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. Yhenneko Taylor, PhD, MS, William Applegate, MD, MPH, MACP and Co-Investigator Dr. Wiliam 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.
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](image)

CVSC: Membership Funding Metrics

![Active Awards and Submission Activity](image)

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

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 AHWF, 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***

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.

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.

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.

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.
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.

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

**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.

**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).

**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” 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).
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.

**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.

**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.


**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.

**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.
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 like 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.

Austin Seals, MSA
aseals@wakehealth.edu
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.

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.