



GOOD NEWS!

Wake Forest University School of Medicine Cardiovascular Sciences Center

Winter 2023

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THE REMOTE HYPERTENSION TRACKING HELP AND MANAGEMENT TO REDUCE DISPARITIES IN BLACK PATIENTS (RHYTHM-B)

The Patient-Centered Outcomes Research Institute (PCORI) has awarded a \$9.9 million grant to **Drs. Yheneko Taylor, PhD, MS, William Applegate, MD, MPH, MACP** and **Co-Investigator Dr. William Downey, MD, MS**, for the 5-year study titled [Remote Hypertension Tracking Help and Management to Reduce Disparities in Black Patients \(RHYTHM-B\)](#) which aims to improve blood pressure control outcomes for non-Hispanic black patients.

RHYTHM-B examines two approaches to improve care for non-Hispanic Black patients with hypertension. One method, self-management support, provides patient care remotely through phone calls and video visits. Building upon a care model developed in the Sanger Heart & Vascular Institute led by Dr. William Downey, a care team, including a pharmacist and community health worker, will offer regular calls and outreach to help give advice, reminders, and education to patients. The other method involves the usual in person doctor's office visits.

The research team is collaborating with 18 doctor's offices in North Carolina, South Carolina, and Kansas to enroll 780 non-Hispanic Black patients with hypertension that is not under control. Remote and in-person patients will undergo training on how to measure their blood pressure at home using a home blood pressure monitor provided by the research team and remain in the study for two years. The results will be compared to see if one method proves more effective at managing high blood pressure.



Taylor



Applegate



Downey



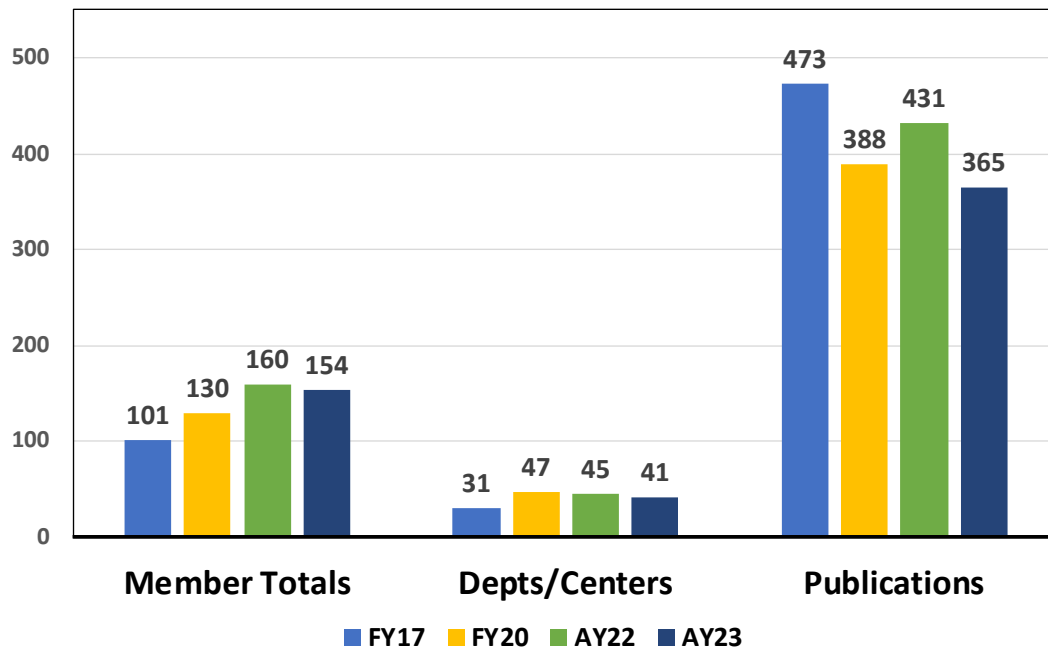
2023 CENTER ANNUAL REPORT HIGHLIGHTS

Membership, Publication and Extramural Funding Activities for 2023: We congratulate members on their continued successes and highlight the many sustained achievements below. Membership averages 2.4 publications per member and continues to steadily increase funding (the number of active awards and total annual funding). Many of the awards reflect the programmatic efforts of our highly collaborative and team-oriented faculty. The number of application submissions increased as well for a total of \$591 million.

Of note, we continue our commitment to training the next generation of diverse scientists and health professionals, with 7 active training awards (T32, T35 and R25) and 2 K awards, where members serve as PI/MPI for a total annual funding of \$1.8 million.

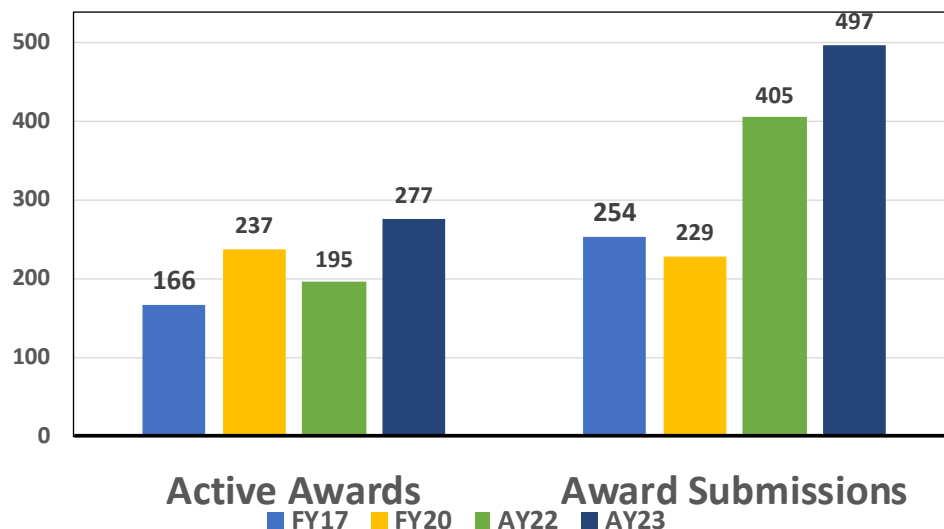
CVSC: Membership, Departments and Centers Represented, Publications

Membership averages ~2.4 Publications per member in 2023



CVSC: Membership Funding Metrics

Active Awards and Submission Activity



Total Member Funding (~72% NIH)
 FY17 - \$42 M
 FY20 - \$86 M
 AY22 - \$73 M
AY23 - \$98 M

32*
Programmatic Awards
 (Pxx, Uxx, PCORI, SPORE, etc.)

AWARDS AND ACCOMPLISHMENTS

Dr. Ana Clara Melo was interviewed for the newsletter *Future Health – Brazil* on novel therapeutics to treat childhood cancer.



Bushnell

Dr. Cheryl Bushnell, MD, MHS is the PI of the Clinical Coordinating Center for a PCORI-funded trial called TEAMS-BP (Telehealth Enhanced Assessment and Management after Stroke—Blood Pressure), which was approved by the PCORI Expert Advisory Panel to proceed with full trial funding (\$20 million in direct

funds). This was after successfully achieving the milestones for an 18-month feasibility phase to test the interventions in 50 randomized participants. The two interventions include Intensive Telehealth Management (telehealth visits and transmission of BPs) and Intensive Clinic Management (in person clinic management). The Data Coordinating Center is led by Wayne Rosamond, PhD who is PI. The full trial will be conducted in 11 sites, including AHWFB, AH-CMC in Charlotte, MUSC, Vanderbilt, Mayo Florida, UAB, USC in Columbia, SC, Grady Hospital (Emory), Duke, and Advocate Christ Hospital, and Advocate Lutheran General in Chicago.

Wake Forest Faculty Strongly Contribute to [Science's 2023 Breakthrough of the Year](#)



Kitzman

The STEP-HFpEF trial of semaglutide for heart failure with preserved ejection fraction (HFPEF) that was co-designed and co-led by **Dr. Dalane Kitzman**, and whose results were reported in the NEJM in September and named as one of their notable articles of the year ([N Engl J Med. 2023 Sep 21;389\(12\):1069-1084](#)), was

cited in [Science's 2023 Breakthrough of the Year](#) article. There is a lot of experience from Wake Forest that drove the study. Its design was based partly on the [SECRET 1](#) experience, which was based partly on Dr. Barbara Nicklas' [Diet, Exercise, Metabolism and Obesity in older women \(DEMO\)](#) studies and the Claude Pepper Older Americans Independence Center overall expertise in obesity research. The Science article also provides a nice review of the history of the glucagon-like peptide-1 (GLP-1) as well as some of the emerging concerns regarding anti-obesity medications that have been making news headlines this past year.

Dr. Ashlesha Kadam (AHA-Postdoctoral Fellow in Dr. Tomar's lab) received a travel grant from the American Society of Cell Biology (ASCB) to attend the ASCB Annual Meeting in Boston.



Tomar

Dr. Dhanendra Tomar was selected as a finalist for the 2024 Biochimica et Biophysica Acta (BBA) Molecular Cell Research Rising Star award.

Dr. Dhanendra Tomar was selected as a Chair of the Early Career Committee and Member of the Executive Committee, Society for South Asian Heart Research (SAHR), USA.

Dr. Dhanendra Tomar was selected as a regular Member of the International Affairs Committee of the American Society of Cell Biology (ASCB), USA.



Gwathmey

Dr. TanYa Gwathmey was selected for the 2023 Faculty Mentoring Program Mentor of the Year Award.

Dr. Kevin Chang has been named Associate Program Director for the Vascular Surgery Fellowship and Integrated Residency.



Velazquez

Dr. Gabriela Velazquez is the Vice Chair for the Department of Vascular and Endovascular Surgery.

Dr. Bartlomiej Imielski accepted the position of Associate Program Director of the Thoracic Surgery Fellowship.

AWARDS AND ACCOMPLISHMENTS *continued*

Kudos to all, including the team members listed below, who worked with the Advanced Practice Providers from Sanger Heart and Vascular Institute to contribute to the first edition of the [Cardiovascular Manual for the Advanced Practice Provider](#).

Electrophysiology:

Chapter 8: Bradycardia by Hannah Kibler PA-C and Sharon Vannoy NP

Chapter 13: Introduction to Electrophysiology Devices by Jamie Dietrich PA-C

Heart Failure:

Chapter 20: Heart Failure with Reduced Ejection Fraction by Lauren Eyadiel PA-C and Bridget Rasmussen NP

Congratulations to the following for winning awards for their poster presentations at the 31st Annual Surgical Sciences Residents' and Fellows' Research Day on Thursday, November 16, 2023.

Jonathan Ray, MS (mentor - Liliya M. Yamaleyeva, MD, MS) for winning the Fellow Basic Science Gold Award.

Mohamed Gaber (mentor - Katherine L. Cook, PhD) for winning the Student Basic Science Gold Award.

Naresh Mahajan, PhD (mentor - Shay Soker, PhD) for winning the Fellow Clinical Science Silver Award.

FUNDING

During the months of September to December, CVSC members were awarded **18 grants**. Below we highlight a some of these awards.



Kavanagh

Dr. Kylie Kavanagh and team received a NCDRC Ignition Fund Pilot award for their project titled "The Visceral Adipobiome in a Multiethnic Cohort of Patients." The project period began 10/1/23 and will go through 3/31/24 with an award amount of \$14,050.



Zhang

Dr. Yuanyuan Zhang received an award for his NIH/HEI R21 grant proposal "Regeneration of human retinal pigment epithelial cells from autologous urine-derived iPSC." The goal is to develop a strategy for the generation of reliably archived retinal pigment epithelial cells (RPEs) derived from human u-iPSC (u-iPSC-RPEs) for the potential treatment of Age-related macular degeneration (AMD).



Akbilgic

Dr. Akbilgic was awarded a R01 from the NHLBI for the project titled "ECG-AI Based Prediction and Phenotyping of Heart Failure with Preserved Ejection Fraction" which investigates the role of AI and electrocardiogram as predictor for HFpEF as well as its role in identifying subtypes

of HFpEF. The team of investigators also includes CV faculty members Drs. Karabayir, Soliman, and Herrington.

Dr. Dhanendra Tomar received a "New to the Field"



Tomar

research grant from Alzheimer's Association to study the mitochondrial protein quality control and calcium flux in Alzheimer's disease.

Drs. Tina Brinkley, Debra Diz and TanYa Gwathmey received a very competitive score of 14 on the Enhancing UNDERgraduate Education and Research in AGing to Eliminate Health Disparities (ENGAGED) program renewal application with anticipated funding for the next 5 years (years 6-11).



Brinkley



Diz



Gwathmey

INVITED PRESENTATIONS



Chappell

On November 18, 2023, **Dr. Mark Chappell** gave an invited lecture on "Dysfunction of the Renin-Angiotensin System in Septic Shock" at the XIV International Symposium on Vasoactive Peptides in Nova Lima, Brazil.



Das

Dr. Swapan K. Das served as a Platform Session Moderator at the 2023 American Society of Human Genetics (ASHG) Annual Meeting, in Washington DC for "Session 100 - Go Beyond GWAS in Type 2 Diabetes, Obesity and Related Metabolic Disorders" on November 4, 2023.

Dr. Esther Kim will present "MINOCA Pharmacology: Is There a Role for Antiplatelet Therapy?" during the Antithrombotic Strategies For Short and Long-Term Secondary Prevention Session at the American College of Cardiology (ACC) 73rd Annual Scientific Session & Expo on Saturday, April 6, 2024, in Atlanta, GA.

Dr. Ana Clara Melo presented a selected talk titled "Angiotensin-(1-7), A Potential Adjuvant to Doxorubicin Cancer Therapy, Reduces Nephrotoxicity by Decreasing Oxidative Stress and Fibrosis" at the XIV International Symposium on Vasoactive Peptides in Nova Lima, Brazil on November 18, 2023.



Gallagher

Dr. Patricia Gallagher presented an invited talk titled "Angiotensin-(1-7): A Prospective Cancer Therapeutic" at the XIV International Symposium on Vasoactive Peptides in Nova Lima, Brazil on November 18, 2023.



Akbilgic

Dr. Oguz Akbilgic gave an invited talk at the 2023 European Society of Cardiology Annual Conference in Amsterdam on "Screening for Cardiac Dysfunction using Artificial Intelligence-enabled ECG".

Dr. Oguz Akbilgic presented the invited talk "New Opportunities and Challenges with Remote Patient Monitoring with AI" at the National Ministry of Health of Türkiye's Conference on Artificial Intelligence in Medicine, in Istanbul, Türkiye, October 19-22, 2023.

Dr. Oguz Akbilgic gave an invited talk at Chicago Health Risk Management Society Patient Safety and Risk Management Law Day, Nov 10, 2023, on "The Emerging Role of AI in Healthcare: New Opportunities & New Challenges."

Dr. Oguz Akbilgic presented "Early Identification of Childhood Cancer Survivors at High Risk for Late Onset Cardiomyopathy: An Artificial Intelligence Approach utilizing Electrocardiography" at the NCI's Reducing Morbidity and Improving Care for Pediatric and AYA Cancer Survivors Meeting.

Dr. Oguz Akbilgic presented an invited talk at the University of Florida AI Pathways Seminar Series on "Emerging Role of Electrocardiographic Artificial Intelligence Models in Cardiovascular Outcome Prediction."

Dr. Ashlesha Kadam (AHA-Postdoctoral Fellow in Dr. Tomar's lab) delivered a scientific talk in a Minisymposium on "Integration of signaling and metabolism in cell physiology" at the American Society of Cell Biology (ASCB) Annual Meeting in Boston.

Dr. Dhanendra Tomar chaired a session on Cardiac Arrhythmia & Ion Homeostasis at Global Talents in Science 5th International Symposium on "Research Advancements for Enabling Precision Medicine in Cardiovascular Disease", USA.

Dr. Carolyn Jean Park presented her work titled "Stress CMR in the Morbidly Obese for Ischemic Evaluation: Differences in Image Quality and Predictors of Cardiac Death and Hospitalizations", which was a joint project with Wake Forest and the Sanger Heart and Vascular Institute, as an oral moderated poster session in London at the Society of Cardiovascular Magnetic Resonance (SCMR) International Conference in January 2024. She will be presenting further data on this project at the American College of Cardiology (ACC) Conference in April 2024.

PUBLICATIONS

Between the months of September-December, Cardiovascular Sciences Center members published 133 manuscripts. Of these, **12** were CVSC first author publications. Below we highlight several of those.

Bancks MP, Pilla SJ, Balasubramanyam A, Yeh HC, Johnson KC, Rigdon J, **Wagenknecht LE**, **Espeland MA**. Association of lifestyle intervention with risk for cardiovascular events differs by level of glycated hemoglobin. *J Clin Endocrinol Metab*. 2023 Nov 18;dgad674. doi: 10.1210/clinem/dgad674. Epub ahead of print. PMID: 37978826.

Busse LW, **Schaich CL**, **Chappell MC**, McCurdy MT, Staples EM, Ten Lohuis CC, Hinson JS, Sevransky JE, Rothman RE, Wright DW, Martin GS, **Khanna AK**; Vitamin C, Thiamine and Steroids in Sepsis (VICTAS) Investigators. Association of Active Renin Content With Mortality in Critically Ill Patients: A Post hoc Analysis of the Vitamin C, Thiamine, and Steroids in Sepsis Trial. *Crit Care Med*. 2023 Nov 10. doi: 10.1097/CCM.0000000000006095. Epub ahead of print. PMID: 37947484.

Kosiborod MN, Abildstrøm SZ, Borlaug BA, Butler J, Rasmussen S, Davies M, Hovingh GK, **Kitzman DW**, Lindegaard ML, Møller DV, Shah SJ, Treppendahl MB, Verma S, Abhayaratna W, Ahmed FZ, Chopra V, Ezekowitz J, Fu M, Ito H, Lelonek M, Melenovsky V, Merkely B, Núñez J, Perna E, Schou M, Senni M, Sharma K, Van der Meer P, von Lewinski D, Wolf D, Petrie MC; STEP-HFpEF Trial Committees and Investigators. Semaglutide in Patients with Heart Failure with Preserved Ejection Fraction and Obesity. *N Engl J Med*.

2023 Sep 21;389(12):1069-1084. doi: 10.1056/NEJMoa2306963. Epub 2023 Aug 25. PMID: 37622681.

Ruggiero AD, Vemuri R, DeStephanis D, Brock A, Block MR, Chou J, **Das SK**, Williams AG, **Kavanagh K**. Visceral adipose microbial and inflammatory signatures in metabolically healthy and unhealthy nonhuman primates. *Obesity (Silver Spring)*. 2023 Oct;31(10):2543-2556. doi: 10.1002/oby.23870. Epub 2023 Aug 24. PMID: 37614163.

Schaich CL, **Hughes TM**, **Kitzman DW**, Jung Y, Chen H, Nicklas BJ, Houston DK, Brubaker PH, Molina AJA, Hugenschmidt CE. Neurocognitive Impairments and Their Improvement Following Exercise and Dietary Interventions in Older Patients With Heart Failure With Preserved Ejection Fraction. *Circ Heart Fail*. 2023 Dec 1:e011134. doi: 10.1161/CIRCHEARTFAILURE.123.011134. Epub ahead of print. PMID: 38037817.

Butler L, Karabayir I, **Kitzman DW**, Alonso A, Tison GH, Chen LY, Chang PP, Clifford G, **Soliman EZ**, **Akbilgic O**. A generalizable electrocardiogram-based artificial intelligence model for 10-year heart failure risk prediction. *Cardiovasc Digit Health J*. 2023 Nov 8;4(6):183-190. doi: 10.1016/j.cvdhj.2023.11.003. PMID: 38222101; PMCID: PMC10787146.

AUSTIN'S DATA TOOLS AND TIPS



Large Language Models

If you've been attuned to mainstream news over the last few months, then you've probably heard about ChatGPT. This AI tool allows the user to ask a question or enter a prompt and get an answer or product as output. Tools like

ChatGPT are built using large language models (LLMs). These are machine learning models with the ability to predict and generate plausible human language. An example of a language model is autocomplete, a standard function in word processors, internet search, email and text messaging apps. The model takes a sequence of words (aka tokens) as inputs and produces a list of the most probable words to appear next in the sequence. ChatGPT does this on a larger scale and is able to ingest and produce a large amount of text. This creates an experience that makes it feel like you are chatting with a human. All models need to be trained on existing data, so ChatGPT will be built on data from many different sources most of which are from the internet. However, not all information on the internet is accurate so

not all answers, produced by a tool like this, are guaranteed to be reliable or ethical. Do not input sensitive information into tools like ChatGPT because that data is sent to remote servers where others could see it. As this a young, rapidly emerging technology, these aspects will be improved upon over time.

The applications of LLMs like this are seemingly endless. In the healthcare setting, the most immediate application is the summarization/aggregation of vast amounts of unstructured data likes patient notes or a large list of diagnoses codes. One day, we may be able to use AI to query EHR data. A handful of R and Python packages that interact with ChatGPT have already been developed. For example, the package 'R Tutor' can analyze datasets and produce R code.

Thanks for reading this edition of data tools and tips. Don't hesitate to reach out to me if you have any questions or would like to talk more.

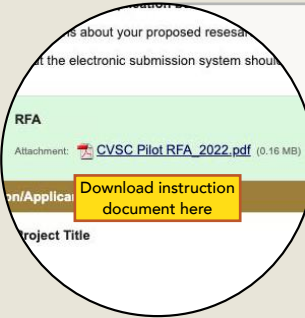
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ANNOUNCEMENTS

The Cardiovascular Sciences Center (CVSC) is seeking proposals for the 2024 Pilot Award Program. The projects should be those in need of support 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. The goal of the CVSC Pilot Program is to allow investigators (particularly early career researchers) to pursue novel and innovative ideas that will improve the likelihood of obtaining extramural funding for their research. We encourage research that uses Institutional Cores and other shared resource. 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.

Here is how you get started!

Go to this link to access the application form and RFA instructions. <https://redcap.wakehealth.edu/redcap/surveys/?s=LT9KFC9XFLEKX8HP>

A screenshot of a web-based application form titled '2022/2023 Cardiovascular Sciences Center (CVSC) Request for Pilot Applications'. The form is divided into sections: 'RFA', 'Project Information', and 'Abstract and Research Plan'. The 'Project Information' section contains several input fields: 'Project Title', 'Principal Investigator Name', 'Principal Investigator Department', 'Principal Investigator Rank' (a dropdown menu), 'Principal Investigator Email', and 'Number of Project Key Personnel'. The 'Abstract and Research Plan' section has a text area for 'Abstract (300 words max)'. A 'Logout' button is visible in the bottom right corner.

Completed applications are due Saturday, 03/30/2024. Please contact Dr. Liliya Yamaleyeva (lyamaley@wakehealth.edu) if you need further guidance.

Atrium Health Wake Forest Baptist Named in the Top 20 of Cardiovascular Hospitals, per Fortune, PINC. The rankings focused on short-term, acute care, nonfederal hospitals that treated a broad spectrum of cardiology patients. Hospitals had to provide all forms of cardiovascular care, including open heart surgery, to be included in the study. The final ranking, which is on a scale of one to five stars, was based on measures of acute myocardial infarction, heart failure, coronary artery bypass graft and percutaneous coronary intervention. Of 940 hospitals that participated in the study, only 50 were named to the list including AHWFBH which was ranked 19th.



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