Hazards and Lung Cancer Susceptibility in Females", which complements his other grants on inhaled toxic respiratory exposures.


Borges

Nyal Borges, MD was awarded a grant from Kardion, Inc. titled "PICANTE: PIvotal Trial of the KARDION Cory P4 MechANical Circulatory SupporT SystEm", indicated for use during high-risk percutaneous coronary interventions, lasting 6 hours or less, performed in hemodynamically stable patients with severe coronary artery disease and depressed left ventricular ejection fraction.

David Hobson, MD was awarded a grant from Weill Medical College of Cornell University PCORI titled "Recharge: REvascularization CHoices Among under-Represented Groups Evaluation (The RECHARGE Trial)". The RECHARGE Trial consists of two independently powered trials, RECHARGE: Women and RECHARGE: Minorities, to compare the effect of percutaneous coronary intervention (PCI) vs coronary artery bypass grafting (CABG) on survival and improvement in quality-of-life (QOL) in women (RECHARGE:Women).


Mawardi

George Mawardi, MD received a grant from Edgewise Therapeutics titled "Cirrus-HCM", an Open-label Study to Evaluate Safety, Tolerability, Pharmacokinetics, and Pharmacodynamics of EDG-7500 in Adults with Hypertrophic Cardiomyopathy.

Hector Crespo-Soto, MD received a grant from Abbott Cardiovascular Systems, Inc. titled "Esprit-BTK PAS", a post-approval study designed to evaluate Esprit™ BTK Everolimus Eluting Resorbable Scaffold System for the planned treatment of narrowed infrapopliteal lesions.


Gulati

Sanjeev Gulati, MD was awarded a grant from Abbott Inc. titled "Team HF", a prospective, randomized, open-label study of left ventricular assist device (LVAD) vs continued guideline directed medical therapy (GDMT) in non-inotrope dependent heart failure patients with refractory pulmonary hypertension secondary to left ventricular failure.

Frank Arko, MD and Fanny Alie-Cusson, MD received a grant from the University of Missouri/ Medtronic titled "Life Registry", a retrospective US Registry of Laser Fenestrated Endovascular Repairs to evaluate the efficacy, safety and short-term outcomes in aortic arch and visceral aortic pathologies.


Kim

Esther Kim, MD received a grant from Duke University/Novartis titled "Victorion-Inclusion", aimed at Evaluating INClisiran as a soLUtion to improve LDL-C management and close care gaps in an Inclusive ASCVD and ASCVD risk equivalent population.

Dr. Rajeev Dhupar was awarded an intramural Wake Forest CTSI Ignition Fund Pilot Award as Primary Investigator for the project "Quantifying the Burden of Microplastics in Humans".

FUNDING *continued*

Halim Yammine, MD was awarded a grant from ViTAA Medical Solutions titled “Pro-ViTAA: An Exploratory Analysis of a Rupture Cohort to Assess the Predictive Value of ViTAA’s growth Algorithms,” to assess a cohort of abdominal aortic aneurysm (AAA) patients who have been monitored with static abdominal CT scans and who subsequently experienced a rupture of their aneurysm.

Christopher Mitromaras, MD received a grant from Lifenet Health titled “Nexeon: Safety, Efficacy, & Use of Decellularized Femoral Artery Allograft for Arteriovenous Access for Hemodialysis”, with the clinical objective of this prospective, observational, post market registry study, CR-21-005, being to assess the safety and efficacy of a decellularized human femoral artery allograft (Nexeon AVX Decellularized Femoral Artery, LifeNet Health, Virginia Beach, VA) in the creation of vascular access for hemodialysis in patients with ESRD.

MCCLUNG LAB *continued*

therapeutic design. Using molecular biology, virology, and pre-clinical modeling the lab applies the information to test precision medicine approaches to rescue myopathy and support revascularization and blood flow recovery. The lab has current and pending funding related to genetic variants in vascular disease, mitochondria, myosteatosis, non-coding RNAs, flow mediated changes in endothelial cell bioenergetics, and growth factor signaling effects in endothelial cell metabolism.

In collaboration with the other faculty of Vascular and Endovascular Surgery, the lab is recruiting PAD patients under an approved IRB with a goal of biobanking tissues, primary cells, blood, and data related to tissue level bioenergetics, pathology, and clinical outcomes. The group hopes to use these samples and their collective expertise in gene manipulation and bioenergetics to drive collaboration across all cardiovascular diseases at Wake.

AUSTIN’S DATA TIPS & TOOLS

What is Data Clustering?

In the world of data science/statistics, clustering is the process of grouping a set of data points that are similar to one another based on the observed variables collected for each data point. Things you might cluster are customers (a lot of application in marketing), patients, biomarkers, clinical outcomes and much more. Clustering can help you discover new groups/populations you might initially overlook.

One key advantage of clustering is that it can be an unsupervised analysis. This means you do not need to the train the model on data with known outcomes our labels. For example, perhaps you have a sample of patients with protein biomarker data but you lack some detailed information on additional disease outcomes you did not collect initially. However, you do know that the elevated expression of certain biomarkers you measured may be good indicators that a patient has the disease or may have complications in their medical history related to them. In this case, you could cluster patients using the biomarker data and find out if any patient clusters exhibit biomarker expression related to the disease(s). Clustering is also a good way to explore your data and identify outliers.

To perform cluster analysis, you need an input dataset where rows represent what you are trying to cluster and columns represent the variables you want to cluster by. Additionally, the input data needs to be numeric. Standard clustering algorithms work by computing a distance/similarity matrix that quantitatively measures how much one data point is similar to each of the other data points. This step can take a lot of time if you are working with a large dataset. The output is a cluster assignment for each data point based on the distance/similarity matrix. Once you get these assignments, you can see what variables best define each cluster using descriptive statistics.

There are many types of clustering algorithms that are implemented in all the standard statistical software’s such as SAS, Python, R, MATLAB, etc. If you would like to know more about them, do not hesitate to reach out to me to talk more. Thanks for reading this edition of data tools and tips.

Austin Seals, MSA
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INVITED PRESENTATIONS


South

Dr. Andrew M. South was invited to give talks in January and February about the COACH Catalyst© approach to team science at the at the University of Louisville Department of Pediatrics Research Symposium and the University of Arkansas Department of Pediatrics Research Symposium.


Jadiya

Dr. Pooja Jadiya was invited to give a talk titled "Targeting Mitochondrial Calcium Regulation in Alzheimer's Disease" at the Charleston Conference on Alzheimer's Disease (CCAD) Reunion Conference, held in Puerto Rico on April 9, 2025.

Natasha Jaiswal, PhD (Postdoctoral Fellow in the Jadiya Lab) has been selected to present at the Internal Medicine Grand Rounds Research Day on May 8, 2025. This selection recognizes her outstanding research contributions and dedication to advancing science within the Department of Internal Medicine.

Dr. Pooja Jadiya presented "Mitochondrial Calcium Regulation to Mitigate Alzheimer's Progression" at the Celebrate Research! Research Centers Ignite Talk held at Wake Forest University School of Medicine on March 17, 2025.

The Cardio-OB team had 2 abstracts presented at the at the 9th International Congress on Cardiac Problems in Pregnancy in Vienna, Austria, April 24-27, 2025. This is a big win for the team as this is just their 3rd year, and they presented at the largest and most prestigious Cardio-OB conference.


Kim

- Maternal Risk Factors Associated With Adverse Maternal And Fetal Outcomes In An Urban, Quaternary Care Hospital. Diane Holmes, MSN, FNP-BC, CHFN; William Saunders, PhD, MPH; Ashley Moore-Gibbs, DNP, RN, AGPCNP-BC, Kelecia Brown, MD; **Esther Kim, MD, MPH, FACC**
- Improving clinician self-efficacy when caring for the cardio-obstetric patient admitted to the hospital. Diane Holmes, MSN, FNP-BC, CHFN; William Saunders, PHD, MPH; Laura Magennis, DNP, RN, RNC-OB, NPD-BC; **Esther Kim, MD, MPH, FACC**

The SHVI faculty presented, moderated, served as panelists, and led the organization on the board at the ACC.25 in Chicago, Illinois. Below we highlight some of the SHVI's ACC.25 activities.

Atrium Health Heart and Vascular teammates from SHVI, WF and St Luke's.

- **Dr. Holly Gonzales**, Co-Chair, TR Management in the Modern Era; Co-Chair, High Acuity Valve Disease: The Great "Around the Horn" Debate
- Diane Holmes, FNP-BC,CHFN, Poster Presenter, CV Team Poster Session, Session II
- **Dr. Noreen Kelly**, Panelist, Vexing Valves: Unraveling Challenging Valvular Hemodynamics
- **Dr. Esther Kim**, Co-Chair and Emcee, Who Wants to Be a Millionaire: PAD Guidelines; Co-Chair, It's Tearing Up My Heart: New Approaches to SCAD Care
- **Dr. Dermot Phelan**, Co-Chair, Contemporary Approaches to Medical Therapy for HCM II; Presenter, Take It to the Limit: CV Imaging in the Masters Athlete; Panelist and Presenter, In the Thick of It: The Role of Imaging in Hypertrophic Cardiomyopathy; Presenter, The Master Athlete's Tug of War? Peak Performances vs Pills and Procedures
- **Dr. Michael Rinaldi**, Panelist and Presenter, TMVR is Coming: Update on TMVR Devices
- **Dr. Geoffrey Rose**, Presenter, The Changing Dynamics of CV Practice in the US; Presenter, ACC.25 Crowd-Sourced Session: Private Equity in Cardiology; Can Clinicians and Patients Thrive Here?

INVITED PRESENTATIONS *continued*

- **Dr. Jonathan Schwartz**, Presenter, TR Management in the Modern Era
- Catherine Shah, NP, Panelist, TR Management in the Modern Era
- **Dr. Hadley Wilson**, Moderator, LBCT Panelist, Putting IQ into AI for Cardiac Imaging
- Amy Winiger, NP, Poster Presenter, Bridging the Americas to Improve Patient Education Post MI


Gonzales


Kelly


Kim


Phelan


Rinaldi


Rose


Schwartz


Wilson

A special shout-out to the Structural Heart Team (Gonzales, Schwartz and Shah) for taking complete ownership of the TR session on Monday, March 31st.

Michael A. Moore, MD, FACP, FAHA presented an enduring material internet-based CME lecture for the Virginia Osteopathic Medical Association 2025 Spring CME Conference, May 30 – June 1, 2025, Williamsburg, VA, on "The Continuing Importance of Hypertension Detection & Management"

In addition, during January to April, CVSC and SHVI members presented at several conferences and educational programs including, the International Society for Heart and Lung Transplant 45th Annual Meeting & Scientific Sessions, the Heart Rhythm Society Conference, ACC.25, SCMR Annual Scientific Sessions, AHA EPI Lifestyle Scientific Sessions, American Society of Echocardiography Echo Hawaii, 61st STS Annual Meeting, and the Scripps Structural Heart Intervention and Imaging Conference.

ANNOUNCEMENTS

Dr. Whalen and the SHVI team went live across the system in both Charlotte and Winston-Salem with the Medtronic Affera Ablation System, which is a combination of pulse field and radio frequency ablation and a high-density mapping catheter as well. This is generally a tool for ablation of atrial fibrillation, and they also performed their first compassionate use of this catheter for a patient with refractory ventricular tachycardia.

The Cardiovascular Sciences Center (CVSC) will be seeking proposals for the **2026 Pilot Award Program**. The goal is to promote new areas or technologies for cardiovascular research (basic, clinical, population), as well as to foster new collaborations, particularly across the Atrium Health System. Projects from early career researchers, pursuit of novel and innovative ideas and research that uses Institutional Cores and other shared resources are encouraged. The funding is also meant to allow investigators to perform critical experiments, access core facilities or improve analyses to address specific critiques raised by reviewers for already submitted and reviewed applications. **Completed applications are due ~ Spring 2026.** Please contact Dr. Liliya Yamaleyeva (lyamaley@wakehealth.edu) if you need further guidance.

Congratulations to our 2025 CVSC Pilot Awardees:


Stettler

Greg Stettler, MD Department of Surgery: "Renin-Angiotensin-Aldosterone System Activation in Injured Patients at Risk of Hemorrhagic Shock."


Kavanagh

Kylie Kavanagh, DVM, MS, MPH Biomedical Engineering: "A role for pericytes in regulating skeletal muscle and adipose tissue microvascular insulin sensitivity in health and type 2 diabetes."


Maiocchi

Sophie Maiocchi, PhD Biomedical Engineering: "Degradation of Neutrophil Extracellular Traps to Enhance Thrombolysis in Venous Thrombo-Embolic Disease."

CAREER CORNER

ENVISION – Employing Novel Virtual and In-person Strategies to Increase the Number Of Students PursuiNg Healthcare and Biomedical Research Careers

In this month's CVSC ENVISION portfolio feature we showcase ***Dr. TanYa Gwathmey. Follow these links to access*** ***TanYa's brochure***, ***podcast***, ***podcast transcript*** and ***podcast PowerPoint***. A survey link is provided with all materials to gather feedback from those accessing the portfolios. All materials are free to download and use without copyright restraints. ***More materials to come!***

The target audience for the portfolios is high school/ early college level and their teachers, with resources for teachers to implement within their curriculum or share with their students directly, including Lesson Plans/ Activity Sheets, Online Journal Articles, Brochures, Careers-focused PowerPoints, and Podcasts with transcripts and PowerPoints. Materials are produced in English and Spanish.

Please visit the ENVISION website to access other materials published so far and feel free to share this information with your networks, particularly with high school and early college students, and science teachers (materials are free to download and use without copyright restraints). The ENVISION team (Drs. Debra Diz, David Herrington, Indra Newman and Shea Gilliam-Davis) partners with Futurum, a publishing company specializing in profiling scientists, to produce these portfolios of our amazing colleagues as relatable role models. *If anyone wishes to participate as a featured individual or team or has suggestions for those to feature, please reach out to:* Shea.Gilliamdavis@Advocatehealth.org

AWARDS AND ACCOMPLISHMENTS

Shiridhar, PhD (Postdoctoral fellow in the Tomar Lab; mentoring team includes Drs. Dhanendra Tomar, David Herrington, Pooja Jadiya, Giselle Melendez, and collaborators Sophie Maiocchi and Kiran Kumar Solingapuram Sai) was awarded a Career Development Award from the American Heart Association to study "Neutrophil CLPB-Regulated Mitochondrial Homeostasis in Myocardial Injury Repair." The project period is from April 1, 2025, to March 31, 2028. This award will support Shiridhar's transition from a postdoctoral fellow to a faculty member.


Eyadiel

Lauren Eyadiel, MMS, PA-C has achieved a remarkable milestone by becoming the first PA to be named a Fellow of the Heart Failure Society of America. This is a significant accomplishment and a testament to her dedication and expertise in the field. You can read more about it and find additional details at https://school.wakehealth.edu/departments/pa-studies/inside-wake-pa/inside-wake-pa-winter-2025/lauren-eyadiel

AWARDS AND ACCOMPLISHMENTS *continued*

Kunal Samantaray, PhD (Postdoctoral fellow in the Jadiya Lab) received the Travel Award from the Center for Redox Biology and Medicine – Metabolism and Inflammation Working Group (MIG) for his active participation in the MIG Program.

Natasha Jaiswal, PhD (Postdoctoral fellow in the Jadiya Lab) received first Place for Best Poster Presentation at 2025 Internal Medicine Research Symposium at Wake Forest University School of Medicine.

Kunal Samantaray, PhD (Postdoctoral fellow in the Jadiya Lab) received Second Place for Best Poster Presentation at the Postdoctoral Fellow Research Day and the 2025 Internal Medicine Research Symposium at Wake Forest University School of Medicine.

Chang

Alegria

Congratulations to **Dr. Kevin Chang** and **Dr. Jorge Alegria** for being selected as recipients of the 2025 Dean's Excellence in Education Award! This honor is bestowed by the Wake Forest University School of Medicine in recognition of outstanding contributions to teaching and student mentorship.

Jarret Dobbins, a 1st year medical student working in Dr. Dhupar's lab, received an award from the Wake Forest Medical Student Research Program for his summer project "Examining the Physiological Effects of Systemically Distributed Microplastics".

Scherer

Dr. Markus Scherer was invited to be a part of the TREAT TR International Steering Committee.

Dr. Rohit Mehta is a member of the Heart Rhythm Advocates Governing Board.

Dr. Christopher Mitromaras was nominated for the Cabarrus Healthcare Foundation Rising Star Physician.

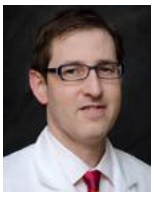
Congratulations to the following CVSC members for being WFUSM 2024 Research Award Day Recipients:

- **Michael P. Bancks, PhD, MPH**: Early Career Investigator in Clinical/Population Sciences
- **Tina Brinkley, PhD**: Research Educator
- **Katherine L. Cook, PhD**: Mid-Career Investigator in Basic/Translational Sciences
- **Michael Rinaldi, MD, FACC, FSCAI**: Clinician Investigator
- **Elsayed Z. Soliman, MD, MS**: Established Investigator in Clinical/Population Sciences
- **Andrew M. South, MD, MS**: Mid-Career Investigator in Clinical/Population Sciences
- **Nildris Cruz-Diaz, PhD** and **Liliya Yamaleyeva, MD, MS, FAHA**: New Team Science Award as part of the PhotoAcoustic Imaging for Necrotizing EnteroColitis (PAI4NEC) Team

Bancks

Brinkley

Cook



Rinaldi

Soliman

South

PAI4NEC Team

PUBLICATIONS

During the months of January to April, Cardiovascular Sciences Center members published 135 manuscripts. Of these, 17 were CVSC first author publications. Below we highlight several publications.

Vincent CL, Poehling KA, Rigdon J, **Schaich CL, South AM**, Downs SM. Cost-Effectiveness of Intensive Blood Pressure Control in Youth With Chronic Kidney Disease. Hypertension. 2025 Feb;82(2):393-401. doi: 10.1161/HYPERTENSIONAHA.124.23437. Epub 2024 Dec 5. PMID: 39633564.

Scherer E, Kerwin A, **Schwartz J, Scherer M.** Novel Use of Intra-Aortic 3D ICE to Guide Ascending Aorta Pseudoaneurysm Repair. JACC Cardiovasc Interv. 2025 Mar 24;18(6):811-812. doi: 10.1016/j.jcin.2024.11.022. Epub 2025 Jan 22. PMID: 39846920.

Mirzai S, Volk MC, Kazibwe R, Gabani M, **Schaich CL,** Hammonds R, Seals A, Singleton MJ, **Yeboah J, Shapiro MD, Herrington D, Kitzman DW, Hughes TM,** Williamson JD, **Kritchevsky SB**. Association of Gait Speed With Cognitive Outcomes in Older Adults With Hypertension: A Secondary SPRINT MIND Analysis. J Aging Phys Act. 2025 Feb 12:1-9. doi: 10.1123/japa.2024-0152. Epub ahead of print. PMID: 39947193.

Frye C, Escudero M, Saunders W, Ajijola O, **Mawardi G, Nandkeolyar S, Kelly N, Phelan D.** The Efficacy of Goal-Directed Valsalva to Elicit Clinically Significant Gradients in Patients With Obstructive Hypertrophic Cardiomyopathy Taking Mavacamten Therapy. J Am Soc Echocardiogr. 2025 Jan;38(1):51-52. doi: 10.1016/j.echo.2024.10.002. Epub 2024 Oct 12. PMID: 39401730.

Kamaraj S, Firdaus ML, Norfarahdina R, Muizz AMA, Ranga ARA, Henry TD, **Wilson H,** Glendon LSK, Raqib AGA, Kahar AGA. Clinical Outcomes and Practicality of Transferring Patients Immediately to Originating Hospitals After Primary Percutaneous Coronary Intervention-A Retrospective Study. Catheter Cardiovasc Interv. 2025 Jan;105(1):99-108. doi: 10.1002/ccd.31290. Epub 2024 Nov 15. PMID: 39548661.

Ashburn NP, Snavely AC, Ehrig MR, Shapiro MD, **Herrington DM,** Reboussin DM, Gesell SB, Initiating Preventive Care for Hyperlipidemia in the Emergency Department: The EMERALD (Emergency Medicine Cardiovascular Risk Assessment for Lipid Disorders) Trial. Crit Pathw Cardiol. 2025 Apr 22. doi: 10.1097/HPC.0000000000000390. Epub ahead of print. PMID: 40293837.

Ray JW, Sun X, **Cruz-Diaz N, Pulgar VM, Yamaleyeva LM.** Sex differences in middle cerebral artery reactivity and hemodynamics independent from changes in systemic arterial stiffness in Sprague-Dawley rats. Physiol Rep. 2025 Apr;13(7):e70250. doi: 10.14814/phy2.70250. PMID: 40165608; PMCID: PMC11959158.

Supples MW, Snavely AC, **Ashburn NP,** Koehler LE, Stopyra JP, Park CJ, Vasu S, Kutcher M, Hundley G, **Mahler SA, Miller C**; CMR-IMPACT Research Group. Cardiac testing choices by physician specialty in the CMR-IMPACT trial. Am J Emerg Med. 2025 Apr;90:200-204. doi: 10.1016/j.ajem.2025.01.073. Epub 2025 Jan 27. PMID: 39908686.

The following publication represents a tool that **Dr. Bancks** and team created, an individualized type 2 diabetes (T2D) risk prediction and prevention calculator: https://diabetesriskcalculator.phs.wakehealth.edu/. This risk prediction model does what no other T2D risk prediction model can do. This tool is designed for individuals at high-risk for developing T2D and provides predicted risk estimates in the presence and absence of starting recommended first-line preventive interventions (intensive lifestyle intervention for weight loss or metformin therapy).

- Jaeger B, Casanova R, Demesie Y, Stafford J, Wells B, **Bancks MP**. Development and validation of a diabetes risk prediction model with individualized preventive intervention effects. J Clin Endocrinol Metab. 2025 Apr 23:dgaf250. doi: 10.1210/clinem/dgaf250. Epub ahead of print. PMID: 40265376.

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