



GOOD NEWS!

Wake Forest University School of Medicine Cardiovascular Sciences Center

Winter 2024

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Drs. Dhanendra Tomar and Pooja Jadiya et al Awarded Multiple Grants



Tomar



Jadiya

Drs. Tomar and Jadiya and team were awarded several grants including:

- American Heart Association Innovative Project Award: "Mitochondrial Calcium Heterogeneity in Cerebrovascular System During Alzheimer's Disease", PI: **Jadiya**, Co-I: **Tomar**
- Two intramural CRBM Pilot Grants: "Serine Beta-lactamase-like Protein's Function in Mitochondrial Health and Alzheimer's Disease", PI: **Jadiya**, Co-Is: **Tomar**, Lee and "MAVS Mediated Interferon Signaling and Mitochondrial Function in the Skin of Dermatomyositis Patients: A Pilot Study" PI: Edminister, Co-Is: Hollis, **Tomar**
- Extramural Oklahoma Nathan Shock Center of Excellence in Aging Research Pilot Grant: "IMS proteases in Mitochondrial Proteostasis", PI: **Tomar**
- Two Alzheimer's Association Grants: "Mitochondrial Protein Quality Control and Ca²⁺ Flux in Alzheimer's Disease", PI- **Tomar**, Co-I- **Jadiya**, and "Microglia-Mediated Mitochondrial Calcium Signaling in Alzheimer's Disease", PI- **Jadiya**, Co-I- **Tomar**
- Postdoctoral Fellowship Award from the American Heart Association: **Ashlesha Kadam, PhD** (Postdoc in **Tomar** lab)
- Postdoctoral Fellowship Award from the American Heart Association: **Natasha Jaiswal, PhD** (Postdoc in **Jadiya** lab)
- Predoctoral Fellowship Award from the American Heart Association **Sarah Kaye** (Graduate Student in **Jadiya** lab)

Please join us in congratulating Drs. Tomar, Jadiya, and their team for receiving several grant awards.

FUNDING

During the months of September to December, CVSC members were awarded 24 grants including 6 from federal agencies for a sum of ~\$12.9M and 18 from other sources for a sum of ~\$3.5M. Below we highlight some of these awards.



Imielski



Chappell

Drs. Bartlomiej Imielski (PI), Mark Chappell, Ashish Khanna (Primary Co-Is), Ettore Crimi, Ted Kincaid, Spencer Tingey, Neal Kon, Adrian Lara and **Christopher Schaich (Co-Is)** were awarded a \$40,000 grant from the Heineman-Robicsek Foundation for their project “RAPCAV: The role of



Khanna

RAAS in Post-Cardiopulmonary Bypass Associated Vasoplegi” to continue work on vasoplegia after cardiopulmonary bypass. This study collects serum and blood samples from patients undergoing cardiopulmonary bypass, and analyzes the metabolite of renin aldosterone angiotensin system to characterize the normal response to cardiopulmonary bypass, as well as the changes underlying those patients who develop post-CPB vasoplegia.



Soliman

Elsayed Z. Soliman, MD, MS, along with PIs from the University of Alabama-Birmingham, was awarded a NINDS RF1 grant for “Understanding Cohort Effects on Stroke, VCID, and Cognition After Major Epidemiologic Transitions” with a project period of 09/17/2024 to 08/31/2026.

Extramural Funding (Industry sponsored multicenter trial awards)

Each of these four trials were highly competitive for selection and continues the national and international recognition of the SHVI Structural Heart Program.

- **Jonathan Schwartz, MD (PI) and Michael Rinaldi, MD (Co-I)** received funding for the JOURNEY, CMC 2025. The Journey Trial will study an investigational TAVR platform for pure aortic insufficiency and CMC will be one of a select group of centers nationally invited to participate.
- **Michael Rinaldi, MD** is the Site PI for the following awards:
 - » SympLAAfy, Multicampus 2025: SympLAAfy is a multicenter randomized trial investigating different post implant anticoagulation regimens following left atrial appendage occlusion with Watchman technology.
 - » ATLAS 4C AltaValve Pivotal, CMC 2024: Atlas is a pivotal trial studying an investigation transcatheter mitral valve replacement technology. CMC was part of early feasibility and one of the first in the world to study this technology.
 - » LAMINAR, CMC 2024: Laminar is a pivotal trial studying a novel left atrial appendage closure technology where the LAA is closed with a twist and lock system instead of traditional plug technology.

AUSTIN'S DATA TIPS & TOOLS



Modeling Longitudinal Data with Random Effects

Longitudinal data is data that records outcomes of individuals/entities

across multiple time points. This is also referred to as repeated measures data or panel data. A common example is readmissions data or a study where patients are exposed to a treatment and their response to it is measured at multiple time points post-exposure. With this type of data, the standard ways of modeling data such as linear or logistic regression may not be appropriate because the assumptions of these techniques are not met. Specifically, the assumption that observations are independent from each other. In the longitudinal data context, observations are often dependent with each other because they come from the same individual/entity which can cause observations to have correlated variances. Something that standard linear regression is not built to handle. It is important to consider if these subject effects need to be controlled for.

This brings us to the random effects regression modeling. It considers both between and in-group variations. The “group” could be the patients, subjects, etc. This grouping variable would be specified as a random effect. For example, you want to measure the effectiveness of drug “A” compared to a control “B” at multiple time points. The random effect would be the “subject”, and the effect of the drug a fixed effect. Fixed effects are in the standard regression model (the effects of interest) but random effects are not.

This is a bird's eye view of a concept than can be tricky to grasp during application. However, there are plenty of online resources that dig into the details of random effects modeling. Most, if not all, statistical analysis software have this modeling capability. The SAS “PROC MIXED” procedure and the R package “lme4” provide random effects modeling.

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

Austin Seals, MSA

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AWARDS AND ACCOMPLISHMENTS



Tomar

Dhanendra Tomar, PhD received the "2024 - Biochimica et Biophysica Acta (BBA) Rising Star Award" in Biochemistry and Biophysics from BBA journals.

Ashlesha Kadam, PhD (Postdoc in Tomar lab) received the "Best Basic Science Poster Presentation Award" at the 2024 CVSC Ignite Conference.



Drs. Liliya Yamaleyeva, Ashlesha Kadam and Matthew Goldman



Schaich

Christopher Schaich, PhD was made a standing member of the AGCD-4 NIH Study Section (Career Development for Established Investigators and Conference Grants), for 2025-2029.

Christopher Schaich, PhD served on the RRD6-Chronic Medical Conditions and Aging grant review panel for the US Department of Veterans Affairs.

Dermot Phelan, MD, PhD, FASE is the Program Co-Chair of the 2025 American Society of Echocardiography (ASE) Scientific Sessions.



Gilbert

Dr. Olivia Gilbert was invited to Chair the ACC Anumana Work Group for ECG AI in Cardiology and will serve as the ACC Liaison to the PROTEUS Consortium which is focused on advancing the use of patient-reported outcomes in cardiology clinical trials and clinical practice.

Dr. Esther Kim was invited to participate in a NASA Technical Interchange Meeting (TIM) as part of the Venous Thromboembolism (VTE) Working Group held on October 23-24, 2024, at Johnson Space Center in Houston, Texas.

Dr. Troy Leo was appointed as a member of the ACC Partners in Quality Committee.

Dr. Sherry Saxonhouse was on the writing committee of the 2024 ACC Expert Consensus Decision Pathway on Practical Approaches for Arrhythmia Monitoring After Stroke: A Report of the American College of Cardiology Solution Set Oversight Committee.

Dr. Jonathan Schwartz has two start-up companies (CorFlow: Dr. Killian McCarthy, Local PI and LifeLens Technologies: Dr. Michael Rinaldi, Local PI) and will be a part of some clinical trials investigating technology that his team has developed. He is heavily involved in the companies as a co-founder/co-inventor and the trials will be starting at CMC soon.

SELECTED INVITED PRESENTATIONS



South

Dr. Andrew South gave an invited talk at the Third Pediatric Renovascular Hypertension Symposium at Duke University on November 4, 2024. The title of the presentation was "The Physiology of Renovascular Hypertension: Renin Kinetics."

On November 16, 2024, **Dr. Andrew South** moderated the AHA Scientific Session "Pecha Kucha: Future is Now - What is the Best Way to Reduce Blood Pressure Among Patients with Uncontrolled Hypertension?"



Wilson

B. Hadley Wilson, MD, MACC presented a Key Talk at the ACC Washington Chapter Meeting on September 14, 2024, titled "The Present and Future of Cardiology."

Dr. B. Hadley Wilson presented "Embedding AI into Cardiovascular Care: From Discovery to Practice" at the NC & SC Chapters ACC 31st Annual Joint Meeting in September 2024.

Dr. Michale Rinaldi presented three invited lectures titled "Update on Trans-Catheter Mitral Valve Repair", "Indications for LAA Closure: Available Devices and Scientific Evidence" and "What you need to know about the Accurate TAVR Platform" at the SCAI Fellows Course in Miami, FL, December 2024.

Dr. Dermot Phelan presented the following:

- "Athletic Cardiac Remodeling in Elite Baseball Players" Major League Baseball Annual Meeting, Dallas, TX, December 14, 2024
- "Managing Athletes with Bicuspid Aortic Valve Disease and Aortopathy: A Sports Cardiologist's Perspective." Yale School of Medicine Grand Rounds, November 20, 2024
- "New Era in the Game: Pioneering Advances in Sports Cardiology" **Keynote Speaker CVSC Ignite Conference**, December 6, 2024



2024 CVSC Ignite Conference Speakers pictured left to right: Drs. Joseph McClung, Dermot Phelan, Matthew Goldman, Nicole Cyrille-Superville, Nick Ashburn and Xuewei Zhu

CAREER CORNER

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

Continuing our interests in promoting pathways into careers in the biomedical sciences and health professions, we are happy to report a new Duke Endowment grant with the goal of attracting more high school and early college students to consider careers in the biomedical workforce. 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 a series of portfolios featuring some of our amazing colleagues as relatable role models from diverse backgrounds. The material is geared to the high school/early college level and provides resources for teachers to implement within their curriculum or share with their students, including Lesson Plan/Activity Sheets, Online Journal Articles, Brochures, Careers-focused PowerPoints, and Podcasts with a transcript and PowerPoint. Materials are produced in English and Spanish. A survey link is provided with all materials to gather feedback from those accessing the portfolios whatever source of access.

Dr. Tina Brinkley is the first faculty member featured. Access [Tina's brochure](#), [podcast](#), [podcast transcript](#) and [podcast PowerPoint](#). More materials to come!



Please visit the [ENVISION website](#) to access 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). Also, if anyone wishes to participate as a featured individual or team or has suggestions for those to feature, please reach out to: sgilliam@wakehealth.edu

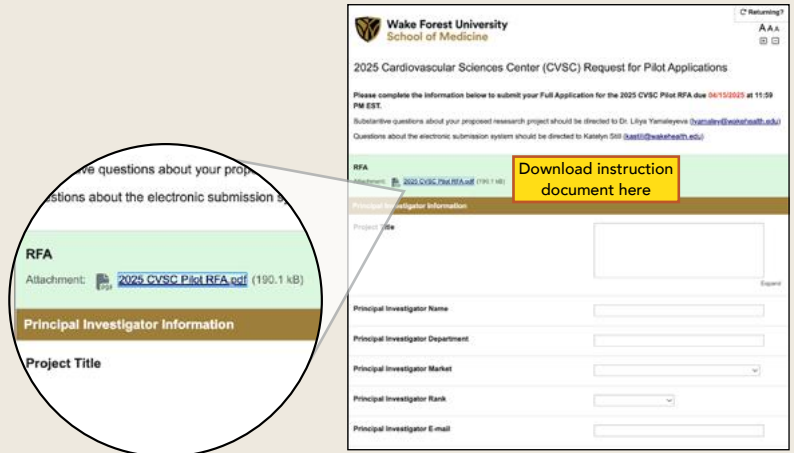
ANNOUNCEMENTS

The Cardiovascular Sciences Center (CVSC) is seeking proposals for the 2025 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=YPXFLDXP7EAF3KCY>



Completed applications are due April 15, 2025, with an award start date of June 15, 2025.

Please contact Dr. Liliya Yamaleyeva (lyamaley@wakehealth.edu) if you need further guidance.

The **ENVISION Campaign**, the campaign to accelerate discovery, hope and health continues to raise the critical funding needed to support promising research efforts across the enterprise. Funds raised will enable us to invest in research throughout an individual's lifespan across key areas of focus including cardiovascular research.

To learn more about the **ENVISION Campaign**, visit: <https://giving.wakehealth.edu/find-your-cause/greatest-need/envision/cardiovascular>

Contact the Office of Philanthropy and Alumni Relations for more information. Philanthropy@wakehealth.edu or 336.716.4589



PUBLICATIONS

Between the months of September-December, Cardiovascular Sciences Center members published **124** manuscripts. Of these, **9** were CVSC first author publications. Below we highlight several publications.

Chappell MC*, Schaich CL*, Busse LW, Martin GS, Sevransky JE, Hinson JK, **Khanna AK**; Vitamin C, Thiamine, Steroids in Sepsis (VICTAS) Investigators. Stronger association of intact angiotensinogen with mortality than lactate or renin in critical illness: post-hoc analysis from the VICTAS trial. *Crit Care*. 2024 Oct 14;28(1):333. doi: 10.1186/s13054-024-05120-w. PMID: 39402593; PMCID: PMC11472595.

***Shared first authorship**

Dvir D, Tchétché D, Leon MB, Généreux P, Seguy B, Makkar R, Pibarot P, Gada H, Nazif T, Hildick-Smith D, Kempfert J, Dumonteil N, Unbehaun A, Modine T, Whisenant B, Caussin C, Conradi L, Waggoner T, Mishell JM, Chetcuti SJ, Kar S, **Rinaldi MJ**, Szerlip M, Ramana RK, Blackman DJ, Ben-Dor I, Kornowski R, Waksman R, Gerckens U, Denti P, Kukucka M, Ternacle J, Skaf S, Kovac J, Jilaihawi H, Patel V, Jubeh R, Abdel-Wahab M, Kodali S. Leaflet modification before transcatheter aortic valve implantation in patients at risk for coronary obstruction: the ShortCut study. *Eur Heart J*. 2024 Sep 1;45(33):3031-3041. doi: 10.1093/eurheartj/ehae303. PMID: 38747561; PMCID: PMC11365606.

Ferris T, Yohannan E, Daniel K, **Richardson KM**. Comparing Echocardiographic Strain Imaging in Cardiac Amyloid and End-Stage Renal Disease Patients. *Echocardiography*. 2024 Oct;41(10):e15962. doi: 10.1111/echo.15962. PMID: 39403011.

Herrera CJ, Levenson BJ, Natcheva A, Lucca AC, Olsson K, Miki K, Fong A, Jollis JG, McCormick A, **Wilson BH**. Improving STEMI Management Internationally: Initial Report of the American College of Cardiology-Global Heart Attack Treatment Initiative. *JACC Adv*. 2024 Dec 10;4(1):101438. doi: 10.1016/j.jacadv.2024.101438. PMID: 39737139; PMCID: PMC11683228.

Kazibwe R, **Rikhi R**, Mirzai S, **Ashburn NP, Schaich CL, Shapiro M**. Do Statins Affect Cognitive Health? A Narrative Review and Critical Analysis of the Evidence. *Curr Atheroscler Rep*. 2024 Nov 9;27(1):2. doi: 10.1007/s11883-024-01255-x. PMID: 39520593; PMCID: PMC11550230.

Kim JH, Martinez MW, Guseh JS, Krishnan S, Gray B, Harmon KG, Papadakis M, **Phelan DM**, Stewart K, Levine BD, Baggish AL; American College of Cardiology Sports & Exercise Leadership Council. A contemporary review of sudden cardiac arrest and death in competitive and recreational athletes. *Lancet*. 2024 Nov 30;404(10468):2209-2222. doi: 10.1016/S0140-6736(24)02086-5. PMID: 39616000.

Kotani Y, **Khanna AK**. Angiotensin II and Thromboembolism-Reading the Fine Print. *Crit Care Med*. 2024 Dec 1;52(12):1981-1985. doi: 10.1097/CCM.0000000000006468. Epub 2024 Nov 14. PMID: 39637267.

Rai AK, Sanghvi S, Muthukumaran NS, Chandrasekera D, Kadam A, Kishore J, Kyriazis ID, **Tomar D**, Ponnalagu D, Shettigar V, Khan M, Singh H, Goukassian D, Katare R, Garikipati VNS. Role of mitochondrial ribosomal protein L7/L12 (MRPL12) in diabetic ischemic heart disease. *Free Radic Biol Med*. 2024 Sep;222:531-538. doi: 10.1016/j.freeradbiomed.2024.07.003. Epub 2024 Jul 6. PMID: 38977138.

Veasey CJ, Snaveley AC, Kearns ZL, **Ashburn NP**, Hashemian T, **Mahler SA**. The High-Sensitivity HEART Pathway Safely Reduces Hospitalizations Regardless of Sex or Race in a Multisite Prospective US Cohort. *Clin Cardiol*. 2024 Oct;47(10):e70027. doi: 10.1002/clc.70027. PMID: 39417405; PMCID: PMC11483562.



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GOOD NEWS!

Wake Forest University School of Medicine Cardiovascular Sciences Center

Summer 2024

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Dr. Michael Shapiro Appointed as President of the American Society for Preventive Cardiology



Shapiro

We are proud to announce that Dr. Michael Shapiro, Professor of Cardiovascular Medicine, has been appointed as the [President](#) of the [American Society for Preventive Cardiology](#) (ASPC). This prestigious appointment is a testament to Dr. Shapiro's leadership, expertise, and longstanding commitment to the advancement of cardiovascular health and disease prevention.

As the new President of the ASPC, Dr. Shapiro will lead the Society's mission to promote the prevention of cardiovascular disease, which remains the leading cause of death globally. Under his leadership, the ASPC aims to expand its educational programs, foster collaborative research, and advocate for policies that enhance preventive care practices.

Dr. Shapiro's extensive work in preventive cardiology, including his involvement in clinical trials, research, and education, has significantly impacted the field. His vision for the ASPC includes a strong focus on bridging the gap between clinical practice and emerging research, particularly in areas such as lipid management, risk assessment, and innovative prevention strategies.

This appointment is not only a significant achievement for Dr. Shapiro but also reflects the continued excellence and influence of Wake Forest University School of Medicine in shaping the future of cardiovascular care.

Please join us in congratulating Dr. Shapiro on this remarkable achievement and his ongoing efforts to lead the fight against cardiovascular disease.

AWARDS AND ACCOMPLISHMENTS



Khanna

Congratulations to **Ashish K. Khanna, MD, MS, FASA, FCCM** for being selected as the recipient of the American College of Critical Care Medicine's (ACCM) Distinguished Investigator Award. This is the highest recognition given by the ACCM and is awarded to "an individual whose scientific and educational contributions to the art and science of critical care demonstrates career

commitment and excellence." The award encourages excellence in clinical research and recognizes an established and active Society of Critical Care Medicine (SCCM) clinical investigator for meritorious and pioneering clinical research in critical care that has significantly contributed to the treatment and/or understanding of patients. Dr. Khanna will be presented this award during the ACCM Convocation/SCCM Awards Presentation at the SCCM Congress in Orlando, February 2025.

Continued on page 7

FUNDING

During the months of May to August, CVSC members were awarded **29** grants. Below we highlight some of these awards.



Tomar



Jadiya

Drs. Tomar (PI) and Jadiya (Co-I) received an American Heart Association Transformational Project Award for their grant titled MICU1's Protein Quality Control in Cardiac Health with

a project period of 07/01/2024-06/30/2027 and a total cost of \$299,995.30.



Chappell



Khanna



Schaich



Files

Drs. Mark Chappell and Ashish Khanna (CPIs) received a fundable score of 11 percentile for their NIH R01 HL177834 "Dysfunctional Renin-Angiotensin System in Septic Shock." Co-Investigators include **Drs. Christopher Schaich and D. Clark Files** along with Drs. Marica Goldberg, Michael Filbin, Daniel Leisman from Massachusetts General Hospital/ Harvard University.



Allred



Bancks



Bertoni



Das



Wagenknecht

Drs. Fang-Chi Hsu, **Nichollette Allred**, and **Mike Bancks (MPIs)** were chosen for funding to join an NIDDK U01 consortium on diabetes heterogeneity (NIDDK RFA: Integration of Novel Markers for Improved Classification of Type 2 Diabetes). The U01 from WFUSM is titled Metabolomic and Genomic Expansion of Type 2 Diabetes Subtyping in Multiethnic Populations. The proposal team includes Drs. Ralph D'Agostino Jr., **Alain Bertoni**, **Swapan Das**, and **Lynne Wagenknecht**.

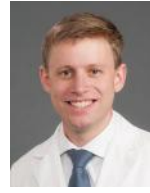


Cyrille-Superville

Dr. Nicole Cyrille-Superville (PI: Dr. Dalane Kitzman) was awarded a NHLBI administrative supplement grant (3U01HL160272-04S1) for the "Wake Forest Atrium HeartShare Clinical Center" study.



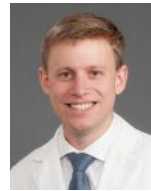
Mahler



Ashburn

Drs. Mahler (PI), Ashburn, Snavelly and Supplies (Co-Is) were awarded \$430,000 from Abbott to investigate point-of-care high-sensitivity cardiac troponin I assays in a multisite emergency department study

over a three-year period with the ACUTE (Assessing Chest Pain Using Point-of-Care High-Sensitivity Troponin I in the Emergency Department) study.



Ashburn



Mahler



Shapiro



Herrington

Drs. Ashburn (PI), Mahler, Snavelly, Shapiro, and Herrington (Co-Is) were awarded \$100,000 from the Emergency Medicine Foundation to assess the role of lipoprotein(a) and glycated albumin in emergency medicine chest pain risk stratification with the CHARISMA (Chest Pain and ASCVD Risk Stratification in a Multisite Emergency Department Cohort) study.



Yamaleyeva



Cruz-Diaz



Pulgar



Shaltout

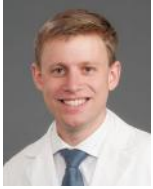
Dr. Liliya Yamaleyeva was awarded a NIH R21 grant (1R21HD114073-01) for her project "Apelin Receptor Axis and Long-term Consequences of Preeclampsia" from 9/01/2024- 08/30/2026 for a total amount of \$426,250. The goal is to establish the effects of apelin receptor axis on cerebrovascular function postpartum. Co-Investigators include Drs. Robert Gould (Translational Neuroscience), Tao Ma (Gerontology), **Nildris Cruz-Diaz** (Surgery/Hypertension), **Victor Pulgar** (Campbell University; Surgery/Hypertension, WFUSM), **Hossam Shaltout** (Department of Obstetrics and Gynecology; Surgery/Hypertension), Jeffrey Denney (Department of Obstetrics and Gynecology).

INVITED PRESENTATIONS



Tomar

Dhanendra Tomar, PhD, served as an organizing committee member at the 6th Asian Cardiovascular Symposium, held on July 21, 2024, in Chicago, IL. He also co-chaired the session titled Data Blitz: Pre-doctoral Trainee Presentations.



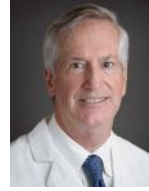
Ashburn

On June 27th, **Dr. Nicklaus Ashburn** presented at the 28th Annual Building Partnerships for Healthier Heart Conference. He talked about the recently funded NIH clinical trial Emergency Medicine Cardiovascular Risk Assessment for Lipid Disorders (EMERALD) on ED-initiated preventive cardiovascular care.



Schaich

Dr. Christopher Schaich has been invited to present "Dysfunction of the Renin-Angiotensin System in Critical Illness" at Winthrop University's Department of Biology on November 6.



Wilson

B. Hadley Wilson, MD, MACC presented "Introduction to the ACC" at the The Society for Cardiovascular Angiography & Interventions (SCAI) Emerging Leaders Mentorship (ELM) Program on May 2.

On May 16, **B. Hadley Wilson, MD, MACC** presented "Late Breaking EMPACT MI Trial" for the New Jersey Chapter of the American College of Cardiology.

B. Hadley Wilson, MD, MACC presented "Does ischemia evaluation still have a place in these patients?" for the Uruguayan Society of Cardiology on May 23.

Dr. Michael Moore was an invited speaker for the Virginia Osteopathic Medical Association's 2024 Spring CME Conference in Williamsburg, VA, April 26-27, 2024. He presented two online lectures: "Getting a Hypertensive Patient's Blood Pressure to Goal" and "Recognizing Glomerular Disease."



AUSTIN'S DATA TIPS & TOOLS

Metrics for Evaluating Binary Classification Models

In this edition of data tools and tips we'll review some of the most common metrics for assessing the quality of binary classification models. Binary classification is one of the most common problems addressed in research so it's important to know what makes a good (or bad) classification model. Commonly reported ones are area under the curve (AUC), sensitivity, specificity and no information rate (NIR).

AUC represents the probability that the model, if given a randomly chosen positive and negative example, will rank the positive higher than the negative. AUC has values between 0 and 1. The closer to 1 the AUC is the better the model. Generally values above 0.7 or 0.8 are considered good.

Sensitivity and Specificity are complements of one another. Sensitivity is the likelihood that a test will correctly identify a patient with a disease as positive while specificity is the likelihood that a test will correctly identify a patient without a disease as negative. These two often have an inverse relationship as when one is high the other tends to be low. The two values can be useful in deciding if your training data is biased in any way (i.e. imbalanced outcomes creating biased model) especially if one is really high and the other is extremely low.

Lastly there is NIR. It's a statistical test that assesses if a classification system's accuracy is significant for a given problem. NIR compares a classifier's performance to random assignment, and is calculated as the proportion of observations that fall into the majority class. If a classifier's accuracy is lower than the NIR, it's performing worse than simply guessing the majority class. NIR can be helpful in determining if your accuracy is high enough.

Note that the last three metrics mentioned depend on the classification cutoff for predicted probabilities (Are probabilities > 0.5 classified as positive? Or > 0.6?).

This is not an exhaustive list of metrics but are ones you can look for in most research publications. Others you might see are: F1, False Positive Rate, and True Positive Rate.

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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CAREER CORNER

The Cardiovascular Sciences Center (CVSC), Sticht Center for Healthy Aging and Alzheimer's Prevention and Hypertension and Vascular Research Center welcomed the undergraduate college students and WFUSM medical students listed below into 3 summer research programs for 2024.

These programs involve CVSC faculty and are led by a collaborative team of members committed to increasing diversity in the biomedical sciences (BMS). The programs are made possible by the outstanding mentors who host these students for meaningful research experiences and the students who are selected from schools across the nation. The cohorts this year represent 9 different universities within North Carolina, 3 HBCUs and 3 different campuses of the University of Puerto Rico. Research topics address aging, cardiovascular function and disease, and child health broadly, within the overarching concept of health disparities that impact the lifespan.

Our partners include many other summer programs, the Graduate School BMS programs, prior participants who have gone on to successful careers for professional development, career opportunities and social activities to provide networking and a sense of community. Our **CVSC members** and staff (particularly Ms. Lydia Durr and Dr. Claudia Olivier) deserve many, many thanks for all they do to make these programs successful, and we are very appreciative of the continuing support and enthusiasm they provide to the students.

The following trainees and mentors participated in the programs for 2024:

Excellence in Cardiovascular Sciences (EICS)

EICS STUDENT	UNDERGRAD INSTITUTION	MENTOR(S) & DEPARTMENT	PROJECT TITLE
Moesha Andze	MCPHS University	Patricia Smyre, PhD; TanYa Gwathmey, PhD MACHE	The Role of Health Ministries in Reducing Cardiovascular Health Disparities: Faith Leaders' Perspectives of Impact
Ellie Cyrus	Winston-Salem State University	Katherine Cook, PhD Cancer Biology	Investigating the Effects of Oral Probiotics on Mitigating Cardiac Dysfunction Induced by Breast Cancer Therapies
Mykyrah Davis	Delaware State University	Xuewei Zhu, PhD Molecular Medicine	Mamaki Tea Extract Modulation of Macrophage Polarization into Different Phenotypes Atherosclerosis using Mbmdm
Jalen Furqan	Morehouse College	Sophie Maiocchi, PhD Biomedical Engineering	Precision Control of Nanoparticle Size via Flash Nanoprecipitation
Serinity Her	University of Wisconsin-Madison	Leslie Poole, PhD Biochemistry	TREX1 Regulates the Inflammation Response to Oxidatively Damaged Cytosolic DNA
Alayna Lisbon	University of West Georgia	Jill Keith, PhD; Ryan Fitzgerald, PhD Biochemistry, WSSU	Chiral Synthesis of WSSU-5: A Diphenylpyraline Derivative for Cardiovascular Activity Analysis
Nayelis Lorenzo Mendez	University of Puerto Rico - Aguadilla	Allison Caban-Holt, PhD MACHE	Trust in Hispanics: The Relationship of Acculturation with Trust in Healthcare Researchers
Kevin Rosa Dieppa	University of Puerto Rico at Cayey	Chia-Chi Key, PhD Molecular Medicine	Propofol Effects on Bioenergetics in Blood Cells (PEBBLE)
Noah Sampson	East Carolina University	Megan Irby, PhD Health & Exercise Science, WFU	Perceptions of Pain and Pain Management Among Cancer Survivors Participating in an Online Pain Coping Skills Training Program
Adah Stancil	UNC Charlotte	Nicole Levi, PhD Plastic & Reconstructive Surgery	Disrupting Staphylococcus Aureus Biofilms Using Farnesol in Polyoctanediol Citrate Nanoparticles
Ashley Szymonski	Wake Forest University	David Soto-Pantoja, PhD Cancer Biology	The Influence of Cancer in Chemotherapy-Related Cardiotoxicity
Nicole Wu	Wake Forest University	Jeffrey Willey, PhD Radiation Oncology	The Additive Effects of Diabetes and a Sedentary Lifestyle Decreases Joint Health

Enhancing UNderGRaduate Education and Research in AGing to ELiminate Health DISparities (ENGAGED)

ENGAGED STUDENT	UNDERGRAD INSTITUTION	MENTOR(S) & DEPARTMENT	PROJECT TITLE
Chloe Bryant	Winston-Salem State University	Tina Brinkley, PhD Gerontology & Geriatric Medicine	Association Between Area Deprivation Index Scores and Primary Care Physician Visits Among Rural Older Adults
Kayari Harris	Winston-Salem State University	Daniel Kim-Shapiro, PhD Physics, WFU	Reaction of Catalase, Azide, and Hydrogen Peroxide
Abigail Hilsman	St. Olaf College	Gagan Deep, PhD Gerontology & Geriatric Medicine	Mitochondrial Signatures in Small Extracellular Vesicles to Predict Age-Related Muscle Dysfunction
Niyyah Lindsay	Western Carolina University	William Booth, PhD Clinical Laboratory Science, WSSU	Initiation of Structural Determination Experiments for Nicotinamide Adenine Dinucleotide Dehydrogenase Subunit-6
Leah Osei	Howard University	Sarah Adjei-Fremah, PhD Biological Sciences, WSSU	PFAS-Induced Mitochondrial Dysfunction and Aging in Neuroblastoma Cells (N18)
Luis Perez Dieppa	University of Puerto Rico at Cayey	Rachel Zimmer, DNP, NP Implementation Science	Evaluation of Food Landscape in Winston Salem: A City-Academic Partnership
Gargi Rao	Cornell University	Caryn Gee Morse, MD, MPH Infectious Diseases	Targeting Frailty in Older Adults with HIV
Bailey Reutinger	Elon University	Emilie Duchesneau, PhD Epidemiology & Prevention	The Association Between Frailty and Incident Cognitive Impairment in the National Health and Aging Trends Study
Marcus Stamps	Cornell University	Tennille Presley, PhD Physics, WSSU	Exploring the Effects of Pure Tone Solfeggio Frequencies on Galvanic Skin Response and Cell Activity
Diana Umpierre Diaz	University of Puerto Rico - Rio Piedras Campus	Christopher Schaich, PhD Hypertension & Vascular Research	The Association of Lipoprotein(a) with Atherosclerotic Cardiovascular Disease and Interactions by Body Mass Index
Kayla Young	Mississippi State University	Ashley Weaver, PhD Biomedical Engineering	Computed Tomography to Assess Body Composition and Lung Volumes in Heart Failure Patients and Controls

Training in Research Affecting Child Health (TRAC)

TRAC UNDERGRAD STUDENT	UNDERGRAD INSTITUTION	MENTOR(S) & DEPARTMENT	PROJECT TITLE
Aaliyah Alston	UNC Greensboro	Elizabeth Jensen, PhD Epidemiology & Prevention	Blood Lead Level Testing Rate Among Different Demographics
Adah Freeman	North Carolina State University	Giya Harry, MD, MPH, MSc Pediatrics- Rheumatology	Impact of Weight Status on Health-Related Quality of Life in Adolescents with Rheumatic Conditions: A Study of Spanish and English-Speaking Cohorts
Sophia Garganta	Elon University	Thomas McLean, MD; Joanna Robles, MD Pediatrics- Hematology & Oncology	Association of Language and Healthcare Utilization Among Pediatric Cancer Patients
Daniel Lake	Queens University of Charlotte	Cara Janusz, PhD, MPH, MA Implementation Science	Implementation of HPV Vaccination in Retail Pharmacies: Foundational Survey
Corinne Laws	UNC Greensboro	Arezo Movaghar, PhD Pediatrics	Co-Occurrence of Depression and Physiological Conditions in Patients with Down Syndrome
Autumn Lynch-Coleman	UNC Chapel Hill	Sarah Vess, PhD Pediatrics- Developmental	Evaluating the Efficacy of Parent-Child Interaction Therapy in Medically Complex Children Aged 3-8
TRAC MEDICAL STUDENT	MEDICAL INSTITUTION	MENTOR(S) & DEPARTMENT	PROJECT TITLE
Riayn Deria	WFU School of Medicine	Asma Ahmed, PhD, MD Epidemiology & Prevention	Maternal Traumatic Injuries During Pregnancy: Validity of Diagnostic Code
Mary Graham	WFU School of Medicine	Sarah Cilvik, MD, PhD Pediatrics - Neonatology	The Effects of Maternal Age on Offspring Growth in a Non-Human Primate Model
Brittney Hoard	WFU School of Medicine	Carol Vincent, MD Pediatrics - Nephrology	Understanding Pediatrician Perspective and Practice Regarding Hydration in Youth
Jamie Means	WFU School of Medicine	Kristina Lewis, MD, MPH, SM Epidemiology & Prevention	Quantifying the Knowledge and Perceptions about the WIC Program in Pregnant Patients and OBGYN Staff Members
Jeremy Odens	WFU School of Medicine	Jillian Urban, PhD, MPH Biomedical Engineering	Relationship Between Tackling Form and Head Acceleration Events in Youth Football Competition
Sydney Warner	WFU School of Medicine	Callie Brown, MD, MPH Pediatrics-General	Effects of Family Intervention of Parental Diabetes Mellitus

ANNOUNCEMENTS

Welcome to our newest CVSC members!

Jorge Alegria, MD	Sherry J. Saxonhouse, MD, MS	Priyesh A. Patel, MD	Satish Misra, MD
Theodore A. Frank, MD	Nicole Cyrille-Superville, MD	Jonathan G. Schwartz, MD	Brian D. Powell, MD
Andrew E. Kott, MD	Sanjeev K. Gulati, MD	William E. Downey, MD	Gregory James Sinner, MD, MPT
Michael Olivier, PhD	Troy Leo, MD, MHCM	John Holshouser, MD	John M. Fedor, MD
Geoffrey A. Rose, MD	Neel Jaiprakash Patel, MD	Joseph D. Mishkin, MD	Noreen P. Kelly, MD, MBA
Nyal Ernest Borges, MD	Markus D. Scherer, MD	Dermot M. Phelan, MD, PhD	Shuktika Nandkeolyar, MD
Holly Gonzales, MD	Amar Doshi, MD	Jai Singh, MD	Michael J. Rinaldi, MD
Glen J. Kowalchuk, MD	Terrence E. Hill, MD	Michael D. Elliott MD	B. Hadley Wilson, MD
Amar P. Parikh, MD	George Mawardi, MD	Thomas V. Johnson, MD	

For a complete list of members see [WFUSM CVSC](#).

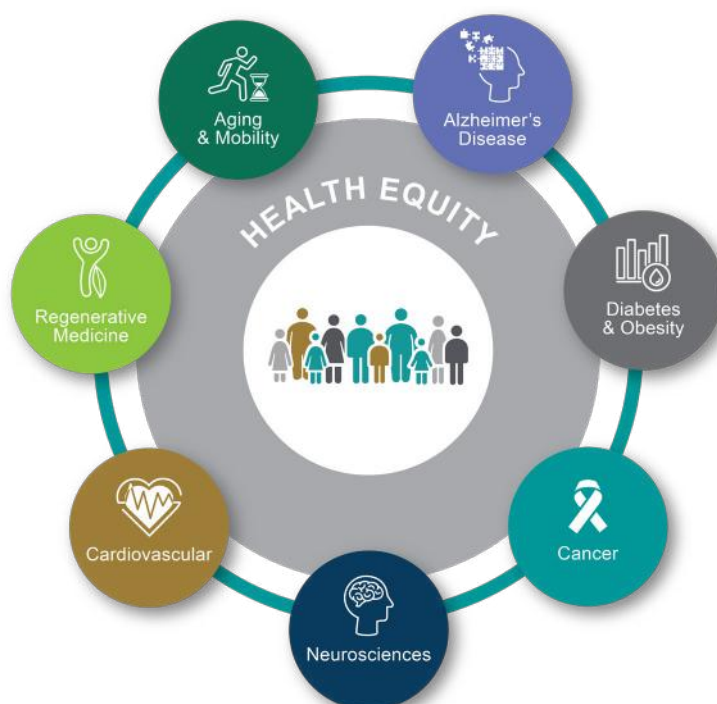
The Cardiovascular Sciences Center (CVSC) is seeking proposals for the 2025 Pilot Award Program. The projects should be those in need of support to promote new areas or technologies for cardiovascular research (basic, clinical, population), as well as to foster new collaborations, particularly across 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 Spring 2025. Please contact Dr. Liliya Yamaleyeva (lyamaley@wakehealth.edu) if you need further guidance.

The **ENVISION Campaign**, the campaign to accelerate discovery, hope and health continues to raise the critical funding needed to support promising research efforts across the enterprise. Funds raised will enable us to invest in research throughout an individual's lifespan across key areas of focus including cardiovascular research.

To learn more about the ENVISION Campaign, visit:
<https://giving.wakehealth.edu/find-your-cause/greatest-need/envision/cardiovascular>

Contact the Office of Philanthropy and Alumni Relations for more information. Philanthropy@wakehealth.edu or 336.716.4589



AWARDS AND ACCOMPLISHMENTS *continued*

Michael A. Moore, MD, FACP, FAHA has been appointed the Chairperson of the Southern States CME Collaborative (SSCC) which manages Category 1 AMA CME credit for physicians' educational programs in Mississippi, North Carolina, and Virginia. For over 25 years, Dr. Moore has been the Director of CME for Sovah Health in Danville VA. He was a member of the Medical Society of Virginia's Interstate Accreditation (CME) Committee of which he was Chairperson in 2023 until it merged into the SSCC.



Cyrille-Superville



Kitman

Congratulations to **Dr. Nicole Cyrille-Superville** on being awarded the Top Principal Investigator Award by the Heart Failure Collaboratory (HFC), in collaboration with the AHA. She was nominated by **Dr. Dalane W. Kitman** for her outstanding

performance in the REHAB-HFpEF and HeartShare clinical trial. **Dr. Cyrille-Superville** will be recognized during an event at the AHA's annual Scientific Sessions conference, at the McCormick Convention Center in Chicago, IL.



Velazquez

Kudos to **Gabriela Velazquez, MD, FACS** for receiving the 2025-2026 James IV Traveling Fellowship Award. The James IV Travelling Fellowship is designed to promote communication and collaboration in the surgical community. Travelers are both ambassadors representing their home countries, and conduits for the dissemination of knowledge.



South

Researchers at WFUSM, led by PI **Dr. Andrew M. South**, launched the website for the [Study of the Epidemiology of Pediatric Hypertension \(SUPERHERO\)](#), a retrospective registry of youth referred to subspecialty clinics for hypertension disorders. The first SUPERHERO manuscript was recently published in the [American Journal of Epidemiology](#).

South AM, Giammattei VC, Bagley KW, Bakhoun CY, Beasley WH, Bily MB, Biswas S, Bridges AM, Byfield RL, Campbell JF, Chanchlani R, Chen A, D'Agostino McGowan L, Downs SM, Fergeson GM, Greenberg JH, Hill-Horowitz TA, Jensen ET, Kallash M, Kamel M, Kiessling SG, Kline DM, Laisure JR, Liu G, Londeree J, Lucas CB, Mannemuddhu SS, Mao KR, Misurac JM, Murphy MO, Nugent JT, Onugha EA, Pudupakkam A, Redmond KM, Riar S, Sethna CB, Siddiqui S, Thumann AL, Uss SR, Vincent CL, Viviano IV, Walsh MJ,

White BD, Woroniecki RP, Wu M, Yamaguchi I, Yun E, Weaver DJ Jr. [The Study of the Epidemiology of Pediatric Hypertension Registry \(SUPERHERO\): Rationale and Methods](#). Am J Epidemiol. 2024 Jun 17;kwae116. doi: 10.1093/aje/kwae116. Epub ahead of print. PMID: 38881045.

The study was established in January 2015 with more than 16,000 study participants to date. It is the largest cohort of youth with hypertension disorders, and WFUSM is the primary coordinator center. The study is open to enrollment for other hospitals interested in participating, and currently includes [14 Children's Hospitals](#) in North America that will follow participants from childhood through adulthood.



Kim

Dr. Esther Kim has been named as a director to the inaugural proposed independent Board of Cardiovascular Medicine. The proposed American Board of Cardiovascular Medicine is governed by a Board of Directors comprising cardiovascular professionals spanning the field of cardiology. The directors will guide the new Board and be responsible for strategically developing and implementing the initial certification and supporting continuous certification programs once a decision by the American Board of Medical Specialties has been made.



Rose

Dr. Geoffrey Rose was recently named to Board of Trustees for the American College of Cardiology, starting in 2025.

Olivia Gilbert, MD, MSc, on behalf of the American College of Cardiology (ACC) and the Solution Set Oversight Committee (SSOC), has been invited to serve as Chair of the writing committee for the Concise Clinical Guidance: An ACC Expert Consensus Statement on Weight Loss Medications for CV Benefit.

SHVI held its first APP Grand Rounds on July 23 with **Dr. Nyal Borges** discussing Cardiogenic Shock 101. There were over 55 attendees (virtually and in person). SHVI APP Grand Rounds have been created to provide education on the clinical application of cardiovascular medicine. This educational offering will be occurring monthly.

PUBLICATIONS

Between the months of May-August, Cardiovascular Sciences Center members published **82** manuscripts. Of these, **8** were CVSC first author publications. Below we highlight publications from the CVSC and SHVI.

Millard MJ, **Ashburn NP**, Snavely AC, Hashemian T, Supples M, Allen B, Christenson R, Madsen T, McCord J, Mumma B, Stopyra J, Wilkerson RG, **Mahler SA**. European Society of Cardiology O/1-hour algorithm (high-sensitivity cardiac troponin T) performance across distinct age groups. *Heart*. 2024 May 23;110(12):838-845. doi: 10.1136/heartjnl-2023-323621. PMID: 38471727.

Marzook H, Gupta A, Jayakumar MN, Saleh MA, **Tomar D**, Qaisar R, Ahmad F. GSK-3 α -BNIP3 axis promotes mitophagy in human cardiomyocytes under hypoxia. *Free Radic Biol Med*. 2024 Aug 20;221:235-244. doi: 10.1016/j.freeradbiomed.2024.05.041. Epub 2024 May 28. PMID: 38815772.

Hughes TM, Tanley J, Chen H, **Schaich CL**, **Yeboah J**, **Espeland MA**, Lima JAC, Ambale-Venkatesh B, Michos ED, Ding J, Hayden K, Casanova R, **Craft S**, Rapp SR, Luchsinger JA, Fitzpatrick AL, Heckbert SR, Post WS, Burke GL. Subclinical vascular composites predict clinical cardiovascular disease, stroke, and dementia: The Multi-Ethnic Study of Atherosclerosis (MESA). *Atherosclerosis*. 2024 May;392:117521. doi: 10.1016/j.atherosclerosis.2024.117521. Epub 2024 Mar 15. PMID: 38552474; PMCID: PMC11240239.

Lerakis S, Kini AS, Giustino G, Anastasius M, Asch FM, Weissman NJ, Grayburn PA, Kar S, Lim DS, Mishell JM, Whisenant BK, **Rinaldi MJ**, Kapadia SR, Rajagopal V, Sarembok II, Brieke A, Tang GHL, Li Y, Alu MC, Lindenfeld J, Abraham WT, Sharma SK, Mack MJ, Stone GW. Changes in Left Ventricular Function and Outcomes After Transcatheter Edge-to-Edge Repair for Secondary Mitral Regurgitation. *J Soc Cardiovasc Angiogr Interv*. 2024 Feb 23;3(5):101345. doi: 10.1016/j.jscsai.2024.101345. PMID: 39132458; PMCID: PMC11307461.

Kelly N, Scherer E, Swayampakala K, **Phelan D**, Ross E, Johnson T, **Rose G**, **Scherer M**. Precardioversion assessment with computed tomography compared with transesophageal echocardiography in patients with atrial fibrillation or flutter. *Heart Rhythm*. 2024 Jun 22:S1547-5271(24)02805-4. doi: 10.1016/j.hrthm.2024.06.031. Epub ahead of print. PMID: 38909719.

Wells BJ, Wood MJ, O'Duffy AE, Sumner JA, Chi G, Grodzinsky A, Gornik HL, Kadian-Dodov D, Taylor A, Hess CN, Sanghavi M, Henkin S, Wells G, Tam L, Orford J, Lindley K, Kumbhani DJ, Vitarello C, Alkhalfan F, Gibson CM, Leon KK, Naderi S, Kim ES. Migraine headache in patients with spontaneous coronary artery dissection: A report of the iSCAD Registry. *Vasc Med*. 2024 Jun;29(3):286-295. doi: 10.1177/1358863X241252444. PMID: 38898631; PMCID: PMC11188565.

Cyrille-Superville N, Rao SD, Feliberti JP, **Patel PA**, Swayampakala K, Sinha SS, Jeng EI, Goswami RM, Snipelisky DF, Carroll AM, Najjar SS, Belkin M, Grinstein J; FLIGHT Working Group. PREDICT HF: Risk stratification in advanced heart failure using novel hemodynamic parameters. *Clin Cardiol*. 2024 Jun;47(6):e24277. doi: 10.1002/clc.24277. PMID: 38838029; PMCID: PMC11151004.

Misra S, Swayampakala K, Rajwani A, Davenport E, **Fedor J**, **Saxonhouse S**, **Holshouser J**, **Patel N**, Thompson J, Beaty E, Jain M, **Powell B**, Mehta R. Outcomes of an expedited same-day discharge protocol following cardiac implantable electronic device (CIED) implantation. *J Interv Card Electrophysiol*. 2024 Aug;67(5):1173-1179. doi: 10.1007/s10840-024-01734-w. Epub 2024 Jan 9. PMID: 38194120.

Rymer JA, Wegermann ZK, Wang TY, Li S, Smilowitz NR, **Wilson BH**, Jneid H, Tamis-Holland JE. Ventricular Arrhythmias After Primary Percutaneous Coronary Intervention for STEMI. *JAMA Netw Open*. 2024 May 1;7(5):e2410288. doi: 10.1001/jamanetworkopen.2024.10288. PMID: 38717772; PMCID: PMC11079687.

Sadjadi M, von Groote T, Weiss R, Strauß C, Wempe C, Albert F, Langenkämper M, Landoni G, Bellomo R, **Khanna AK**, Coulson T, Meersch M, Zarbock A. A Pilot Study of Renin-Guided Angiotensin-II Infusion to Reduce Kidney Stress After Cardiac Surgery. *Anesth Analg*. 2024 Jul 1;139(1):165-173. doi: 10.1213/ANE.0000000000006839. Epub 2024 Jan 30. PMID: 38289858



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GOOD NEWS!

Wake Forest University School of Medicine Cardiovascular Sciences Center

Spring 2024

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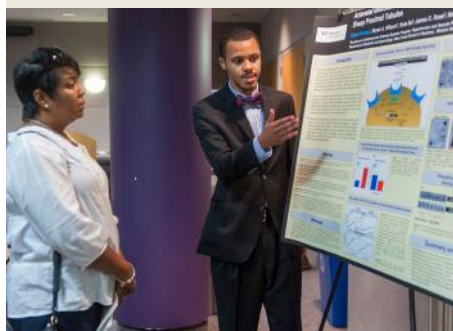
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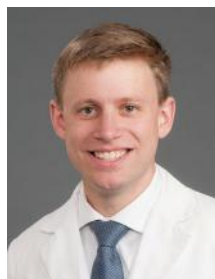
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NICKLAUS ASHBURN, MD, MS, AWARDED DEPARTMENT OF EMERGENCY MEDICINE'S FIRST-EVER NIH K23 GRANT



Ashburn

Nicklaus Ashburn, MD, MS, Assistant Professor of Emergency Medicine, received a K23 grant from the NIH/NHLBI for his study titled Emergency Medicine Cardiovascular Risk Assessment for Lipid Disorders (EMERALD), which is a 5-year randomized control trial focused on providing preventive cardiovascular care for at-risk patients in the Emergency Department. This novel, protocolized intervention is the first of its kind in the country and will address a critical gap in

knowledge by determining the efficacy of an Emergency Department-driven cardiovascular disease prevention program that aims to identify and treat patients with high cholesterol. EMERALD is highly significant and innovative and could also be applicable to other cardiovascular disease risk factors among Emergency Department patients.

This outstanding achievement is even more noteworthy since it is the first time anyone in the Department of Emergency Medicine has earned this honor from the NIH. Dr. Ashburn and his team of experts in emergency medicine, cardiology, social sciences, and biostatistics helped design this patient-centered intervention that aims to improve the health of our community and advance cardiovascular disease prevention and treatment.

The K23 award offers support for an intensive, mentored research career development experience for individuals with a clinical doctoral degree who have made a commitment to conduct patient-oriented research. Dr. Ashburn's mentoring team includes Drs. Herrington, Shapiro, Mahler, Snaveley, Reboussin, and Gesell.

Congratulations to Dr. Ashburn and his team for their unprecedented accomplishment!

FUNDING

During the months of January to April, CVSC members were awarded 29 grants. Below we highlight awards from the CVSC and SHVI.



Kavanagh

Dr. Kavanagh's T35OD010946 training grant "Summer Veterinary Student Research Fellows at Wake Forest University" received a good score of 16 and will be funded.



Tomar



Jadiya

Drs. Tomar (PI) and Jadiya (Co-I) received an American Heart Association Innovative Project Award for their grant titled "TRIM-NHL Proteins and Mitochondria

Associated Biomolecular Condensates in Cardiac Aging" with a project period of 07/01/2024-06/30/2026 and total cost of \$199,998.52.



Maxwell

Drs. Tomar (PI), Maxwell (Co-I) and Jadiya (Co-I) were awarded a \$20,000 WFUSM Center for Redox Biology and Medicine (CRBM) Pilot Grant for their grant "Mitochondrial Inter-membrane Space Proteostasis in Myofibroblast Activation" with a project period of 01/01/2024-12/31/2024.



Yamaleyeva

Dr. Yamaleyeva's NICHD R21 application titled "Apelin receptor axis and long-term consequences of preeclampsia" scored at the 5th percentile.



Schaich

Drs. Schaich, Khanna and Chappell (Co-PIs) were awarded a CTSI Pilot Award for their project "Precision-Based Renin Assessment in Septic Shock Outcomes."



Khanna



Chappell

Boston Scientific has provided funding through Medaxiom for Advocate Health to be the first healthcare system in the U.S. to report initial clinical experience and outcomes with the new FaraPulse Pulsed Field Ablation technology for atrial fibrillation ablations. This study will be a joint effort across the Charlotte area hospitals, Wake Forest, and St. Luke's Hospital in Wisconsin. This will be a unique opportunity to have an Advocate Enterprise-wide research study across the Southeast and Midwest hospitals. Congratulations to Drs. Powell and Whalen and the EP teams at SHVI and Wake Forest for negotiating this fantastic opportunity with Boston Scientific!

Congratulations to the 2024 CVSC Pilot Awardees:



Gallagher

Patrica Gallagher, PhD Hypertension & Vascular Research Center, \$20,000 for "Characterization of Orally-Active Angiotensin-(1-7) Analogs."



Cyrille-Superville

Nicole Cyrille-Superville, MD Internal Medicine-Cardiovascular Medicine/SHVI-Charlotte, \$20,000 for "The Influence of Social Support and Health Literacy on Outcomes in Older Patients Hospitalized for Decompensated Heart Failure with Preserved Ejection Fraction." Co-

Investigators — **Dalane Kitzman, MD, David Herrington, MD, MHS, Alain Bertoni, MD, MPH, Tiarney Ritchwood, PhD, MA**



Tomar

Dhanendra Tomar, PhD, MSc Internal Medicine-Cardiovascular Medicine, \$20,000 for "Mitochondria Derived Extracellular Vesicles as Early Indicators of Heart Failure." Co-Investigator — **Gagan Deep, PhD**

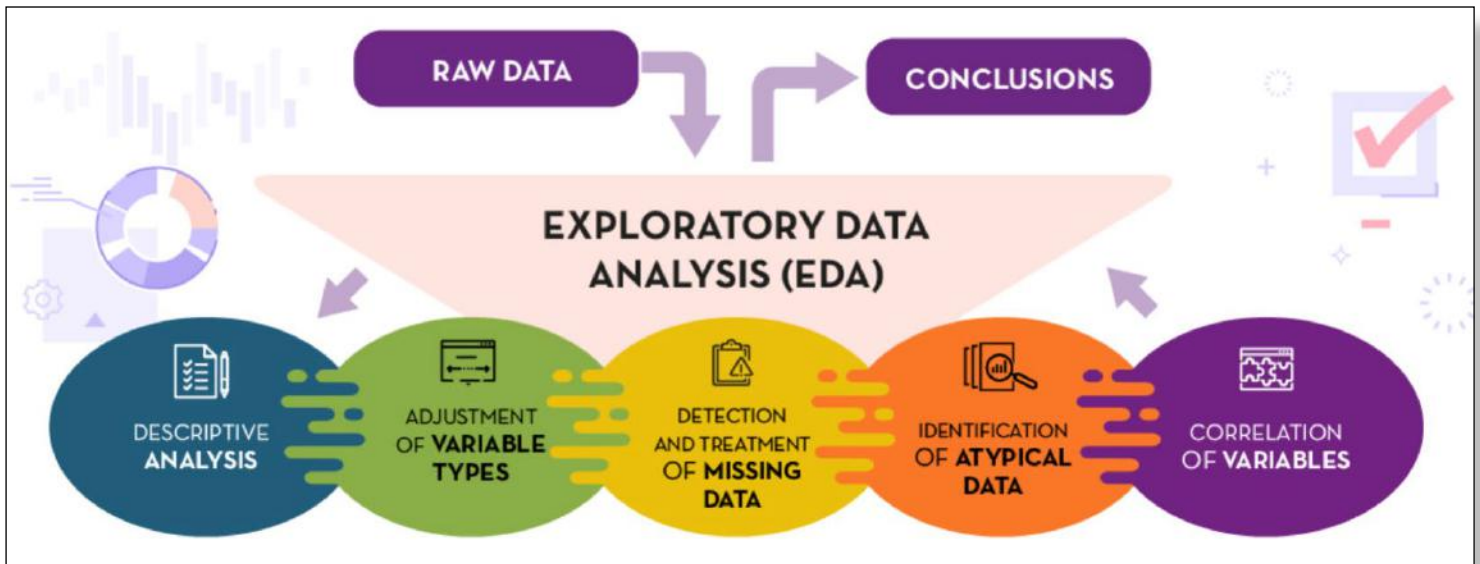
AUSTIN'S DATA, TIPS & TOOLS



The Importance of EDA

One of the most important yet overlooked steps in research is exploratory data analysis or EDA. We're often so excited to build that new predictive model on our brand new data that we forget that it's important to know your data at the most basic level. In many ways, EDA will shape your data analysis plan. When writing the proposal you had one analysis plan in mind but after collecting your data and doing some careful EDA you discover you need to make some changes or alter some of the proposed statistical methods. Good EDA will answer question like How many samples/variables

are their? How many samples/variables have a lot of missing data? If you're studying a particular outcome, how prevalent is it to your data? More rigorous EDA may try to explore the correlation structure of the data as this often plays a key role in multivariate regression modeling.



Every statistical analysis software has some EDA functions to help the user investigate their data. In R, I like to use the package 'finalfit' as it offers functions that analyze missing data and functions that generate summary tables with descriptive statistics for every variable in your data. In SAS, one can use procedures like PROC CONTENTS, PROC MEANS, and PROC UNIVARIATE to explore the data.

EDA can shape the analysis plan but it can also help the analyst interpret and contextualize results of the analysis. For example, a regression model might show that a patient's blood pressure during hospitalization can help predict 30 day readmission but that model won't tell you that only 40% of the patients had their blood pressure recorded thus skewing the results. Knowing things like this is what takes you from a good analyst to a great analyst.

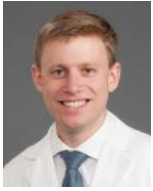
Thanks for reading this edition of data tools and tips. Don't hesitate to reach out to me if you have any questions or would like to talk more.

Austin Seals, MSA

aseals@wakehealth.edu

INVITED PRESENTATIONS

The Emergency Medicine Cardiovascular Research Team presented 17 abstracts at the 2024 Society for Academic Emergency Medicine conference in Phoenix, AZ.



Ashburn

On February 15, 2024, **Dr. Nicklaus Ashburn** presented "Emerging Technologies for ED Chest Pain Risk Stratification" at the 14th Annual J. Lee Garvey Chest Pain Network Summit.



Kavanagh

Kylie Kavanagh, VMS, MPH, presented "Healthy Fat" at the University of Massachusetts Medical School Department of Molecular Medicine on May 17, 2024.



Yamaleyeva

Liliya Yamaleyeva, MD, MS, FAHA, gave a talk titled "Preeclampsia Attenuates Middle Cerebral Artery Resistance Post-Pregnancy in the Setting of Sustained Hypertension" at the 71st Annual Meeting of the Society for Reproductive Investigation (SRI) in Vancouver, Canada.

Xuming Sun, MD, PhD, a Senior Research Associate in Dr. Yamaleyeva's lab, presented his studies as a poster titled "Apelin Downregulates Interleukin-6 Signaling in Trophoblastic HTR-8/SVneo Cells Exposed to Hypoxia" at the 71st Annual Meeting of the SRI in Vancouver, Canada.



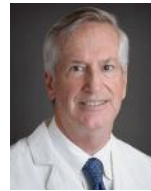
Tomar

Dhanendra Tomar, PhD presented an invited talk titled "Decoding Mitochondrial Calcium: Regulatory mechanisms and its impact on health" at the Kalinga Institute of Industrial Technology (KIIT) in India on January 17, 2024.

- Presented an invited talk titled "The Calcium Code: Unveiling Mitochondrial Calcium Regulation" at the International Conference on Biology Beyond Boundaries: Mitochondrial Insights, Computational Breakthroughs, and Clinical Transformations in India on January 30, 2024.

- Presented an invited talk titled "Beyond Calcium Uniporter: MICU1's Impact on Mitochondrial Cristae and Ultrastructure" at the Biophysical Society Annual Meeting in Philadelphia, PA on February 10, 2024.
- Served as a Panelist at the Society for South Asian Heart Research Mentoring Workshop/Panel Discussion on "Navigating The Academic Career; Fellow to Faculty Transition" on May 25, 2024.

Kevin Lobdell, MD gave a Late Breaking CTSNet Interview for the 60th Annual Meeting of the Society of Thoracic Surgeons (STS): "Remote Patient Monitoring in Cardiothoracic Surgery: An Interview With Kevin Lobdell"
<https://youtu.be/mcTFaWNvPZw?si=4pLrVGzdU6-csL-5>



Wilson

On February 9, 2024, **B. Hadley Wilson, MD, MACC**, presented the Virtual Keynote Lecture "The Cardiovascular Future and the New Frontiers" for the 14th Bangla Interventions Therapeutics (BIT) with Sri Lanka College of Cardiology on the CV Future and AI.

- On February 23, 2024, participated in the HVC Leadership Summit panel discussions.
- Presented "STEMI Around the World and the ACC Global Heart Attack Treatment Program" on March 8, 2024, during the 88th Annual Scientific Meeting of the Japanese Circulation Society.
- Presented the following sessions during the American College of Cardiology 2024 (ACC.24) in Atlanta, GA, April 6-8.
 - Opening Session
 - Session 402: Joint American College of Cardiology/Journal of the American College of Cardiology Late-Breaking Clinical Trial
 - Session 2002: Charting A New Frontier: Next Steps in Efforts to Create A New CV Board

CAREER CORNER

- Session 2006: ACC at 75: Honoring the Past, Envisioning Tomorrow
- Session 712: Joint Symposium of the American Heart Association and the American College of Cardiology
- Session 700: Joint Symposium II of the European Heart Journal and the American College of Cardiology
- Session 664: Joint Symposium of the European Society of Cardiology and the American College of Cardiology
- Immediate Past President of the ACC, was a guest on April 18, 2024 (Live at CV TRANSFORUM SPRING'24) | Synergizing Success – The Power of Dyad Leadership in Cardiology as part of the HeartTalk with Cathie Biga, MSN, FACC, current ACC President. The archive of HeartTalk with Cathie discussions can be accessed here: <http://www.acc.org/ACCPresident>
- Presented the following during the 2024 Africa STEMI Live April 24-27 in Nairobi, Kenya.
 - The Plenary Program-Hear of Africa: Acute Coronary Syndromes –What ACC considers a center of excellence in ACS management, Keynote Address: “The American College of Cardiology concept of a center of excellence in Acute Myocardial Infarction.”
 - Shock Case based discussion: “Drugs, revascularization, and gadgets. State-of the art on management of shock.”
 - Cardiovascular Intervention Africa: “How the Ischemia trial has and has not affected my clinical practice – an interventionalist’s perspective.”
 - Cardiovascular Intervention Africa: “Complex high-risk intervention- with mechanical circulatory support.”

The Cardiovascular Sciences Center (CVSC), Sticht Center for Healthy Aging and Alzheimer’s Prevention and Hypertension and Vascular Research Center welcomed 29 undergraduate college students and 6 WFUSM medical students into 3 summer research programs on May 29, 2023: the Excellence in Cardiovascular Sciences (EICS) in the 32nd year (12), the Enhancing UNDERgraduate Education and Research in AGing to Eliminate Health Disparities (ENGAGED – joint with WSSU and WFU) in its 6th year (11), and the Training in Research Affecting Child-Health (TRAC) in its first year (6 undergraduate and 6 medical students).

These programs are led by a collaborative team of **CVSC faculty** members committed to increasing diversity in the biomedical sciences (BMS), including Drs. Tina Brinkley, TanYa Gwathmey, Debra Diz, David Soto-Pantoja and Andrew South at WFUSM with Drs. Jill Keith (WSSU) and Gary Miller (WFU). The students are selected after a national call for applications and represent 9 different universities within North Carolina, 3 HBCUs and 3 different campuses of the University of Puerto Rico. Research topics address aging, cardiovascular function and disease, and child health broadly, within the overarching concept of health disparities that impact the lifespan.

We continue to partner for professional development and social activities with other summer programs sponsored by Biomedical Engineering, Microbiology & Immunology, WF Institute for Regenerative Medicine, Cancer Biology and Precision Medicine to provide networking and a sense of community. Many of the **CVSC members** serve as program faculty and as mentors. We are very appreciative of their continuing support and enthusiasm for these programs and the outstanding research experiences they provide for the students.

Please welcome these students as you encounter them during their summer activities.

AWARDS AND ACCOMPLISHMENTS



Tomar

Dhanendra Tomar, PhD, received the Early Career Faculty Travel Award at the 2024 annual meeting of the American Society for Biochemistry and Molecular Biology (ASBMB) in San Antonio, TX.

Ashlesha Kadam, PhD, a postdoctoral fellow in Dr. Tomar's lab, received the Best Postdoctoral Poster Presentation Award at the 2024 Wake Forest University School of Medicine Research Day.

Shiridhar, PhD, a postdoctoral fellow in Dr. Tomar's lab, received the Best Basic Science Poster Presentation Award at the 2024 Department of Medicine Research Day, Wake Forest University School of Medicine.

The SHVI SH Team performed the first successful Trans-catheter Tricuspid Valve Repair with TriClip and first successful Trans-catheter tricuspid valve replacement in the Carolinas to follow their first for both of these as part of clinical trials since 2018 with Dr. Schwartz co-author of the Triluminate Clinical Trial of T-TEER with TriClip in the NEJM 2023.

ANNOUNCEMENTS

Thank you to **David Soto-Pantoja, PhD, Christopher Schaich, PhD, Jasmine Malachi, MA and Lydia Durr** for organizing a successful 2024 Women & Cardiovascular Health Annual Event. Thank you to the American Heart Advocacy Representative being present as well. Please consider contacting and becoming an advocate- they do a great deal of work beyond heart awareness.

The **ENVISION Campaign**, the campaign to accelerate discovery, hope and health continues to raise the critical funding needed to support promising research efforts across the enterprise. Funds raised will enable us to invest in research throughout an individual's lifespan across key areas of focus including cardiovascular research.

To learn more about the **ENVISION Campaign**, visit: <https://giving.wakehealth.edu/find-your-cause/greatest-need/envision/cardiovascular>

Contact the Office of Philanthropy and Alumni Relations for more information. Philanthropy@wakehealth.edu or 336.716.4589



ANNOUNCEMENTS *continued*

The 2024 **Sanger Spontaneous Coronary Artery Dissection (SCAD)** Alliance Conference held on April 19th – 20th at the Sanger Heart & Vascular Institute (SHVI) in Charlotte, NC was a resounding success. Dr. Esther Kim, from SHVI, served as the course director for the second Sanger SCAD Symposium. Drawing attendees from various parts of the country, the conference showcased more than 30 faculty physicians who discussed their knowledge and insights on spontaneous coronary artery disease, presenting their research discoveries and suggestions. The 2024 Sanger SCAD Conference immersed attendees in a case-based learning environment focused on SCAD. Recent research findings on SCAD and updated recommendations for the care of patients with SCAD were discussed through the lens of the practicing physician caring for the patient who has experienced SCAD.

B. Hadley Wilson, MD, MACC, published the following Cardiology Magazine articles:

- [Feature | From Magic to Mission: ACC President Hadley Wilson Reflects on Past Year; March 29, 2024](#)
- [ACC.24 Opening Showcase Presidential Address; April 6, 2024](#)
- [ACC.24 Convocation Outgoing President's Address: B. Hadley Wilson, MD, MACC; April 8, 2024](#)

The Cardiovascular Sciences Center (CVSC) is seeking proposals for the 2025 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 Spring 2025. Please contact Dr. Liliya Yamaleyeva (lyamaley@wakehealth.edu) if you need further guidance.

PUBLICATIONS

Between the months of **January-April**, Cardiovascular Sciences Center members published **71 manuscripts**. Of these, **11** were CVSC first author publications. Below we highlight publications from the CVSC and SHVI.

Stopyra JS, Snively AC, **Ashburn NP**, Supples MW, Brown WM, **Miller CD**, **Mahler SA**. Rural STEMI Patients – Why the delay to PCI? Prehosp Emerg Care. 2024 Jan 18;1-8. doi: 10.1080/10903127.2024.2305967. Epub ahead of print. PMID: 38235978.

Mahler SA, **Ashburn NP**, Paradee BE, Stopyra JP, O'Neill JC, Snively AC. Safety and Effectiveness of the High-Sensitivity Cardiac Troponin HEART Pathway in Patients With Possible Acute Coronary Syndrome. Circ Cardiovasc Qual Outcomes. 2024 Mar;17(3):e010270. doi: 10.1161/CIRCOUTCOMES.123.010270. Epub 2024 Feb 8. PMID: 38328912.

El Husseini N, **Schaich CL**, Craft S, Rapp SR, Hayden KM, Sharrett R, Klein R, Klein B, Cotch MF, Wong TY, Luchsinger JA, Espeland MA, Baker L, **Bertoni AG**, Burke GL, **Hughes TM**. Retinal Vessel Caliber and Cognitive Performance: The Multi-Ethnic Study of Atherosclerosis (MESA). Sci Rep. 2024 Feb 19;14(1):4120. DOI: 10.1038/s41598-024-54412-2. PubMed PMID: 38374377. PubMed Central PMCID: PMC10876697.

Hamid N, Aman E, Bae R, Scherer M, Smith TWR, Schwartz J, Rinaldi M, Singh G, Sorajja P. 3D Navigation and Intraprocedural Intracardiac Echocardiography Imaging for Tricuspid Transcatheter Edge-to-Edge Repair. JACC Cardiovasc Imaging. 2024 Apr;17(4):441-447. doi: 10.1016/j.jcmg.2024.02.005. PMID: 38569794.

Biga C, Wilson B. Realizing Our Vision: ACC's Next 5-Year Strategic Plan. J Am Coll Cardiol. 2024 Apr, 83 (15) 1489–1491. <https://doi.org/10.1016/j.jacc.2024.03.366>

Congratulations to **Drs. Mahler, Ashburn** and team for their manuscript in JACC with an associated editorial.

Mahler SA, **Ashburn NP**, Supples MW, Hashemian T, Snively AC. Validation of the ACC Expert Consensus Decision Pathway for Patients With Chest Pain. J Am Coll Cardiol. 2024 Apr 2;83(13):1181-1190. doi: 10.1016/j.jacc.2024.02.004. Epub 2024 Mar 25. PMID: 38538196.

- Kontos MC, de Lemos JA. Chest Pain in the Emergency Department: Chasing Perfection. J Am Coll Cardiol. 2024 Apr 2;83(13):1191-1193. doi: 10.1016/j.jacc.2024.02.018. Epub 2024 Mar 25. PMID: 38538197.

Congratulations to the Wake Forest team which served as a field site for trials that produced the following publications in which **Dr. Dalane Kitzman** had a key leadership role.

Kosiborod MN, Petrie MC, Borlaug BA, Butler J, Davies MJ, Hovingh GK, **Kitzman DW**, Møller DV, Treppendahl MB, Verma S, Jensen TJ, Liisberg K, Lindegaard ML, Abhayaratna W, Ahmed FZ, Ben-Gal T, Chopra V, Ezekowitz JA, Fu M, Ito H, Lelonek M, Melenovský V, Merkely B, Núñez J, Perna E, Schou M, Senni M, Sharma K, van der Meer P, Von Lewinski D, Wolf D, Shah SJ; STEP-HFpEF DM Trial Committees and Investigators. Semaglutide in Patients with Obesity-Related Heart Failure and Type 2 Diabetes. N Engl J Med. 2024 Apr 18;390(15):1394-1407. doi: 10.1056/NEJMoa2313917. Epub 2024 Apr 6. PMID: 38587233.

Butler J, Shah SJ, Petrie MC, Borlaug BA, Abildstrøm SZ, Davies MJ, Hovingh GK, **Kitzman DW**, Møller DV, Verma S, Einfeldt MN, Lindegaard ML, Rasmussen S, Abhayaratna W, Ahmed FZ, Ben-Gal T, Chopra V, Ezekowitz JA, Fu M, Ito H, Lelonek M, Melenovský V, Merkely B, Núñez J, Perna E, Schou M, Senni M, Sharma K, van der Meer P, Von Lewinski D, Wolf D, Kosiborod MN; STEP-HFpEF Trial Committees and Investigators. Semaglutide versus placebo in people with obesity-related heart failure with preserved ejection fraction: a pooled analysis of the STEP-HFpEF and STEP-HFpEF DM randomised trials. Lancet. 2024 Apr 27;403(10437):1635-1648. doi: 10.1016/S0140-6736(24)00469-0. Epub 2024 Apr 7. PMID: 38599221.



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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. Yhenneko 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



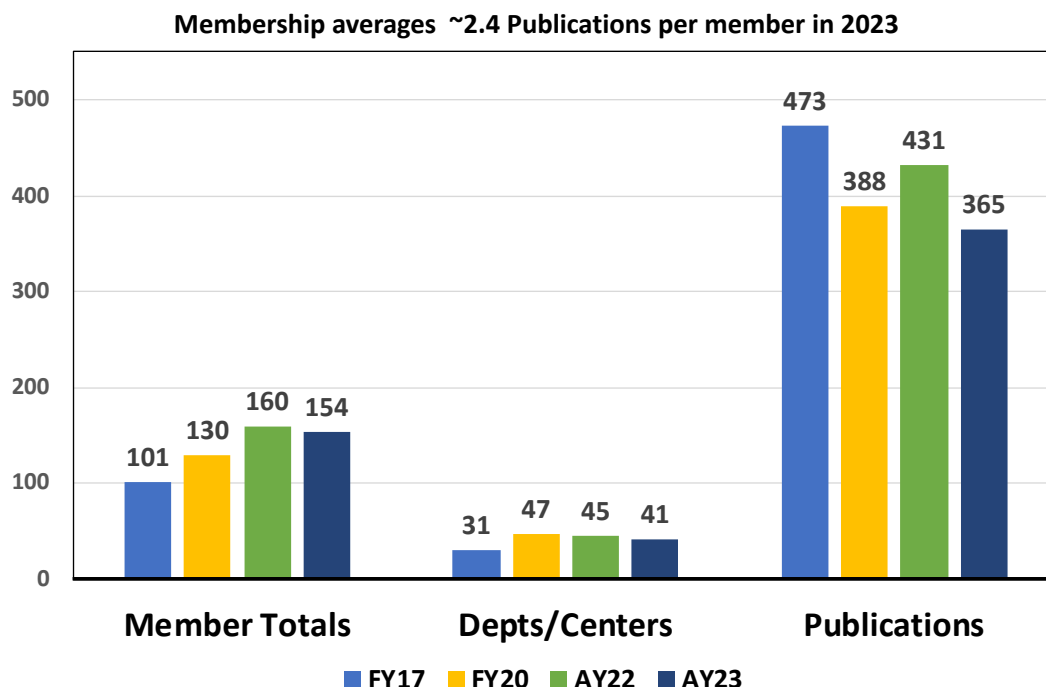
Downey

2023 CENTER ANNUAL REPORT HIGHLIGHTS

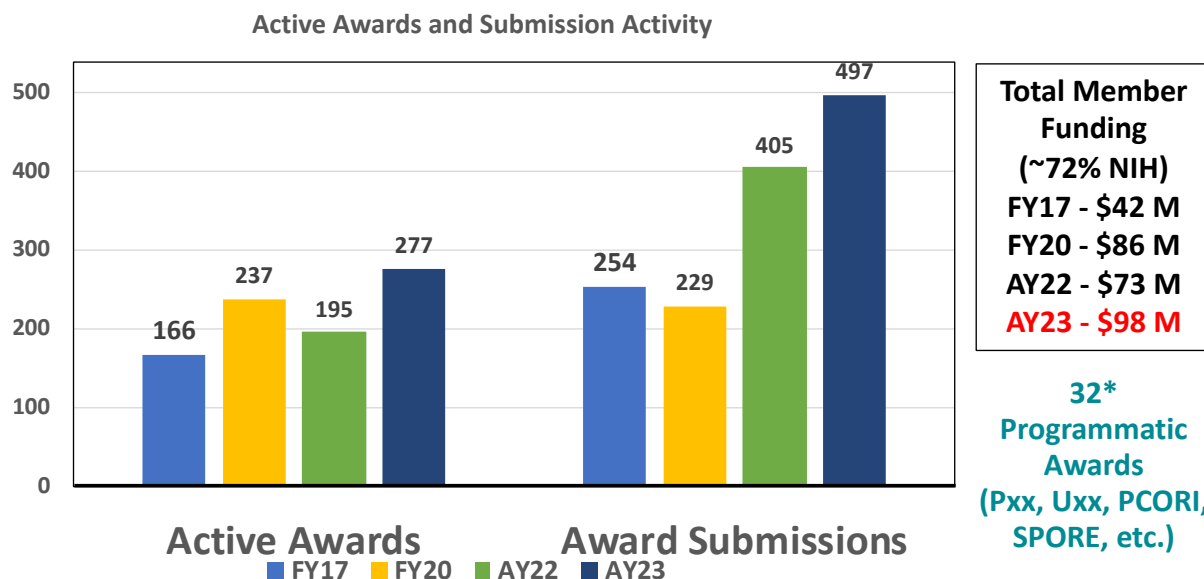
Membership, Publication and Extramural Funding Activities for 2023: We congratulate members on their continued successes and highlight the many sustained achievements below. Membership averages 2.4 publications per member and continues to steadily increase funding (the number of active awards and total 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



CVSC: Membership Funding Metrics



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. Bartłomiej 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.

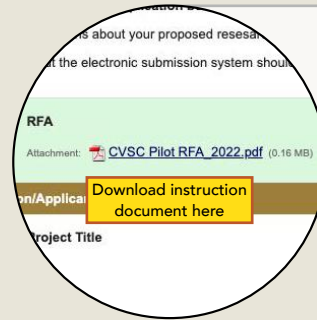
Austin Seals, MSA
aseals@wakehealth.edu

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 the "2022/2023 Cardiovascular Sciences Center (CVSC) Request for Pilot Applications" form. The form is titled "Please complete the full application below for the 2022/2023 CVSC Pilot Application." and includes instructions. The form fields include: "Project Title", "Principal Investigator Name", "Principal Investigator Department", "Principal Investigator Rank", "Principal Investigator Email", and "Number of Project Key Personnel". There is also a section for "Abstract and Research Plan" with a sub-section for "Abstract (300 words max)".

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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GOOD NEWS!

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DRS. TANYA GWATHMEY & ANDREW SOUTH (MPIs)

were awarded a R25 from the NICHD for “The Wake Forest University School of Medicine Training in Research Affecting Child-Health (TRAC) Program”, with a project period of Sept. 1, 2023, through June 30, 2028 to support 9-12 participants per year. This is the first child health research training grant in the history of WFUSM. It is an immersive eight-week pediatric-specific skills course over the summer with a longitudinal component over the following academic year that fosters peer-to-peer mentorship. This longitudinal program will empower learners at all levels (undergraduate, graduate, and medical students, residents, and fellows) to conceptualize, design, and implement a novel and innovative research project centered on an idea that they are passionate about and that addresses a critical knowledge gap in child health and development. Participants will be the Principal Investigators of their project, and faculty members will coach participants through their independent, mentored research project. Several faculty mentors are members of the Cardiovascular Sciences Center, and TRAC affords the opportunity to improve cardiovascular health in youth related to vascular development and hemodynamics of pregnancy and parturition, youth-onset hypertension and renal mechanisms of cardiovascular disease, and antenatal programming of adult cardiovascular and cardiometabolic diseases. TRAC will foster acquisition of lasting child health-related research skills with an emphasis on independence and critical thinking.



AUSTIN'S DATA TOOLS AND TIPS



Correlation

Correlation analysis is one of the central analysis methods in statistics and is a simple idea that most novice analyst can grasp on to. Most correlation metrics return values between -1 and 1. The positive or negative value determines the direction

of the relationship between the two variables. If you have a positive correlation, then the value of variable A increases when the value of variable B increases. The relationship is inverted when the correlation is negative (when A increases B decreases). Correlation is a foundational concept of many regression modeling concepts, especially linear regression. For example, the assumption that there is no auto-correlation (correlated samples/subjects) in linear regression. Correlation analysis is a great way to get know your data and is one the first things I consider doing when starting a new project. It should be noted that correlation analysis is best suited for numeric continuous data; however, there are alternative correlation methods that can handle data in other distributions (like binomial data).

One common product of this analysis is a correlation heat map. These heat maps visualize the relationships amongst different variables in your data usually with brighter colors representing positive correlations. Network maps can also be produced from correlation analyses. From visualizations like these, one can tell which variables will be important in subsequent analyses or which variable may be redundant or non-informative during outcome modeling. These will help summarize the overall complexity of your data.

Almost all statistical analysis software applications have a correlation analysis feature. If you're using SAS, you can run PROC CORR. R users can use the `cor()` function which will produce a correlation matrix.

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.

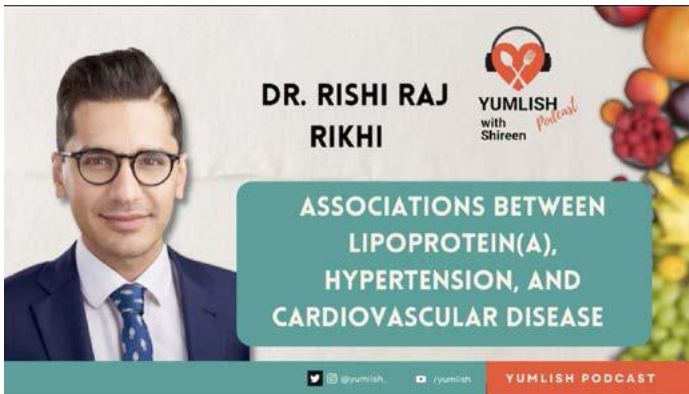
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ANNOUNCEMENTS

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. We intend to fund 3 pilot awards at \$20,000 each 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 will be due ~ Spring 2024.** Please contact Dr. Liliya Yamaleyeva (lyamaley@wakehealth.edu) if you need further guidance.

INVITED PRESENTATIONS

Dr. Rishi Rikhi discussed the associations between lipoprotein(a), hypertension, and cardiovascular disease during the Yumlish with Shireen podcast.



Click Image to view the podcast.



Akbilgic

Dr. Akbilgic presented an invited talk at St. Jude Children's Research Hospital, Memphis, TN on July 31, 2023, titled "Remote Delivery of ECG-AI Models for Disease Detection and Risk Prediction."

Dr. Akbilgic gave an invited talk at the University of Wisconsin Cardiology Grand Rounds, Madison, WI titled "Emerging Role of Electrocardiographic Artificial Intelligence Modes in Cardiovascular Outcome Prediction."

Dr. Liam Butler has been invited to present "Feasibility of Remote Monitoring for Fatal Coronary Heart Disease from Single Lead ECG" during the HRX Innovators at Heart Conference in Seattle, WA, September 21-23, 2023.

FUNDING

During the months of May to August, CVSC members were awarded 33 grants. Below we highlight a couple of these awards.



Goldman

Dr. Matthew Goldman and Co-Is **Dr. Matthew Edwards, Dr. David Herrington, Dr. William Downey, and Dr. Greg Stanley** have been awarded a 2-year grant from Janssen Scientific Affairs. "Utilization of Optimal Medical Therapy to Prevent Cardiovascular Morbidity in Patients with Peripheral Vascular Disease" is a multi-institutional grant between Atrium Wake Forest Baptist and Sanger Heart and Vascular. The aims of this grant are to evaluate adherence rates to AHA Guideline-Directed Optimal medical therapy in patients with Peripheral Arterial Disease (PAD) based upon non-invasive vascular laboratory studies. It also evaluated cardiovascular outcomes in this PAD population.



Edwards



Herrington



Xu

Dr. Haodong Xu's research program titled "Role of the ATP-dependent chromatin-remodeling enzyme Brg1 in the regulation of cardiac Na⁺ channel" has recently secured funding through an NHLBI R56 grant. In their pursuit, Dr. Xu's team employs cutting-edge techniques, including state-of-the-art methods for molecular signaling and electrophysiological investigations. Their ultimate goal is to furnish direct evidence that Brg1's suppression of Nav1.5 expression constitutes one of the pivotal mechanisms driving VT/VF development in IHD, leveraging transgenic mouse models to achieve this insight.

2023 Summer Research Programs to Increase Diversity in Biomedical Science Careers:

The Cardiovascular Sciences Center and Sticht Center for Healthy Aging and Alzheimer's Prevention host two summer research programs: the Excellence in Cardiovascular Sciences (EICS) program in the 31st year and the Enhancing UNDERgraduate Education and Research in AGing to Eliminate Health Disparities (ENGAGED – joint program with WSSU and WFU) in its 4th year.

The following trainees and mentors participated in the programs for 2023:

EICS STUDENT	UNDERGRADUATE INSTITUTION	MENTOR
Joshua Abrams	Wake Forest University	Katherine Cook — Surgery Hypertension
Blessed Asare	University of Colorado Denver	Andrew South — Pediatrics- Nephrology
Ternya Gibson	Fort Valley State University	Leah Solberg Woods — Internal Medicine-Molecular Medicine /Mackenzie Fitzpartrick (PhD Graduate Student)
Autumn Huskey	Lander University	David Soto Pantoja — Surgery Hypertension
Nicole Morales	University of Puerto Rico - Cayey	Christina Hugenschmidt — Internal Medicine- Gerontology & Geriatric Medicine
Bella Parker	Stetson University	Xuewei Zhu — Internal Medicine-Molecular Medicine
Ajay Roy	Wake Forest University	Liliya Yamaleyeva — Surgery Hypertension
Shayla Sanders	East Carolina University	TanYa Gwathmey — Surgery Hypertension //Patricia Smyre — Maya Angelou Center for Health Equity
Daniel Sartin	North Carolina State University	Justin Moore — Implementation Science
Leilani Whyte	North Carolina A&T State University	Dhanendra Tomar — Internal Medicine-Cardiovascular Medicine

ENGAGED STUDENT	UNDERGRADUATE INSTITUTION	MENTOR
Sami Atassi	North Carolina State University	Rachel Zimmer — Internal Medicine-Gerontology & Geriatric Medicine
Mia Barnes	Wake Forest University	Ken Kishida — Physiology & Pharmacology
Natnael Belay	Hope College	Pooja Jadiya — Gerontology & Geriatric Medicine
Alice Chong	Wake Forest University	Miranda Orr — Gerontology & Geriatric Medicine
Kathryn Espinosa-Ponce	Greensboro College	Ashley Weaver — Biomedical Engineering
Ivy Greene	Wake Forest University	Dhanendra Tomar — Internal Medicine-Cardiovascular Medicine
Quinecia Hayes	Winston Salem State University	Jill Keith — Biological Sciences & Chemistry, Winston Salem State University
Christian Johnson	Virginia Commonwealth University	Jeff Williamson — Gerontology & Geriatric Medicine/ Michelle Mielke — Epidemiology & Prevention
Grace Kiwanuka-Woernle	Emory University	Allison Caban-Holt — Maya Angelou Center for Health Equity
Luis Perez Dieppa	University of Puerto Rico - Cayey	Ashley Weaver — Biomedical Engineering
Keysha Resto Bravo	University of Puerto Rico - Mayaguez	Daniel Kim-Shapiro — Physics

As evidence of the success of these programs, a recent review of the first 4 years of the ENGAGED program documents early program outcomes: 1) 119 paid undergraduate research opportunities via in-person or virtual programming for 61 unique individuals during academic year and summer sessions, with 49% participating in >1 session (academic year Research Club, academic year Research Internship, Summer Internship); 2) New formal and informal aging-related activities created or revamped/updated for trainees across the three partner sites (Research Club, lectures/seminars, didactic courses, discussion sessions focused on aging); 3) Short-term scholarly achievements include 31% trainee attendance/presentations at scientific meetings and 20% published an abstract of the ENGAGED research; 4) While 26 remain in undergraduate training, 34 of 35 obtained a BS/BA (100% in medicine, science, technology, engineering and math [MSTEM] and 29% aging-related degrees). Longer-term career outcomes at this early stage in the program indicate success of graduates overall: ~80% are currently in the BMS workforce and/or advanced degree programs, with ~27% returning to WFUSM as trainees or in research staff positions; 59% plan a future career in BMS research, with 56% of those interested in aging/health disparities research; 35% entered MSTEM advanced degree programs (MD, PhD, MS, health professional programs; 4 MS degrees already attained) with 9 more applying. Thus, ENGAGED is well-positioned to advance our objectives from a solid foundation of promoting interest in, and exposure to, research experiences in aging/health disparities for diverse undergraduate trainees.

PUBLICATIONS

Between the months of May-August, Cardiovascular Sciences Center members published 114 manuscripts. Of these, **10** were CVSC first author publications. Below we highlight publications from the CVSC and SHVI.

Perrin EC, Ravi HL, Borra GS, **South AM**. Prevalence and risk factors of disordered eating behavior in youth with hypertension disorders. *Pediatr Nephrol*. 2023 May 17:1–11. doi: 10.1007/s00467-023-05921-1. Epub ahead of print. PMID: 37195544; PMCID: PMC10189692.

Alexander BT, **South AM**, August P, Bertagnolli M, Ferranti EP, Grobe JL, Jones EJ, Loria AS, Safdar B, Sequeira-Lopez MLS; American Heart Association Council on the Kidney in Cardiovascular Disease; Council on Cardiovascular and Stroke Nursing; Council on Cardiovascular Radiology and Intervention; Council on Hypertension; and Council on Lifestyle and Cardiometabolic Health. Appraising the Preclinical Evidence of the Role of the Renin-Angiotensin-Aldosterone System in Antenatal Programming of Maternal and Offspring Cardiovascular Health Across the Life Course: Moving the Field Forward: A Scientific Statement From the American Heart Association. *Hypertension*. 2023 May;80(5):e75–e89. doi: 10.1161/HYP.0000000000000227. Epub 2023 Mar 23. PMID: 36951054; PMCID: PMC10242542.

Corneil H, Liblik K, Varghese SS, Masotti B, Moulson N, McKinney J, Allan KS, Phelan D, Thakrar A, Johri AM, Grubic N. Shared Decision-Making in Athletes Diagnosed With a Cardiovascular Condition: A Scoping Review. *Curr Probl Cardiol*. 2023 May 19;48(10):101815. doi: 10.1016/j.cpcardiol.2023.101815. Epub ahead of print. PMID: 37211302.

Mitchell CC, Frye C, Jankowski M, Symanski J, Lester SJ, Woo A, Gilliland Y, Dragulescu A, Abraham T, Desai M, Martinez MW, Nagueh SF, Phelan D. A Practical Approach to Echocardiographic Imaging in Patients With Hypertrophic

Cardiomyopathy. *J Am Soc Echocardiogr*. 2023 May 7:S0894-7317(23)00249-3. doi: 10.1016/j.echo.2023.04.020. Epub ahead of print. PMID: 37160197.

Slivnick JA, Alvi N, Singulane CC, Scheetz S, Goyal A, Patel H, Sarswat N, Addetia K, Fernandes F, Vieira MLC, Cafezeiro CRF, Carvalhal SF, Simonetti OP, Singh J, Lang RM, Zareba KM, Patel AR. Non-invasive diagnosis of transthyretin cardiac amyloidosis utilizing typical late gadolinium enhancement pattern on cardiac magnetic resonance and light chains. *Eur Heart J Cardiovasc Imaging*. 2023 May 31;24(6):829–837. doi: 10.1093/ehjci/jeac249. PMID: 36624559.

Malahfi M, Crudo V, Kaolawanich Y, Nguyen DT, Telmesani A, Saeed M, Reardon MJ, Zoghbi WA, Polsani V, Elliott M, Bonow RO, Graviss EA, Kim R, Shah DJ. Influence of Cardiac Remodeling on Clinical Outcomes in Patients With Aortic Regurgitation. *J Am Coll Cardiol*. 2023 May 16;81(19):1885–1898. doi: 10.1016/j.jacc.2023.03.001. Epub 2023 Mar 5. PMID: 36882135.

Kalscheur MM, **Akbilgic O**. AI-Enabled ECG for Paroxysmal Atrial Fibrillation Detection: One Step to Closer to the Finish Line. *JACC Clin Electrophysiol*. 2023 Jun 14:S2405-500X(23)00336-5. doi: 10.1016/j.jacep.2023.05.023. Epub ahead of print. PMID: 37498242.

Karabayir I, Gunturkun F, Butler L, Goldman SM, Kamaleswaran R, Davis RL, Colletta K, Chinthala L, Jefferies JL, Bobay K, Ross GW, Petrovitch H, Masaki K, Tanner CM, **Akbilgic O**. Externally validated deep learning model to identify prodromal Parkinson's disease from electrocardiogram. *Sci Rep*. 2023 Jul 29;13(1):12290. doi: 10.1038/s41598-023-38782-7. PMID: 37516770; PMCID: PMC10387090.



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GOOD NEWS!

Wake Forest University School of Medicine Cardiovascular Sciences Center

Spring 2023

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DR. GISELLE MELÉNDEZ LEADS A STUDY AWARDED BY THE AMERICAN HEART ASSOCIATION'S STRATEGICALLY FOCUSED RESEARCH NETWORK



The American Heart Association Strategically Focused Research Network on Biologic Pathways of Chronic Psychosocial Stressors on Cardiovascular Health has awarded \$15 million to research teams from 3 universities to study the biological mechanisms of chronic stress that can increase the risk of cardiovascular disease. The collaborative research project includes Ohio State University, University of California Davis and the Pauley Heart Center at Virginia Commonwealth University (VCU) with investigators at WFUSM partnering with the VCU team.

Assistant Professor of Internal Medicine and Comparative Medicine, **Dr. Giselle Meléndez, MD**, serves as the PI of the study at WFUSM which is a large (~\$2.4 million) nonhuman primate project. Drs. **Appt**, Burkart, **Shively** and **Kaplan** are co-investigators. The focus of the VCU/WFUSM study is chronic psychosocial stress and cardiovascular dysfunction in cancer survivorship and it involves two basic science projects originating from the WFUSM nonhuman primate study and one clinical project at VCU. The project led by Dr. Meléndez, which is the second of the pre-clinical studies, is titled *Role of chronic psychosocial stress on chemotherapy-induced cellular senescence and cardiac fibrosis*. See the press release [here](#).

CAREER CORNER

2023 SUMMER RESEARCH PROGRAMS TO INCREASE DIVERSITY IN BIOMEDICAL SCIENCE CAREERS:

The Cardiovascular Sciences Center and Sticht Center for Healthy Aging and Alzheimer's Prevention host two summer research programs: the Excellence in Cardiovascular Sciences (EICS) program in the 31st year and the Enhancing UnderGraduate Education and Research in AGing to Eliminate Health Disparities (ENGAGED – joint program with WSSU and WFU) in its fourth year. These programs are led by a collaborative team of faculty committed to increasing diversity in the biomedical sciences (BMS), including Drs. Tina Brinkley, Debra Diz, TanYa Gwathmey and David Soto-Pantoja at WFUSM and Drs. Jill Keith (WSSU) and Gary Miller (WFU).

The summer students are undergraduate students selected from across the country to participate in research topics related to aging and cardiovascular disease, as well as health disparities. Joint sessions and social activities are planned with summer trainees in programs sponsored by Biomedical Engineering, Microbiology & Immunology and Precision Medicine to provide networking and a sense of community. Many of the Cardiovascular Sciences Center members serve as program faculty and as mentors. We welcome these students to our research activities and thank the CVSC faculty who provide meaningful research experiences.



AUSTIN'S DATA TOOLS AND TIPS



Advanced Imputation Methods

Missing data is a common occurrence in many datasets and is something you will probably run into when working with EMR data or survey data. As analytical methods advance, it has

become more apparent that simple mean and mode imputation may not be appropriate for the complex datasets we work with as they can introduce bias or not meet the assumptions our predictive models need to make about the data. Two methods I often use are PPCA (Probabilistic PCA), for unsupervised analysis, and Random Forest Imputation, a supervised method. PPCA is best suited for high dimensional data where you are working with data that includes thousands of features and a handful of samples (omics data comes to mind). In a traditional predictive analysis case, random forest imputation would be more appropriate as it uses outcome data to help inform the imputation model.

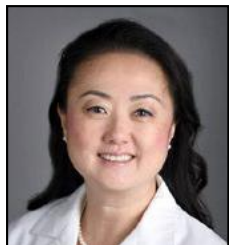
Both methods use the known (non-missing) data to predict what the missing data would be so it would be wise to consider the distribution of missing data at the outset as too much could introduce random noise into the data after imputation. In most cases, it is assumed that the data is missing at random. This means the missing data can't be explained by outside factors like data collection methods. For example, a subset of survey respondents are missing data for a set of questions because they never had the opportunity to answer them (for whatever reason). Another consideration is that these two methods only accept numeric data as input, so if your raw data includes text data you will need to consider recoding these variables.

These two methods can be implemented in R/R Studio using the "pcaMethods" and "randomForest" packages. They can also be used in other environments such as python or SAS.

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



Kim

SHVI and **Dr. Esther Kim** hosted the first Spontaneous Coronary Artery Dissection (SCAD) Conference and Patient Symposium, which included faculty and patients who traveled to Charlotte from 25 different states plus DC and Australia in April 2023.

Day 1 was a CME-accredited event with talks delivered by esteemed

internal and external faculty from multiple institutions across the country. Day 2 was a non-CME conference for patients and their loved ones organized in partnership with SCAD Alliance.

The Cardiovascular Sciences Center (CVSC) is seeking proposals

for the 2023 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 will be due ~ Spring 2024.

Please contact Dr. Liliya Yamaleyeva (lyamaley@wakehealth.edu) if you need further guidance.

FUNDING

During the months of January to April, CVSC members were awarded 29 new grants. Below we highlight some of these awards.



Tomar



Jadiya

Drs. Tomar (PI) and Jadiya (Co-I) received a NIA Administrative Supplement for R00DK120876 “Impact of mitochondrial structure on cellular homeostasis and Alzheimer's disease” from 05/16/2023 to 04/30/2024.



Bancks

Dr. Michael Bancks (PI) received an R01 (1R03AG077368-01) from the NIA for the project period of 01/01/2023-12/31/2024. The proposed study will assess the epidemiology of potentially inappropriate medication use and risk for mild cognitive impairment and dementia among ARIC, Look AHEAD, and MESA study populations.



Cilvik

Dr. Sarah Cilvik was awarded an R01 from the NHLBI that will start 9/1/2023 for her project titled Developmental Origins of Cardiovascular Disease in Offspring from Nonhuman Primate Pregnancies at Advanced Maternal Age. Co-investigators include **Drs. Kylie Kavanagh** (Pathology-Comparative Medicine), Matt Jorgensen (Pathology-Comparative Medicine), **Giselle Meléndez** (Cardiology), Carmen Kiper (Pediatrics-Cardiology), Joshua Nitsche (Maternal Fetal Medicine), and **Andrew South** (Pediatrics-Nephrology).

A Notice of Award was received for an NHLBI-R21 (PIs Younghan, **Akbilgic**, Azarbarzin) titled “Deep learning of awake and sleep electrocardiography to identify atrial fibrillation risk in sleep apnea.”

A Notice of Award was received for an NHLBI-R01 (**PI Akbilgic**) titled “ECG-AI Based Prediction and Phenotyping of Heart Failure with Preserved Ejection Fraction.”

A Notice of Award (**PI Akbilgic**) was received for WFBMI Pilot Award titled “AI-assisted prediction of Fatal Coronary Heart Disease using 12-lead ECGs.”

A Notice of Award (**PI Akbilgic**) was received for WFBMI-NC State Wearable Medical Technology Pilot Funding titled “Evaluation of Left Arm ECG for Deep Learning Risk Prediction of Heart Failure.”

A Notice of Award (**PI Akbilgic**) was received for Wake Forest Innovations Award titled “ECG-Air: **MO**thers **N**eed Innovative **CA**re (**air-MONICA**).”



Howlett

Allyn Howlett, PhD, received the Notice of Grant Award from the National Institute on Drug Abuse to renew work on “Cannabinoid Receptors and Interacting Proteins” to begin June 1, 2023, for five years of support. This is a multi-PI grant with Dr. W. Todd Lowther, Co-Director of the Structural Biology Core in the Department of Biochemistry and Molecular Biology.

Drs. Patricia E. Gallagher and Ana Clara Melo received a \$140,130 Capital Medical Equipment Institutional Grant for the purchase of a Sartorius Incucyte Live-Cell Imaging and Analysis System to quantify complex cellular changes in real time.



Mahler

Dr. Simon Mahler (PI) and Co-Is Jason Stopyra, Anna Snaveley, Nick Ashburn, Tara Hashemian, Doug Easterling, Matt Belford, Amresh Hanchate, Dave Pearson, Santosh Rao, Joe Miller, James McCord, and Wake Forest QPRO have been awarded a 5-year R01 grant from AHRQ. This grant directly addresses how best to care for moderate risk patients in the era of high sensitivity troponins and will ensure that Wake Forest remains at the cutting edge and continues to lead the development of best practices for ED chest pain risk stratification in the U.S. and beyond.



South

Dr. Andrew South received a WFUSM CTSI Ignition Fund Pilot Award (5/2023 – 8/2023) for the project titled “The Relationship Between Preexisting Undernutrition and the Development of Chronic Kidney Disease and Cardiovascular Disease.” This pilot award provides funds to perform a rat model of undernutrition. The study is led by Learner-PI Kayla McMillian for her master's thesis.

FUNDING *continued*



Kitzman

Dalane Kitzman, MD of Wake Forest and Nicole Cyrille-Superville, MD of Sanger Heart & Vascular Institute received Notice of Grant Award of \$1.5M from the National Heart, Lung, and Blood Institute to support the development of the Wake Forest — Atrium Health HeartShare Clinical Center. The HeartShare Project is a \$50M national effort to study heart failure treatment. As one of a planned 6 national clinical care centers, Wake Forest — Atrium Health is also positioned to receive further NIH funding in support of serving as a core laboratory for multiple aspects of the project.



Meléndez

Dr. Meléndez was awarded an NIAID R21 (1R21 AI68902-01A1) for her project "A novel, genetic model of IL-6 trans-signaling to interrogate cardiac fibrosis pathology."

The 2023 CVSC Pilot Awards went to the following:

Saraschandra Vallabhajosyula, MD – Dept. of Medicine. \$20,000. "Differences in Healthcare Delivery, Management and Outcomes of Cardiogenic Shock from Heart Failure versus Acute Myocardial Infarction" Co-Investigators – Olivia N Gilbert, MD MSc, P Matthew Belford, MD, **David X Zhao, MD, PhD, David M Herrington, MD, MHS**

Rong Chen, PhD – Dept of Physiology and Pharmacology. \$20,000. "Interactions between the renin-angiotensin and dopamine system in the brain" Co-investigator – **Liliya Yamaleyeva, MD, MS**

Mark C. Chappell, PhD – Hypertension Center. \$20,000. "Prorenin, renin and the prorenin receptor in septic shock patients: potential biomarkers of disease of severity" Co-investigators – **Ashish Khanna MD, Christopher Schaich, PhD, MHS**

AWARDS HIGHLIGHT

Dr. Esther Kim was named chair of the Council on Peripheral Vascular Disease at the American Heart Association.



Pictured left to right: FMDSA President Brad Daar, Dr. Heather Gornik and Ester Kim. Two of the FMDSA Founders, Rich and Susan Gould and Executive Director, Pam Mace.

INVITED PRESENTATIONS



Cilvik

Dr. Sarah Cilvik was invited to give a talk at the Center for Reproductive Health Sciences Seminar Series at Washington University School of Medicine in St. Louis, MO on April 7, 2023. Her presentation was titled “Adverse Pregnancy Outcomes and Developmental Programming in Nonhuman Primate Pregnancies at Advanced Maternal Age.”



Vallabhajosyula

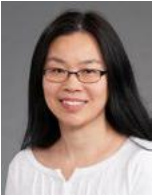
Drs. Vallabhajosyula and Akbilgic presented at the Internal Medicine Grand Rounds on March 16, 2023. The title of the talk was “Most Influential Papers in Cardiovascular Medicine.”



Akbilgic

Dr. Akbilgic presented “Artificial Intelligence to Unlock the Potential of Electrocardiogram in Disease Detection and Risk Prediction” at the NC State Advanced Self-Powered Systems of Integrated Sensors and Technologies (ASSIST) Center, April 12, 2023.

Dr. Akbilgic has been invited to give a talk at the European Society of Cardiology’s (ESC) 2023 Conference, August 25-28 in Amsterdam, Netherlands. The title of his talk is “Screening for cardiac dysfunction using artificial intelligence-enabled ECG.”



Zhu

Dr. Xuwei Zhu was invited to present a seminar at the Center for Cardiovascular Research (CCR) at Washington University School of Medicine in their weekly CCR Seminar Series on April 27, 2023. Her seminar was titled “Regulation of Macrophage Immunometabolism in Acute and Chronic Inflammatory Diseases.”



Yeboah

Dr. Joseph Yeboah was invited to participate as a speaker at the 83rd Scientific Sessions of the American Diabetes Association panel titled “Above and Beyond the Regular Lipid Panel—Are Additional Measurements Really Needed?” The title of his presentation is “When to use Coronary Artery Calcium and New Imaging to Complement Lipid Panels.”

Drs. Akbilgic, Herrington and Soliman’s et al abstract has been accepted as a moderated poster presentation at the 2023 ESC in Amsterdam, Netherlands.

- Karabayir I, Butler L, Gunturkun F, Chinthala L, Jefferies J, Baykaner T, **Herrington D, Soliman E**, Davis R, **Akbilgic O**. A real-world evidence for the performance of an ECG-AI based heart failure risk predictor.



South

Dr. Andrew South’s research team presented 22 abstracts at the Pediatric Academic Societies Annual Meeting in April 2023 in Washington, DC, including 75% first-authored by learners (3 undergraduate students), 80% by women, and 25% by learners who are underrepresented in the biomedical sciences.

Dr. Dermot Phelan presented to NBA leadership and NBA team cardiologists at the NBA Combine in Chicago on May 19, 2023. His presentation was titled “Echocardiographic Quality in the National Basketball Association” and showcased all of SHVI’s work thus far on echo quality assurance for the league.

The following 7 abstracts from SHVI were presented at the 2023 ACC’s Cardiovascular Summit and 1 was awarded the best abstract award.

- *Sanger Heart & Vascular Institute – Perfect Care Improves Patient Outcomes After Surgery.* Shannon Crotwell, RN / Maya Gantt, RN / Yolanda Cousen, APP / Leslie Doyle, RN / James Reynolds, MBA / Larry Watts, MD / John Frederick, MD / Thomas Maxey, MD / William Downey, MD / Troy Leo, MD / Geoffrey Rose, MD / Kevin Lobdell, MD
- *Sanger Heart & Vascular Institute – Health Equity Evaluation of the EVAR Patient’s Journey.* Elizabeth Ross, MSN / Ethan Shi / Frank Arko, MD / Charles Briggs, MD / Stephanie Irausquin, PhD / William Downey, MD
- *Leveraging Implantable Devices with Heart Failure Risk Stratification Features to Manage More Patients and Decrease Cost.* Meghan Emig, MPAS, PA-C / Sanjeev Gulati, MD, FACC / Elizabeth Davenport, MSN, RN / Satish Misra, MD / Kelsey Guffey, MSN, MBA, RN
- *Expanding Access to Efficient Evaluation for Advanced Heart Therapy Referral Leveraging a 3-Day Process.* Taylor Foster, MBA / Joseph Mishkin, MD, FACC / Meghan Emig, MPAS, PA-C / Sarah Caldwell, CMA / Susan Bernardo, BSN, RN, CCTC / Hani Nabi, BSN
- *Implementation of a 72-Hour Outpatient Cardiology Follow-up Pathway for Moderate Risk Chest Pain Patients Presenting to the ED.* **David Pearson, MD, MS, MBA** / William Downey, MD / Sanjeev Gulati, MD, FACC / Christina Lesassier, MSN, RN / Carolyn Miller, MHA, FACHE / Kelsey Guffey, RN / Kamala Swayampakala, PhD
- *Implementation of Advanced Practice Provider – Led Inpatient Service to Provide Cost-Effective Cardiovascular Care.* Ashley McDaniel, AGACNP-BC, FNP-C / Sanjeev Gulati, MD, FACC / Troy Leo, MD, MHCM, FACC / Carolyn Miller, MHA, FACHE
- **Best Abstract Award**
Reducing the Risks: A Quality Improvement Project for the Prevention of Atrial Fibrillation in Cardiac Surgery Patients. Sherry Saxonhouse, MD, MS, FHRS, FACC / Theresa Remolina, BS, RVT, RDMS / John Frederick, MD / Douglas Haden, MD

Elizabeth Ross, Olivia Ohrenstien, Aru Rama-Krishnan, Michael Rinaldi, Eric Skipper, Terence Hill, Jonathan Schwartz, John Frederick, Catherine Shah, William Downey. Equity Opportunities in the severe aortic stenosis care pathway. *J Am Coll Cardiol.* 2023 Mar, 81 (8_Supplement) 2001. [https://doi.org/10.1016/S0735-1097\(23\)02445-2](https://doi.org/10.1016/S0735-1097(23)02445-2).

Dr. Jonathan Ray, a research fellow in **Dr. Liliya Yamaleyeva’s** lab, presented his work as a poster titled “Sex differences in middle cerebral artery reactivity and hemodynamics in 6-month-old Sprague-Dawley rats independent from systemic arterial stiffness or blood pressure” at the America Physiology Summit in Long Beach, CA in April 20-23, 2023

AWARDS AND ACCOMPLISHMENTS



Potts

Congratulations to **Kimber Potts, NP** on receiving the Hero Award for Trust! A huge thank you to Kimber for all you do for Atrium Health Wake Forest Baptist Cardiology!



Chappell

A 2014 review by **Dr. Mark Chappell et al** has more views than 99% of all other Frontier articles.

Chappell MC, Marshall AC, Alzayadneh EM, Shaltout HA, Diz DI. Update on the angiotensin converting enzyme 2-angiotensin (1–7)-Mas receptor axis: fetal programing,

sex differences, and intracellular pathways. *Front Endocrinol (Lausanne)*. 2014 Jan 9;4:201. doi: 10.3389/

fendo.2013.00201. PMID: 24409169; PMCID:

PMC3886117.

Congratulations to the following list of individuals from the Section of Cardiovascular Medicine recognized for their achievements!

- Manrique Alvarez, MD, FACC, FASC - Master Teacher Award
- Luke Peters, MD, FACC – Class of 2024 - Best Inpatient Clerkship Teacher
- **Barbara Pisani, DO, FACC, FAHA**- Class of 2024 - Best Inpatient Clerkship Teachers
- **David Zhao, MD, PhD** - Class of 2024 - Best Inpatient Clerkship Teachers
- **Brandon Stacey, MD** - Class of 2023 and Class of 2025 - Annual Teaching Award
- Aysha Amjad, MBBS - 2023 Clinical Excellence Award
- Karl Richardson, MD - Promotion to Associate Professor
- Robert Applegate, MD - Retired
- **Michael Kutcher, MD** - Retired
- **Heng-Jie Cheng, MD, PhD, FAHA** - Retired
- **Che-Ping Cheng, MD, PhD, FAHA** - Retired
- Frederic Kahl, MD - Retiring



Tallant

Dr. E. Ann Tallant retired after thirty-one years of service to the University and School of Medicine in the Section of Hypertension, Department of Surgery, with secondary appointments in the Department of Physiology and Pharmacology and

Department of Cancer Biology. She is recognized for exceptional contributions as a researcher, mentor and leader; for innovation in translational research focused on the development of novel therapeutics to treat and prevent cancer and cardiovascular disease; for exceptional mentorship of graduate students, fellows, staff scientists and faculty, particularly from under-represented groups; and for an exemplary record of professional scholarship with over 280 abstracts, articles and book chapters, two awarded patents and more than \$27 million in research funding. Dr. Tallant will continue to contribute to the university and the department as an Emeritus Professor.



Akbilgic

Dr. Oguz Akbilgic was invited to become a member for the Statisticians Group of American Diabetes Association's Diabetes Care Journal.

Dr. Oguz Akbilgic was invited to become a member for NCI-DOE Collaboration Computational Resources of Cancer Research Portal, Community Engagement Working Group.



South

Dr. Andrew South is the new Chair of the Membership Committee of the AHA Council on the Kidney in Cardiovascular Disease.

B. Hadley Wilson MD, Executive Vice Chair of Sanger Heart & Vascular Institute, advanced to president of the American College of Cardiology (ACC). The ACC is a

56,000-member national cardiovascular (CV) professional society dedicated to advancing research, education, and clinical care in CV medicine and surgery. The ACC also advises the US Congress and the Centers for Medicare and Medicaid on health policy matters. Dr. Wilson's term continued through March 2023.

The William, Jeff, and Jennifer Gross Family Foundation provided a \$2 million gift to endow Dr. William (Bill) Downey as chair and medical director of The Jenny & Jeff Gross Family Center for Cardiovascular Care Transformation. Dr. Downey, who is also the vice chair of quality care and transformation at SHVI, is the first named chairholder and will continue his groundbreaking CV research and development of programmatic needs for the Center. This is the third gift to SHVI from the Gross family in support of the Center, and their previous generosity has supported initiatives such as a virtual Hypertension Bootcamp and creation of an advanced analytics team to focus on enterprise-wide quality improvement.

SHVI received a \$2 million donation from The Dowd Foundation to develop the Dowd Cardio-Oncology Center of

AWARDS AND ACCOMPLISHMENTS *continued*

Excellence, opening at SHVI Kenilworth by the end of 2023. This program will offer improved care models and advance novel research efforts for vulnerable patient populations. Dr. Jai Singh is the Director for the Center and leading a pilot study to evaluate the effect of supervised cardiac rehabilitation in patients with cardiac amyloidosis. SHVI will also be joining the Global Cardio-Oncology Registry (G-COR), the first prospective international observational registry in the field.

SHVI received a donation of \$300,000 from the Tysinger Family Fund for Excellence in Cardiovascular Care. Mr. Tim Tysinger was the recipient of a heart transplant in October 2021 at SHVI and wanted to share his gratitude for his entire care team. His generosity will enable SHVI to create a full-time ICU nurse educator position, a critical role for the training and recruitment of additional nurses.

SHVI's Heart Transplantation team performed 51 adult heart transplants in 2022, placing the program amongst the top 20 centers in the US. 1-year survival in the program exceeded 98%, compared to a national average of <92%.

Dr. Jonathan Schwartz and Dr. Markus Scherer performed the first-ever live structural heart case at Atrium Health --- 3D ICE-guided LAAO with a WATCHMAN FLX device.

SHVI's cardiovascular program at Carolinas Medical Center was recognized on the Fortune/PINCAI 2023 list of the nation's 50 Top Cardiovascular Hospitals. This designation is awarded based solely on objective, publicly reported data on clinical outcomes, the efficiency of care, and the patient experience.

The Marfan Foundation has recognized the efforts of SHVI's Marfan and genetic aortopathy program. This work was a collaboration among the SHVI, Levine Children's, and Wake Forest Baptist teams.

Dr. Esther Kim was awarded the Founders Award by the Fibromuscular Dysplasia Society of America (FMDSA) in May 2023. This award is for those who have taken extraordinary measures to advance FMD awareness, research, and treatment.

Dr. Jonathan Schwartz was elected to the ACC's Healthcare Innovation Council and the SCAI's Structural Heart Disease Council (Spring 2023). He also presented at both the 2023 Cardiovascular Research Technologies (CRT) meeting and the Scottsdale Interventional Forum (SIF) (Spring 2023).

Dr. Esther Kim was named chair of the Council on Peripheral Vascular Disease at the American Heart Association.

Dr. Dermot Phelan has been invited to join the following organizations:

- Cardiology representative on the National Football League General Medical Board (2023-present)
- Chair of the Cardiology Advisory Task Force for the National Football League (2023-present)
- Chair of the American Society of Echocardiography Advocacy Committee (2023-2025)
- Course chair of the ACC's "Care of the Athletic Heart" (2023)



Yamaleyeva

Anna Soloshenko, a Wake Forest University undergraduate student mentored by **Dr. Liliya Yamaleyeva**, successfully defended her Biochemistry Honors thesis and graduated with a B.S. degree with honors in Biochemistry and Molecular Biology. She has been accepted to the Wake Forest University School of Medicine Class of 2027!

Recent studies funded by the NIH Human Placenta Project from **Dr. Yamaleyeva's** lab are featured on NIH website under Human Placenta Project Findings: "**Identifying High-Risk Pregnancies with Photoacoustic Imaging of Placental Oxygen**" <https://www.nichd.nih.gov/research/supported/human-placenta-project/findings/photoacoustic-imaging-for-high-risk-pregnancies>



Willey

Dr. Jeffrey Willey launched mice to the International Space Station (ISS) as a lead scientist for the first ever official NASA - Japanese Space Agency rodent research collaboration aboard the ISS as part of a NASA grant. Two Molecular Medicine PhD students served as leaders for the project as well,

Chirayu Patel and Kaitlyn Reno. They tested if artificial gravity could protect against musculoskeletal damage by housing the mice in a centrifuge module that spun the mice at different gravitational levels, like on Mars. PBS reached out after reading about the work on <https://school.wakehealth.edu/features/research/scientists-and-students-study-the-risks-of-space-travel> and will be doing a story on their research.

Based on their findings, NASA wants to test whether housing conditions aboard the ISS can impact musculoskeletal health and performance in rodents. Therefore, NASA funded Dr. Willey et al to fly mice to the ISS again next with SpaceX and perform another mission. NASA grant: 80NSSC23K0918. Title: *Rodent Research Standard Housing Mission: Multidisciplinary Approach to Understanding Spaceflight Responses*. Willey: Institutional PI. Start Date: June 1, 2023.

PUBLICATIONS

Between the months of January-April, Cardiovascular Sciences Center members published **123** manuscripts. Of these, **10** were CVSC first author publications. Below we highlight publications from the CVSC and SHVI.

Wang JF, **Tomar D**, Martin TG, Dubey S, Dubey PK, Song J, Landesberg G, McCormick MG, Myers VD, Merali S, Merali C, Lemster B, McTiernan CF, Khalili K, Madesh M, Cheung JY, Kirk J, Feldman A. Bag3 regulates mitochondrial function and the inflammasome through canonical and noncanonical pathways in the heart. *J Am Coll Cardiol Basic Trans Science*. 2023 Apr 19. DOI: 10.1016/j.jacbts.2022.12.013

Chappell MC. *Renin-Angiotensin System and Sex Differences in COVID-19: A Critical Assessment. *Circulation Research*. 2023;132:1320–1337. doi: 10.1161/CIRCRESAHA.123.321883

* Impact factor of 23

Bancks MP, Byrd GS, Caban-Holt A, Fitzpatrick AL, Forrester SN, Hayden KM, Heckbert SR, Kershaw KN, Rapp SR, Sachs BC, **Hughes TM**. Self-reported experiences of discrimination and incident dementia. *Alzheimers Dement*. 2023 Feb 1. doi: 10.1002/alz.12947. Online ahead of print. PMID: 36724324.

Falkner B, Gidding SS, Baker-Smith CM, Brady TM, Flynn JT, Malle LM, **South AM**, Tran AH, Urbina EM, American Heart Association Council on Hypertension, Council on Lifelong Congenital Heart Disease and Heart Health in the Young, Council on Kidney in Cardiovascular Disease, Council on Lifestyle and Cardiometabolic Health, Council on

Cardiovascular and Stroke Nursing. Pediatric Primary Hypertension: An Underrecognized Condition: A Scientific Statement from the American Heart Association. *Hypertension* 2023 Mar 30; ePub; doi: 10.1161/HYP.0000000000000228. PMID 36994715.

Hill B, Grubic N, Williamson M, Phelan DM, Baggish AL, Dorian P, Drezner JA, Johri AM. Does cardiovascular preparticipation screening cause psychological distress in athletes? A systematic review *Br J Sports Med*. 2023 Feb;57(3):172-178 PMID: 36418151

Dr. Jonathan Schwartz was a co-author of the Triluminate clinical trial, which showed that tricuspid transcatheter edge-to-edge repair was safe and reduced the severity of tricuspid regurgitation in patients with severe tricuspid regurgitation.

- Sorajja P, Whisenant B, Hamid N, Naik H, Makkar R, Tadros P, Price MJ, Singh G, Fam N, Kar S, Schwartz JG, Mehta S, Bae R, Sekaran N, Warner T, Makar M, Zorn G, Spinner EM, Trusty PM, Benza R, Jorde U, McCarthy P, Thourani V, Tang GHL, Hahn RT, Adams DH; TRILUMINATE Pivotal Investigators. Transcatheter Repair for Patients with Tricuspid Regurgitation. *N Engl J Med*. 2023 May 18;388(20):1833-1842. doi: 10.1056/NEJMoa2300525. Epub 2023 Mar 4. PMID: 36876753.



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GOOD NEWS!

Wake Forest University School of Medicine Cardiovascular Sciences Center

Winter 2022

WHAT'S INSIDE

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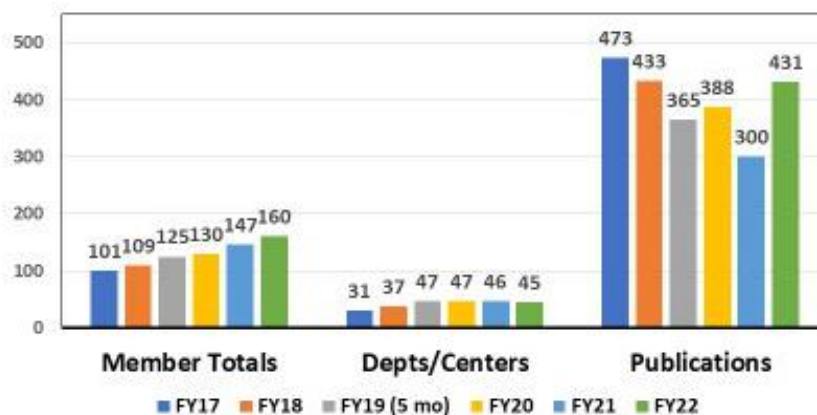


2022 CENTER ANNUAL REPORT HIGHLIGHTS

Membership, Publication and Extramural Funding Activities: We congratulate members on continued successes and highlight below the many sustained achievements! Membership is steadily increasing and the data indicate a gratifyingly dramatic rebound in submitted applications, which we expect will be followed by a similar bump in actual funded awards in the coming year(s).

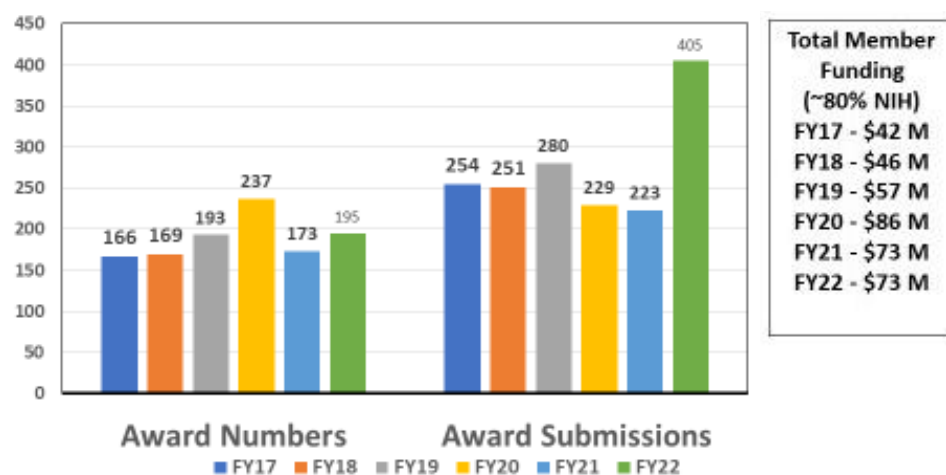
CVSC: Membership, Departments and Centers Represented, Publications

Steadily increasing Membership averaging ~2.7 Publications per month in 2022



CVSC: Membership Funding Metrics

Active Awards and Submission Activity



Wake Forest University
School of Medicine

continued on page 2

2022 CENTER ANNUAL REPORT HIGHLIGHTS *continued*

Pilot Awards: Did you Know? In 2022 we transitioned away from using the CTSI common solicitation and deadline strategy and adopted a separate solicitation and deadline in the Spring for the CVSC Pilot awards that was promoted in our emails and *GoodNews* newsletter. As a result, we received more than twice the number of applications as in prior years and the survey results indicated greater awareness of the program. To maintain increased awareness, we intend to continue this approach in 2023. In addition, we will dedicate an article in an upcoming issue of *GoodNews* to the pilot funding mechanism including past recipients. We highly encourage projects with collaborating investigators across the Winston-Salem and Greater Charlotte regions. Please be on the lookout for these updates!

\$393,000 Total CVSC Pilot investment (as of 8/2022) *Women faculty represent 58% and URM faculty represent 26% of the CVSC Pilots funded)*

\$4.8 M Total extramural funding from Award recipients (as of 8/2022)

12:1 Ratio of subsequent funding/investment

50% At least 8 grants have been submitted with a total of 4 awarded for a 50% success rate

AUSTIN'S DATA, TIPS AND TOOLS



The Importance of Checking Data Quality

The importance of checking the quality of your data is an essential part of your research/analytic project. Data quality can be defined in many different ways and is context specific but it can be described by one question. Can this data be

analyzed in its current state? This is one of the questions I ask myself at the beginning of every analysis and usually leads to more specific questions like, is a significant proportion of my data missing? Is the (non-missing) data recorded in a uniform manner? For example, date and time data can often be in different formats if recorded manually. Fixing a problem like this often called data harmonization and can take a very long time to fix on the back end if not

properly considered during data collection. Addressing questions like these during the data collection stage will help the data analysis stage be more efficient. This will also shape your expectations in the results and greatly influence the analytic approach of the project. If pulling data from the EMR, it would be wise to form a template defining what information/variables to record and the format it should be recorded in. I've found that doing this helps you get to know your data very well. As many analyst say "If you put garbage data in, you will get garbage data out."

Thanks for reading this winter 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

FUNDING

During the months of September- December, CVSC members were awarded 11 new grants. Below we highlight some of these awards.



Dr. Sarah Cilvik awarded an R56 from NHLBI for the project titled "Developmental Origins of Cardiovascular Disease in Offspring from Non-human Primate Pregnancies at Advanced Maternal Age" from 9/2022-8/2023. Co-investigators include **Drs. Kylie**

Kavanagh (Pathology-Comparative Medicine), **Matt Jorgensen** (Pathology-Comparative Medicine), **Giselle Melendez** (Cardiology), **Carmen Kiper** (Pediatrics-Cardiology), **Joshua Nitsche** (Maternal Fetal Medicine), and **Andrew South** (Pediatrics-Nephrology).



Dr. Dhanendra Tomar received a research grant from the Harold S. Geneen Charitable Trust Awards Program for Coronary Heart Disease Research titled "Mitochondrial protein quality control and calcium signaling in myocardial ischemia-reperfusion injury."

Dr. Ashlesha Kadam, a postdoctoral fellow in Dr. Dhanendra Tomar's lab received a postdoctoral fellowship grant from the American Heart Association titled "Mitochondrial inter-membrane space protein quality control in Barth syndrome-associated cardiomyopathy."



Dr. Michael Bancks was selected for an American Diabetes Association's Precision Medicine and Diabetes Innovative Clinical or Translational Science Award Research Program. The is titled "Individualized risk prediction for type 2 diabetes, prediabetes subgrouping, and impact of lifestyle and

therapeutic preventive interventions". Co-Investigators include **Drs. Byron Jaeger, Ramon Casanova, and Brian Wells** all of Wake Forest University Public Health Sciences.

The Scientific Advisory Committee of the Heineman-Robicsek Foundation received 10 research proposals in 2022 for consideration for funding, only awarding funding for two of those proposals through the James N. Heineman Endowment. Dr. Priyesh Patel's proposal "Impact of Mobile Integrated Health on Acute Care Utilization after Hospitalization for Heart Failure" was one of the two selected for funding by the James H. Heineman Endowment for the amount of \$19,000.

CAREER CORNER



Dr. TanYa Gwathmey



Dr. Justin Moore

CVSC Focus on Career Development and Diversity: We use our training programs as pathways into further training and WFUSOM faculty positions. The CV Research T32 serves as a pipeline for faculty recruitment. In addition, our undergraduate research training programs Excellence in Cardiovascular Sciences (EICS, NHLBI funded 30 years) summer program and Enhancing UnderGraduate Education and Research in AGing to Eliminate Health Disparities (ENGAGED, NIA funded 4 years) academic year and summer program continue to serve as pathways for diversity in our masters and PhD programs. Faculty in CVSC are involved in CTSI, WIMS and Office of Faculty Affairs professional and research career development and mentoring programs for early career faculty. A new program funded by NIDDK for high school students developed by **Drs. TanYa Gwathmey and Justin Moore** began this year. In 2022, there were 9 training grants with CVSC member as PI/PD and 2 faculty K awards with CVSC faculty as mentor/mentee for a total annual NIH funding of \$2,094,420.

INVITED PRESENTATIONS

Drs. Cheping Cheng and Heng-Jie Cheng's lab had 5 abstracts presented at the 2022 AHA Scientific Sessions in Chicago, IL and published in *Circulation* 2022;146. A few are highlighted below:



Dr. Heng-Jie Cheng was the first author and presenter for the following:

- *Upregulation of Cardiac Beta3-Adrenergic Receptor-Activated INOS Uncoupling Promotes Diabetic Cardiomyopathy in Type II Diabetic Mice: Role of Oxidant Stress.*

Circulation. 2022;146:A9608. **Heng-Jie Cheng**, Jing Cao, Xiaoqiang Sun, **David X.M. Zhao**, **Dalane W. Kitzman**, **Che Ping Cheng**



Dr. Che Ping Cheng was the first author on the following presentations:

- *Cardiac β_3 -Adrenergic Receptor Deficiency Mice Protected from Cardiac Aging: Insights into the Cellular and Molecular Mechanism of Myocardial Aging.* *Circulation.* 2022;146:A9703.

Che Ping Cheng, Zhe Chen, Peng Zhou, Yixi Liu, **David M. Herrington**, **David X.M. Zhao**, **Dalane W. Kitzman**, **Heng-Jie Cheng**.

- *Cariporide, a Selective Na^+-H^+ Exchange Inhibitor, Enhances Cardiac Positive Inotropic and Lusitropic Responses to Dobutamine in Heart Failure: Assessment by Pressure-Volume Analysis.* *Circulation.* 2022;146:A9515. **Che-Ping Cheng**, Tiankai Li, Xiaowei Zhang, Zhi Zhang, **David X.M. Zhao**, **David M. Herrington**, **Dalane W. Kitzman**, **Heng-Jie Cheng**.



Dr. Liliya Yamaleyeva was invited to give a talk at the Molecular Medicine Seminar Series at Tufts University School of Medicine in Boston, MA on October 18, 2022. Her presentation was titled "Apelin/APJ Axis in Preeclampsia – A Novel Therapeutic Approach".

Anna Soloshenko, a WFU undergraduate student mentored by **Dr. Liliya Yamaleyeva**, presented a poster at the AHA Hypertension Sessions Conference on September 6-10, 2022 in San Diego, CA. The title of her presentation was "Apelin and Elabela Attenuate the Pro-Inflammatory Response in Hypoxic HTR-8/SVneo Trophoblastic Cells".

Jonathan Ray, MD, MS, a research fellow mentored by **Dr. Liliya Yamaleyeva**, presented his studies at the WFUSOM 30th Annual Surgical Sciences Research Day on November 15, 2022. His presentation was titled "Sex Differences in Middle cerebral artery hemodynamics but not systemic arterial stiffness in normotensive adult rats".



Dr. Oguz Akbilgic was invited to present "Introduction to Machine Learning " during The Foundation for Sickle Cell Research, Research Symposium, September 22, 2022.

Muscadine Grape Extract Inhibits Trastuzumab-Sensitive and –Resistant HER2 Positive Breast Cancer and Prevents Trastuzumab-Induced Cardiotoxicity by Drs. Jessica D. Mackert, **E. Ann Tallant** and **Patricia E. Gallagher** was presented at the 8th International Conference on Tumor Microenvironment and Cellular Stress: Signaling, Metabolism, Imaging and Therapeutic Targets, Rhodes, Greece, September 26-October 1, 2022



Dr. Mark Chappell presented "The Renin-Angiotensin System in Fetal Programming of Hypertension" at Tulane University Hypertension & Renal Center of Excellence on December 8, 2022.

INVITED PRESENTATIONS *continued*



Dr. Michael Shapiro gave the following invited presentations:

ACC Latin America September 2022 in Mexico City, Mexico

- Target PCSK9: New Strategies, New Questions
- Evolving therapies: Going Beyond Diabetes

AHA Scientific Sessions November 2022 in Chicago, IL

- Lipoprotein(a) 101: The Fundamentals

Chilean Congress of Cardiology in Santiago, Chile (Plenary Session and 3 additional talks)

- Management of Dyslipidemia: The Most Important CV Risk Factor in Atherosclerosis
- Lipoprotein(a): The Silent Enemy
- Role of CAC in Prevention of ASCVD
- Changing Paradigms in LDL-C Reduction

Cardiology Grand Rounds at Montefiore Medical Center, NY

- Pushing the Envelope with PCSK9 – Twenty Years of Progress

Dr. Shapiro et al had the following abstracts at the 2022 AHA Scientific Sessions in Chicago, IL:

Quispe R, Mszar R, Lahan S, Elizondo JV, Budoff MJ, Cury RC, Feldman T, Arias L, Blaha MJ, **Shapiro MD**, Blankstein R, Sharma G, Cainzos-Achirica M, Nasir K, Fiaklow J.

Association Between Remnant Cholesterol And Coronary Plaque Features: The Miami Heart Study At Baptist Health South Florida. *Circulation* 2022;146:A11601.

Mszar R, Cainzos-Achirica M, Elizondo JV, Quispe R, Ali SS, Saxena A, Cury RC, Budoff MJ, Feldman T, Lahan S, Blaha M, **Shapiro MD**, Sharma G, Santos R, Fiaklow J, Nasir K. Lipoprotein(a), Coronary Atherosclerotic Plaque, And High-risk Plaque In Asymptomatic Individuals: The Miami Heart Study At Baptist Health South Florida. *Circulation* 2022;146:A12006.

Rikhi R, Bhatia H, **Schaich CL**, Ashburn N, **Herrington DM**, Tsai MY, Michos ED, Chevli PA, Tsimikas S, **Shapiro MD**. Association Of Lipoprotein(a) And Hypertension In Primary Prevention Of Cardiovascular Disease: The Multi-Ethnic Study Of Atherosclerosis (MESA). *Circulation* 2022;146:A10239.

Chevli PA, Selvaraj S, Hammoud A, Connelly MA, Defilippi C, Lima JAA, Khan SS, **Herrington DM**, **Shapiro MD**, Vaduganathan M. Integrating Ketone Bodies in Multi-marker Risk Prediction Of Incident Heart Failure In The Multi-ethnic Study Of Atherosclerosis (MESA). *Circulation* 2022; 146:A12121.

Bhatia HS, Rikhi R, Allen TS, Yeang C, Guan W, Garg PK, Tsai MY, Criqui MH, **Shapiro MD**, Tsimikas S. Lipoprotein(a) and the Pooled Cohort Equations for Risk Prediction: The Multi-Ethnic Study of Atherosclerosis. *Circulation* 2022;146:A11309.

Lahan S, Cainzos-Achirica M, Elizondo JA, Ali SS, Arias L, Saxena A, Feldman T, Blaha MJ, **Shapiro MD**, Blankstein R, Sharma G, Cury RC, Budoff M, Fiaklow J, Nasir K. Systemic Inflammation and Coronary Plaque Among Asymptomatic US Adults - Insights From the Miami Heart Study at Baptist Health South Florida. *Circulation* 2022;146:A11584.

Hagan K, Cainzos-Achirica M, Mszar R, Ali SS, Arias L, Saxena A, Cury RC, Budoff M, Feldman T, Lahan S, Blaha MJ, **Shapiro MD**, Sharma G, Santos RD, Fiaklow J, Nasir K. LDL-Cholesterol, Coronary Plaque, and Resilience to Coronary Atherosclerosis in a Middle-Aged Asymptomatic US Population: The Miami Heart Study at Baptist Health South Florida. *Circulation* 2022;146:A13515.

Patel J, Al Rifai M, Cainzos-Achirica M, Feldman T, Blaha MJ, **Shapiro MD**, Blankstein R, Sharma G, Ali SS, Arias L, Saxena A, Feldman D, Cury RC, Budoff M, Fiaklow J, Nasir K. Family History of Atherosclerotic Cardiovascular Disease and Subclinical Coronary Atherosclerosis Among Asymptomatic Individuals: The Miami Heart Study at Baptist Health South Florida. *Circulation* 2022;146:A11698.

AWARDS AND ACCOMPLISHMENTS



Dr. Andrew South accepted the position of Chair of the Communications Committee of the American Heart Association's Council on the Kidney in Cardiovascular Disease.



Dr. Matthew Goldman received The Dr. Paul Jansen Award for Biomedical Research to study disparate care in vascular disease.



Dr. Dhanendra Tomar co-chaired the Session "Mitochondria in Health and Disease" at Cell Bio 2022, the joint annual meeting of the American Society for Cell Biology (ASCB) and European Molecular Biology Organization (EMBO) in Washington, DC, December 3-7, 2022.



Led by **Dr. Gabriela Velazquez-Ramirez** Vascular and Endovascular Surgery received an approval of 0/5 integrated residency program in Vascular Surgery.

Dr. Dhanendra Tomar was selected to serve as an Associate Member of the American Society for Cell Biology's International Affairs Committee (IAC).



Dr. Maureen Sheehan was named co-chair of the Society for Vascular Surgery committee on self-assessment Graduate Medical Education.



Dr. Oguz Akbilgic joined the Editorial Board of European Heart Journal Digital Health.

Dr. Oguz Akbilgic became the Associate Editor for Frontiers in Cardiovascular Epidemiology and Prevention.



Dr. Elijah Beaty was recognized as an outstanding reviewer for Circulation in 2022! This recognition is based on objective criteria of the quality of reviews provided, total number of papers reviewed, proportion of invitations accepted, and timeliness of review submissions.

Drs. Jim Jordan, Ellie Rabar, Lucas Neff and Tim Williams received a New Team Science Award for "Advanced Computational Cardiovascular Lab for Trauma, Hemorrhagic Shock & Critical Care". The award was given on Nov. 18, 2022, with each team member receiving a plaque. The New Team Science Award is given to recently formed teams of researchers collaborating on a new project. The goal is to reward early-stage, multidisciplinary teams that address innovative research questions.

Dr. Michael Elliot et al provided the Society for Cardiovascular Magnetic Resonance guidelines for training and competency of CMR technologists published in the Journal of Cardiovascular Magnetic Resonance:

Darty S, Jenista E, Kim RJ, Dyke C, Simonetti OP, Radike M, Bryant J, Lawton CB, Freitag N, Shah DJ, Bucciarelli-Ducci C, Raman S, Plein S, Elliott MD. Society for cardiovascular magnetic resonance recommendations for training and competency of CMR technologists. J Cardiovasc Magn Reson. 2022 Dec 5;24(1):68. doi: 10.1186/s12968-022-00900-1. PMID: 36464719; PMCID: PMC9721081.

ANNOUNCEMENTS



The documentary "Healthy Hope" was awarded the Best Documentary by the GO Independent International Film Festivals after screening at the Atlanta Cinefest, Chapel Hill Film Festival, Cleveland Cinefest, Dallas Cinema Awards, Milwaukee Movie Fest and Fame Factor. "Healthy Hope" promotes the health benefits of muscadine grape extracts through interviews with six clinicians and scientists currently conducting clinical and basic research on muscadine grape extracts, including Dr. Patricia E. Gallagher from Hypertension & Vascular Research at Atrium Health Wake Forest Baptist. "Healthy Hope" premiered on February 26, 2022, at the 15th Annual Amelia Island Film Festival and was chosen as the commencement film for the documentary segment of the festival. The documentary was also selected for screening at the RiverRun International Film Festival in Winston-Salem and the Northern Virginia International Film & Music Festival in Fairfax, Virginia. "Healthy Hope" is now available for screening on Vimeo at <https://healthyhope-themuscadinedocumentary.vhx.tv/>

The **Wake Mitochondrial Research Symposium**, designed to foster collaborative opportunities for research investigators from the Wake Forest University School of Medicine and Atrium Health Wake Forest Baptist in the field of mitochondrial biology, will be held Thursday, April 6, 2023. The keynote speaker will be Darrell Neuffer, PhD, Director, East Carolina Diabetes and Obesity Institute, Professor of Medicine and Professor in Physiology and Kinesiology East Carolina University. The program includes trainee's poster and platform presentations. Registration and Abstract Submission Form:

<https://forms.office.com/r/BfU2Y9WFEJ>



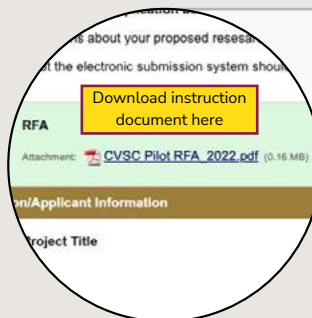
For more information please contact: dtomar@wakehealth.edu

The Cardiovascular Sciences Center (CVSC) is seeking proposals for the 2023 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 Friday, 03/17/2023.** Please contact Dr. Liliya Yamaleyeva (lyamaley@wakehealth.edu) if you need further guidance.

Here is how you can get started!

Go to this link to access the application form and RFA instructions.

<https://redcap.wakehealth.edu/redcap/surveys/?s=8T7NR7N3PHEEK8RM>

A screenshot of the "2022/2023 Cardiovascular Sciences Center (CVSC) Request for Pilot Applications" form. The form includes sections for "RFA", "Project Information", "Principal Investigator Information", and "Abstract and Research Plan". Fields include Project Title, Principal Investigator Name, Department, Rank, Email, and Number of Project Key Personnel. The Abstract section has a 200-word limit. A "Download" button is visible at the bottom right.

PUBLICATIONS

Between the months of September-December, Cardiovascular Sciences Center members published **105** manuscripts. Of these, **9** were CVSC first author publications. Below we highlight several of those.

Beaty EH, Fernando RJ, Jacobs ML, Winter GG, Bulla C, Singleton MJ, Patel NJ, Bradford NS, **Bhave PD**, Royster RL. Comparison of Bolus Dosing of Methohexital and Propofol in Elective Direct Current Cardioversion. J Am Heart Assoc. 2022 Oct 4;11(19):e026198. doi: 10.1161/JAHA.122.026198. Epub 2022 Sep 21. PMID: 36129031; PMCID: PMC9673741.

Hughes TM, Lockhart SN, Suerken CK, Jung Y, Whitlow CT, Bateman JR, Williams BJ, **Espeland MA**, Sachs BC, Williamson J, Cleveland M, Yang M, Rogers S, Hayden KM, **Baker LD, Craft S**. Hypertensive Aspects of Cardiometabolic Disorders Are Associated with Lower Brain Microstructure, Perfusion, and Cognition. J Alzheimers Dis. 2022;90(4):1589-1599. doi: 10.3233/JAD-220646. PMID: 36314205.

Li T, Wang Q and **Cheng C**. Effect of aging on cardiovascular responses to cold stress in humans. Frigid Zone Medicine, vol.2, no.3, 2022, pp.149-157. <https://doi.org/10.2478/fzm-2022-0022>

*Patil PD, Melo AC, Westwood BM, **Tallant EA, Gallagher PE**. A Polyphenol-Rich Extract from Muscadine Grapes Prevents Hypertension-Induced Diastolic Dysfunction and Oxidative Stress. Antioxidants (Basel). 2022 Oct 14;11(10):2026. doi: 10.3390/antiox11102026. PMID: 36290749; PMCID: PMC9598776.

Xu P, Wang M, Sharma NK, Comeau ME, Wabitsch M, Langefeld CD, Civelek M, Zhang B, **Das SK**. Multi-omic integration reveals cell-type-specific regulatory networks of insulin resistance in distinct ancestry populations. Cell Systems. [https://www.cell.com/cell-systems/fulltext/S2405-4712\(22\)00493-8](https://www.cell.com/cell-systems/fulltext/S2405-4712(22)00493-8) DOI: <https://doi.org/10.1016/j.cels.2022.12.005>

Rikhi R, Bhatia HS, **Schaich CL**, Ashburn N, Tsai MY, Michos ED, Chevli PA, **Herrington DM**, Tsimikas S, **Shapiro MD**. Association of Lp(a) (Lipoprotein[a]) and Hypertension in Primary Prevention of Cardiovascular Disease: The MESA. Hypertension. 2022 Dec 13. doi: 10.1161/HYPERTENSIONAHA.122.20189. Epub ahead of print. PMID: 36511156.

**Invited Article as part of the Special Issue "Antioxidants in Fruits and Vegetables"*



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School of Medicine

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GOOD NEWS!

Wake Forest University School of Medicine Cardiovascular Sciences Center

Summer 2022

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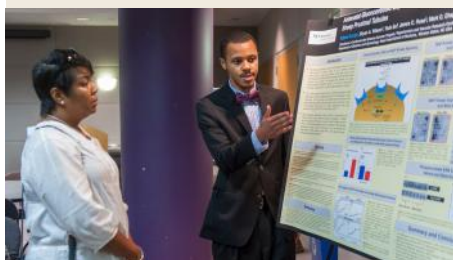
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MARK C. CHAPPELL, PHD, FAHA, HONORED BY THE AHA



Dr. Chappell presents the Corcoran Memorial Lecture at the 2022 Council for Hypertension Meeting.



Dr. Lindsey, former fellow, presents Dr. Chappell with the Corcoran Award.

Dr. Mark C. Chappell, PhD, FAHA, is the recipient of the 2022 Arthur C. Corcoran Memorial Lecture Award sponsored by the Council on Hypertension. This honorary lecture, presented annually at the AHA Hypertension Scientific Sessions by a distinguished honoree from the field of hypertension, was established in 1977 in honor of Arthur Curtis Corcoran. Dr. Corcoran's major achievement was his early application of clearance methods in both hypertensive patients and animals.

Dr. Chappell's lecture "Evolving Concepts of the Renin-Angiotensin System: From Hypertension to COVID-19" is based on 30 years of research involving the role of the renin-angiotensin system (RAS) in fetal programming events, salt sensitivity, sex differences in hypertension and the role of the estrogen receptor GPER, as well as the influence of the intracellular RAS in the nucleus and mitochondria of the kidney.

Dr. Chappell presented the Arthur C. Corcoran Memorial Lecture on Thursday, September 8th in San Diego, CA at the

Hilton San Diego Bayfront. He received an engraved plaque at the Annual Council on Hypertension Awards Banquet presented to him by his former fellow, Dr. Sarah Lindsey. Please join us in congratulating Dr. Chappell on receiving this prestigious award!



Wake Forest University
School of Medicine

CAREER CORNER



Dr. Ellie Rahbar is actively recruiting MD, DVM, or PhD postdoctoral fellows who are interested in the field of hemorrhagic shock and cardiovascular physiology. Individuals interested should email Dr. Rahbar (erahbar@wakehealth.edu) a copy of their CV and 2 references.

2022 Summer Research Programs to Increase Diversity in Biomedical Science Careers:

The Cardiovascular Sciences Center and Sticht Center for Healthy Aging and Alzheimer's Prevention hosted two summer research programs: the Excellence in Cardiovascular Sciences (EICS) program directed by Drs. David Soto Pantoja and Debra Diz, which has been ongoing for 30 years, and a new program, Enhancing UNderGraduate Education and Research in AGing to Eliminate Health Disparities (ENGAGED – joint program with WSSU and WFU), directed by Drs. Tina Brinkley and Debra Diz, with additional Program Directors Drs. Gwathmey, Keith (WSSU) and Miller (WFU) in its third year.

The EICS and ENGAGED undergraduate students were selected from across the country and they participated in research topics related to aging and cardiovascular disease, as well as health disparities. Current events topics ranged from COVID-19 to racism/social inequity and injustice and the impact of these on minority health. Guest speakers were from Howard University, Winston-Salem State University, Wake Forest University, Johnson C. Smith and the Center for Disease Control, as well as

Wake Forest University School of Medicine. Panels of current and former graduate school and diversity-focused training program participants provided career insights in several professional development sessions. Students participated in sessions on data collection relevant to cardiovascular sciences and aging-related research, including blood pressure and gait speed, in addition to various basic science demonstrations. Joint sessions and social activities with summer trainees in programs sponsored by NSF (Biomedical Engineering), WFIRM and Precision Medicine created peer networking opportunities for the 120+ student participants. The EICS and ENGAGED summer session concluded with poster presentations of the research projects developed with their mentors over the course of the summer program. We thank the students and the faculty, many of whom are members of the Cardiovascular Sciences Center, who served as mentors, guest lecturers and journal club faculty, for contributing to the program's success.

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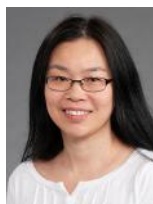
CAREER CORNER *continued*

The following 24 trainees and mentors participated in the programs for 2022:

ENGAGED		
Taniya Ballard	Winston-Salem State University	Andrew South-Pediatrics Nephrology; CVSC
Nataley Der	University of Maryland, Baltimore County	Leah Solberg-Woods-Internal Medicine-Molecular Medicine; CVSC
Summayah El Azzioui	Emory University	Ken Kishida-Physiology & Pharmacology;
Beatrice Gar	North Carolina A & T University	Andrew South-Pediatrics Nephrology; CVSC
Ivy Greene	Wake Forest University	Kimberly Montez-Pediatrics
Christian Johnson	Virginia Commonwealth University	Kathryn Callahan-Internal Medicine-Gerontology & Geriatric Medicine
Justin Lam	Carnegie Mellon University	Ashley Weaver-Biomedical Engineering; Critical Illness, Injury and Recovery Research Center
Luke Morton	Wake Forest University	Shannon Macauley- Internal Medicine-Gerontology & Geriatric Medicine; CVSC
Ely Sanchez	University of Puerto Rico at Ponce	Justin Moore-Implementation Science; Office of Global Health/Comprehensive Cancer Center/Maya Angelou Center for Health Equity/Office of Women in Medicine & Science
Adaiah Stevens	Wake Forest University	Tony Reeves-Internal Medicine-Molecular Medicine
Juleika Torres	University of Puerto Rico Mayagüez	Rachel Zimmer-Internal Medicine-Gerontology & Geriatric Medicine
Arshum Mirzaeifard	University of North Carolina at Chapel Hill	David Soto-Pantoja-Surgery Hypertension/Comprehensive Cancer Center, CVSC

EICS		
Marco Benavides	Tecnológico de Monterrey	Nicole Levi- Surgery Plastic Reconstructive
Makala Crawford	Winston Salem State University	Daniel Kim-Shapiro-Physics
Ellie Cyrus	Winston Salem State University	Katherine Cook-Surgery Hypertension/Comprehensive Cancer Center/CVSC
Romeo Espinosa-Ponce	Greensboro College	David Soto-Pantoja-Surgery Hypertension/Comprehensive Cancer Center, CVSC
Breauna (Bre) Lane	Radford University	Leslie Poole-Biochemistry
Daryna Lapomarede	Wake Forest University	Giselle Melendez- Internal Medicine-Cardiovascular Medicine
Niaria Leach	Winston Salem State University	Ashley Weaver-Biomedical Engineering; Critical Illness, Injury and Recovery Research Center
Nicole Morales	University of Puerto Rico-Cayey	Christina Hugenschmidt- Internal Medicine-Gerontology & Geriatric Medicine Gerontology & Geriatric Medicine; J. Paul Sticht Center for Health Aging & Alzheimer's Prevention/Claude Pepper Older Americans Independence Center, CVSC
Olivia Smith	North Carolina State University	Bumsoo Ahn- Internal Medicine- Gerontology & Geriatric Medicine; CVSC
Yesenia Sosa	University of Texas at San Antonio	Gagan Deep- Internal Medicine- Cancer Biology
Brianna Thompson	University of North Carolina at Chapel Hill	Dhanendra Tomar- Internal Medicine-Cardiovascular Medicine/Cardiology; CVSC
Alexandra (Allie) Williams	Wake Forest University	Sarah Adjei-Fremah- Biology-Genetics & Microbiology (WSSU)

INVITED PRESENTATIONS



Dr. Xuewei Zhu presented at the 2022 Gordon Research Conference- Immunometabolism in Health and Disease. The title of her talk was “Pyruvate dehydrogenase kinase supports macrophage NLRP3 inflammasome activation during acute inflammation”.



Dr. Michael Shapiro was invited to speak at two international conferences over the summer. He presented “Current guidelines for the use of CAC in preventive cardiology” at the 17th Annual Scientific Meeting of the Society of Cardiovascular Computed

Tomography in Las Vegas, NV in July. He presented “Relationship of Inflammation and Dyslipidemia” at the American Society of Preventive Cardiology in Louisville, KY in July.

Dr. Michael Shapiro was invited to give Cardiology Grand Rounds at the University of Chicago. The title of his presentation was “Pushing the Envelope with PCSK9 – 20 years of progress”.



Dr. Christopher Schaich was invited to speak at The George Washington University Biostatistics Center on September 1, 2022. His presentation was titled “The Impact of Heart Failure with Preserved Ejection Fraction on Neurocognitive Function and Brain Health.”



Dr. Yashashwi Pokharel and team had three abstracts at national conferences as follows:

- Acharya S, Senner J, Lee J, Berlin M, Maul A, Hanford H, **Pokharel Y**. Addressing Gaps in Cholesterol Management in

Primary Cardiovascular Prevention in a Resident Run Internal Medicine Clinic: A Mixed Method Approach. This abstract was presented at 2022 AHA Quality of Care and Outcomes Research Conference. **Congratulations to Dr. Acharya, Dr. Pokharel's mentee, for receiving the QCOR 2022 Early Career Investigator Travel Stipend Award to present this work!**

- Jao G, **Pu M, Pokharel Y**. Constrictive pericarditis associated with COVID-19 infection. This abstract was presented at the 2022 American Society of Echocardiography.
- Caldarera T, Penmesta M, Seals A, Ip E, Virani S, **Shapiro M, Pokharel Y**. Clinicians' Self-Reported Efficacy in Cardiovascular Prevention Practice in the Southeastern United States. This abstract was presented at the 2022 American Society of Preventive Cardiology.



Dr. Mark Chappell co-chaired the Session “Mechanisms of Sex Disparities in COVID-19 Outcomes for the NIH workshop “Sex/Gender-Specific COVID-19 outcomes and management relevant for heart, lung, blood and sleep disorders” June 16-17,

2022. He also gave a talk for this session “Signaling in SARS-CoV-2 entry, regulation and effects” on June 16.

Dr. Mark Chappell and team had three abstract presentations for the Council on Hypertension:

- **Chappell M, Yamaleyeva L**. Differential Expression of ACE2, Neprilysin and ACE in Extracellular Vesicles Isolated from Human Urine.
- **Chappell M**. Delta And Omicron Variants Of SARS-Cov-2 Do Not Stimulate ACE2 Conversion Of Ang II To Ang-(1-7).
- Mackert J, Wilson A, Cruz-Diaz N, Melo AC, **Chappell MC, Soto-Pantoja D**. Targeting The Thrombospondin-CD47 Axis Attenuates Blood Pressure And Renal Injury In Female Hypertensive (mRen2)27 Rats.



Yismeilin Feliz-Mosquea, mentored by **Drs. Katherine Cook** and **David Soto-Pantoja**, will give an oral presentation at the Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) National Diversity in STEM (NDiSTEM)

Conference, October 27-29, 2022, in San Juan, Puerto Rico. The title of her presentations is “Targeting inositol-requiring enzyme-1 (IRE1) affects triple-negative breast cancer chemotherapy sensitivity and prevents chemotherapy-related cardiotoxicity.”

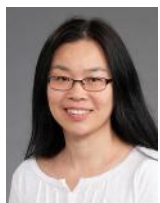
FUNDING

During the months of May - August, CVSC members were awarded several new grants. Below we highlight some of these awards.



Dr. TanYa Gwathmey received a Duke Endowment grant titled "The Triad Pastors Network – Congregational Health Ambassadors Program to Improve Cardiovascular Health." The major goal of this project is to reduce cardiovascular health

disparities within African American communities through an academic partnership with Faith Leaders and houses of worship in the Piedmont Triad region of North Carolina.



Dr. Xuewei Zhu received a pilot grant titled "Pyruvate dehydrogenase kinase is a critical metabolic switch controlling microglia NLRP3 inflammasome and mitochondrial health in AD" from the Alzheimer's Disease Research Center with co-investigators **Drs. Tao Ma** and

Shannon Macauley.



Dr. Oguz Akbilgic, as an MPI (with **MPIs Kwon** and **Azarbarzin**), has received a fundable score (7 percentile) with pending NOA on an R21 titled "Deep learning of awake and sleep electrocardiography to identify atrial fibrillation risk in sleep apnea."

Dr. Oguz Akbilgic as a Co-I (**PI Makowski, Site PI Cook**) has received an U01 award titled "Determining the contribution of microbial-derived metabolites to protective immunity in obesity-driven cancer risk."

Dr. Oguz Akbilgic as a Co-I (**PIs Adams, Topaloglu**) has received an R24 Administrative Supplement Award for R24Da055306 "Wake Forest IMPOWR Dissemination Education and Coordination Center (IDEA-CC)."



Dr. Yashashwi Pokharel is the Site PI for a NIH Subaward from Tulane University Medical Center titled the IMPACTS-MIND "Effectiveness of Implementing an Intensive Blood Pressure Reduction Intervention on Cognitive Decline in Low-income and Minority

Hypertensive Patients." The IMPACTS-MIND (Implementation of Multifaceted PATient-Centered Treatment Strategies for Intensive Blood Pressure Control to Minimize Cognitive Decline) study is a cluster-randomized hybrid implementation-effectiveness trial to test the effectiveness of

a multifaceted strategy for intensive blood pressure treatment to slow cognitive decline. The study is being conducted in real-world primary care settings serving racial minority and low-income hypertension patients.



Dr. Ellie Rahbar, in collaboration with **Drs. Tim Williams, Jim Jordan, Lucas Neff, and Alberto Figueroa** at the **University of Michigan**, has received two federally funded grants (NIH and DOD-over \$5.4 million for the next 4-5 years) to support the development

and validation of a new multi-scale 3D-0D closed-loop computational model for hemorrhagic shock, which will be used to optimize the design and implementation of endovascular hemorrhage control devices such as REBOA. These projects aim to develop a novel computational fluid dynamic (CFD) model that can accurately simulate transitional blood flow during phases of active bleeding, aortic occlusion, and resuscitation. In addition, the CFD models will provide new insights into the acute cardiovascular physiologic response to blood loss by integrating both hemodynamic and biologic responses, including oxygen transport, vascular autoregulation, and key biomarkers of acute inflammation.



A team led by **Dr. Dalane Kitzman** has received three NIH grant awards in just the past year, totaling \$35 million. Dr. Kitzman's team includes collaborators from Wake Forest Cardiovascular Medicine, Geriatrics and Gerontology, Public Health Sciences, Wake

Forest University Reynolda Department of Exercise and Sports Science, and Sanger Heart and Vascular Institute. The successes from these collaborations were recently highlighted by Eugene Woods at an Academic Forum. The largest, most recent NIH award is a 5-year trial called Physical Rehabilitation for Older Patients with Acute HFpEF (REHAB-HFpEF). The application was funded on first submission and involves 20 sites, 46 investigators plus staff, 880 patients, and a budget of \$30 million. This phase 3 trial is based on the promising results of the phase 2 REHAB-HF trial which was reported last July in NEJM. The REHAB-HFpEF trial will determine whether a novel physical rehabilitation intervention will improve the primary outcome of combined all-cause rehospitalizations and mortality in patients hospitalized for heart failure with preserved ejection fraction (HFpEF), which is

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FUNDING *continued*

nearly unique to older persons, particularly women and Black persons, and for which there are few treatment options.

The following CVSC Pilot Projects were funded:



Dr. Stacey Wolfe - Neurosurgery

“Hypertension worsens secondary brain injury after ICH by Piezo1 mechanoreceptor-induced IL-12 release from monocyte/macrophages” Key Personnel – Drs. Debra Diz (Surgery-Hypertension), Resto Asmis (Internal Medicine)

and Zhidan Xiang (Neurosurgery).

The proposal/study will characterize the cellular mechanisms involved in intracerebral stroke (ICH).



Dr. Katherine L. Cook - Surgery-Hypertension

“Targeting inositol-requiring enzyme-1 (IRE1) to prevent chemotherapy-related cardiotoxicity in triple negative breast cancer. Key Personnel – Dr. Katherine Cook (Surgery-Hypertension).

The study assesses the role of IRE-1 in Adriamycin/Cyclophosphamide (AD/CYP)-induced cardiac damage in mice fed a Western diet with a tumor burden.



Dr. Andrew South - Pediatrics “Maternal cardiovascular health and offspring programmed hypertension in Vervet monkeys: role of the renin-angiotensin system. Key personnel – Dr. Kylie Kavanagh (Comparative Medicine), Carol Vincent (Pediatrics).

This proposal/project/study will characterize the circulating and urinary components of the renin-angiotensin system (RAS), klotho and uric acid to determine their association with mother-child determinants in the origin of cardiovascular disease (CVD) such as hypertension; specifically, associations of maternal cardiovascular health and offspring early-life weight gain, as well as offspring blood pressure and target organ damage.

PUBLICATIONS

Between the months of May-August, Cardiovascular Sciences Center members published **114** manuscripts. Of these, **8** were CVSC first author publications. Below we highlight several of those.

Nagueh SF, **Phelan D**, Abraham T, Armour A, Desai MY, Dragulescu A, Gilliland Y, Lester SJ, Maldonado Y, Mohiddin S, Nieman K, Sperry BW, Woo A. Recommendations for Multimodality Cardiovascular Imaging of Patients with Hypertrophic Cardiomyopathy: An Update from the American Society of Echocardiography, in Collaboration with the American Society of Nuclear Cardiology, the Society for Cardiovascular Magnetic Resonance, and the Society of Cardiovascular Computed Tomography. *J Am Soc Echocardiogr.* 2022 Jun;35(6):533-569. doi: 10.1016/j.echo.2022.03.012. PMID: 35659037.

*Clark CE, Warren FC, Boddy K, McDonagh STJ, Moore SF, Teresa Alzamora M, Ramos Blanes R, Chuang SY, Criqui MH, Dahl M, Engström G, Erbel R, **Espeland M**, Ferrucci L, Guerchet M, Hattersley A, Lahoz C, McClelland RL, McDermott MM, Price J, Stoffers HE, Wang JG, Westerink J, White J, Cloutier L, Taylor RS, Shore AC, McManus RJ, Aboyans V, Campbell JL. Higher Arm Versus Lower Arm Systolic Blood Pressure and Cardiovascular Outcomes: a Meta-Analysis of Individual Participant Data From the INTERPRESS-IPD Collaboration. *Hypertension.* 2022 Oct;79(10):2328-2335. doi: 10.1161/HYPERTENSIONAHA.121.18921. Epub 2022 Aug 2. PMID: 35916147; PMCID: PMC9444257.

Alfaddagh A, Kapoor K, Dardari ZA, Bhatt DL, Budoff MJ, Nasir K, Miller M, Welty FK, Miedema MD, Shapiro MD, Tsai MY, Blumenthal RS, Blaha MJ. Omega-3 fatty acids, subclinical atherosclerosis, and cardiovascular events: Implications for primary prevention. *Atherosclerosis.* 2022 Jul;353:11-19. doi: 10.1016/j.atherosclerosis.2022.06.1018. Epub 2022 Jun 20. PMID: 35759823.

Khanna AK, Minear S, Kurz A, Moll V, Stanton K, Essakalli L, Prabhakar A; Predict AKI Group. Intra-abdominal hypertension in cardiac surgery patients: a multicenter observational sub-study of the Accuryn registry. *J Clin Monit Comput.* 2022 Jun 13. doi: 10.1007/s10877-022-00878-2. Epub ahead of print. PMID: 35695943.

Jain V, Al Rifai M, Khan SU, Kalra A, Rodriguez F, Samad Z, **Pokharel Y**, Misra A, Sperling LS, Rana JS, Ullah W, Medhekar A, Virani SS. Association Between Social Vulnerability Index and Cardiovascular Disease: A Behavioral Risk Factor Surveillance System Study. *J Am Heart Assoc.* 2022 Aug 2;11(15):e024414. doi: 10.1161/JAHA.121.024414. Epub 2022 Jul 29. PMID: 35904206; PMCID: PMC9375494.

*This article was selected by the editors as the “Best Clinical Science Paper” of the year for the *Journal Hypertension*.

AWARDS AND ACCOMPLISHMENTS



Dr. Dermot Phelan served as Co-Chair for the recently published American Society of Echocardiography Practice Guidelines for the imaging evaluation of patients with hypertrophic cardiomyopathy. The document entitled “Recommendations for Multimodality Cardiovascular Imaging of

Patients with Hypertrophic Cardiomyopathy: An Update from the American Society of Echocardiography, in Collaboration with the American Society of Nuclear Cardiology, the Society for Cardiovascular Magnetic Resonance, and the Society of Cardiovascular Computed Tomography” was published in the Journal of the American Society of Echocardiography (JASE) in June. **Dr. Phelan** is Co-Director of the Sanger Heart & Vascular Institute’s Hypertrophic Cardiomyopathy Association (HCMA) Center of Excellence.



Dr. Christopher Schaich received the award for Best Poster – Vascular Cognitive Disorders presented at the Alzheimer’s Association International Conference (AAIC) 2022 for presenting the following abstract: **Schaich CL**, Mujtaba M, Hugenschmidt CE, Jung Y, **Bertoni AG**, Shah SJ, Chen H,

Kitzman DW, **Hughes TM**. Heart Failure Associations with Cerebral Structure: A Combined Analysis from the Multi-Ethnic Study of Atherosclerosis and SECRET-II Trial of Heart Failure with Preserved Ejection Fraction.



Dr. Chia-Chi Chuang Key was selected as the recipient of the 2022 Daryl and Marguerite Errett Discovery Award which provides support for one outstanding post-doctoral fellow or early career faculty member to conduct cutting-edge research in biomedicine and launch promising projects

that nurture the careers of gifted young investigators who will have an impact on pioneering developments that advance human health.

Dr. Yashashwi Pokharel was selected as a WFUSOM CTSI Translational Research Academy Scholar.

Dr. Elizabeth Stirling won the Gordon A. Melson Outstanding Doctoral Student Award.

AUSTIN’S DATA, TIPS & TOOLS



Variable Selection using LASSO Regression

A common problem in many statistical association analyses is the identification of informative independent variables in

a dataset with moderate or highly correlated data. This issue can be compounded in datasets with a high number of features (hundreds of features). Examples of this include RNAseq data or micro-array data.

One method for variable selection is LASSO regression. LASSO regression is similar to the typical regression techniques like linear and logistic regression in that it produces beta (or coefficient) estimates for each independent variable’s effect on the outcome. What makes LASSO distinct is that it incorporates a regularization parameter. This parameter forces independent variables that are correlated with other independent variables, but not associated with the outcome, to have coefficient estimates equal to zero. Variables with a non-zero coefficient can be considered as import variables and can be used subsequent analysis/modeling. It should be noted that is best suited for data with continuous variables; however, it can handle categorical data as well.

The LASSO regression algorithm is implemented in common statistical programming languages like R (the “glmnet” package) and SAS (“PROC GLMSELECT”). This technique is also implemented in JMP.

If you have any questions about these resources (or others not mentioned) don’t hesitate to contact me!

Austin Seals, MSA

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ANNOUNCEMENTS

Dr. Cheryl Bushnell and team developed the Center for Transformative Stroke Care which is supported by the Opportunity Fund. The mission of the Center for Transformative Stroke Care is to expand and synergize translational stroke research to transform stroke care across the continuum with the aLHS approach. The Center programs will specifically address health equity and diversity across the lifespan. The Center for Stroke Transformative Care Director will recruit a Director and Associate Director with international reputations in stroke clinical research, specifically in population health, epidemiology, and/or health services research.

Under the leadership of **Dr. Mike Miller**, an Opportunity Fund award has been designated to recruit leadership to establish a new Center for Remote Patient and Participant Monitoring (CRPPM). The CRPPM will be developed to promote innovative development and effective, efficient, and equitable use of remote and digital engagement technologies. The Center will recruit a Director and Associate Director with goals of: growing extramural funding, and evaluating and harnessing existing expertise to provide a centralized entity with expertise spanning the AH/WFUSM Enterprise; generating high levels of collaboration across new and existing institutional centers; cataloguing existing technology and infrastructure (e.g., dissemination channels) available to researchers; and developing new technology applicable to piloting and implementation of new research discoveries into clinical care.

Those involved in developing the CRPPM concept include the following individuals:

Biomedical Engineering – Joel Stitzel, PhD	Gerontology and Geriatric Medicine	WFU Health & Exercise Science
Biostatistics and Data Science	Timothy Hughes, PhD	Jason Fanning, PhD
Walter Ambrosius, PhD	Jeff Williamson, MD, MHS	
Scott Rushing	Information and Analytics Services	CHARLOTTE REGION:
Cancer Biology – Umit Topaloglu, PhD	Will Showalter, MPA, MURP	Sanger Heart & Vascular Institute
Cardiology	Neurology – Cheryl Bushnell, MD	William Downey, MD
Oguz Akbilgic, PhD	Pediatrics – Eric Kirkendall, MBI, MD	Virtual Care
David Herrington, MD, PhD	Psychiatry and Behavioral Medicine	Guy Glorioso, MBA, MHA
Elsayed Soliman, MD, MS	Ruth Benca, MD, PhD	Molly McColl, MBA
CTSI Informatics Program	Public Health Sciences	Joshua Brown, PhD
Brian Ostasiewski	Michael E. Miller, PhD	
General Internal Medicine	Lynne Wagenknecht, DrPH	
Metin Gurcan, PhD	Social Sciences and Health Policy	
David Miller, MD, MS	Kathleen Hayden, PhD	



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GOOD NEWS!

Wake Forest University School of Medicine Cardiovascular Science Center

Spring 2022

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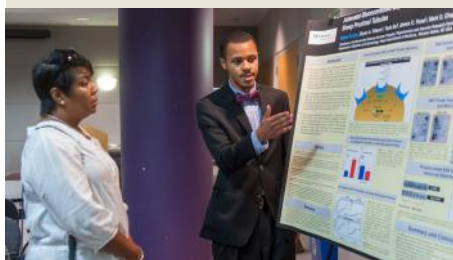
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OBESITY IS NOT AUTOMATIC DIABETES



Dr. Kylie Kavanagh's most recent award is investigating the role of brown adipose tissue (BAT) in type 2 diabetes (T2D). The scope of her work is that as of February 2020, more than 1.9 billion adults worldwide are overweight (BMI: 25-29.9kg/m²), and over 650 million are obese (BMI >30 kg/m²)(1). Obesity decreases lifespan and increases the risk of developing non-alcoholic fatty liver diseases (NAFLD), hypertension, dyslipidemia, several cancers, and T2D. Despite the number and variety of deployed weight-loss

interventions, very few overweight or obese patients maintain weight loss over time, and globally the number of obese individuals continues to increase. While most obese individuals display metabolic derangements, up to 30% of obese individuals are metabolically sound which indicates that fatness alone is not a good predictor of insulin resistance (IR) or T2D risk. Adipose tissue is classified as white (WAT) or BAT. BAT is a fat-burning tissue, as opposed to the fat-storing WAT, secretes factors beneficial to systemic glucose tolerance and reducing diabetes risk. Our hypothesis is that BAT abundance will dictate T2D risk independently of total fatness and WAT distributions, and augmenting BAT amounts will effect reduction in IR and result in better metabolic health measures. **WAT was found to contain adipocytes that have similar fat burning properties as brown adipocytes. These cells (denoted as "beige" or "thermogenic" adipocytes) can be grown and expanded in culture and re-implanted back into the donor-individual and we believe they will function like BAT to improve IR and T2D.** Our hypothesis is supported by

Continued on page 2

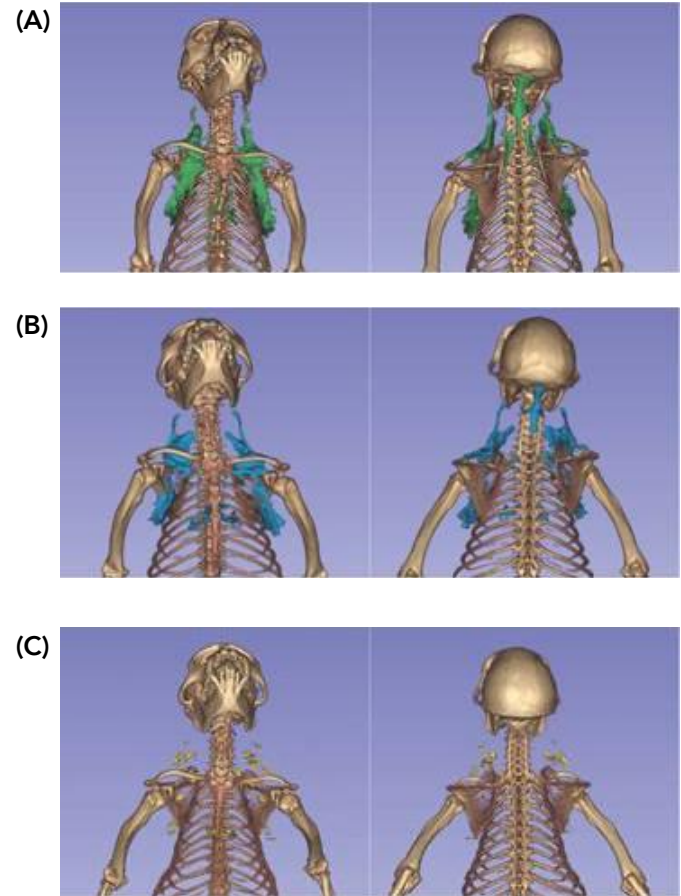


Wake Forest University
School of Medicine

preliminary imaging studies in our nonhuman primates (NHPs) showing that BAT abundance, rather than obesity, relates directly to metabolic health, with diabetic and insulin resistant individuals having little to no detectable BAT. NHP are singularly the animal model that faithfully represents the human clinical spectrum relating to metabolic health and obesity so we plan to use this animal model to demonstrate BAT presence, biology, potency, and efficacy in metabolic disease in a relevant NHP model of IR and T2D development and prove the feasibility of autologous transplantation approaches to metabolic disease therapy.

There is a publication in press relating to this work: Garside J, **Kavanagh K**, Block MR, Williams AG, Branca RT. Xenon-enhanced CT assessment of BAT distribution and perfusion in lean, obese and diabetic primates. *In Press Obesity* 2022.

3D segmentation of BAT depots identified using XECT in a **(A)** healthy lean vervet monkey, **(B)** healthy obese vervet monkey, and **(C)** diabetic vervet monkey.



ANNOUNCEMENTS

An anonymous donor gave \$5,000 in appreciation for the excellent care he received in our Cardiac Pulmonary Rehabilitation at the Sticht Center. He wanted to be sure that the staff was aware of how wonderful they all were. Even though the team was short of staff and overwhelmed by the pandemic, patient care was not compromised. The team takes the extra steps to make sure our patients feel safe and receive the care that they deserve. Thank you to the staff of the Cardiac Pulmonary Rehabilitation for doing such a great job and making this gift possible!

Healthy Hope, a documentary on muscadine grape products that features an interview with **Dr. Patricia Gallagher**, was shown during the River Run Film Festival on Saturday, April 30, at 2pm at the Market Place Theater.

Dr. Ann Tallant was recognized for her years of service to the EICS program, including leadership, mentorship, and devotion, to the program, the students, and the mentors. During her tenure, she provided research experience for over 350 trainees. **Dr. Soto-Pantoja** will be assuming Dr. Tallant's role as Multi-PI for the NHLBI grant and hopes to continue her legacy as she turns over the reins.

Dr. Hossam Shaltout was featured in an article that was posted to the School of Medicine website. The article highlights his journey from Pharmacy School 29 years ago to the Hypertension Center for the past 17 years.

<https://school.wakehealth.edu/Features/Profiles/Hossam-Shaltout>

INVITED PRESENTATIONS

The 2022 American College of Cardiology (ACC) Scientific Session was held April 2-4 in Washington DC with a virtual option for those that could not attend in person. Several CVSC faculty/team members submitted abstracts and presented as follows:



Ye F, Amjad A, Winsor S, **Pu M, Jao GT**. Light Chain and Transthyretin Cardiac Amyloidosis are Morphologically and Hemodynamically Distinct.



Dr. Saraschandra Vallabhajosyula served as a session moderator for "The pump is in and the hard part begins: Post-implantation management in MCS" and was also invited to present the following:

- Research Proposal Pitch #1.
- Case Presentation: Important issues in the evaluation and management of cardiogenic shock. Cardiogenic Shock: Progress, Paradigms and Unresolved Problems.



Dr. Oguz Akbilgic presented a poster along with **Dr. Ibrahim Karabayir** titled "ECG-AI: An Externally Validated Deep Learning Model to Predict Heart Failure Risk"



Dr. Michael Shapiro was asked to lead a series 3 podcasts for the American College of Cardiology on Familial Hypercholesterolemia. These came out in May.

Dr. Shapiro was a faculty panelist at the Prevention Sessions Highlights and Chair of the Prevention Sessions Year in Review. Abstracts presented include:

- Sharma G, Mehta L, Valero Elizondo J, Cainzos M, Blaha M, Blankstein R, **Shapiro MD**, Nasir K. The Association of Sex-Specific Hormones with High-risk Coronary Artery Plaque Characteristics in a Multiracial cohort: Miami Heart (MiHeart) Study at Baptist Health South Florida.
- Chevli PA, Shemesh E., Islam T, German CA, Otvos J, Yeboah J, Rodriguez F, Blaha M, **Shapiro MD**. Association between Circulating Ketone Bodies and Cardiovascular Outcomes among Participants of the Multi-Ethnic Study of Atherosclerosis (MESA).

During the 51st Critical Care Congress, Society of Critical Care Medicine held in San Juan, PR in February 2022, **Dr. Saraschandra Vallabhajosyula** served as a session moderator for "The Forgotten Right Ventricle" and was also invited to present the following:

- Case Presentation: Current opinions in shock monitoring.
- Extracorporeal Membrane Oxygenation. Mechanical Circulatory Support for Cardiogenic Shock: Past, Present and Future.
- Heart Pumps: Which One, When, How and Why? Mechanical Circulatory Support for Cardiogenic Shock: A SWOT Analysis.



Dr. Michael Bancks led each project for the following presentations at the American Heart Association Epidemiology and Lifestyle 2022 Scientific Sessions, March 1-4, 2022 in Chicago, Illinois (co-investigators in bold):

- Oral abstract presentation: "Differential Effect Of An Intensive Lifestyle Intervention On Risk For Cardiovascular Events According To Baseline Level Of Glycated Hemoglobin". Writing group: **Michael P. Bancks, Joseph Rigdon**, Ashok Balasubramanyam, Scott Pilla, Hsin-Chieh Yeh, Karen C. Johnson, **Lynne E. Wagenknecht, Mark A. Espeland**.
- Oral abstract presentation: "Self-reported experiences of discrimination in relation to incident dementia: The Multi-Ethnic Study of Atherosclerosis (MESA)." Writing group: **Michael P. Bancks, Goldie Byrd, Allison Caban-Holt**, Annette L. Fitzpatrick, Sarah N. Forrester, **Kathleen M. Hayden**, Susan R. Heckbert, Kiarri N. Kershaw, **Stephen R. Rapp, Bonnie C. Sachs, Timothy M. Hughes**.
- Moderated poster presentation: "Impact of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic on diabetes care among a North Carolina patient population". Writing group: **Michael P. Bancks, Meng-Yun Lin, Alain Bertoni, Wendell M. Futrell**, Zhixiu Liu, **Brian Ostasiewski, Brian J. Wells, Amresh Hanchate**.

Continued on page 4

INVITED PRESENTATIONS *CONTINUED*

Dr. Michael Shapiro was invited to give Grand Rounds at Albert Einstein Medical Center (April) and University of Chicago (May). In addition, **Dr. Shapiro** spoke at the NYU symposium "2nd Annual Cardiometabolic Risk in Inflammatory Conditions: Emerging Insights and Treatment of Inflammation in Cardiovascular Disease."

Dr. Oguz Akbilgic presented "The Role of AI in Lung Cancer Management" during the Turkish Thoracic Society 15th Annual Congress on Lung Health in the Digital Age, May 24-28, 2022 and "ECG-AI: Electrocardiographic Artificial Intelligence Model" during the Turkish Association of Cardiology, Digital Health and Innovation Symposium, June 4, 2022.

Dr. Ibrahim Karabayir, in collaboration with **Dr. Oguz Akbilgic**, presented an abstract at the AHA-Quality of Care and Outcomes Research Scientific Sessions in Reston, Virginia. The abstract was titled "Artificial Intelligence To Predict Late Onset Cardiomyopathy Among Childhood Cancer Survivors Using Electrocardiogram, Echocardiogram, And Clinical Data"

The following abstracts were presented during the International Society for Heart and Lung Transplantation (ISHLT) 42nd Annual Meeting and Scientific Sessions, April 27-30, 2022:

Rose S, **Kelkar AA** (Senior Author). Clinical Utility of Patient Reported Outcome Instruments in the Management of Pulmonary Hypertension.



Kelkar AA, Amjad A, Clodfelter J, Gilbert O, Jao G, O'Neill IV TJ, Paris C, **Pisani B**. Clinical Decision Support to Identify Care Gaps and Improve

Efficiency of Health Maintenance Documentation for Heart Transplant Recipients.

Goslen K, Hilton T, Raby K, Williams D, **Pisani B**. Pulmonary Hypertension and Diastolic Heart Failure in an Adolescent African-American Cantú Syndrome Patient.

Ye F, **Pu M**, Rodriguez C, Callahan K, Seals A, **Vasu S**, **Jao G**. Risk Factors Associated with One Year Mortality from the Time of Cardiac Amyloid Diagnosis.



Brian Westwood, MS will be presented a first author abstract at the 2022 Summer Biomechanics, Bioengineering, and Biotransport Conference,

June 20-23. Brian M. Westwood, Pooja D. Patil, E. Ann Tallant, Patricia E. Gallagher. Microbiome Metabolic Network Expansion Following Muscadine Grape Extract Intervention of Hypertensive Rats. **Dr. David Soto-Pantoja** has been invited to speak and chair a session at "The Matricellular Proteins Conference: Fundamental Concepts and New Directions" FASEB Summer Conference in Lisbon, Portugal, July 17-21, 2022.



Dr. Liliya Yamaleyeva was invited to chair an oral session "Preeclampsia II" at the 69th Annual Meeting of the Society for Reproductive Investigation in Denver, CO, USA, March 15 - 19, 2022. She also served as a Judge for Trainee Poster Competition at the same conference.



Dr. TanYa Gwathmey has been invited to deliver the keynote address on Mentoring for Black HealthCare Professionals at the Inclusion, Diversity and Equity Conference for the Ujima Institute and Foundation, November 3-5, 2022.



Dr. Christopher Schaich will be presenting a first-author abstract at the Alzheimer's Association International Conference, July 31-August 4 in San Diego, titled "Heart Failure Associations with Cerebral Structure." In addition, **Dr. Schaich** was the invited guest for Season 3, Episode 8 of the podcast Casual Inference (2/14/22) – "The History of John Snow, Cholera, and Cookies with Chris Schaich"

AWARDS AND ACCOMPLISHMENTS

- **The Sanger Heart and Vascular Institute (SHVI)** performed the 700th heart transplant at Carolinas Medical Center in April 2022. The SHVI Heart Transplant program began in 1986 and has achieved national top decile rankings in patient survival.
- **SHVI Cardiac Surgery** exhibited exceptional performance in Coronary Artery Bypass Grafting (CABG), recording 30-Day mortality of 0% at all 3 sites in the Greater Charlotte Region for the rolling 12-months of February 2021 – January 2022.
- **Dr. Michael Bancks** received the Scott Grundy Award for Excellence in Metabolism Research from the American Heart Association for the abstract presentation “Differential Effect Of An Intensive Lifestyle Intervention On Risk for Cardiovascular Events According To Baseline Level Of Glycated Hemoglobin.”
- **Dr. Michael Shapiro** was awarded the Journal of the American College of Cardiology (JACC) Simon Dack Elite Reviewer Award.
- **Dr. Christopher Schaich** received the Scott Grundy Award for Excellence in Metabolism Research at the AHA EpiLifestyle 2022 conference.
- Fall 2020 ENGAGED student **Sebastian Sandler**, WFU, working with **Dr. Chris Schaich** was accepted into the MPH program at Columbia University
- **Elizabeth Stirling** (graduate student with **Dr. David Soto-Pantoja**) received the WFU Alumni travel award.

PUBLICATIONS

Highlighted below are several publications by CVSC members between the months of
January-April

Ahn YJ, Wang L, Tavakoli S, Nguyen HN, Short JD, **Asmis R**. Glutaredoxin 1 controls monocyte reprogramming during nutrient stress and protects mice against obesity and atherosclerosis in a sex-specific manner. *Nat Commun*. 2022 Feb 10;13(1):790. doi: 10.1038/s41467-022-28433-2. PMID: 35145079; PMCID: PMC883160

Bancks MP, Lin M-Y, Bertoni A, Futrell WM, Liu Z, Ostasiewski B, Wells BJ, Hanchate A. Impact of COVID-19 Pandemic on Diabetes Care Among a North Carolina Patient Population. *Clinical Diabetes*. 2022; (epub ahead of Print) cd210136, <https://doi.org/10.2337/cd21-0136>.

Marcovina SM, **Shapiro MD**. Measurement of Lipoprotein(a): A Once in a Lifetime Opportunity. *J Am Coll Cardiol*. 2022 Feb 22;79(7):629-631. doi: 10.1016/j.jacc.2021.11.053. PMID: 35177191.

Saddic L, Orosco A, Guo D, Milewicz DM, Troxclair D, Heide RV, **Herrington D**, Wang Y, Azizzadeh A, Parker SJ. Proteomic analysis of descending thoracic aorta identifies unique and universal signatures of aneurysm and dissection. *JVS Vasc Sci*. 2022 Jan 22;3:85-181. doi: 10.1016/j.jvssci.2022.01.001. PMID: 35280433; PMCID: PMC8914561.

Reding KW, Cheng RK, Vasbinder A, Ray RM, Barac A, Eaton CB, Saquib N, Shadyab AH, Simon MS, Langford D, **Branch M**, Caan B, Anderson G. Lifestyle and Cardiovascular Risk Factors Associated With Heart Failure Subtypes in Postmenopausal Breast Cancer Survivors. *JACC CardioOncol*. 2022 Mar 15;4(1):53-65. doi: 10.1016/j.jacc.2022.01.099. PMID: 35492810; PMCID: PMC9040098.

CAREER CORNER

2022 Summer Research Programs

The Cardiovascular Sciences Center faculty host two summer research programs—the Excellence in Cardiovascular Sciences (EICS) celebrating 30 years (**Drs. Debra Diz and David Soto-Pantoja, Co-Directors**) and the Enhancing UNdergraduate Education and Research in AGing to Eliminate Health Disparities (ENGAGED) entering its third year (**Drs. Tina Brinkley and Debra Diz, Co-Directors**).

These programs address the need to increase the diversity of biomedical scientists involved in research in the fields of cardiovascular diseases and aging towards a greater awareness and resolution of the related health inequities. The programs, hosting a total of 25 undergraduate students, will run from June 1st to July 29th. Students from all over the country will spend the summer in research laboratories at WFUSOM and WSSU (basic and clinical) gaining hands-on research skills experience under the guidance of research mentors, participate in journal clubs and demonstrations of technologies, and attend seminar and professional development activities to foster interests in careers in biomedical research. The NHLBI- and NIA-funded programs pay for the stipend, travel and housing during the summer for each participant. Not only are these programs successful in encouraging completion of the undergraduate degree (100% of the 270 individual EICS trainees tracked, with 96% in STEM fields), a recent assessment of outcomes over 29 years for EICS shows that ~83% continue in the biomedical workforce (34% with graduate degrees, 33% with medical/health professional degrees and 16% in technical/teaching positions without advanced degrees). Importantly, these programs contribute to the diversity of our institution and the Biomedical Sciences Graduate Programs with ~15% returning as PhD, masters or medical students, residents and technicians. Former EICS participants received 18% of the *PhDs awarded to underrepresented minority students in the past 4 years*.

Please join us for the Poster Symposium on July 29th, 9am – noon in the Atrium of Biotech Place, to celebrate their work.

AUSTIN'S DATA, TIPS & TOOLS



Resources for learning R

The statistical programming language known as R is one of the most popular languages for data analysis especially in the world of academic research. For those just starting out, learning a new programming language can be

daunting, so I thought it might be helpful to share some resources that helped me get started with R.

R for Everyone

This book is a must get if you are completely new to programming and statistics. This book will walk you through the installation of R and give you a rundown of the basic structure of the language. Everything from simple data manipulation to graphing and dashboard building is covered in this book that's sold on Amazon.

An Introduction to Statistical Learning

This book is great for those who are already familiar with R as it delves more deeply into applications of statistics in R. Here you will find more information describing the theory of popular statistical methods. This walks you through example analyses (with code) to help illustrate the important concepts. Sold on Amazon but a free PDF can be downloaded at <https://www.statlearning.com/>.

Datacamp

This is not a book, but an online resource where students can learn to code. It features interactive lessons and homework projects to help you learn. All coding is done directly in your web browser so there is no software to download. This is not a free service but it's worth the subscription. Datacamp is respected by many companies like Google, Microsoft, and Uber and it even offers certifications that many organizations recognize.

If you have any questions about these resources (or others not mentioned) don't hesitate to contact me!

Austin Seals, MSA

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FUNDING

During the months of January-April, CVSC members were awarded a total of 15 new grants. Seven different departments were represented in this count and 10 CVSC members served as PIs of these projects. Below we highlight a few of these awards.

- A NIH U01 grant has been approved for funding for \$1.5M, with **Dr. Dalane Kitzman** serving as the Primary Investigator, in collaboration with **Dr. Nicole Cyrille-Superville** at Atrium Health – Sanger Heart and Vascular Institute in Charlotte. The project is titled: "Repurposing of Metformin for Older Patients with Heart Failure with Preserved Ejection Fraction (MET-PEF)." It will test the repurposing of Metformin, a generic, inexpensive, well-tolerated drug, with a wide range of beneficial anti-aging properties, to determine if it will improve symptoms and quality of life in older persons with HFpEF. It will also examine if Metformin acts by improving inflammation originating from the bacterial environment in the gut (microbiome). This is the second such NIH grant that Drs. Superville and Kitzman have received since the Wake-Atrium integration.
- **Dr. Oguz Akbilgic** received a notice of award from the NCI for ~\$2.2M for his R01 titled "Early Identification of Childhood Cancer Survivors at High Risk for Late Onset Cardiomyopathy: An Artificial Intelligence Approach utilizing Electrocardiography."
- **Dr. Liliya Yamaleyeva** received an R01 from NHLBI titled "Endogenous Apelin Receptor Ligands and Early Stages of Preeclamptic Pregnancy." These studies are focused on identifying mechanisms underlying dysregulated feto-maternal interface in preeclampsia. The team includes Co-Investigators **Drs. Mark Chappell** and **Jeffrey Denney**, and **Brian Westwood, MS**.
- **Dr. Liliya Yamaleyeva** is a Co-investigator on a Wake Forest Atrium COVID-19 Pilot Research Project with PIs Drs. Anna McDonald (Pathology) and Jeffrey Shenberger (Pediatrics) titled "Prenatal SARS-CoV-2 Infection and Maternal and Offspring Outcomes: Role of Placental ACE2 and the Renin-Angiotensin System".
- **Drs. TanYa Gwathmey** and **Justin Moore** were awarded a five-year NIDDK R25 Short-Term Research Experience Program to Unlock Potential (STEP-UP) to support research opportunities in the areas of cardiometabolic and cardiovascular diseases for underrepresented high school students.
- **Dr. Liliya Yamaleyeva** received the Amnion Foundation Seed Grant titled "Placental 3D Cultures to Study Trophoblast Function." These studies will utilize human placenta-derived primary cells to establish clinically relevant three-dimensional cell models to study placental development.
- **Dr. David Soto-Pantoja** received a Redox Biology and Medicine Pilot Award with Co-PI Dr. Steven M. Bronson titled "CD47 blockade prevents cardiotoxic effects and sensitizes tumors to chemotherapy in a juvenile mouse model for lymphoma."



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GOOD NEWS!

Wake Forest School of Medicine Cardiovascular Science Center

Winter 2021

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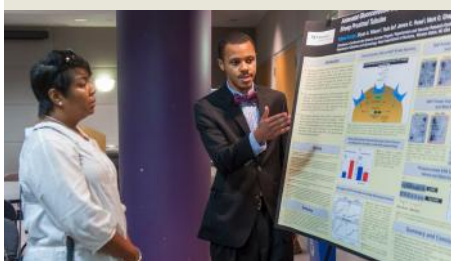
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NEW YEAR, NEW STUDY



Stroke division chief and professor of Neurology, **Dr. Cheryl Bushnell**, who is the PI of the Phased Large Award for Comparative Effectiveness Research (PLACER), was recently selected to receive a \$29.9 million, six-and-a-half year award from Patient-Centered Outcomes Research Institute (PCORI). The other 4 funded applications were from Massachusetts General Hospital, Brigham and Women's Hospital, University of Michigan, and Kaiser Foundation. The

study will compare two ways to control high blood pressure in the first six months after a stroke. The first way is to teach the patient to use a Bluetooth-enabled blood pressure cuff at home and to provide clinical care remotely. The second way is to measure the patient's blood pressure frequently at a clinic and provide clinical care in person. The team plans to enroll 3,200 people in the study. People who consent to be in the study will be assigned at random to one of two groups. Both groups will receive intensive blood pressure management for six months so there is a benefit to being in each group. Patients in one group will receive care via telehealth (Intensive Tailored Telehealth Management, or ITTM) while the other group will receive care in-person (Intensive Clinic Management, or ICM). This study is an extension of a previous research collaboration between WFSM and the UNC Gillings School of Global Public Health on post-acute stroke care – COMprehensive Post-Acute Stroke Services Study, or COMPASS.

INVITED PRESENTATIONS

AHA Scientific Sessions were held virtually November 13-15, 2021. Sanger Heart and Vascular/Wake Forest School of Medicine presented 35 total abstracts/posters this year. **Drs. Cheping Cheng** and **Heng-Jie Cheng's** lab accounted for 9 of those abstracts.



Dr. Heng-Jie Cheng was the first author on three of those presentations as follows:

- **Heng-Jie Cheng**, Zhe Chen, Peng Zhou, Jing Cao, Xiaoqiang Sun, **David M Herrington**, **David Zhao**, **Dalane W Kitzman**, **Che Ping Cheng**, Upregulation of Cardiac

SERCA 2a is a Key Molecular Mechanism of the Protective Effect on Myocardial Aging in Beta3-Adrenergic Receptor Deficiency Mice.

- **Heng-Jie Cheng**, Jing Cao, Xiaoqiang Sun, Yixi Liu, **Dalane W Kitzman**, **David Zhao**, **Donald McClain**, **Che Ping Cheng**. Molecular Mechanism of Chronic Beta3-Adrenergic Receptor Antagonist Caused Regression of Diabetic Cardiomyopathy in a Murine Model with Type 2 Diabetes.
- **Heng-Jie Cheng**, Xiaoqiang Sun, Jing Cao, Zhe Chen, Yixi Liu, **David M Herrington**, **David Zhao**, **Donald McClain**, **Dalane W Kitzman**, **Che Ping Cheng**. Chronic Beta3-Adrenergic Receptor Antagonist Therapy Rescues Diabetic Cardiomyopathy Through Ca²⁺/Calmodulin-Dependent Protein Kinase II Inhibition in a Type II Diabetes Murine Model.



Dr. Che Ping Cheng was first author on the below two presentations:

- **Che Ping Cheng**, Xiaowei Zhang, Tiankai Li, Zhi Zhang, Xiaoqiang Sun, Jing Cao, **David M Herrington**, **David Zhao**, **Heng-Jie Cheng**. Effects of Acute Doses of Cocaine on Arterial Left Ventricular Coupling and

Mechanical Efficiency in Conscious, Chronically Instrumented Dogs.

- **Che Ping Cheng**, Zhe Chen, Jing Cao, Xiaoqiang Sun, Peng Zhou, **David Zhao**, **David M Herrington**, **Dalane W Kitzman**, **Heng-Jie Cheng**. Gender Differences and Aging on Beta-Adrenergic Receptor Subtypes Expression and Function in Murine Left Ventricular Myocytes.



Dr. Michael Shapiro was invited to give Cardiology Grand Rounds at the University of Minnesota on December 8, 2021. The title of his talk was, "Pushing the PCSK9 Envelope – From Small Molecules to Science Fiction".

Dr. Shapiro was also invited to give an oral presentation at AHA Scientific Sessions. The title of that presentation was, "Efficacy and Safety of Bempedoic Acid in Patients with Metabolic Syndrome". In addition, he also had 3 other abstracts accepted for presentation at Sessions as follows:

- Karwowska-Prokopczuk E, Tardif JC, Gaudet D, Ballantyne CM, **Shapiro MD**, Moriarty PM, Baum SJ, St. Amour E, Alexander VJ, Xia S, Otvos JD, Witztum JL, Tsimikas S. Effect of APOCIII-LRx on Lipoprotein Size and Particle Numbers Measured by NMR in Patients with Hypertriglyceridemia: Results of the AKCEA-APOCIII-LRx Trial
- **Hammoud A**, Chen H, **Ivanov A**, **Yeboah J**, Cainzos-Achirica, **Bertoni A**, Kahn SU, Blaha MJ, **Herrington DH**, **Shapiro MD**. Association of Cumulative Social Risk Score With Cardiovascular Outcomes in the Multi-Ethnic Study of Atherosclerosis.
- Chevli PA, Islam T, **Pokharel Y**, Rodriguez F, Virani SS, Blaha MJ, **Bertoni AG**, Budoff M, Otvos JD, **Shapiro MD**. Association Between Remnant Cholesterol, High-Sensitivity C-reactive Protein, and Risk of Atherosclerotic Cardiovascular Disease Events in the Multi-ethnic Study of Atherosclerosis (MESA).

Drs. Carolyn Park and **Yashashwi Pokharel** had their abstract accepted at to the Society for Cardiovascular Magnetic Resonance (SCMR) conference as a poster presentation. The title of the abstract is, "Fibrosing Mediastinitis: A Rare Case Associated with Immune Checkpoint Inhibitor Use in a Melanoma Patient." The conference is scheduled for February 2022.

INVITED PRESENTATIONS

Dr. Anita Kelkar had two abstracts accepted to the International Society of Heart & Lung Transplant Conference scheduled to be held in April 2022. The titles of these abstracts are, "Clinical Utility of Patient Reported Outcome Instruments in the Management of Pulmonary Hypertension" (senior author) and "Clinical Decision Support to Identify Care Gaps and Improve Efficiency of Health Maintenance Documentation for Heart Transplant Recipients".



Dr. Olivia Gilbert was invited to give a lecture at the ACC's North Carolina and South Carolina Chapter Meeting held in September 2021. Her lecture was titled, "Advances in Hypertrophic Cardiomyopathy: Current Standards & Frontiers." She also served on a panel discussion at the same meeting, titled, "Choosing the Right Practice for You" during the Fellows-In-Training session.

In recognition of World Heart Day on September 29, 2021, **Dr. Olivia Gilbert** was invited by Philips for a discussion on cardiovascular disease. She was joined by two other leading cardiologists, Drs. Jennifer Franke (Philips Medical Officer) and Magnus Jensen (Amager og Hvidovre Hospital, Copenhagen, Denmark). The discussion highlighted the resurgence of cardiovascular disease, what needs to happen to reverse the trend, the role of technology in tackling the challenges, and how to build a cardiac care system that improves the quality of care and experience for both patients and professionals. Read the interview here.



Dr. Saraschandra Vallabhajosyula was invited to speak at Internal Medicine Grand Rounds, Texas Tech University Health Science Center in December. The title of his talk was, "Cardiogenic Shock in 2021: Opportunities and Challenges." In the same month, he also presented at SOA 21, Intensive Care Society in London UK. The title of that presentation was, "Critical Care Training in the United States: Past Present, and Future." In addition to these two presentations in 2021, Dr. Vallabhajosyula also participated as a session moderator for the ACC-Indonesian Society of Interventional Cardiology in a session on Support Strategies in Cardiogenic Shock and moderated an ACC session on Interventional, Early Career, & FIT Monthly Cath Case Discussions.

Dr. Oguz Akbilgic has an abstract accepted for presentation at The Alzheimer's & Parkinson's Disease Conference in Barcelona, Spain in March 2022. The title of his abstract is, "Deep Learning on ECGs to Identify Parkinson's Disease at Prodromal Stage."

Drs. Andrew South, Patricia Gallagher, Liliya Yamaleyeva, Mark Chappell and Debra Diz presented invited talks virtually at the XIII International Symposium on Vasoactive Peptides, October 15th -18th, Brazil. The presentations are as follows:

- **Dr. Andrew South** "Angiotensin-(1-7) in Pediatric Hypertension: New Mechanistic Insights" <https://vasoactivepeptides.org/andrew-south/>
- **Dr. Patricia Gallagher** "The Therapeutic Potential of Angiotensin-(1-7)" <https://vasoactivepeptides.org/patricia-gallagher-2/>
- **Dr. Liliya Yamaleyeva** "Apelin Receptor System and Cardiovascular Health in Preeclampsia" <https://vasoactivepeptides.org/liliya-yamaleyeva/>
- **Dr. Mark Chappell** "Characterization of the RAS enzymes ACE, ACE2 and Neprilysin in Human Exosomes" <https://vasoactivepeptides.org/mark-chappell-2/>
- **Dr. Debra Diz** "Sex-dependent brain signaling changes accompany dysregulation of blood pressure in sheep with fetal-programmed brain RAS alterations and neuro-inflammation" <https://vasoactivepeptides.org/debra-diz/>

Yismeilin Feliz-Mosquea, a graduate student mentored by **Drs. Katherine Cook and David Soto-Pantoja**, presented a selected talk for the session: Cardiovascular Biology & ECM Remodeling, on Wednesday, September 15 at 11:30am at the 2021 American Society for Matrix Biology (ASMB) Meeting. Her talk was titled "Inositol-requiring enzyme-1 (IRE1) signaling impacts triple-negative breast cancer chemotherapy sensitivity preventing chemotherapy-related cardiotoxicity".

Steven M. Bronson, DVM, a post-doctoral fellow mentored by **Dr. David Soto-Pantoja**, presented a selected talk at the 2021 American Society for Matrix Biology (ASMB) Meeting. His 15-minute talk was titled "Blockade of CD47/Thrombospondin-1 signaling modulates cellular energetics as a protective mechanism from chemotherapy-induced cardiac injury."

Continued on page 4

INVITED PRESENTATIONS *continued*

Jessica D. Mackert, PhD and **Steven M. Bronson**, DVM, fellows mentored by **Dr. David Soto-Pantoja**, presented selected talks at the 2021 Society for Immunotherapy of Cancer Annual Meeting. Dr. Mackert's talk was titled "Anti-CD47 immunotherapy as a therapeutic strategy for the treatment of breast cancer brain metastasis", and Dr. Bronson's talk was titled "PD-1 blockade affects inflammation and metabolic flexibility to potentially mediate cardiac immune-related adverse events."

Omar Shaltout, a WFU undergraduate student in **Dr. Liliya Yamaleyeva's** lab, presented his summer research as a poster and a 3-minute presentation titled "Simulated Microgravity Alters Cardiovascular Function in the Female Sprague Dawley Rats" at the APS Conference: New Trends in Sex and Gender Medicine on October 20, 2021.



Rose



Wilson



Downey

SHVI presence at ACC's Cardiovascular Summit starting 2/16:

- ACC faculty: **Geoffrey A. Rose**, MD, FACC (event co-chair); **William E. Downey**, MD, FACC; **B. Hadley Wilson**, MD, FACC (vice president, 2022-2023)
- Course leaders:
 - "Add-On" Codes – Embedding Them Into Your Daily Practice; **William E. Downey**, MD, FACC et al
 - Appropriate Coding for Type 2 Myocardial Infarction; **William E. Downey**, MD, FACC et al
 - The New Chest Pain Guidelines: Implications and Implementation; **Geoffrey A. Rose**, MD, FACC et al
 - A Practical Approach to HCC Capture and RAF Scoring; **Geoffrey A. Rose**, MD, FACC et al
- Abstract submissions:
 - HTN Bootcamp: Pharmacist **Caleb Little** et al
 - TXP/VAD Eval Process: AVP **Meghan Emit**
 - HTN – Blood Pressure Rechecks and Real-Time Reporting: AVP **James Reynolds**; director **Kelsey Guffey**
 - Same-day discharge AFib: **Rohit Mehta**, MD et al
 - Valve Center: **Michael Rinaldi**, MD; **Catherine Shah**, NP et al
 - AFib Center of Excellence: **Sherry Saxonhouse**, MD
 - AFib ED Pathway: **Sherry Saxonhouse**, MD
 - Impact of COVID-19 on RPM for Cardiac Implantable Devices: **Rohit Mehta**, MD

The following abstracts were presented by EICS/ENGAGED students who also received registration waivers for the Annual Biomedical Research Conference for Minority Students (ABRMMS) meeting November 10-13, 2021

EICS Students

- **Don Asafu-Adjaye** (Emory University); Dr. Mark Chappell- Mentor "Optimal Conditions for Assessment of the SARS-COV-2 Binding Protein ACE2 in Human Serum"
- **Alex Bart** (Lafayette College); Dr. Allison Caban-Holt- Mentor "Is Cigarette Smoking Good for Problem Solving"
- **Dana Carreno** (Johns Hopkins University); Dr. Joanne Sandberg- Mentor "Diabetes Inheritance and Causation: Lay Beliefs among Latina immigrants with Limited Education"
- **Evelyn Farkas** (Georgia State University) Dr. Ken Kishida- Mentor "Adaptive Choice Behavior and Subjective Feelings are Predictive of Clinical Outcomes in Depression"
- **Erian Watkins** (Washington University in St. Louis); Dr. David Soto-Pantoja- Mentor "Role of RIE1 Signaling in Chemotherapy-related Cardiac Toxicity"

ENGAGED Students

- **Elili Brown** (Occidental College); Drs. Christopher Schaich and Nildris Cruz-Diaz – Mentors "Visit-to-visit Glucose Variability and its Association with Dementia-related Neuroimaging Markers: Preliminary Analyses from the Multi-Ethnic Study of Atherosclerosis (MESA)" and "Young Hypertensive Male and Female Rats Have Increased Carotid Arterial Stiffness"
- **Drew Nwokeafor-Laz** (Wake Forest University); Dr. Bethany Kerr-Mentor "Effect of SCF and DCC-2618 Treatment on Prostate Cancer Bone Homing"
- **Moriah Wells** (Winston Salem State University); Dr. Ashley Sanderlin-Mentor "Sleep Oxygen Saturation Association with Mood and Behavior in MCI"

AWARDS AND ACCOMPLISHMENTS



In October, **Dr. Dalane Kitzman** received the 2021 Michael L. Pollock Established Investigator Award from the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR) in recognition of his outstanding work in the field of cardiac rehabilitation. This

award is presented to an individual who has made significant advances in the field of cardiac rehabilitation through his/her research and scholarly contributions and has earned national prominence in his/her field through contributions in contemporary research and/or education.

Dr. Dalane Kitzman and **Mr. Ben Nelson** were selected for a Top Research Site Award for their outstanding performance in the REHAB-HF clinical trial. This award is given on behalf of Dr. Christopher O'Connor, HFSA Research Committee Chair and HF-Collaboratory PI. In addition to an invitation with complementary registration to the Heart Failure Society of America Scientific Sessions where they were to be recognized for the award, Dr. Kitzman and Mr. Nelson were also been invited to join the HFSA Research Network, which is comprised of clinical investigators and coordinators within the HFSA.

The PREVENTABLE trial investigator team was selected to receive a WFSOM Research Award for New Team Science in November 2021. Faculty members who are involved with PREVENTABLE include: **Drs. Walter Ambrosius** (MPI), **Jeffery Williamson** (MPI), **Michael Bancks**, **Kathryn Callahan**, **Denise Houston**, **Dalane Kitzman**, **Barbara Nicklas**, **Nicholas Pajewski**, **Steve Rapp**, **David Reboussin**, **Gary Rosenthal**, **Bonnie Sachs**, and **Jamie Speiser**. The award was presented to the team November 17, 2021 at the WFSOM Research Awards Day Ceremony. Funded by the National Institute on Aging, the PREVENTABLE trial is the largest (30,000 patients) and most expensive trial ever funded by the NIA. The purpose of the trial is to determine whether atorvastatin improves geriatric and cardiovascular outcomes in persons 75 years and older.



Dr. Saraschandra Vallabhajosyula was recognized by the Cardiovascular Research Technologies (CRT) as a Yong Leader. The CRT is a leading educational forum on new cardiovascular technology and procedures for physicians and health-care

professionals. CRT provides a forum for exemplary education for interventional cardiologists, general cardiologists, cardiothoracic and vascular surgeons, catheterization laboratory managers, nurses and technologists, scientists and those with an interest in cardiovascular medicine.

Dr. Olivia Gilbert was appointed to the planning committee for the ACC's Faculty Quality Summit and participated in a moderated session titled, "The New Normal: Innovative Approaches to Managing and Measuring Your Accreditation and Registry Workforce." The Quality Summit was held virtually in September 2021. In addition, Dr. Gilbert has also been nominated by the American College of Cardiology to be considered as a writing committee member for the 2023 HRS/EHRA/APHRS/LAHR Expert Consensus Statement on Practical Management of the remote Device Clinic. Dr. Gilbert has also been invited to serve on the ACC's Clinical Policy Approval Committee for a 3-year term. That committee is comprised of 40 College leaders with the charge of reviewing and approving clinical policy documents on behalf of the College.

WFSOM/Atrium Health held the 2021 Research Awards Day ceremony on November 17, 2021. Several CVSC members were among the awardees:

- **Dr. Giselle Melendez:** Early Career Investigator in Clinical/Population Science
- **Dr. Kylie Kavanagh:** Mid-Career Investigator in Basic/Translational Science
- **Dr. Allyn Howlett** and **Dr. Timothy Howard:** Established Investigator in Basic/Translational Science
- **Dr. Katherine Cook:** Early Career Investigator in Basic/Translational Science

Continued on page 6

AWARDS AND ACCOMPLISHMENTS *continued*



Dr. Elijah Beaty was named to the Board of Editors for Circulation: Arrhythmia and Electrophysiology. In this new role, Dr. Beaty will work with **Dr. Paul Wang**, Editor in Chief, to review EP specific articles submitted to the journal for publication.

Yismeilin Feliz-Mosquea, mentored by **Drs. Katherine Cook** and **David Soto-Pantoja**, received the Silver Award in the basic science student category at the 2021 Surgical Sciences Residents' and Fellows' Research Day.

IBM Watson Health recognizes **Atrium Health Pineville** as a winner of the 2022 Top 50 Cardiovascular Hospitals award, part of the Watson Health 100 Top Hospitals national benchmark series.

Sanger Heart and Vascular TAVR program has been granted a 3-star rating by the STS/ACC TVT public reporting ranking — its highest designation. This is granted to only the top 10% of TAVR programs in the US. SHVI is now one of only a small number of programs in the US to receive both the highest STS/ACC TVT Star Rating (3/3) and the highest USNWR ranking (5/5).

TAVR program at Atrium Health Cabarrus completed its 100th TAVR case. In addition to rapid growth under Dr. Terence Hill and Dr. Christopher Cicci's leadership, the team also achieved 0% 30-day mortality rate; 0% 1-year mortality rate and stroke rates; and 0% 30-day mod/severe AI in their first 53 patients at the 1-year mark.

AUSTIN'S DATA, TIPS & TOOLS



Creating a Propensity Score Matched Cohort

Match cohort analysis is often used when investigators want to compare the effects of a treatment against a control while taking into account the effect of confounders in observational studies. These are variables that might be associated with both the treatment variable and the outcome of interest. In a matched analysis a member of the treatment group is matched with a control member with similar characteristics.

There are two main steps to creating a propensity score matched cohort. The first includes creating a logistic regression model to estimate propensity (probability) of being in the treatment group. In the second step, each treatment member is matched to a control member based on propensity score. There are several methods that can be used here but the most common is nearest neighbor matching.

Most implementations will use 1:1 matching schema, but 1: many, where a treatment member is matched to multiple control members, can also be done. However, any multivariate modeling done after 1: many matching will need to be weighted. Propensity score matching is implemented in most statistical software. In R, it can be found in MatchIt package and in SAS it can be done with PSMATCH procedure.

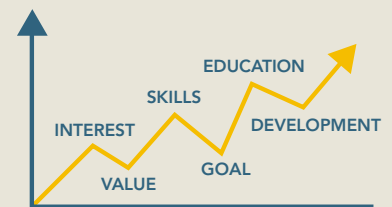
If you have any questions about how this approach can be applied to your data please don't hesitate to contact me!

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CAREER CORNER



Wake Forest School of Medicine summer programs provide increased opportunities for underrepresented students to diversify the pipeline of future students by offering a range of STEM research experiences. Programs funded by Wake Forest School of Medicine, philanthropy and grants from NSF, NHLBI and NIA and led by faculty in the Cardiovascular Sciences Center, Center for Precision Medicine, Wake Forest Institute for Regenerative Medicine, Informatics, Biomedical Engineering, the Hypertension and Vascular Research Center and the Sticht Center for Healthy Aging and Alzheimer's Prevention. Undergraduate and high school students in the Biomedical Engineering (BME), Excellence in Cardiovascular Sciences (EICS), and Enhancing Undergraduate Education and Research in Aging to Eliminate Health Disparities (ENGAGED) summer programs participate in research projects that study aging, cardiovascular disease, trauma, informatics and health disparities. To learn more about the summer programs offered at WFSOM, visit their information page here:

<https://school.wakehealth.edu/Features/Education/DiversifyingPipeline>

PUBLICATIONS

Between the months of July-December,
Cardiovascular Sciences Center members have published an astounding **136 manuscripts**.

Below we highlight several of those.

Akbilgic O, Butler L, Karabayir I, Chang PP, **Kitzman DW**, Alonso A, Chen LY, **Soliman EZ**. ECG-AI: electrocardiographic artificial intelligence model for prediction of heart failure. *Eur Heart J Digit Health*. 2021;2(4):626-34. Epub 20211009. doi: 10.1093/ehjdh/ztab080. PubMed PMID: 34993487; PMCID: PMC8715759.

Brinkley TE, Leng I, Bailey MJ, Houston DK, Hugenschmidt CE, Nicklas BJ, Hundley WG. Effects of Exercise and Weight Loss on Proximal Aortic Stiffness in Older Adults With Obesity. *Circulation*. 2021;144(9):684-93. Epub 20210802. doi: 10.1161/circulationaha.120.051943. PubMed PMID: 34333991; PMCID: PMC8405553.

Bushnell CD, Kucharska-Newton AM, Jones SB, Psioda MA, Johnson AM, Daras LC, Halladay JR, Prvu Bettger J, Freburger JK, Gesell SB, Coleman SW, Sissine ME, Wen F, Hunt GP, Rosamond WD, Duncan PW. Hospital Readmissions and Mortality Among Fee-for-Service Medicare Patients With Minor Stroke or Transient Ischemic Attack: Findings From the COMPASS Cluster-Randomized Pragmatic Trial. *J Am Heart Assoc*. 2021;10(23):e023394. Epub 20211103. doi: 10.1161/jaha.121.023394. PubMed PMID: 34730000.

Kitzman DW, Pastva AM, Mentz RJ. Physical Rehabilitation in Patients with Heart Failure. Reply. *N Engl J Med*. 2021;385(14):1340-1. doi: 10.1056/NEJMc2113494. PubMed PMID: 34587395.

Shapiro MD, Ibanez B. Closing the Glycemic Divide: The Time for Preventive Cardiology Is Now. *J Am Coll Cardiol*. 2021;78(5):465-7. doi: 10.1016/j.jacc.2021.05.040. PubMed PMID: 34325835.

Upadhyia B, Willard JJ, Lovato LC, Rocco MV, Lewis CE, Oparil S, Cushman WC, Bates JT, Bello NA, Aurigemma G, Johnson KC, Rodriguez CJ, Raj DS, Rastogi A, Tamariz L, Wiggers A, Kitman DW. Incidence and Outcomes of Acute Heart Failure With Preserved Versus Reduced Ejection Fraction in SPRINT. *Circ Heart Fail*. 2021;14(12):e008322. Epub 20211126. doi: 10.1161/circheartfailure.121.008322. PubMed PMID: 34823375; PMCID: PMC8692397.

ANNOUNCEMENTS

A \$5.2M grant has been awarded by the National Institute of Aging to **Drs. Shively, Craft, and Whitlow** (MPIs) for the Development of an Innovative Vervet (*Chlorocebus aethiops sabaeus*) Model of Early Alzheimer's-like Neuropathology and Symptomatology (R24AG073199). This project will further establish a novel and promising model of late-onset sporadic Alzheimer's disease – the most common type – in vervet monkeys. Development of this novel animal model will yield insights into the causes and early neuropathology of Alzheimer's disease, and identify promising targets for early intervention that could alter the course of this devastating disease.

We will determine age-related changes in cognitive and physical function, cerebrospinal fluid and imaging biomarkers; identify targets for early intervention by characterizing modifiable risk factors for late-onset sporadic AD; and assess the predictive validity of these risk factors for neuropathology in 30 vervets from our Vervet Research

Colony (from 10 to 30 years old) which comprise the Aging Vervet Cohort. This award will support the Aging Vervet Cohort until natural death at which time the brain will be collected and characterized for early Alzheimer's disease (AD) -like neuropathology. Premortem risk factors to be regularly assessed include psychosocial stress, sleep, gait speed, physical activity, autonomic function, adiposity, blood pressure, and glucose metabolism.

CVD risk factors are also prominent risk factors for Alzheimer's disease. Ancillary studies are very welcome! Contact Dr. Shively for further information.

Carol A. Shively, Ph.D.

Professor, Department of Pathology/Comparative Medicine
Alzheimer's Disease Research Center Nonhuman Primate
Service Leader
cshively@wakehealth.edu

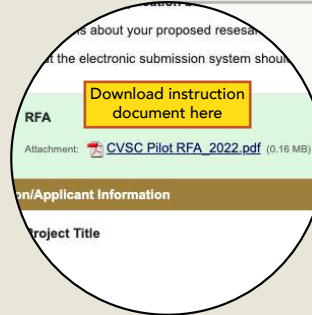
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ANNOUNCEMENTS *continued*

The Cardiovascular Sciences Center (CVSC) is seeking proposals for projects in need of support to promote new areas or technologies for cardiovascular research (basic, clinical, population), as well as to foster collaborative efforts or new collaborations, particularly across the Atrium Health System. The goal of the pilot project is to allow investigators to pursue novel and innovative ideas that will improve the likelihood of obtaining extramural funding. The funding is also meant to allow investigators to perform critical experiments, access core facilities or improve analyses that address specific critiques raised by reviewers for extramural funding.

Here is how you can get started!

[Click this link to access the application form and RFA instructions.](#)

A screenshot of the "2022/2023 Cardiovascular Sciences Center (CVSC) Request for Pilot Applications" form. The form includes sections for "Project Information" (Project Title, Principal Investigator Name, Department, Rank, Email, Number of Project Key Personnel) and "Abstract and Research Plan" (Abstract, 300 words max). A line from the text "Click this link to access the application form and RFA instructions." points to the form.

Wake Forest Contributes to National COVID-19 Collaborative Research

Four Wake Forest NHLBI-funded cohort studies are participating in the "Collaborative Cohort of Cohorts for COVID-19 Research" (aka, C4R) to learn about COVID-19 health effects. These studies include ARIC, MESA, SARP, and SPIROMICS. This national study includes more than 50,000 participants and will help us learn why some people get infected and become very ill, while others do not. This study will evaluate people with and without prior COVID infections.

These four cohort studies are also involved in a collaboration called "Researching COVID to Enhance Recovery" (RECOVER). This study will focus primarily on people with prior infections to

learn why some people recover quickly, while others have prolonged symptoms such as heart problems, brain fog, shortness of breath, depression, or sleep problems. Results from these studies will help doctors learn more about how to treat infected people and how to prevent COVID infections.

If you would like to review the Center's information, including mission, goals, and current membership, please refer to the following link: <https://school.wakehealth.edu/Departments/Internal-Medicine/Cardiovascular-Medicine/Cardiovascular-Sciences-Center>



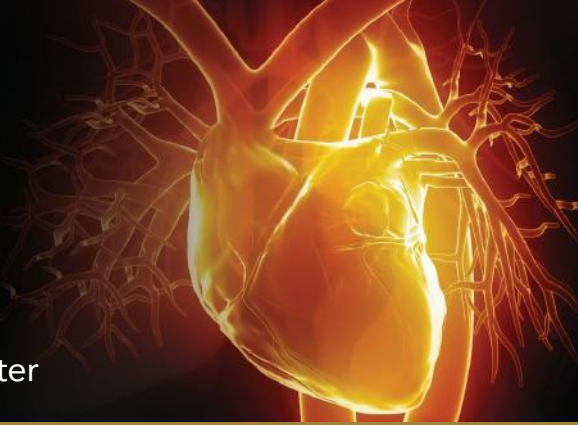
Medical Center Boulevard
Winston-Salem, NC 27157
[WakeHealth.edu](https://www.wakehealth.edu)



GOOD NEWS!

Wake Forest School of Medicine Cardiovascular Science Center

Summer 2021



WELCOME TO THE NEWEST MEMBERS OF THE CARDIOVASCULAR MEDICINE FACULTY!



Dr. Vallabhajosyula



Dr. Akbilgic

We are excited to welcome two new members to the Wake Forest family, **Dr. Oguz Akbilgic** and **Dr. Saraschandra Vallabhajosyula**.

Dr. Vallabhajosyula is our newest faculty member at Cogden Heart and Vascular Center-High Point. He joins us as Assistant Professor in Cardiovascular Medicine specializing in Interventional and Critical Care Cardiology and serves as the Medical Director of the CICU. Dr. Vallabhajosyula attended medical school at Manipal University in Manipal, India, trained in Internal Medicine at Creighton University School of Medicine in Omaha Nebraska, Critical Care Medicine at Mayo Clinic in Rochester Minnesota, Cardiovascular Diseases at Mayo Clinic in Rochester Minnesota, and Interventional Cardiology at Emory University School of Medicine in Atlanta Georgia. He also

received his Master's of Science in Clinical and Translational Science from the Mayo Clinic Graduate School of Biomedical Sciences in Rochester Minnesota. He is a clinician and outcomes researcher whose work encompasses the fields of cardiogenic shock, acute myocardial infarction, cardiac arrest, high-risk percutaneous coronary intervention, percutaneous mechanical circulatory support, non-cardiac organ failure, septic shock, septic cardiomyopathy, and circulatory shock. In his spare time, he loves to play and watch cricket, watch movies, read fiction and non-fiction books, and spend time with his wife, Pranathi, and children, Brihati (5) and Agastya (3)."

Dr. Akbilgic will be joining us this September as an Associate Professor in Cardiovascular Medicine. In addition, he will also assume the role of Associate Director of EPICARE and work with Dr. Elsayed Soliman to support the ongoing operational and academic activities of this important research core and as a WFBMI faculty member. Dr. Akbilgic is a health informaticist focusing on artificial intelligence applications in medicine, especially on cardiovascular disease detection and prediction. He obtained a Bachelor of Science degree in Mathematics (2001) from Istanbul University, Master of Science degree in Statistics (2005) from Mimar Sinan University, and Ph.D. in Quantitative Methods (2011) from Istanbul University. He carried out postdoctoral studies in Machine Learning and Statistics at the University of Tennessee, Knoxville and University of Calgary (2013-15). He has worked at the Center for Biomedical Informatics, University of Tennessee Health Sciences Center, Memphis, TN as an Assistant Professor (2015-19). He is currently working as an Associate Professor at the Department of Health Informatics and Data Science, Loyola University Chicago and he is the Director for the Public Health Division of Cardiovascular Research Institute. Oguz is married and a father of one baby boy. He likes playing soccer and hiking in his free time.

FUNDING AND AWARDS

During the months of April-July, CVSC members were awarded a total of 37 new grants. 12 different departments were represented in this count and 16 CVSC members served as PIs of these projects. Below we highlight a few of these awards.



- **Dr. Dalane Kitzman** and a team of others comprised of faculty from both Wake Forest and Atrium Health, including Dr. Cyrille-Superville at Sanger Heart and Vascular Clinic, recently received the news that their project titled, "Role of Metformin on Physical Function, Leaky Gut and

Inflammation in Patients with HFpEF," was selected as the recipient of the Wake Forest School of Medicine's Translational Research Initiative Joint Pilot Project. The 1-year project will recruit up to 20 patients, 10 each at Wake Forest and Atrium Health, and the award totals \$40,000 dollars.

- A grant entitled "Creating a Diverse, Equitable and Inclusive Research Culture and Environment: The Wake Forest Faculty Institutional Recruitment for Sustainable Transformation (WFFIRST) Cohort Program" was submitted with **Drs. Michael Olivier, Goldie Byrd and Debra Diz** as Multi-PIs. The grant is for recruitment of 15 early career stage faculty from groups underrepresented in the biomedical sciences over a 3-year period in clusters with research areas in CVSC, CDOM and Center for Healthy Aging and Alzheimer's Prevention, and within the overarching areas of Center for Precision Medicine and MACHE.
- A CVSC Pilot award was given to **Dr. Liliya Yamaleyeva**, PI and Co-I's Drs. **Katherine Loree Cook, Nildris Cruz-Diaz** and **Brian Westwood**. The title of the grant is "Gut Microbiome Dysbiosis and Arterial Stiffness in Response to Simulated Weightlessness." Also awarded with a CVSC Pilot award was **Dr. Ashish Khanna, PI and Co-I Dr. Christopher Schaich**. The title of the grant is "Association of baseline and post-treatment circulating renin levels and clinical outcomes in patients with septic shock".

- **Dr. Christopher Schaich's** K01 grant application "Cardiac Autonomic Function, Cognitive Performance, and Neurocognitive Outcomes" received a fundable score and is currently pending.



- \$50,000 funded by the Wake Forest Atrium COVID-19 Pilot Research Projects and is entitled "A Non-human Primate Model of Cognitive Dysfunction and Recovery from Post-Acute Sequelae of SARS CoV2 (PASC)". The team involved is **Dr. James Daunais (PI)**, Drs. John Sanders (Co-I), Jennifer Stapleton Kotloski (Co-I), Jared Rowland (Co-I), Dwayne Godwin (Co-I) all from Wake Forest. Dr. Rowland is also with the W.G. "Bill" Hefner VA Medical Center.

- **Dr. Reto Asmis** received an RO1 award for \$3.2M from the NHLBI entitled, "Role of Monoamine Oxidase A and Diet-Induced Monocyte Dysfunction, Macrophage Reprogramming, and Atherosclerosis."



- **Dr. Nichole Allred** received an R01 to examine NAFLD using WGS data. DK128871: Identification and Characterization of Loci Associated with Non-alcoholic Fatty Liver Disease. The objective of this application is to identify additional rare variants with effects on NAFLD through whole genome sequencing (WGS) in ethnically diverse populations. In addition, CRISPR/Cas9 will be used to identify and test genes for effects on hepatic steatosis. Results from our work will help us to understand the genetic architecture of NAFLD and link these associations to genes that can be targeted for therapeutic intervention.

ANNOUNCEMENTS

EPICARE ECG Reading Center Recognized as an Institutional Shared Resource

The Epidemiological Cardiology Research Center (EPICARE) has been a uniquely valuable resource for the institution. Its national and international reputation is unrivaled, with over 25 years of contributions to some of the most significant cardiovascular trials and cohort studies in the United States. Therefore, the Intramural Research Support Committee (IRSC) has recommended funding EPICARE as an institutional shared resource. The institutional core funding will help EPICARE continue as the trusted ECG reading center for major NIH-funded studies, and also seek new opportunities to expand the scope of the center's current services. This includes exploring the possibility of getting involved in industry-sponsored FDA safety studies, utilizing ECG machine/deep learning models to improve prediction of cardiovascular outcomes, and developing innovative methods for acquiring and analyzing telehealth (remote/wearable/mobile) data. Effective July 1, EPICARE Center will move from the Division of Public Health Sciences to Section on Cardiovascular Medicine under the leadership of Dr. Elsayed Soliman.

Cardiovascular Sciences Center Membership Drive

In an ongoing effort to keep the Cardiovascular Sciences Center (CVSC) thriving, we are conducting a membership drive to ensure that all who have an interest in cardiovascular research have the opportunity to serve and to be recognized by way of appointment to the CVSC. We recently emailed potential members who have been on our mailing lists but did not have membership status in their faculty profiles for the CVSC. We are currently collecting CVs from all who are interested in being an official member. Once received, we will submit the proper documentation to the Office of Faculty Affairs (OFA) so they can present the requests to the Faculty Executive Council (FEC) for approval. We will submit names for the next FEC meeting, currently scheduled for August 11, 2021. If you or a colleague are interested in membership, please submit your CVs to Pam Stafford and cc your department chair so they are aware of the impending appointment and can provide additional documentation if required by the OFA.

We would like to have your CVs in hand by **Friday, October 1, 2021**, in order to have adequate time to submit the proper paperwork and to do any necessary follow-up prior to the FEC meeting.

If you are unsure if you are an official member of the CVSC, search your name on the website below. Memberships will be shown as in the pictures here:

If you would like to review the Center's information, including mission, goals, and current membership, please refer to the following link: <https://school.wakehealth.edu/Departments/Internal-Medicine/Cardiovascular-Medicine/Cardiovascular-Sciences-Center>





Debra I. Diz, PhD
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Co-Director, Cardiovascular Sciences Center
Professor, Hypertension
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Centers and Institutes
Cardiovascular Sciences Center - Center on Diabetes, Obesity, and Metabolism
Maya Angelou Center for Health Equity
Hypertension and Vascular Research Center

[View Profile](#)



David M. Herrington, MD, MHS
Professor, Cardiology
Centers and Institutes
Cardiovascular Sciences Center - Hypertension and Vascular Research Center
J. Paul Sticht Center for Healthy Aging and Alzheimers Prevention - Center for Precision Medicine
Research Interests
Heart Diseases - Genomics - Clinical and Population Research - Hormone Therapy - Pathogenesis and Prevention of Atherosclerosis

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AUSTIN'S DATA, TIPS & TOOLS



Comparing Survival Curves using the Log Rank Test

When conducting Survival (or Time to Event) Analysis, a common practice is to stratify the survival probabilities by different subgroups of interest and plot the survival curves. When doing this, it is good practice to go beyond visual inspection of the curves and test for any statistically significant differences. The Log Rank Test is a common method for doing this. This is a non-parametric test, that makes no assumptions about the underlying survival distribution. The null hypothesis, is that the survival curves are identical. It is similar to a Chi Square Test in that it compares the observed number of events in each group to what would be expected if the null hypothesis were true (no difference in curves).

The Log Rank Test can be applied in SAS as an option of the STRATA statement in the PROC LIFETEST procedure. This procedure has options for similar test as well. The Log Rank Test is also available in the widely used 'Survival' package in R. If you have any questions how about this survival analysis can applied to your data don't hesitate to contact me!

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INVITED PRESENTATIONS

Yismeilin Mosquea, a graduate student in **Dr. David Soto-Pantoja** and **Dr. Katherine Cooke's** lab, gave a poster presentation at the Interdisciplinary Nutrition Sciences Symposium, a virtual conference sponsored primarily by UNC, on June 21-22. The title of her presentation was, "Diet Impacts Triple Negative Breast Cancer Growth and the Development of Chemotherapy-induced Cardiac Damage." Another of Dr. Cook's graduate students, **Alana Arnone**, also presented her poster on cardiometabolic – cancer interactions at the symposium which was titled, "Endocrine-targeted Therapy and Diet Interactions on Gut Permeability and the Microbiome."



Dr. Olivia Gilbert was invited to give a talk on VuMedi, a video education platform for medical providers. She spoke about the 2021 Update to the 2017 ACC Expert Consensus Decision Pathway for Optimization of Heart Failure Treatment. Dr. Gilbert is also an Official Reviewer for ACC Solution Set Oversight

Committee for the paper with this same title, which was published in the Journal of American College of Cardiology.

Dr. Olivia Gilbert, Assistant Professor of Cardiovascular Medicine at Wake Forest, served as the Chair for the American College of Cardiology's Heart House Roundtable on Advanced in Hypertrophic Cardiomyopathy, which was held on June 8, 2021. Dr. Gilbert also served as lead moderator for the National System group within the breakout session covering Population Health-Creating Thoughtful and Efficient Pathways for Success. Also included in the planning committee for this roundtable discussion was

Dr. Mahesh Chandrasekhar, fellow in Cardiovascular Medicine at Wake Forest. Dr. Chandrasekhar was the lead moderator for the Current Standards and Frontiers group within the breakout session titled, Sudden Cardiac Death Risk Stratification and Arrhythmia/Device Management. Other participants in the round table included **Dr. David Zhao**, Chief of CV Medicine at Wake Forest and **Dr. Dermot Phelan**, Medical Director of CV Imaging and Director of Sports Cardiology at Atrium Health Sanger Heart & Vascular Institute.

Wake Forest and Sanger Heart and Vascular Institute made tremendous contributions to this year's American College of Cardiology Virtual Scientific Sessions, held May 15-17, 2021. Collectively, Atrium Health/Wake Forest Baptist Enterprise Heart and Vascular had more than 30 presentations, panel discussants, and/or session moderators, including a late breaking clinical trial by **Dr. Dalane Kitzman**. This is a credit to all of the hard work across the Enterprise and shows what remarkable potential there is for the future as our teams continue to build collaborations and grow our combined research capacity.



Drs. David Zhao and **Michael Shapiro** presented "From Cardiovascular Intervention to Cardiovascular Disease Prevention: Advances in

Preventive Cardiology" at the Wake Forest School of Medicine Dean's Forum on May 13, 2021.



Dr. Prashant Bhawe was invited to give a presentation at the 2021 Heart Rhythm Society Meeting in July. The title of his talk is "Atrial Arrhythmias after Heart Transplant."

Dr. Bharathi Upadhy has been invited to give a talk at the South Atlantic Cardiovascular Society Focus on Adult Congenital Heart Disease, which was held July 15-18 in South Carolina. The topic of her talk with focus on interesting Adult Congenital Heart Disease (ACHD) cases.



Dr. Mary Branch has been invited to participate as a panelist for the Cardio-Oncology meeting hosted by Rush University, which is planned for early October, 2021. Dr. Branch will be discussing, "Overview of Short and Long Term Management of Cardiovascular Disease in the Cancer Patient: Research-Driven Guidance for the Clinician."

Dr. Dalane Kitzman gave an interview to Medscape on May 24, 2021. Dr. Kitzman spoke about REHAB-HF laying the groundwork for recovery of function in post heart failure. See the full interview here: <https://www.medscape.com/viewarticle/950968>

Dr. Giselle Melendez and **Dr. Mary Branch** have both been invited to participate in the virtual Cardio-Oncology Summit scheduled for September 30-October 1, 2021. This annual meeting is hosted by the International Cardio-Oncology Society (ICOS). Recognized as an expert in the area, Dr. Melendez will be speaking on the topic of, "Year in Review: Key Developments in Cardio-Oncology (Basic and translational Science Perspective). Dr. Branch has been invited to participate as a panelist and will be discussing, "Fellowship Training Programs in Cardio-Oncology."

Dr. Michael Shapiro presented at the Israeli Atherosclerosis Society meeting held virtually on June 24, 2021. The topic of his talk was, "Therapeutic Approaches to Antagonizing PCSK9."

Continued on page 5



Dr. Christopher Schaich was the senior and presenting author of the abstract titled, "Association of Lower Heart Rate Variability with Neuroimaging Markers for Dementia-related Pathology: the Multi-Ethnic Study of Atherosclerosis (MESA)," which was presented at the Alzheimer's Association International

Conference (AAIC) in July. Dr. Schaich was also a contributing author on the abstract titled, "Racial Differences in Dementia-related Pathology Underlying Cognitive Decline: The Multi-Ethnic Study of Atherosclerosis (MESA)," which was also accepted for presentation at the AAIC conference. In addition, Dr. Schaich was a contributing author on the abstract titled, "Number and Location of Cerebral Microbleeds (CMBs) are Associated with Global and Domain-Specific Cognitive Impairment," which was presented at the Annual Meeting of the American Academy of Neurology, held in April 2021.

The following students presented their research during the 13th Women's Health Research Day:

- **Elizabeth Stirling** – Mentor: Dr. David Soto-Pantoja - "Testing novel immune checkpoint therapy combinations targeting CD47 in an immune-competent tumor organoid platform of triple-negative breast cancer" for cardiac protective chemotherapy. Congratulations to Elizabeth for winning 1st place for best poster out of the trainees that presented their research!

- **Kenysa Clear** – Mentor: Dr. Kathrine Cook - "Investigating lactate isoforms as a potential mechanism to reduce obesity-mediated breast cancer risk" that will provide cardiometabolic benefits.
- **Tiffany Newman** – Mentor: Dr. Katherine Cook - "Intervention with probiotics and muscadine grape extract shifts western diet-associated metabolic, microbial, and inflammatory parameters to reduce breast tumor growth" in addition to cardiac benefits.

Elizabeth Stirling's abstract titled "Targeting Thrombospondin-1/CD47 signaling potentiates anti-tumor immune responses by modulation of cellular bioenergetics," was accepted for an oral presentation at the New York Academy of Science Conference Frontiers in Cancer Immunotherapy 2021.



On May 3, 2021, **Dr. Liliya Yamaleyeva** presented for - "ZOOMing in on Preeclampsia Research" online seminar series, "Ultrasound-guided photoacoustic imaging - novel tool for in vivo quantification of placental oxygenation"

CAREER CORNER

2021 Summer Research Programs to Increase Diversity in Biomedical Science Careers:

The Cardiovascular Sciences Center and Sticht Center for Healthy Aging and Alzheimer's Prevention hosted two summer research programs: the Excellence in Cardiovascular Sciences (EICS) summer research program directed by Drs. David Soto Pantoja and Debra Diz, which has been ongoing for >27 years, and a new program, Enhancing UNderGraduate Education and Research in AGing to Eliminate Health Disparities (ENGAGED – joint program with WSSU and WFU), directed by Drs. Tina Brinkley and Debra Diz, with additional Program Directors Drs. Gwathmey, Keith and Flowers (WSSU) and Miller (WFU) in its second year.

The EICS and ENGAGED undergraduate students were selected from across the country and participated in research topics related to aging and cardiovascular disease, as well as health disparities. Current events topics ranged from COVID-19 to racism/ social inequity and injustice and the impact of these on minority health. Guest speakers were from Howard University, Winston-Salem State University, Wake Forest University, Johnson C. Smith and the Center for Disease Control, as well as Wake Forest School of Medicine. Panels of current and former graduate school and diversity-focused training program participants provide career insights in several professional development sessions. Students participate in sessions on data collection relevant to cardiovascular sciences and aging-related research, including blood pressure and gait speed, in addition to various basic science demonstrations. Joint sessions and social activities with summer trainees in programs sponsored by NSF (Biomedical Engineering), WFIRM and Precision Medicine create peer networking opportunities for the ~100 students participants. The EICS and ENGAGED summer session will conclude with poster presentations of the research projects developed with their mentors over the course of the summer program. We thank the students and the faculty, many of whom are members of the Cardiovascular Sciences Center, who serve as mentors, guest lecturers and journal club faculty, for contributing to the program's success.

Continued on page 6

The following 22 trainees and mentors are participating in the programs for 2021:

ENGAGED

Abha Athawale	Wake Forest University	Andrew South Pediatric Nephrology; CVSC
Laurence Bangert	Purdue University	Ashley Weaver – Biomedical Engineering; Critical Illness, Injury and Recovery Research Center
Elili Brown	Occidental College	Chris Schaich – Hypertension; CVSC
Beatrice Gar	NC A&T State University	Andrew South – Pediatric Nephrology; CVSC
Christian Johnson	Virginia Commonwealth University	Jeff Williamson – Gerontology and Geriatric Medicine; Program Director, Sticht Center for Healthy Aging and Alzheimer's Prevention / Director, Center for Healthcare Innovation, CVSC
Sophia Lino	Florida State University	Giselle Melendez, Nazli Gharrae, & Jessica McCanless – Internal Medicine-Cardiology, CVSC
David Morton	Wake Forest University	Christian Hugenschmidt – Gerontology and Geriatric Medicine; J. Paul Sticht Center for Healthy Aging and Alzheimer's Prevention/Claude Pepper Older Americans Independence Center, CVSC
Drew Nwokeafor-Laz	Wake Forest University	Bethany Kerr – Cancer Biology; Comprehensive Cancer Center/ Center for Redox Biology and Medicine, CVSC
Bryonna Peebles	Tuskegee University	Justin Moore – Implementation Science; Office of Global Health/ Comprehensive Cancer Center/ Maya Angelou Center for Health Equity/ Office of Women in Medicine and Science
Moriah Wells	Winston Salem State University	Ashley Sanderlin – Gerontology and Geriatric Medicine
Albi Zhiva	Forsyth Tech	Kristen Beavers – Health and Exercise Science; Wake Forest University

EICS

DonAsafu-Adjaye	Emory University	Mark Chappell – Hypertension and Vascular Research Center, CVSC
Alex Bart	Lafayette College	Allison Caban-Holt – Maya Angelou Center for Health Equity
Dana Carreno	Johns Hopkins University	Joanne Sandberg – Health Equity/ Family and Community Medicine
Evelyn Farkas	Georgia State University	Ken Kishida – Physiology and Pharmacology, CVSC
Mya Hopper	Winston Salem State University	Joanne Sandberg – Health Equity/ Family and Community Medicine
Mi-Tien Lee	Georgia State University	Nicole Levi – Plastic and Reconstructive Surgery; Comprehensive Cancer Center, CVSC
Glen (Dave) Myatt	Wake Forest University	David Soto Pantoja, Steven Bronson – Surgery/Hypertension, Comprehensive Cancer Center, CVSC
Savannah Pollock	Wesleyan College	Rong Chen – Physiology and Pharmacology, CVSC
Dejanae Potter	Xavier University of Louisiana	David Soto-Pantoja, and Jessica Mackert – Surgery/Hypertension, Comprehensive Cancer Center, CVSC
Olivia Smith	North Carolina State University	Katherine Cook – Surgery/ Hypertension, Comprehensive Cancer Center, CVSC
Erian Watkins	Washington University in St. Louis	David Soto-Pantoja, and Yismeilin Feliz Mosquea – Surgery/Hypertension, Comprehensive Cancer Center, CVSC

AWARDS AND ACCOMPLISHMENTS

Dr. Xuewei Zhu has recently been named the 2021 Dolph O. Adams Awardee by the Society for Leukocyte Biology (SLB). The annual award is to recognize excellence of an investigator working in the area of cellular and molecular mechanisms of host defense and inflammation. This award is named in honor of the outstanding macrophage researcher Dolph O. Adams, MD, Ph. D and is given out to a junior/mid-career faculty or equivalent investigator. As the Adams Awardee, Dr. Zhu will present her work on the role of ER membrane-anchored G6P transporter SLC37A2 in macrophage inflammation and metabolic homeostasis on July 29 during the Immunometabolism session II of the 2021 SLB meeting.

Dr. Prashant Bhawe was named to the editorial board for the Journal of the American Heart Association.

Dr. Olivia Gilbert has started a 3 year term on the American College of Cardiology's Science & Quality Committee.

Dr. Giselle Melendez has been invited to serve as Associate Editor for JACC Cardio-Oncology.

Dr. David Soto-Pantoja was invited to serve on the Florida Breast Cancer Foundation Study Section for expertise in cardio-oncology.

2021 Internal Medicine Tinsley R. Harrison Cardiology Faculty Award Winners:

Master Teachers: **Drs. Karl Richardson** and **Bharathi Upadhy**

Clerkship Best Teachers: **Drs. Barbara Pisani** and **Brandon Stacey**

Cardiovascular Medicine Nominees: **Drs. Manrique Alvarez, Aysha Amjad, Matthew Belford, Anita Kelkar, Luke Peters, Octavia Rangel,** and **Li Zhou**

Highlights from the Department of Internal Medicine Research Day Top Research Papers published in 2020:

- **Dr. Priyesh Patel** (Sanger Heart and Vascular Institute) – "Association between Systolic Ejection Time and Outcomes in Heart Failure by Ejection Fraction," published in European Journal of Heart Failure
- **Dr. Matthew Singleton** (Wake Forest Baptist Health) – "Effect of Intensive Glycemic and Blood Pressure Control on QT Prolongation in Diabetes: The ACCORD Trial," published in Diabetes
- **Dr. Dermot Phelan** (Sanger Heart and Vascular Institute) – "Screening of Potential Cardiac Involvement in Competitive Athletes Recovering from COVID-19: An expert Consensus Statement," published in JACC Cardiovascular Imaging.
- **Dr. Hadley Wilson** (Sanger Heart and Vascular Institute) – "New ACC Global Heart Attack Treatment Initiative: Improving STEMI Care Worldwide," published in Journal of the American College of Cardiology.

PUBLICATIONS

Between the months of April-July, Cardiovascular Sciences Center members have published an astounding 101 manuscripts. Of these, 9 were CVSC first author publications. Below we highlight several of those.

Banks MP, Carnethon M, Chen H, Cotch MF, Klein B, Klein R, Szklo M, **Bertoni A**. Diabetes subgroups and risk for complications: The Multi-Ethnic Study of Atherosclerosis (MESA). J Diabetes Complications. 2021;35(6):107915. Epub 2021/04/01. doi: 10.1016/j.jdiacomp.2021.107915. PubMed PMID: 33785252; PMCID: PMC8113152.

Files DC, Gibbs KW, Schaich CL, Collins SP, **Gwathmey TM**, Casey JD, Self WH, **Chappell MC**. A pilot study to assess the circulating renin-angiotensin system in COVID-19 acute respiratory failure. Am J Physiol Lung Cell Mol Physiol. 2021;321(1):L213-I8. Epub 2021/05/20. doi: 10.1152/ajplung.00129.2021. PubMed PMID: 34009036.

Schaich CL, Yeboah J, Espeland MA, Baker LD, Ding J, Hayden KM, Sachs BC, **Craft S**, Rapp SR, Luchsinger JA, Fitzpatrick AL, Heckbert SR, Post WS, **Burke GL**, Allen NB, **Hughes TM**. Association of Vascular Risk Scores and Cognitive Performance in a Diverse Cohort: The Multi-Ethnic Study of Atherosclerosis. J Gerontol A Biol Sci Med Sci. 2021. Epub 2021/07/04. doi: 10.1093/gerona/ glab189. PubMed PMID: 34216214.

Kitzman DW, Whellan DJ, Duncan P, Pastva AM, Mentz RJ, Reeves GR, Nelson MB, Chen H, **Upadhy B**, Reed SD, **Espeland MA**, Hewston L, O'Connor CM. Physical Rehabilitation for Older Patients Hospitalized for Heart Failure. N Engl J Med. 2021;385(3):203-16. Epub 2021/05/18. doi: 10.1056/NEJMoa2026141. PubMed PMID: 33999544.

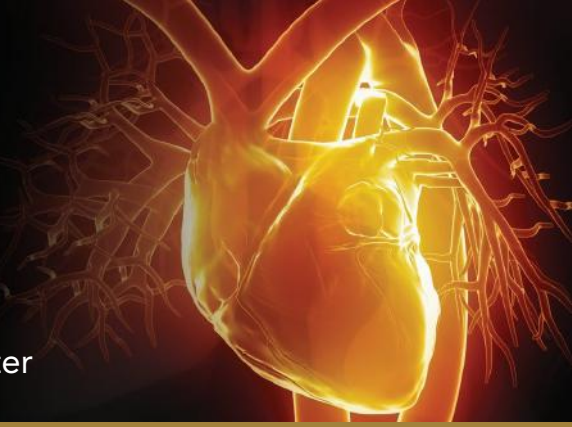
Upadhy B, Pajewski NM, Rocco MV, **Hundley WG**, Aurigemma G, Hamilton CA, Bates JT, He J, Chen J, Chonchol M, Glasser SP, Hung AM, Pisoni R, Punzi H, Supiano MA, Toto R, Taylor A, **Kitzman DW**. Effect of Intensive Blood Pressure Control on Aortic Stiffness in the SPRINT-HEART. Hypertension. 2021;77(5):1571-80. Epub 2021/03/30. doi: 10.1161/hypertensionaha.120.16676. PubMed PMID: 33775127; PMCID: PMC8035296.



GOOD NEWS!

Wake Forest School of Medicine Cardiovascular Science Center

Spring 2021



THE POINTER NEUROVASCULAR ANCILLARY STUDY



Tina Brinkley, PhD



Hossam Shaltout, PhD

In April 2020 **Tina Brinkley, PhD** and **Hossam Shaltout, PhD** were awarded a \$10.1 million 5-year grant from the National Institutes on Aging to study neurovascular outcomes in the The U.S. study to PrOtect brain health through lifestyle INTERvention to Reduce risk (U.S. POINTER). U.S. POINTER is an ongoing multi-center randomized clinical trial designed to investigate whether randomization to one of two lifestyle interventions that differ in format and intensity alters cognitive trajectory over 2 years in 2,000 older adults aged 60-79 years who are cognitively normal but at increased risk for dementia due to factors such as first degree family history of memory impairment, sedentary lifestyle, poor diet, race/ethnicity, and suboptimum cardiometabolic health.

The POINTER Neurovascular Ancillary study, referred to as POINTER-NV, will comprehensively assess autonomic function, cerebral autoregulation, and vascular structure and function by evaluating aortic, carotid, and cerebral hemodynamics using complementary techniques (i.e., ultrasound, tonometry, and continuous blood pressure and heart rate monitoring) under a variety of conditions (i.e., at rest, during posture changes, and during carbon dioxide inhalation). These neurovascular outcomes will be assessed at baseline, Month 12 and Month 24 in 500 parent trial participants (~250 per intervention arm) at up to 5 clinical sites. The primary aim is to assess the effects of the POINTER lifestyle intervention on cerebral autoregulation and baroreflex sensitivity. Intervention effects on aortic stiffness, carotid stiffness, and cerebral vasomotor reactivity will also be assessed. In addition, POINTER-NV will examine whether these neurovascular outcomes are associated with cognition (assessed every 6 months in the parent study) and brain structure/function (assessed every 1-2 years in the NIA-funded POINTER Imaging ancillary study).

The results of this innovative study could provide critical insight about preclinical changes that compromise brain perfusion, and may identify an effective strategy for improving neurovascular function, which could have important consequences for preventing Alzheimer's disease and related dementias. Key collaborators at Wake include **Aarti Sarwal, MD** and **Charles Tegeler, MD** from Neurology, **Dalane Kitzman, MD** from Cardiology, **Laura Baker, PhD** from Geriatrics, and **Iris Leng, PhD** and **Mark Espeland, PhD** from Public Health Sciences. External collaborators include **Gary Mitchell, MD** (Cardiovascular Engineering, Inc., Norwood, MA) and **Jurgen Claassen, MD, PhD** (Radboud University, The Netherlands).

FUNDING

During the months of December 2020–March 2021, CVSC members were awarded a total of **28** new grants. **20** different departments were represented in this count and **15** CVSC members served as PIs of these projects. Below we highlight a few of these awards.



Dr. Xuewei Zhu is the latest recipient of a CVSC Pilot Award of \$20,000 over 1 year. The title of the project is, "PUFA Desaturation, NAD+ Metabolism, and Microphage NLRP3 Inflammasome."



Drs. David Soto-Pantoja, Co-Investigator, and Multi-PIs (Drs. Miller, Lance David; Votanopoulos, Konstantinos) received an NIH/NCI award in the amount of \$50,170 over 1 year for their project titled, "Tumor Organoid-Mediated Drug Testing and

Clonality Analysis in Peritoneal Surface Disease of Intestinal Origin."



Dr. Ashish Khanna was awarded a WFSM Cardiovascular Sciences Center Pilot Award in the amount of \$30,000 over 1 year. The title of his project is, "Association of Baseline and Post-Treatment Serum Renin Level and Clinical Outcomes in Patients with Septic Shock."

Co-Is on the project are **Drs. Mark Chappell** and **Christopher Schaich** from the Hypertension Center and involved a team of collaborators from the VICTAS trial group.



Drs. Nicholette Allred and **Donald Bowden** received \$651,974 over 5 years in funding from the National Institute of Diabetes and Digestive and Kidney



Disease for their project titled, "Genetic and Epidemiological Predictors of Glucose Homeostasis Measures."



Dr. Charles Tegeler (PI), received funding from University Hospitals of Cleveland for his pilot study titled, "Imaging and Serologic Biomarkers of Treatment-Related Carotid Artery Inflammation in Head and Neck Cancer Patients (Radiation-Related Carotid Injury Study)" in the amount of \$14,920.



Dr. Liliya Yamaleyeva was awarded a WFSM Cardiovascular Sciences Center Pilot Award in the amount of \$30,000 over 1 year. The title of her project is, "Gut Microbiome Dysbiosis and Arterial Stiffness in Response to Simulated Weightlessness." Co-Is on this

project are **Drs. Katherine Loree Cook, Nildris Cruz-Diaz,** and **Brian Westwood, MS**

AUSTIN'S DATA TIPS AND TOOLS



Power Analysis

In statistics, power is the probability that a statistical test correctly rejects the null hypothesis. This can also be thought of as the probability of detecting a true positive result. The more power the better. It is important to consider power before conducting any experiment or collecting data for a sample. Power analysis can be used to determine the minimum sample size needed to achieve a desired result. In most cases power analysis is used to determine sample size for an experiment. This done by supplying a desired significance level, effect size, and statistical power. However, these three parameters can be estimated if the sample size already known. How effect size is measured is dependent on what test you will be conducting. In addition, power curves can be used to visualize how sample size effects the power of the experiment.

A common application of power analysis is Student's t Test Power analysis, where the experiment is comparing means from two samples, but power analysis can be extended to discrete outcomes and can even accommodate repeated measures designs. Power analysis can be conducted in SAS using the POWER procedure. If you have any questions how about this approach can applied to your data don't hesitate to contact me!

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INVITED PRESENTATIONS



Dr. Patricia Gallagher gave an invited talk at the educational session of the Southeastern Regional Fruit and Vegetable Conference, as a result of her research on the beneficial effects of muscadine grape extracts on cardiovascular and cancer disease progression.



Dr. Katherine Cook gave an oral presentation on December 10th for the American Society for Matrix Biology: Matrix Remodeling in Metabolic Health and Disease. The webinar was titled *Early-life dietary exposures result in persistent gut microbiome alterations affecting visceral fat fibrosis and inflammation lasting into adulthood*.



Dr. Kunal Sangal has been invited to speak at the Global Summit on Cardiology and Cardiovascular Medicine. The conference is scheduled for October 21-23, 2021 and will be held in Valencia, Spain. Dr. Sangal will present his research on contrast and kidney function or refractory angina.



Dr. Yashashwi Pokharel's abstract titled, "Community-Centric Study to Mitigate Cardiovascular Disease in Rural Nepal: The Non-Communicable Disease in Nepal Study," has been accepted at the American College of Cardiology Scientific Sessions. The conference is currently scheduled for May 15-17, 2021 in Atlanta, Georgia and will offer both in-person attendance as well as the option to attend virtually.



Dr. Xuewei Zhu has been invited by the Society for Leukocyte Biology (SLB) to give a talk April 29th in the 2021 SLB Special Interest Group Session-Innate Immune Memory. The title of her talk is "Regulation of the NLRP3 inflammasome by pyruvate oxidation." Dr. Zhu has also been invited by Society for Leukocyte Biology (SLB) to give a talk July 29th in the 2021 SLB Conference-Immunometabolism II Session. The title of her talk is "The impact of G6P transporter SLC37A2-mediated glucose metabolism on macrophage inflammation and atherosclerosis".

PUBLICATIONS

Between the months of January-March 2021, Cardiovascular Sciences Center members have published an astounding **84** manuscripts. Of these, **19** were CVSC first author publications.

Aladin A, Soliman E, **Kitzman D**, Dardari Z, Rasool SH, **Yeboah J**, Budoff MJ, Psaty BM, Ouyang P, Polak JF, Blumenthal RS, McEvoy, JW, Gandhi SK, **Herrington DM** *Comparison of the Relation of Carotid Intima-Media Thickness with Incident Heart Failure with Reduced Versus Preserved Ejection Fraction (From the Multi-Ethnic Study of Atherosclerosis [MESA])* The American Journal of Cardiology

Brinkley TE, Semba RD, **Kritchevsky SB**, Houston DK *Dietary protein intake and circulating advanced glycation end product/receptor for advanced glycation end product concentrations in the Health, Aging, and Body Composition Study.* American Journal of Clinical Nutrition

German CA, **Shapiro MD** *Statins and coronary artery calcium: What's the score?* Atherosclerosis

*Pandey A, **Kitzman D** *Searching for the Optimal Exercise Training Regimen in Heart Failure with Preserved Ejection Fraction.* JAMA

*This article received national press

AWARDS AND ACCOMPLISHMENTS



Congratulations to **Jessica Mackert**, a graduate student mentored by **Drs. Ann Tallant** and **Patricia Gallagher**, for winning the Student Basic Science Silver award out of over 50



submissions in total this year for her project titled, Muscadine Grape Extract Inhibits Trastuzumab-Sensitive and -Resistant HER2 Positive Breast Cancer And Reduces Trastuzumab-Induced Cardiotoxicity.



Dr. David Soto-Pantoja received 3rd runner up in the Research Scientist Category at the 6th Annual Immuno-Oncology Young Investigators' Forum. This award was for demonstrating excellence, leadership, and a dedicated commitment to the field of immune-oncology research.



Dr. Patricia Gallagher was listed in Forbes Magazine as one of the top individual fundraisers for the North Carolina Leukemia and Lymphoma Society.



Dr. Jennifer Krall has been selected to receive a 2021 ATS (American Thoracic Society) International Conference Abstract Award in the amount of \$500. The title of her abstract is, "Leukocyte Kinetics in Acute Lung Injury (ALI)-Associated Skeletal Muscle Wasting and Recovery." Her abstract was selected based on the quality, as reviewed by the Assembly on Critical Care Program Committee Chair.



Dr. Dalane Kitzman has been selected as the recipient of the 2021 Michael L. Pollock Established Investigator Award in recognition of his outstanding work in the field of cardiac rehabilitation. This award, which is given on behalf of the American Association of Cardiovascular and

Pulmonary Rehabilitation, is presented to an individual who has made significant advances in the field of cardiac rehabilitation through his/her research and scholarly contributions and has earned national prominence in his/her field through contributions in contemporary research and/or education. Dr. Kitzman will be recognized for this award at the 36th AACVPR annual meeting in San Antonio, Texas this October.



Drs. Andrew South, Debra Diz, and Mark Chappell have won the AJP-Heart Circulation 2020 Impact Award for their article titled, "COVID-19, ACE2, and the



Cardiovascular Consequences." The article was cited 288 times in 2020 and ranked in the top 5% of all research outputs ever tracked (>17 million). The article will be announced as the winner of the award during the AJP-Heart and Circulation Meet the Editor virtual event at Experimental Biology 2021 on Thursday, April 29 at 12:00 PM EDT.



Medical Center Boulevard
Winston-Salem, NC 27157
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Good News!

Wake Forest School of Medicine Cardiovascular Sciences Center

Summer 2020



CVSC Continues to be Productive Despite the Pandemic!



Dr. Kavanagh



Dr. South



Dr. Williams

Even though the COVID-19 pandemic has slowed much of our day to day activities to a crawl, members of the CVSC have been using this time as an opportunity to be extra productive! Between the months of April and August, members of the Cardiovascular Sciences Center have published a total of **198 manuscripts** in peer-reviewed journals. Out of that number, **21 of those manuscripts** were written with a CVSC member as first author. While several of these publications are COVID-19 related, topics range from heart failure to aging, stroke research to cancer research, and many things in between. The CVSC would like to spotlight two of those first authored publications. **Kylie Kavanagh, VMS**, published her manuscript titled, “Biomarkers of Senescence in Non-human Primate Adipose Depots Relate to Aging” in Geroscience. This manuscript has been retweeted 10 times on the Twitter platform. **Andrew Michael-South, MD, MS**, was first author on the publication titled, “COVID-19, ACE2, and the Cardiovascular Consequences” which was published in May in American Journal of Physiology: Heart Circulatory Physiology. This publication has already been cited 111 times and ranked a 142 Attention score which places it in the top 5% of all research outputs ever tracked (out of over 15 million research outputs). Many faculty members have also been using this time to apply for new funding. During the months of April -August, there were **106** new grants awarded to CVSC faculty members. **39 faculty** from **18 different departments** were either a PI or Co-I on these projects. The total dollars awarded were **\$53,909,210!** **Timothy Williams, MD**, recently received yet another large Department of Defense research grant to study issues related to acute hemorrhagic shock resuscitation in the amount of \$998,486. This is his 3rd major award as PI and his 4th major grant award in total received in the last 18 months.

Austin's Data Tips and Tools



Unearthing Data with Principal Components Analysis

If you have ever worked with high dimensional data with no clear target variable of interest, you might have found it hard to know where to start your analysis. This type of situation might be cause for an unsupervised learning approach. Unsupervised learning involves building a model with no specified target variable. One method that aids in this is Principal Components Analysis or PCA for short. PCA aims to reduce the dimensions of the data. For example, we can take thousands of columns of genetic data and reduce it to just two or three dimensions or components. In short, PCA projects the data down into the direction/dimensions that explains the most amount of variance thus reducing dimensionality. The primary results are the principal component scores given to each observation in the data. These scores aren't directly interpretable but can be used to cluster similar observations together or used in principle components regression as predictors.

PCA can be done with software packages such as SAS, Python, R and JMP. In SAS, the procedure PROC PRINCOMP can be used to perform this analysis. This procedure outputs covariance and correlation measures as well as the principal component scores for each observation in the data and a lot more.

If you would like to talk more about PCA, data analysis, or just life in general don't hesitate to reach out to me!

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*Austin is a biostatistician joining our team from the Institute for Advanced Analytics, North Carolina State University where he graduated earlier this year. Welcome to the team, Austin!

In the News



Dr. Gallagher

Patricia Gallagher, PhD, was interviewed for the podcast "Naked Scientist" for the BBC on ACE2 the COVID-19 receptor and for the magazine Garden & Guns on the research by the multi-investigator team investigating a proprietary muscadine grape extract. Dr. Gallagher was also interviewed for NC State electronic newsletter and provided a summary of the research by the multi-investigator team investigating a proprietary muscadine grape extract and a discussion of the difference between a pharmaceutical and a nutraceutical. Read the interview here:

<https://smallfruits.cals.ncsu.edu/2020/06/critical-article-muscadines-health-benefits/>

Andrew M. South, MD, who is an expert contributor to and part of the NephJC COVID-19 and ACE2 in Cardiovascular, Lung, and Kidney Working Group, recently had work published on the NephJC website blog. The manuscript is titled, "The Coronavirus Conundrum: ACE2 and Hypertension Edition" NephJC Sparks MA, Hiremath S et al. Read the blog here:

<http://www.nephjc.com/news/covidace2>



Dr. Chappell

Mark C. Chappell, PhD, FAHA, recently did a podcast for AJP-Heart and Circulatory Physiology on the topic of COVID-19, ACE2 and the Cardiovascular Consequences on Apr 30, 2020, based on the review by Andrew M. South, Debra I. Diz, and Mark C. Chappell titled, "COVID-19, ACE2, and the cardiovascular consequences" *Am J Physiol Heart Circ Physiol*, published April 13, 2020. Listen to the podcast here <https://ajpheart.podbean.com/e/covid-19-ace2-and-the-cardiovascular-consequences/>



The section of Cardiovascular Medicine is pleased to announce that we now have a Twitter page! Follow us @WFCardiology on Twitter!

Invited Presentations



Dr. Willey

Jeffery Willey, PhD, has been invited to give a talk at the NCI-Radiation Research-NASA Workshop, Countermeasures Session in May, 2021. The title of his talk will be, “Protection Against Radiation-induced Skeletal Toxicity.” Dr. Willey has also been invited Dose Radiation and Bone” in March, 2021, in addition to his invited lecture as part of the Seminar Series in the Department of Biomedical Engineering at Rensselaer Polytechnic Institute on Radiation-Induced Skeletal Toxicity in October, 2021.

Patricia Gallagher, PhD, was an invited speaker at the Leukemia & Lymphoma Society Virtual Executive Launch on June 25th.



Dr. Shapiro

Michael Shapiro, DO, MCR, FACC, has been invited to speak at five virtual scientific meetings including the Society of Cardiovascular Computed Tomography Scientific Sessions, the Oregon Chapter of the American College of Cardiology, the Portland Lipid and Prevention Club, and the Cardiovascular Fellows Boot Camp at Houston Methodist. Topics he discussed included, Biomarkers and Imaging in CVD Prevention, adoption of calcium scoring, incorporating CTA plaque into individual prevention decisions, and Charting a career in Preventive Cardiology.

Mark Chappell, PhD, FAHA, has been invited to speak at the AHA Council on Hypertension Scientific Sessions 2020, which is being held virtually. The title of the talk is “Neprilysin Inhibitors and the Cardiovascular System”.

Events

Save the Date: Winston-Salem Heart & Stroke Walk, Sunday, October 18, 2020 at Bailey Park (1:30-3:00)

Debra Diz, PhD, and Mark Chappell, PhD, will again donate \$100 to the first 15 people who sign up with Team Hypertension. Kenya Little can assist with online team sign up. The link to join the team or donate is:

<http://www2.heart.org/goto/HypertensionWFBH> [heart.org].

Cardiovascular Medicine Research Grand Rounds is going virtual! Grand rounds will begin Friday, September 11 (7:30-8:30 am) and will be streamed via WebEx. Our list of guest lecturers includes:



Ana Barac, MD, PhD, FACC
Georgetown University
September 25, 2020



David Morrow, MD
Harvard University/
Brigham and Women's
December 4, 2020



Thomas Porter, MD
University of Nebraska
November 20, 2020



Samar El Khoudary, PhD, MPH, FAHA
University of Pittsburgh
May 21, 2021



Christopher O'Connor, MD
Inova Heart and Vascular Institute
October 23, 2020

Accomplishments and Awards



Morgana Mongraw-Chaffin, PhD, MPH, FAHA, was elected a Fellow of the American Heart Association. Her accomplishment was announced at the AHA Epi/Lifestyle conference in March.

Dr. Mongraw-Chaffin

Jeffery Willey, PhD, was invited to serve as an Instructor in NASA's STAR (Spaceflight Technologies, Application, and Research) Academy, to be held at the NASA Ames Research Center and also virtually throughout 2020-2021. Dr. Willey also served as Director for 2 Red Risk Schools for NASA (April and June, 2020) and the Translational Research Institute for Space Health, teaching risks to astronaut health during spaceflight to investigators, entrepreneurs, clinicians, and educators, specifically focusing on risk caused by Radiation, and risks to Behavioral Health. There were 2310 registrants for 10 virtual sessions, with 1520 attendees.

On May 27, 2020 **Jessica Mackert**, a graduate student mentored by **Ann Tallant, PhD** and **Patricia Gallagher, PhD** was named a finalist in the American Society for Nutrition's (ASN) Student Interest Group Award Program, an educational activity that recognizes students presenting outstanding research.

Charles German, MD, was elected onto the American Heart Association LIFESTYLE Obesity Committee and LIFESTYLE Physical Activity Committee.

Brett Frye, PhD, was awarded a fellowship in the Internal Medicine, Gerontology T32 training program starting June 1, 2020. She will be continuing her training in Dr. Carol Shively's lab. Dr. Frye was also selected to participate in the 2020 Butler-Williams scholars Program sponsored by the National Institute on Aging (July 2020).



Dr. Cheng

This year's AHA Scientific Sessions will be a completely virtual experience and Dr. ChePing Cheng's lab is ready for the event! This year, Dr. Cheng and her lab have 13 accepted abstracts and each one will also be published in Circulation. Members of the team include: **ChePing Cheng, MD, PhD; Heng-Jie Cheng, MD, PhD; Yixi Liu, MD, PhD; Xiaoqiang Sun, MD, PhD; Jing Cao, MD, PhD; Zhi Zhang, MD, PhD.**

Several Cardiovascular Medicine fellows have abstracts accepted at AHA Scientific Sessions this year. **Charles German, MD**, (2 abstracts), **Mahesh Chandrasekhar, MD** (with **Geoffrey Jao, MD**), and **Wei Zhang, MD**, all have accepted abstracts for the virtual conference.

Four posters from the labs of **Ann Tallant, PhD, Patricia Gallagher, PhD, and Katherine Cook, PhD**, were presented virtually at the 2020 American Society of Nutrition Meeting.



Dr. Shaltout

Hossam Shaltout, PhD, has an abstract accepted for presentation at the American Heart Association Hypertension Council Meeting (virtual) in September. The title of his presentation is "Vitamin D Supplementation Improves Autonomic Response to Head Up Tilt in Adolescents Suffering from Orthostatic Intolerance."

Accomplishments and Awards Cont.



Dr. Michalson

Kristofer T Michalson, DVM, PhD, has been selected as the recipient of the 2020 *Radiation Research Editors' Award* for his 1st authored manuscript “*Monocyte Polarization is Altered Post-Irradiation in Male Rhesus Macaques: Implications for Delayed Effects of Acute Radiation Exposure*” which appeared in the August 2019 publication of *RADIATION RESEARCH* 192, 121-134. Dr. Michalson's co-authors were **Drs. Andrew MacIntyre, Greg Sempowski, Dan Bourland, Tim Howard, Greg Hawkins, Greg Dugan, J. Mark Cline and Thomas C. Register.**

David Soto-Pantoja, PhD, received the 3rd Runner Up 2020 Research Scientist Award at the Immuno-oncology young investigators (IOYIF) forum. The title of his project was, “Cell Bioenergetics as a Potential Clinical Biomarker of Immune Checkpoint Therapy Response.”



Dr. Pu

Min Pu, MD, PhD, received the 2020 Timothy C. Pennell International Fellowship Fund award for creating echo educational case database for WFSOM. The funding was to support a 2-month visiting clinician from China so that she could learn the POCUS program and echo advanced imagining technologies available in the US. Unfortunately, COVID-19 travel restrictions prevented the visit.

The 2020 AHA Council on Hypertension Scientific Sessions will be a completely virtual experience. Hypertension faculty and trainees have **10 accepted abstracts** and each one will also be published in *Hypertension*. CVSC faculty members who have abstracts accepted include **Mark Chappell, PhD, Nildris Cruz-Diaz, PhD, Debra Diz, PhD, Patricia Gallagher, PhD, Tanya Gwathmey-Williams, PhD, Hossam Shaltout, PhD, Ann Tallant, PhD, Stacey Wolfe, MD, and Liliya Yamaleyeva, PhD.** The AHA Council on Hypertension abstract from **Nildris Cruz-Diaz, PhD**, as 1st author was selected for an oral presentation: “*Glyburide Treatment Improves Aortic Arch Pulse Wave Velocity (PWV) in a Murine Model of Alzheimer's Disease sure*”. The work represents a new collaboration with senior author Dr. Shannon Macauley. Other co-authors include Stephen Day, Andy Snipes and Debra Diz.



Dr. Shapiro

Michael Shapiro, DO, MCR, FACC, has been very busy these days, having 10 abstracts accepted at national meetings since April. Two abstracts accepted at the American Society of Echocardiography, two abstracts accepted at the American Society of Preventive Cardiology-Virtual Summit on CVD Prevention, and six abstracts accepted to American Heart Association Scientific Sessions.

Career Development

2020 Summer Research Programs

The Cardiovascular Sciences Center and Sticht Center for Healthy Aging and Alzheimer's Prevention hosted two summer research programs: the Excellence in Cardiovascular Sciences (EICS) summer research program directed by Ann Tallant and Debra Diz, which has been ongoing for >25 years, and a new program, Enhancing Undergraduate Education and Research in AGing to Eliminate Health Disparities (ENGAGED – joint program with WSSU and WFU), directed by Tina Brinkley and Debra Diz. Drs. Brinkley, Diz, Gwathmey and Tallant converted the 2020 summer programs into an online format held June 1 - July 31, 2020. The following 25 trainees and mentors participated in the programs:

Student Name	Mentor	Department
(ENGAGED)		
Ikenna Okoro	Rong Chen	Physiology and Pharmacology
Venay Wilkins	Monique Bethell	Maya Angelou Center for Health Equity
Alexis Delapuenta	Amy Pulliam	Maya Angelou Center for Health Equity
Morris Brown	Monique Bethell	Maya Angelou Center for Health Equity
Tajauna Batchelor	Gary Miller	Health and Exercise Science (WFU)
Abbey Kampel	Gary Miller	Health and Exercise Science (WFU)
Kathleen Kwon	Giselle Melendez	Cardiovascular Medicine
Ismael Muhammad	Giselle Melendez	Cardiovascular Medicine
David Morton	Jason Fanning	Health and Exercise Science (WFU)
Dustin Sellers	Ashley Weaver	Biomedical Engineering
Ayana Loudon	Kristen Beavers	Health and Exercise Science (WFU)
(EICS)		
LeAndria Norwood	Rong Chen	Physiology and Pharmacology
Claudio Gomez-Ascencio	David Soto-Pantoja	Hypertension Vascular Research Center
Aliah Harris	Nicole Levi	Plastic and Reconstructive Surgery
Joshua Chaj-Ulloa	Nicole Levi	Plastic and Reconstructive Surgery
Shannon Kelty	Jessica Mackert	Hypertension Vascular Research Center
De'Shabrion Williams	David Soto-Pantoja	Hypertension Vascular Research Center
Seth Campbell	Jeff Willey	Radiation Oncology
Alexis Cunningham	Andrew South	Pediatrics
Adrianna Brown	Jeff Willey	Radiation Oncology
Nathana Murray	Nicole Levi	Plastic and Reconstructive Surgery
Landon Bradshaw	Andrew South	Pediatrics
Kayla Jenkins	Leah Solberg-Woods	Molecular Medicine
Kristen Long	Leah Solberg-Woods	Molecular Medicine

These undergraduate students were selected from all over the country and participated in research topics related to aging and cardiovascular disease, as well as health disparities. Current events topics ranged from COVID-19 to racism/social inequity and injustice and the impact of these on minority health. Guest speakers were from Howard University, Winston-Salem State University, Wake Forest University, and Nova Southeastern University, as well as Wake Forest School of Medicine. Panels of current and former graduate school and diversity-focused training program participants provided career insights in several professional development sessions. Students participated in sessions on data collection relevant to cardiovascular sciences and aging-related research, including blood pressure and gait speed. The summer sessions ended with trainee presentations of virtual research projects developed with their mentors over the course of the summer program. We thank the students, mentors and journal club leaders for taking on the challenge of daily sessions in WebEx format for this inaugural undertaking!

Good News!

Wake Forest School of Medicine Cardiovascular Sciences Center

First Quarter 2020



CVSC Faculty Contribute to National Guidelines and Scientific Statements about ACEis and ARBs in COVID-19 Infections



Dr. South

The enzyme Angiotensin Converting Enzyme 2 (ACE2), which degrades the pro-hypertensive hormone Angiotensin II to form the counter regulatory peptide Ang-(1-7), is also the co-receptor for SARS-COV-1 and the new coronavirus SARS-COV-2. Recognition of ACE2 as a factor in COVID-19 has increased interest in publications on regulation and function of ACE2 by CVSC faculty in Hypertension and Vascular Research (HVR). Interest in recent publications on the Renin-Angiotensin System (RAS) in children and young adults by **Dr. Andrew South, MD, MS**, Assistant Professor, Department of Pediatrics, CVSC and HVR with perinatal research colleagues (**Drs. Washburn, Chappell, Shaltout, Diz, Jensen**) led to Dr. South's role as an expert contributor on the NephJC website and the NephJC COVID-19 and ACE2 in Cardiovascular, Lung and Kidney working group (<https://cjasn.asnjournals.org/content/early/2020/03/27/CJN.03530320>), among other society guideline publications. A first

author Perspective for American Journal of Physiology: Heart and Circulation co-authored by **Drs. Diz and Chappell** (<https://journals.physiology.org/doi/abs/10.1152/ajpheart.00217.2020>) addresses the need for information related to the regulation of ACE2 and continued use of the antihypertensive ACE inhibitors and AT1 receptor blockers during COVID-19. **Drs. Gwathmey and Brosnihan** [Bioanalytical Core Laboratory (BAC)] and **Dr. Chappell** are part of internal and external collaborations for expertise on measurements of the RAS.



Dr. Chappell

IN THIS ISSUE:

- ▶ Scientific Contributions to COVID-19 Infections
- ▶ Grants
- ▶ Diego's Data Tips & Tools
- ▶ Publications
- ▶ Invited Presentations
- ▶ Accomplishments/Awards
- ▶ In the News
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Grant Awards by CVSC Faculty July-December 2019

During the time period of December 15, 2019, -March 25, 2020, there were **28** new grants awarded to CVSC faculty members. **22** different CVSC faculty from many areas of the institution were either a PI or Co-I on these projects. The total dollars awarded were **\$10,284,248!** Below we highlight a few of the top awardees.



Justin Moore, PhD
R21- "A Coordinated Parent/Child Dyad Weight Loss Intervention: Dyad Plus"
Key Personnel: **Jamy Ard, MD**
\$201,094



Chad Miller, MD
National Foundation of Emergency Medicine Training Grant- "NFoEM Scholar/Mentor Program"
\$30,000



Kiran Solingapuram Sai, PhD
R01- "Evaluating Microtubule Binding As a Potential Imaging Biomarker for Alzheimer's Disease"
Key Personnel: **Suzanne Craft, PhD**
\$499,595



Tina Brinkley, PhD, and collaborators: Mechanisms Underlying Cerebrovascular Dysfunction in Obesity and Weight Loss was funded by the CVSC for 1 year at \$30,000.



Genesio Karere, PhD was the recipient of a basic/translational pilot award from CTSI/co-funded by the CVSC. The title of his project is, "MicroRNA-gene Networks Underlying Early Coronary Atherosclerosis."



Stacey Wolfe, MD, and collaborators: "The Effect of Cardiometabolic Disease on the Neuroinflammatory Response after Intracerebral hemorrhage in the hypertensive Ren-2 transgenic rat" was funded by CVSC for 1 year at \$30,000.



Lindsay Reynolds, PhD, received CTSI Pilot funding for: A Feasibility Study Incorporating DNA Methylation-Predicted Aging with a Dietary Intervention to Improve Cardiometabolic Health co-funded by the Cardiovascular Sciences Center.



Timothy Williams, MD received two grant awards from the Department of the Army. The two projects were titled, "Portable Device for Rapid Vascular Access in Trauma and Hemorrhage Control" and the other is, "Evaluation of Partial Flow Strategies in Hemorrhage and Traumatic Brain Injury with Endovascular Variable Aortic Control." One of the awards is with Wake as the prime, for \$1 million. The other is with Wake as a sub-awardee, for \$400K.



David Soto-Pantoja, PhD
American Cancer Society- "Targeting CD47 Prevents Cancer Therapy Adverse Effects"
Key Personnel: **Giselle Melendez, MD**
\$782,000

Accomplishments and Awards



Dr. Otaki

Yoshi Otaki, MD, PhD, was accepted to the American Association of Thoracic Surgery and will be inducted during a ceremony in New York on April 25th.

Congratulations to **Lauren West-Livingston** (Vascular Surgery) on receiving her PhD (mentors are **Gabriela Velazquez-Ramirez, MD**, and **Randolph Geary, MD**)

Brett Frye, MD, was appointed to the Gerontology T32 and was accepted into the CTSI K&R Writers Series led by **Debra Diz, PhD**, and **Barbara Nicklas, PhD**.

Kenysha Clear from **Dr. Katherine Cook's** lab has been accepted into Wake Forest Graduate School.



Gabriela Velazquez-Ramirez, MD, was promoted to Associate Professor of Vascular and Endovascular Surgery as of July 1, 2020

Andrew Michael South, MD, became a member of the Mid-West Pediatric Nephrology Consortium and the Neonatal Kidney Collaborative.

Dr. Velazquez-Ramirez

David Soto-Pantoja, PhD, has been invited to serve in the Florida Breast Cancer Foundation Study Section.

CV COE Faculty Publications from January—March 2020

Over the last three months, Wake Forest School of Medicine CV COE faculty published **84 manuscripts** in peer-reviewed journals including *PLoS One*, *JAMA Cardiology*, *Hypertension*, *JACC*, and *Circulation*. Below are a few articles from the list. All of the publications can be found at <https://www.ncbi.nlm.nih.gov/sites/myncbi/1JSeQsdreOokM/collections/59382808/public/>



Dr. Groban

Leanne Groban, MD, in collaboration with other CVSC colleagues including **Cheping Cheng, MD**, **Dalane Kitzman, MD**, and others, recently published their manuscript titled, “Female Heart Health: Is GPER the missing link?” in *Front Endocrinology*.



Dr. Schaich

Christopher Schaich, MS, PhD, et al, published a manuscript titled, “Amyloidosis of the Brain and Heart: Two Sides of the Same Coin?” in *JACC Heart Failure*.



Dr. German

Charles German, MD, was first author on a manuscript published in the *American Journal of Cardiology*, titled, “Relations between Physical Activity, Subclinical Myocardial Injury, and Cardiovascular Mortality in the General Population.”



Dr. Upadhy

Bharathi Upadhy, MD, and **Dalane Kitzman, MD**, published their manuscript titled, “Heart Failure with Preserved Ejection Fraction: New Approaches to Diagnosis and Management” in *Clinical Cardiology*.

Invited Presentations



Dr. Soto-Pantoja

David Soto-Pantoja, PhD, has been invited to talk on a panel at the Integrating Metabolism and Immunity Keystone Symposia in Colorado April 4-8, 2020. He was also invited to give a talk at the 6th Annual Immuno-Oncology Young Investigators' Forum (IOYIF) being held at The Houstonian Hotel, April 16-18, 2020. In addition to these invited presentations, Dr. Soto-Pantoja was also invited participate as a speaker at the National Institute of Environmental Health Sciences on April 15th.

Jason Stopyra, MD, MS, had three HEART Pathway Implementation abstracts accepted for presentation at the Society for Academic Emergency Medicine meeting. These abstracts were titled, “HEART Pathways Implementation safely Reduces Hospitalizations at 1-Year in Patients with Acute Chest Pain,” “Age Differences in the Safety and Effectiveness HEART Pathway Accelerated Diagnostic Protocol,” and “Sex/Race Differences in Safety and Effectiveness of a Chest Pain Accelerated Diagnostic Protocol at 1-Year.”



Dr. Melendez

Giselle Melendez, MD, was invited to give a talk titled, “Cardiac Fibrosis and Heart Failure with Chemotherapies” during the Cardio-oncology: Cancer, Chemotherapy and CVD Risk session at the North American Artery Meeting. Also of note, **Tina Brinkley, PhD**, is on this year's NAA program committee [Conference canceled due to COVID-19].

Catherine Tegeler will present a poster presentation at the American Academy of Neurology annual meeting in Toronto Canada, April 25th to May 1st, titled, “A Pilot, Placebo-controlled Trial of Cereset Research-Standard Operating Procedures for Insomnia.” Authors on the project are **Catherine Tegeler**, **Lindsay Howard**, **Kenzie Brown**, **Dawn Kellar**, **Lee Gerdes**, **Charles Tegeler, MD**, and **Hossam Shaltout, PhD**. [Conference canceled due to COVID-19].



Dr. Cook

Katherine Cook, PhD, was invited to be the 2020 Louise M. Nicosia Lecturer on Women's Cancer Research at the University Of South Florida Morsani College Of Medicine March 18th in Tampa, FL.

Debra Diz, PhD, was scheduled to speak at the American Journal of Physiology-Heart and Circulatory Physiology Editors Symposium at the EB Meeting in San Diego, CA on Monday, April 6th, 2020. The title of her presentation is “Fetal Programmed Angiotensin-(1-7) Deficiency and Sex Differences in Brainstem Signaling Pathways in Sheep.” [Conference canceled due to COVID-19].

Diego's Data Tips and Tools



When dealing with a categorical response variable with more than two levels, there are two strong reasons for preferring models that take the ordering into account:

- 1) They are more straightforward, and therefore easier to interpret
- 2) Hypothesis tests are more powerful

The disadvantage of ordered models is that they impose restrictions that may not be consistent with the data. So whenever you use an ordered model, it's important to test whether its restrictions are valid.

This tutorial will focus on ordinal logistic regression (where there is an inherent ordering to the categories). For this tutorial, we'll use the cumulative logit model – aka the ordered logit or ordinal logit model – which is widely applicable and also happens to be the easiest to implement in SAS. Whenever PROC LOGISTIC encounters more than two categories on the dependent variable, it automatically estimates a cumulative logit model. So to run this model, you will write the same SAS code you would for binary logistic regression. You'll notice your output is very similar to a simple PROC LOGISTIC other than the appearance of the table Score Test for the Proportional Odds Assumption – it's sufficient to say that this statistic tests whether the ordinal restrictions are valid, and high p-values are desirable.

The default of the model is to predict the probability of being a lower category rather than a higher category. If you want the probability of being in the j th category or higher, or in other words, you want the model to predict the probability of being in a higher category, then use the DESCENDING option in the MODEL statement. The model defaults to predicting the probability of being in a lower category so each reported odds ratio can be interpreted as the effect of the variable on the odds of being in a lower rather than in a higher category. As a very rough rule of thumb, it's reasonable to estimate a cumulative logit model if there are at least 10 observations for each category on the dependent variable. As the number of categories on the dependent variable gets larger, ordinary linear regression becomes an attractive alternative, especially if the distribution of cases is not highly skewed.

You still need to check for problems of multicollinearity, the way you would typically do in any regression problem. Ordinal logistic regression is even easier in JMP - just make sure your variable type is correct before hitting Fit Model. I can expand upon this nonmathematical explanation with its derivation when you swing by my office!

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In the News



Dr. Kutcher holding baby Nova
with mother, Brittany

On November 8th, 2019, a baby was born in the Cardiac Cath Lab. The mother was under the care of **Michael Kutcher, MD** after she suffered a rare type of heart attack. On November 3rd, 2019, the expectant mother had a spontaneous coronary artery dissection and underwent emergency stenting on her left main coronary artery. During the procedure, she sustained cardiac arrest. Five days later, baby girl Nova was born via cesarean in the cath lab so that Dr. Kutcher and his team could perform advanced cardiac intervention in the event she went into cardiac arrest during the procedure. In the end, the patient gave birth to a healthy baby girl without cardiac events for either the mother or child. News reports on this exciting event were published in US News and the Winston-Salem Journal as well as a feature on Good Morning America.



Dr. Zhao with Mr. Christopher G. Sawyer, son of
Dr. C. Glenn Sawyer

On December 13, 2019, the Cardiovascular Medicine Conference room located in Watlington Hall, was rededicated to Dr. C. Glenn Sawyer. Dr. Sawyer helped create the medical school's section on Cardiology and served as chair of the section from 1973 to 1981. As one of his many contributions to the school, Dr. Sawyer and his wife Betsy endowed the C. Glenn Sawyer Scholarship at the WFSM which provides significant financial support to medical students. During the rededication ceremony, **Dr. David Zhao** gave the introduction and welcome, while Dr. Sawyer's son, Mr. Christopher G. Sawyer gave remarks to honor his late father. A portrait of Dr. Sawyer now hangs in the conference room.

Events

The Women Faculty Pinning Ceremony was held February 11th at the Babcock Auditorium. The ceremony honored the achievements of our women faculty leaders who were among the first full professors in the history of the institution. **Drs. Bridget Brosnihan (#5), Debra Diz (#14), Ann Tallant (#37), and Patricia Gallagher (#78)** were among those receiving pins, as well as many other female CVSC members.



Career Development Corner

2020 Summer Research Programs

Within the Cardiovascular Sciences Center, we now have 2 summer programs—the Excellence in Cardiovascular Sciences (EICS) summer research program which has been ongoing for many years and a new program, **Enhancing UNderGraduate Education and Research in AGing to ELiminate Health Disparities (ENGAGED)** program (**Debra Diz and Tina Brinkley, Co-Directors**), which will address the need to increase the diversity of biomedical scientists involved in aging research and the dearth of under-represented (UR) trainees in graduate programs in the biomedical sciences, particularly in aging-related fields. Our plan is to hold the programs together, from May 31st to July 31st. Twenty-four (24) undergraduate students will spend the summer in research laboratories (basic or clinical) on our campus, to learn about biomedical research. We had a number of outstanding applicants, from all over the continental US, and many students have already accepted our invitation to participate in the summer programs. Our NHLBI- and NIA-funded program pays for the stipend, travel and housing cost during the summer for each participant—the only costs to the faculty hosts are expenses related to the research project. If you are interested in hosting one of our students this summer, please contact Dr. Ann Tallant (atallant@wakehealth.edu), Dr. Debra Diz (ddiz@wakehealth.edu) or Dr. Tina Brinkley (tbrinkle@wakehealth.edu). The students, selected based on their academic records and their interest in biomedical research, work in the laboratory for 9 weeks and present a poster of their work at the end of the summer. It is very rewarding to watch these undergraduate students learn about biomedical research and subsequently follow their careers as biomedical scientists.

Good News!

Wake Forest School of Medicine Cardiovascular Sciences Center

Second Quarter 2019



Editors' Choice: Mediterranean Diet Improves Diabetes Risk and Metabolism



Dr. Shively



Dr. Appt



Dr. Vitolins



Dr. Uberseder



Dr. Michaelson



Dr. Silverstein-Metzler



Dr. Register

The Obesity Society has chosen one of Comparative Medicine's/Clarkson Campus' studies as an **Editors' Choice** article for the May issue of Obesity. Articles chosen as Editors' Choice are handpicked by the editors and promoted to the media via a monthly embargo alert. Authors are Drs. Carol Shively, Susan Appt, Mara Vitolins, Beth Uberseder, Kristopher Michalson, Marnie Silverstein-Metzler, and Thomas Register. View the full article here:

<https://onlinelibrary.wiley.com/doi/10.1002/oby.22436>

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 **Wake Forest**
School of Medicine

CV COE Faculty Publications from April-July 2019

Over the last three months, Wake Forest School of Medicine CV COE faculty published **118 manuscripts** in peer-reviewed journals including *JAMA*, *Circulation*, *Lancet*, and *Nature Genetics*. Below are a few articles from the list. All of the publications can be found at <https://www.ncbi.nlm.nih.gov/sites/myncbi/IJSeQsdreOokM/collections/58713849/public/>



Dr. John Parks and colleagues recently had an article published in *Arteriosclerosis, Thrombosis, and Vascular Biology* titled, "Targeted Deletion of Hepatocyte Abca1 Increases Plasma HDL Reverse Cholesterol Transport via Biology."

John Parks, PhD

Dr. Dalane Kitzman co-authored an AHA/ACC scientific statement titled, "Home-Based Cardiac Rehabilitation is an Option to Overcome Barriers of Traditional Cardiac Rehabilitation," which was published in *Circulation* on May 13, generated an estimated 115,038,510 media impressions, meaning it was featured in media outlets with a potential combined total circulation of that amount. In addition, this article had an additional 80,705 views via the AHA social media channels.

Dr. Alain Bertoni and his fellow researchers published an article in *Circulation Cardiovascular Imaging* titled, Glycemic Markers and Subclinical Cardiovascular Disease: The Jackson Heart Study.



Lynne
Wagenknecht, PhD

Dr. Lynne Wagenknecht and colleagues published a manuscript in *PLoS Medicine* titled, "Fatty Acid Biomarkers of Dairy Fat Consumption and Incidence of Type 2 Diabetes: A Pooled Analysis of Prospective Cohort Studies."

Drs. Barbara Pisani and **TJ O'Neill** published their manuscript in *The Journal of Heart and Lung Transplantation* titled, "Too Big to Fail?"

Recent Grant Awards by CVSC Faculty



Leanne
Groban,
MD

Dr. Leanne Groban's (with Co-PI Dr. Emmanuel Opara) R21 titled, "Effects of Cell-Based Hormone Therapy on LV Diastolic Dysfunction and Hypertrophy Progression after Mid-Life Estrogen Loss was funded in early 2019 by NIA/NIH with a two-year total funding of \$435,972.

Dr. Giselle Melendez's K award titled, "Cellular Senescence: A Novel Mechanism of Doxorubicin-Induced Cardiotoxicity" recently received funding. The study will examine cellular senescence and associated mitochondrial dysfunction and their links to myocardial fibrosis and left ventricular (LV) dysfunction induced by Anthracycline therapy. Dr. Melendez will receive funding from the NIH/NHLBI in the total amount of \$584,049 from 2019 through 2024.



Giselle
Melendez, MD



Kylie
Kavanagh,
DVM,
MS, MPH

Dr. Kylie Kavanagh's Summer Veterinary Student Research Fellows program at Wake Forest has been awarded \$60,772 through 2024. This proposed summer research program seeks to expose veterinary students to biomedical research through practical experience.

Dr. Dalane Kitzman's collaborative MESA grant application with pulmonary titled, SPIROMICS, received a perfect score and is scheduled to be funded by the NIH with a preliminary budget of \$619,375 for a period of 5 years. Dr. Kitzman is a coinvestigator on the project, which examines interactions between pulmonary dysfunction and heart failure.

In the News

Beginning in March, four of our Wake Forest Baptist Health Cardiologist began seeing patients at our newly opened Heart and Vascular Practice in Elkin. Our physicians will provide general cardiology care and the clinic is conveniently located next to Hugh Chatham Memorial Hospital where diagnostic testing can be performed if needed. **Dr. David Kay** will be leading the practice along with his team of skilled and highly qualified board certified cardiologists, **Drs. Maria “Octavia” Rangel, Walter Tan, and Li Zhou.** Read the news release here:

<https://newsroom.wakehealth.edu/News-Releases/2019/03/Wake-Forest-Baptist-Opens-Heart-and-Vascular-Practice-in-Elkin>

CVSC Visiting Professors 2019-2020

We have an exciting lineup scheduled for the 2019-2020 academic year, full of top-notch **CV Medicine Research Grand Rounds** Guest Speakers. Save the date for these “can’t miss” seminars! Grand Rounds are held Friday Morning at 7:30 am in the Medical School Board Room (Gray Building, 1st Floor).



Tom Brott	Mayo Clinic (Jacksonville)	November 7, 2019
Stavros Drakos	University of Utah	December 6, 2019
Phillip Levy	Wayne State University	December 13, 2019
Ann Marie Navar	Duke University	January 10, 2020
Lynne Stevenson	Tufts Medical Center	January 24, 2020
David Goff	NHLBI	TBA
Susan Redline	Harvard University	TBA
Navin Kapur	Tufts Medical Center	TBA

Invited Presentations

Dr. Li Zhou was invited to give a poster presentation at the American Society of Echocardiography Scientific Sessions in Portland, Oregon on June 24. The title of her presentation was, “Off-Axis Imaging of the Left Ventricular Outflow Tract by Two-Dimensional Echocardiography Leads to Underestimation of Aortic Valve Area.”

Dr. Liliya Yamaleyeva was an invited speaker at the ASPET Symposium during the Experimental Biology Meeting in Orlando, Florida on April 6. The title of her talk was, “Hemodynamic Effects of Apelin in Preeclampsia” as part of the symposium, “An Apel(-in) a Day Keeps Cardiovascular Disorders at Bay?”

Lauren Eyadiel, PA-C, mentored by **Dr. Barbara Pisani**, has been invited to present her abstract titled “Should I Stay or Should I Go? A Review of LVAD Explants” at the ASAIO annual conference in San Francisco, CA, June 26-29.

Thank you to **Dr. Patricia Gallagher** for her presentation titled, “Angiotensin-(1-7): A Novel Therapeutic for Cardiovascular Disease” given during the 2019 Annual Women & Cardiovascular Health Event which took place on February 26 at Biotech Place.

Awards and Accomplishments



Karl
Richardson, MD

Dr. Karl Richardson's abstract titled, "Clinical Reasoning and HER Stewardship: Development of a Reliable Documentation Assessment Tool," received an award for top abstract in the Educational Initiatives Research category at the Alliance for Academic Internal Medicine National Conference in April. Also, congratulations to Dr. Richardson on becoming the Associate Program Director for the Internal Medicine Residency this summer.

Dr. Li Zhou came in second place receiving the Silver Award in the **Department of Internal Medicine's 13th Annual Research Symposium** on May 15. Her award was for the category of QI Research Junior Faculty and her poster was titled, "Off-Axis Imaging of the Left Ventricular Outflow Tract by Two-Dimensional Echocardiography Leads to Underestimation of Aortic Valve Area."



Fatima Ryalat

Fatima Ryalat, a graduate student mentored by **Dr. Debra Diz**, has received the 2019 Vevo Travel Award-Vascular Track sponsored by FUJIFILM Visual Sonics Inc. to attend Experimental Biology for her submission of "Muscadine Grape Extract Treatment Improves Aortic Pulse Wave Velocity and Superior Mesenteric Artery Pulsatility Index in Hypertensive Transgenic (mRen2)27 Female Rats." The abstract was presented at the Experimental Biology 2019 Sessions.

The Cardiovascular Sciences Center would like to congratulate **Dr. Jason Stopyra**, Assistant Professor in the Department of Emergency Medicine; **Dr. Parag Chevli**, Assistant Professor in the Department of Internal Medicine, Section on Hospital Medicine; and **Dr. Amer Aladin**, T32 Fellow in the Cardiovascular Research Fellowship Program of the Section on Cardiovascular Medicine within the Department of Internal Medicine. We would like to mention that **Dr. Christopher Schaich**, also a T32 Fellow in the Cardiovascular Research Fellowship Program and an instructor in Hypertension and Vascular Research, will receive his MS in Clinical and Population Translational Sciences, graduating in August this year.



Jason Stopyra, MD



Parag Chevli, MD



Amer Aladin, MD



Christopher Schaich,
PhD, MS

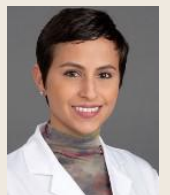
Several Cardiology faculty were the proud recipients of Internal Medicine Faculty Residency Program Awards this year.



Walter Tan,
MD

Dr. Walter Tan, Associate Professor of Cardiology, was recognized by the Internal Medicine residents by receiving the **Master Teacher Award**.

Dr. Octavia Rangel Assistant Professor of Cardiology, received the **William R. Hazzard ACM Recognition of Excellence Award** for her work in Geriatric Medicine.



Octavia
Rangel, MD



Brandon
Stacey, MD

Dr. Brandon Stacey, Associate Professor of Cardiology, received the **Clinical Science Teaching Award** from the class of 2019 and the class of 2020.

Dr. Bharathi Upadyha, Associate Professor of Cardiology, received the **Clerkship Best Teacher Award**.

2018 Top 10 papers from the Department of Internal Medicine were announced in May. Six of the top ten papers were authored by CVSC members!
 Congratulations to these outstanding authors on this accomplishment.



Hariom Yadav, PhD: “Human-Origin Probiotic Cocktail Increases Short-Chain Fatty Acid Production Via Modulation of Mice and Human Gut Microbiome”

Hariom Yadav, PhD

Leah Solberg Woods, PhD: “Genetic Fine-Mapping and Identification of Candidate Genes and Variants for Adiposity Traits in Outbred Rats”

David Herrington, MD, MHS: “Proteomic Architecture of Human Coronary and Aortic Atherosclerosis”

Barry Freedman, MD, FACP: “FGF23 Concentration and APOL1 Genotype Are Novel Predictors of Mortality in African Americans with Type 2 Diabetes.”



Barry Freedman, MD, FACP



Dalane Kitzman, MD: “Regional Adipose Distribution and Its Relationship to Exercise Intolerance in Older Obese Patients Who Have Heart Failure with Preserved Ejection Fraction.”

Dalane Kitzman, MD

Deanna Jones, MD: “Frequency of Transition from Stage A to Stage B Heart Failure after Initiating Potentially Cardiotoxic Chemotherapy.”



Timothy Hughes, PhD: “Arterial Stiffness and Dementia Pathology: Atherosclerosis Risk in Communities (ARIC)-PET Study.”

Timothy Hughes, PhD

CV Medicine Faculty Awards

At the close of every academic year, the graduating group of Cardiovascular Medicine fellows present awards to faculty whom they have been mentored by over the duration of their CV Medicine fellowship. These awards are voted on by the fellows and presented to the faculty at the graduation dinner in June. The recipients of the awards are considered by the fellows to be dedicated to providing outstanding education and support throughout their training and are looked to as one of the best teachers in their respective fields. Congratulations to the following award recipients!

Prashant Bhawe, MD - Overall Faculty Award

Sanjay Gandhi, MD - Invasive Faculty Award

Bharathi Upadhyya -Non-Invasive Faculty Award



Prashant Bhawe, MD



Sanjay Gandhi, MD



Bharathi Upadhyya, MD



2018-2019
 CV Medicine Fellows

Events

The **2019 Annual Women & Cardiovascular Health Event**, which was held on February 26 at Biotech Place, was a great success. Thank you to **Drs. David Soto-Pantoja and Liliya Yamaleyeva** for organizing and planning the event.

The **19th Annual Graduate Student & Postdoc Research Day** was Friday, March 22, at Biotech Place. More than 100 graduate students and postdoctoral fellows from over 30 academic programs from the graduate school presented poster presentations and participated in a Three-Minute Thesis Competition (3MT).

The **Women's Health Research Day** presented by Women in Medicine and Science (WIMS) was held April 17 in the Commons Conference Rooms. The title of the conference was, "What's on HER Mind? Gender Difference in Cognitive Function."

The **7th Annual Mid Atlantic PREP and IMSD Research Symposium (MAPRS)** was held at Biotech Place May 23-24 and was a huge success. Several CVSC faculty, staff and trainees participated in the 2019 MAPRS in various capacities. Thank you to all those that provided support and contributed.



Career Development Corner

On June 3, 2019, the following Excellence in Cardiovascular Sciences (EICS) summer students arrived:

Student

Julman Bottino
Rei Bufi
Maurice Johnson
Hayoung Lee
Maren Plant
Joseph White
Kaila Loera
Chelsea Salmon
Shannon Kelty
Zipporah Cornelius
Jose Luna
Shaniya Singh
Daija McKenzie
Erica Weaver

Mentor

Giselle Melendez
Chia-Chi Chuang Key
Leah Solberg-Woods
Rong Chen
Matt Quinn
Andrew Bishop
Leslie Poole
Allyn Howlett
Ann Tallant
Katherine Cook
Hariom Yadav
Nicole Levi
Andrew South
Liliya Yamaleyeva

Department

Cardiology
Molecular Medicine
Molecular Medicine
Physiology and Pharmacology
Pathology - Comparative Medicine
Molecular Medicine
Biochemistry
Physiology and Pharmacology
Surgery/Hypertension
Surgery/Hypertension
Molecular Medicine
Plastic & Reconstructive Surgery
Pediatric Nephrology
Surgery/Hypertension

Please join us for **2019 Excellence in Cardiovascular Sciences (EICS) Summer Research Program Poster Symposium**, on **Friday, August 2nd**, from 9:30 to 11:00, in the Atrium at Biotech Place. Fourteen undergraduate students from all over the country have been working in our cardiovascular laboratories during the summer and they will present posters describing their summer studies. Light snacks will be served. The symposium will be followed by a brief ceremony, to provide the students with certificates celebrating their participation in our program. Join us and let these bright young students share with you their summer studies.

Good News!

Wake Forest School of Medicine Cardiovascular Sciences Center

First Quarter 2019



WFBMC Heart Transplant Team Leads the State in 1-Year Post Transplant Survival Rates



Sherman Transou, Heart Transplant Patient with Barbara Pisani, DO

The Wake Forest Baptist Medical Center **Heart Transplant Team**, led by Director, Dr. Barbara Pisani, has been recognized as achieving a 1-year survival for 100% for the past 5 years, according to the Scientific Registry of Transplant Recipients, which is the best rating of this kind in the state of North Carolina. This registry analyzes data to provide patients with information so that they can make informed decisions regarding their transplant options. Information from the registry is listed online at www.srtr.org.

IN THIS ISSUE:

- ▶ Heart Transplant Team
- ▶ Funding and Awards
- ▶ Accomplishments
- ▶ Invited Lectures, Presentations, & Conferences
- ▶ In The News
- ▶ Events
- ▶ Publications
- ▶ Career Development Corner

 **Wake Forest**
School of Medicine

Funding and Awards



Giselle Melendez, MD

CVSC Pilot Awards went to:

Dr. Giselle Melendez Assistant Professor, Cardiovascular Medicine, for her proposal "NK-1 Receptor Blockade as a Novel Strategy to Prevent Anthracycline Cardiotoxicity in Breast Cancer and Improve Cancer Outcomes,"

and **Dr. Shivani Ghoshal** Assistant Professor, Neurology, for her proposal "Dialysis Modality Impact on Cerebral Hemodynamics."



Shivani Ghoshal, MD

Dr. Liliya Yamaleyeva was selected as a November 2018 recipient of the **Ignition Fund Pilot Award** for her project titled "Developing and Validating Assays for Measuring Circulating Peptides".



Kylie Kavanagh, VMS

Dr. Kylie Kavanagh has a recently funded **R01** titled, "Adipose Mitochondrial Quality Control and Cardiovascular Function in Metabolically Healthy and Unhealthy Obese Monkeys." Day (April 17, 2019).

Dr. Haiying Chen's project titled, "Effectiveness and Cost-Effectiveness of Glucose Lowering Medications," will be funded in collaboration with the **Center for Disease Control and Prevention (CDC)** and will study on Effectiveness and Cost effectiveness of Glucose Lowering Medications in Type 2 Diabetes. This project will leverage data collected from Action to Control Cardiovascular Risk in Diabetes (ACCORD) and Action for Health in Diabetes (Look AHEAD), two of the largest diabetes clinical trials conducted in the last decade in the United States.



Mark Chappell, PhD

Drs. Mark Chappell and Lisa Washburn

received a favorable score for their **R01 application** entitled "Uric Acid, Klotho and Salt Sensitivity in Young Adults Born Preterm" that is within the current NHLBI funding range.

Start date for the \$2.5 million award (direct cost) is July 1, 2019.



Lisa Washburn, MD

Co-Principal Investigators **Drs. David Soto-Pantoja and Lance Miller** received a pilot award from the **Cancer Center**. The title of the grant is "Metabolic & Immune Endpoints as Biomarkers of Immune-Related Adverse Events & ICB Response". In addition, Dr. Soto-Pantoja was awarded a pilot grant from the CRBM titled, "TSP1/CD47 Blockade Prevents Chemotherapy Related Cardiotoxicity."



Christopher Schaich, PhD

Dr. Chris Schaich's F32 award titled, "Heart Rate Variability as a Predictor of Cognitive Performance in the Multi-Ethnic Study of Atherosclerosis" was funded and will be activated in 2019.

Accomplishments



Deanna Jones, MD

First-year Nephrology fellow, **Dr. Deanna Jones**, received the terrific news that she has been selected as the recipient of the **JACC Young Author Achievement Award**. Deanna was selected for this award based on her manuscript titled, "Frequency of Transition From Stage A to Stage B Heart Failure After Initiating Potentially Cardiotoxic Chemotherapy, which was published in December 2018 in

JACC: Heart Failure. The award will be presented to Deanna and her mentor, Dr. Gregory Hundley, on March 16 at the 2019 ACC Scientific Sessions in New Orleans, Louisiana. After starting her research in cardiology, she has now switched gears to focus on nephrology. Her current projects include: studying urine electrolytes as a way to optimize diuretic dosing in hospitalized patients and the effects and safety of intermittent fasting and low-refined carbohydrate diets in patients with chronic kidney disease and diabetes.



Drs. Reynolds, Freischlag, and Diz

In December, **Dr. Debra Diz** received the **2018 James Edwin Byrum Distinguished Faculty Research Mentor Award** for her dedication and commitment to mentoring and training more than 75 graduate, undergraduate, and medical students as well as faculty during her 26-year career. Dr. Diz shares this award with Dr. Patrick

Reynolds of Neurology. A plaque was presented to both faculty members by the Dean at the FEC meeting on December 12, 2018 for this accomplishment.

Dr. Liliya Yamaleyeva has been invited to serve as a mentor in the **WIMS Mentoring Program**. This program helps recruit, retain and advance early-career women faculty. The longest running WIMS program, it addresses the general career development needs of women faculty at the instructor and assistant professor levels.

Congratulations to **Dr. Jasmina Varagic** for fulfilling all of the criteria required for **promotion to the rank of Full Professor with Tenure** in Department of Hypertension. Dr. Yamaleyeva is also affiliated with the Department of Women in Medicine and Science.



Dr. Olivia Gilbert was selected as an **SSOC lead reviewer** for the 2019 ACC Expert Consensus Decision Pathway on Assessing Trajectory and Risk in Patients Hospitalized with Heart Failure and North Carolina ACC, Councilor (2019-2021), Co-Chair of Legislative and Advocacy Committee (2019-2020).

Olivia Gilbert, MD

Invited Lectures, Presentations, and Conferences



Dr. David Soto-Pantoja's abstract was selected for a talk at the **Keystone Symposia on Cancer Metastasis: The Role of Metabolism, Immunity and the Microenvironment**, March 15-19, 2019, in Firenze Fiera- Fortezza da Basso in Florence. The title of his talk is "Metabolic Endpoints as Biomarkers of Immune Checkpoint Therapy Response". Dr. Soto-Pantoja was also invited to speak at the "Enabling Advancements in Cell Metabolism Research" Agilent Cell Analysis Group User Meeting at the Moffit Cancer Center in Tampa, FL, February 26-27, 2019.

David Soto-Pantoja, PhD



Dr. Mary Branch, CV Medicine Research Fellow, has the honor of her abstract being accepted for **The Dr. Jay Brown Best Abstract Competition**. The competition will take place during ACC and is hosted by the Association of Black Cardiologists. The title of Mary's abstract is, "Incremental Risk for Mortality Among Patients with Diabetes Mellitus: Post Hoc Analysis of the ACCORD Trial." The winner of the competition will receive a monetary award.

Mary Branch, MD



Dr. Jeffrey Willey was invited to visit the **US Congress** on Wed, March 6, 2019 to discuss challenges facing US leadership in maintaining robust space life and physical sciences research.

Jeffrey Willey, PhD

Dr. Andrew Michael South's abstract "Food Insecurity is Associated with High Blood Pressure in a National Sample of Children and Adolescents Independent of Obesity" was accepted as a platform presentation at the **Pediatric Academic Societies Meeting** in Baltimore, MD on April 29, 2019. In addition, Dr. South has been invited to give a talk at the same meeting entitled, "Neonatal Hypertension: Before, During and After the NICU."

Dr. Anita Kelkar was selected as an attendee for the **HFSA (Heart Failure Society of America) Future Leaders Symposia** May 10-11, 2019, in Washington, DC. This conference provides an amazing opportunity for early career physicians to interact with national and international leaders in the field of heart failure.



Thomas O'Neill, MD

Dr. Thomas O'Neill's abstract titled, "Hiding in Plain View: Antibody-Mediated Cardiac Allograft Rejection Presenting as Unilateral Pleural Effusion and Atrial Flutter," was accepted for presentation at **International Society for Heart and Lung Transplant Annual Meeting** in Orlando, FL in April.



Geoffrey Jao, MD

Dr. Geoffrey Jao's abstract titled, "Quantitative Right Ventricular Function Assessment Using the Anterior Tricuspid Annular Plane Systolic Excursion" was accepted for presentation at **ACC Scientific Sessions** in March.

In The News



Stephen Kritchevsky, PhD

The National Institute on Aging has announced they will fund a new exciting resource, **The Research Centers Collaborative Network**. The program promises to advance aging research by bringing different research groups and disciplines together. The project is being led by the American Federation for Aging Research and investigators at Wake Forest School of Medicine. The PI of the project is **Dr. Stephen Kritchevsky**, Professor of Gerontology and Geriatric Medicine.

Dr. Amer Aladin, Cardiovascular Medicine Clinical/Research fellow received the good news that he will receive **media promotion at the American College of Cardiology Scientific Sessions** in New Orleans for his study titled, "Alcohol Consumption and Risk of Hypertension."



Amer Aladin, MD

Events

The **19th Annual Graduate Student and Postdoc Research Day** will be held Friday, March 22, 2019 at Biotech Place.

Women's Health Research Day is April 17, 2019 and will be held in Commons, Wake Forest Baptist Medical Center. Join us for "What's on HER Mind?: Gender Differences in Cognitive Function"

The next **Pathways to Promotion** is scheduled for Thursday, May 30 2019, 5:00-6:30 pm in the Cancer Center Conference Rooms 10B and 10C. Registration is required and can be completed online via the WFBMC Intranet by May 24th.

124 CV COE Faculty Publications from December 2018 – March 2019

During the last three months, Wake Forest School of Medicine CV COE faculty published **124 manuscripts** in peer-reviewed journals including *Journal of the American Heart Association*, *Circulation*, and *JACC*. Below are a few articles from the list. All of the publications can be found at <https://www.ncbi.nlm.nih.gov/sites/myncbi/1JSeQsdreOokM/collections/57871165/public/>



Charles German,
MD

Dr. Charles German and colleagues published a manuscript titled, “Implications of the 2017 American College of Cardiology/American Heart Association Hypertension Guideline in a Modern Primary Prevention Multi-Ethnic Prospective Cohort (Multi-Ethnic Study of Atherosclerosis)” in *The American Journal of Cardiology*.



Brandon Stacey,
MD

Dr. Brandon Stacey and colleagues published a manuscript titled, “Asymptomatic Myocardial Ischemia Forecasts Adverse Events in Cardiovascular Magnetic Resonance Dobutamine Stress Testing of High-Risk Middle-Aged and Elderly Individuals” in the *Journal of Cardiovascular Magnetic Resonance*.



Dalane Kitzman, MD

Dr. Dalane Kitzman and colleagues published a manuscript titled, “New Concepts in an Old Disease: Exercise Intolerance in Moderate Mitral Stenosis” in *JACC Cardiovascular Imaging*.



Joseph Yeboah, MBChB

Dr. Joseph Yeboah published a manuscript titled, “Lung Cancer Screening Eligible?” in *Circulation*.

Career Development Corner

2019 EICS Summer Research Program

The 2019 Excellence in Cardiovascular Sciences (EICS) summer research program will be held this summer, from June 2nd – August 2nd. Twelve (12) undergraduate students will be invited to spend the summer in research laboratories (basic or clinical) on our campus, to learn about biomedical research. We have a number of outstanding applicants, from all over the continental US and Puerto Rico, and will be selecting our participants in the coming weeks. Our NHLBI-funded program pays for the stipend, travel and housing cost during the summer for each participant—the only costs to the faculty hosts are expenses related to the research project. If you are interested in hosting one of our students this summer, please contact Dr. Ann Tallant (6-2108 or atallant@wakehealth.edu). The students, selected based on their academic records and their interest in biomedical research, work in the laboratory for 9 weeks and present a poster of their work at the end of the summer. It is very rewarding to watch these undergraduate students learn about biomedical research and subsequently follow their careers as biomedical scientists. Of the students who participated in the EICS program since its beginning in 1993, 79 percent have remained in science careers, with 31% entering medical or other healthcare professional schools, 31% entering graduate school, into either PhD or Master’s programs, and 17% in technical or teaching careers. We currently have 7 former EICS students in the Wake Forest School of Arts and Sciences PhD program.

Academic Journeys Seminar Series

The Academic Journey meetings are held monthly, featuring a faculty member at Wake Forest School of Medicine or a visiting clinician/scientist from the Cardiovascular Sciences Center Seminar series. These meetings are designed for graduate and medical students/postdoctoral fellow and residents/junior faculty members to spend time with distinguished physicians and scientists from our institution or other academic institutions and learn about their journeys to becoming successful clinicians/research scientists/educators. At our first two meetings of the 2018-2019 year, students/fellows/residents visited with Dr. Scott Levick, from the University of Sydney, and with Dr. Judy Hung, from Massachusetts General/Harvard University. Our most recent Journey meeting featured Dr. Thomas Di Salvo, Professor of Medicine and Chief of the Division of Cardiology at the Medical University of South Carolina, was held on February 21st. Please check your emails for additional Journey meetings in the coming months.

Good News!

Wake Forest School of Medicine Cardiovascular Sciences Center

Third/Fourth Quarter 2018



Watch Out, AHA...Here Comes Wake Forest!



Dr. Cheping Cheng, Dr. Heng-Jie Cheng and their group of research fellows have been very busy this year turning out project after project and it seems all of their hard work is paying off. From the group, 18 total abstracts were accepted for presentation at the 2018 American Heart Association's Scientific Sessions in Chicago, IL. These abstracts consists of 13 poster presentations, 4 oral presentations, and 1 moderated digital poster presentation. The group's research interest spans the Cardiovascular spectrum to encompass topics such as Heart Failure, Diabetes, Genomics, Ageing, Metabolism, Obesity and more, while using mouse, canine, and monkey models. Congratulations to Drs. Cheng and Cheng and their team of researchers (Yixi Liu, Xiaowei Zhang, Zhi Zhang, and Zhe Chen); thank you all for your outstanding representation of Cardiovascular Medicine here at Wake Forest!

Wake Forest in the News

Our very own **Dr. Jeff Williamson** was recently featured in "USA Today" and "Time Magazine" after presenting strong evidence that lowering blood pressure can reduce the risk of Mild Cognitive Impairment through the SPRINT-MIND study. Dr. Williamson is the co-director of the Alzheimer's Research Center here at WF and helped to lead the SPRINT-MIND study. The study found that patients who were treated to reduce their systolic blood pressure to 120 mm Hg were 19 percent less likely to develop mild cognitive impairment than those whose blood pressure was targeted to 140 mm Hg. In the "USA Today" article, Williams says, "I wasn't sure myself as a scientist, was blood pressure-lowering as good for the brain as it was for the heart? That was a really unanswered question." So far, the results of the study are suggesting this could be the case. To read the full articles in "USA Today" and "Time Magazine," visit <https://www.usatoday.com/story/news/nation/2018/07/25/lower-blood-pressure-reduces-risk-mild-cognitive-impairment-study/832090002/> and <http://time.com/5347592/blood-pressure-lower-risk-dementia/>



Dr. Williamson

IN THIS ISSUE:

- ▶ Wake Forest Represents at AHA
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- ▶ Publications
- ▶ Clinical Update
- ▶ Career Development Corner

 **Wake Forest**
School of Medicine

Accomplishments



Dr. Wagenknecht

Effective October 1, 2018, **Lynne Wagenknecht, PhD, MPH**, was named the Director of Public Health Sciences after serving as interim director since August of 2017. Dr. Wagenknecht has been with WFSOM since joining the faculty in 1991.

Over the years, she has held the titles of Chair for the Department of Epidemiology and Prevention, Associate Director of Public Health Sciences, and Associate Dean for Interdisciplinary Research. Congratulations to Dr. Wagenknecht on her new appointment!



Dr. Melendez

Giselle Melendez, MD, was recently selected as a 2018 Dean's Hero award recipient. Dr. Melendez received this award for her Dean's Research Symposium topic, "Myocardial Fibrosis: A New Frontier for Discovery in Cardiotoxicity Induced by Cancer Treatment," after being chosen by Dr. Julie Freischlag.

In recognition of her excellent work, she will receive a \$20,000 award to be used to help further advance her research.



Dr. Varagic

Jasmina Varagic, MD, PhD, was appointed to the Innovative Project Award Study Section for the American Heart Association. The Innovative Project award serves to support innovative, high impact research that could ultimately lead to critical discoveries or advancements that will accelerate the field of CV and stroke research.



Dr. German

During the AHA Scientific Sessions in Chicago, **Charles German, MD**, was highlighted as being a prime example of someone who takes community based interventions to increase physical activity through his work with the Walk with A Doc program.



Dr. Kitzman

Congratulations to both **Dalane Kitzman, MD**, and **Bob Applegate, MD** on achieving the elite honor of being named Top Reviewers for JACC: Heart Failure in 2018.



Dr. Applegate

Funding and Awards



Dr. Schaich

Cardiovascular Medicine research fellow, **Christopher Schaich, PhD**, received a fundable score for his F32 application titled, "Heart Rate Variability as a Predictor of Cognitive Performance in the Multi-Ethnic Study of Atherosclerosis."



Ms. Stirling

Elizabeth Stirling, a Cancer Biology graduate student from Dr. David Soto-Pantoja's lab, has been awarded a Wake Forest Alumni Student Travel Award for the American Society for Matrix Biology Conference in Las Vegas, Nevada in October where she presented "Targeting Thrombospondin -1/Cd47 Signaling Axis Regulates Hypoxia & Metabolism in The Tumor Microenvironment to Enhance Anti-Tumor Immune Responses".

Giselle Melendez, MD, recently received the exciting news that her K-Award application titled, "Cellular Senescence: A Novel Mechanism of Doxorubicin-induced Cardiotoxicity" received a fundable score.



Ms. Ryalat

Fatima Ryalat, a graduate student mentored by Dr. Debra Diz, was awarded a Wake Forest Alumni Student Travel Award for the Council on AHA Hypertension Meeting in Chicago, IL in September where she presented her poster "Sex Differences in the Effects of Chronic Muscadine Grape Extract Treatment on Cardiac Function Parameters and Aortic Pulse Wave Velocity (PWV) in Hypertensive Transgenic (mRen2) 27 Rats".



Andrew Michael South, MD, was awarded first place at the on-site poster competition at the AHA Council for Hypertension in Chicago, IL for his poster titled, "Children with Food Insecurity at Risk for High Blood Pressure." This has

subsequently garnered media attention from the U.S. News & World Report as well as several other news stations. To read the full report from U.S. News and World Report, visit <https://health.usnews.com/health-care/articles/2018-09-06/kids-without-access-to-good-food-face-high-blood-pressure-risk>.



Mark Chappell, PhD, received a 3-year AHA Transformative Grant Award titled, "Endocannabinoid-Angiotensin Systems in Diabetic Hypertension."

Dr. Chappell



Congratulations to **John Parks, PhD**, on the pending renewal of his R01 titled, "Hepatocyte Abca1, Cholesterol Trafficking, and Lipid Management."

Dr. Parks

Events

The annual American Heart Association Winston-Salem Heart and Stroke Walk was held on Sunday, October 14 at Bailey Park. So far, the total for the entire walk has reached \$489,150! The Heart and Vascular Service Line raised a whopping \$15,925 with the help of many creative and exciting fundraisers, which included 13 different Walk Teams! The CVSC sends a huge "Thank You" to all of those who helped make these generous donations possible!



Cardiovascular Sciences Center Guest Speakers

Save the dates for these upcoming guest speakers at Cardiovascular Medicine Research Grand Rounds! Grand rounds are held every Friday, 7:30-8:30 am in the Medical School Board Room

- January 18, 2019: **Dr. Judy Hung** - Massachusetts General
- February 22, 2019: **Dr. Thomas Di Salvo** - Medical University of South Carolina
- March 1, 2019: **Dr. Bill Stevenson** - Vanderbilt University
- March 29, 2019: **Dr. Stavros Drakos** - University of Utah
- April 12, 2019: **Dr. James Fang** - University of Utah
- May 17, 2019: **Dr. Ralph Sacco** - University of Miami

Wednesday, November 7th was the **Surgical Sciences 26th Annual Residents' and Fellows' Research Day**. The keynote speaker, Dr. Todd Rasmussen presented a lecture titled, "From Combat Zone to Civilian Market: Lessons from a Military Program in Endovascular Device Innovation for Torso Bleeding and Shock." Several members of the CVSC (or their mentees) were award recipients.

Basic Science

FELLOW SILVER

Manuel U. Ramirez, PhD

Katherine L. Cook, PhD – Mentor

Hypertension and Vascular Research

STUDENT GOLD

Omeed Rahimi, BS

Patricia E. Gallagher, PhD and E. Ann Tallant, PhD – Mentors

Hypertension and Vascular Research

STUDENT SILVER

Elizabeth R. Stirling, MS

David Soto-Pantoja, PhD – Mentor

Hypertension and Vascular Research

Clinical Science

STUDENT GOLD

Mike C. Lin, BS

James E. Jordan, PhD – Mentor

Cardiothoracic Surgery

STUDENT SILVER

Tracey Pu, BS

Adrian Lucian Lata, MD – Mentor

Cardiothoracic Surgery

FELLOW SILVER

Ioannis Kontopidis, MD

Leonard J. Wudel, MD – Mentor

Cardiothoracic Surgery

Invited Lectures, Presentations, and Conferences



Liliya Yamaleyeva, MD, MS has been invited to give a talk titled, “Hemodynamic Effects of Apelin in Preeclampsia” at the ASPET sponsored symposium during the 2019 Experimental Biology Meeting in Orlando, FL.

Dr. Yamaleyeva



Tom Register, PhD, had a poster presented at the 2018 Radiation Research Society Meeting in Chicago, IL, titled, “Monocyte Polarization in Acute and Delayed Responses to Total Body Irradiation in Male Rhesus Monkeys.”

Dr. Register



Hossam Shaltout, PhD, gave an oral presentation at the AHA Council on Hypertension Meeting in September titled, “Impaired Autonomic Function in Young 135 Adults Born Preterm with Very Low Birth Weight is Associated with Elevated Serum Uric Acid Levels.”

Dr. Shaltout



Debra Diz, PhD, was the keynote speaker at the WFSOM Medical Student Research Day, held on October 10. The title of her talk was, “Insights into Orthostatic Intolerance in Children: A Multidisciplinary Team Effort.”

Dr. Diz

The American Heart Association (AHA) annual Council on Hypertension/AHA Council on Kidney and Cardiovascular Disease joint Scientific Sessions was held September 6-9 in Chicago, IL. This is a three-day scientific program for clinical and basic researchers focusing on recent advances in hypertension research. The following posters were presented at the meeting:

Hossam A Shaltout. *Vitamin D Supplementation Improves Cardiovascular Response to Head Up Tilt in Adolescents Suffering from Syncope.*

Andrew Michael South, Deepak Palakshappa, Callie Brown. *Food Insecurity is Associated with Hypertension in Children and Adolescents Independent of Obesity.*

Andrew Michael South, Patricia A. Nixon, Mark C. Chappell, Debra I. Diz, Elizabeth T. Jensen, Hossam A. Shaltout, Lisa K. Washburn. *Preterm Birth is Associated with Increased Blood Pressure and Increased Urinary Angiotensinogen in Young Adults.*

Snezana Petrovic, Ellen Tommasi, Xuming Sun, Debra I Diz. *Effects of Proton Receptor Gpr4 Deficiency on Angiotensin Receptors in Kidney and Hindbrain.*

Mark Chappell. *The Angiotensin-(1-7) Agonist AVE0991 Attenuates Angiotensinogen Release from Human Proximal Epithelial Cells.*

Chris Schaich, Diego Malaver, Hossam A. Shaltout, Adina Zeki Al Hazzouri, David M. Herrington, Timothy M. Hughes. *Heart Rate Variability is Associated with Future Global Cognitive Performance: the Multi-Ethnic Study of Atherosclerosis.*

Callie Brown, Andrew Michael South, Deepak Palakshappa. *Obesity Modifies the Association between Food Insecurity and Hypertension in Children and Adolescents.*

Fatima Ryalat, Nildris Cruz-Diaz, Jasmina Varagic, Patricia Gallagher, Ann Tallant, Debra Diz, Liliya Yamaleyeva. *Sex Differences in the Effects of Chronic Muscadine Grape Extract Treatment on Cardiac Function Parameters and Aortic Pulse Wave Velocity (PWV) in Hypertensive Transgenic (mRen2)27 Rats.*

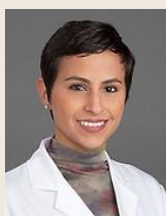
CV COE Faculty and Fellow Publications July through November

During the last five months, Wake Forest School of Medicine CV COE faculty published **114 manuscripts** in peer-reviewed journals including *Journal of the American Heart Association*, *Circulation*, *JACC*, and *Atherosclerosis*. Below are a few articles from the list. All of the publications can be found at <https://www.ncbi.nlm.nih.gov/sites/myncbi/IJSeQsdreOokM/collections/57098868/public/>



Dr. Yeboah

Joseph Yeboah, MBChB, and colleagues recently published a manuscript in *Atherosclerosis* titled, "The Prognostic Value of Interleukin 6 in Multiple Chronic Diseases and All-Cause Death: The Multi-Ethnic Study of Atherosclerosis (MESA).



Dr. Rangel

Octavia Rangel, MD, and colleagues published an article in the *Journal of Cardiac Failure* titled, "Estimation of Incident Heart Failure Risk among US Hispanics/Latinos Using a Validated Echocardiographic Risk-Stratification Index: the Echocardiographic Study of Latinos."



Dr. Register

Thomas Register, PhD, and colleagues published a paper in the *Journal of the American Heart Association* titled, "Estradiol Treatment Initiated Early After Ovariectomy Regulates Myocardial Gene Expression and Inhibits Diastolic Dysfunction in Female Cynomolgus Monkeys: Potential Roles for Calcium Homeostasis and Extracellular Matrix Remodeling."



Dr. Soliman

Elsayed Soliman, MD, and colleagues published an paper in *JAMA* titled, "Racial Differences in Atrial Fibrillation-Related Cardiovascular Disease and Mortality: The Atherosclerosis Risk in Communities (ARIC) Study."

Heart and Vascular Service Line Patient Care By the Numbers*



Cardiac Cath Lab

Caths.....3,253
PCIs.....1,386
New Patient Consults...5,435
New Therapies**544

**MitraClip, Watchman, TAVR

CT Surgery Procedures

Inpatient.....886
Outpatient.....8

Vascular Surgery Procedures

Inpatient.....1,040
Outpatient.....467

Cardiac Ultrasound

TTE.....24,686
TEE.....994
Stress.....4,419

Advance Heart Failure and Transplant

Referrals.....
Transplants.....11
LVADs.....17
Readmission Rate.....17.4%

(National average is 22%)



*Data shown are reflective of FY 2018

2018 EICS Summer Research Program

The 2018 Excellence in Cardiovascular Sciences (EICS) summer research program was a great success this summer, resulting from the outstanding mentoring by our Wake Forest School of Medicine faculty, many of whom are members of the Cardiovascular Sciences Center. The students in this program, undergraduates from schools all over the United States, arrived the first of June and spent two months in the laboratories of faculty, participating in both basic science and clinical research projects. Ten of the scholars are attending and/or presenting their summer research at the 2018 Annual Biomedical Research Conference for Minority Students (ABRCMS) meeting this month in Indianapolis, attesting to the high quality of their summer research projects. The EICS program is supported by a grant from the NHLBI. The EICS scholars, the undergraduate institutes where they are currently students and their WFSM mentors included:



Rabina Mainali	Salem College	Dr. Hariom Yadav (Molecular Medicine)
Joseph White	Berry College	Dr. Leah Solberg-Woods (Molecular Medicine)
Daija McKenzie	WSSU	Dr. Andrew South (Pediatric Nephrology)
Chloe Carpenter	Cornell University	Dr. Nicole Levi (Plastic & Reconstructive Surgery)
Sheldon Smith	WSSU	Dr. Bethany Kerr (Cancer Biology)
Nataleigh Austin	WSSU	Drs. Ann Tallant and Patricia Gallagher (Surgery/Hypertension)
Mykasia Simpkins	WSSU	Drs. Jim Jordan/Tim Williams (Surgery/Cardiothoracic and Vascular)
Alexus Echols	Spelman College	Dr. TanYa Gwathmey-Williams (Surgery/Hypertension)
Jennifer Paxton	WSSU	Dr. Jennifer Jordan (Internal Medicine/Cardiology)
Adam Burke	WSSU	Dr. Giselle Melendez (Internal Medicine/Cardiology)
Avery Salmon	Mars Hill University	Dr. David Soto-Pantoja (Surgery/Hypertension)
Jee Young Yoo	CUNY	Dr. Katherine Cook (Surgery/Hypertension)
Nia Garrett	Villanova University	Dr. Rong Chen (Physiology & Pharmacology)
Brandon Travis	WSSU	Dr. Gagan Deep (Cancer Biology)
Joshua Waller	WSSU	Dr. Tim Hughes (Gerontology & Geriatric Medicine)
Lauren Clines	Liberty University	Dr. Jasmina Varagic (Surgery/Hypertension)

Academic Journeys Seminar Series

The Academic Journey meetings are held monthly, featuring a faculty member at Wake Forest School of Medicine or a visiting clinician/scientist from the Cardiovascular Sciences Center Seminar series. These meetings are designed for graduate and medical students/postdoctoral fellow and residents/junior faculty members to spend time with distinguished physicians and scientists from our institution or other academic institutions and learn about their journeys to becoming successful clinicians/research scientists/educators. Our first meeting of the 2018-2019 year will be with Dr. Scott Levick from the University of Sydney, on Thursday November 15th at 4:00. Our January speaker will be Dr. Judy Hung, from Massachusetts General/Harvard University, on January 17th at 4:00. These informal meetings will be held in the Cardiology Conference Room on the 1st floor of Watlington Hall, with light refreshments. We will continue to update you on the Academic Journeys in 2019.

Good News!

Wake Forest School of Medicine Cardiovascular Sciences Center

Second Quarter 2018



Wake Forest Baptist Health Named as Newest StrokeNet Site



Dr. Bushnell



Dr. Duncan



Dr. Wolfe

Drs. Cheryl Bushnell, Pamela Duncan, and Stacey Wolfe are excited to announce that Wake Forest has been named the newest U24 Regional Clinical Center for StrokeNet, a program funded by National Institute of Neurological Disorders and Stroke (NINDS). StrokeNet is a network of 25 regional stroke centers working with nearby satellite facilities that span the country. The program's primary goal is to have teams of researchers representing every medical specialty needed for stroke care and to maximize efficiencies to develop, promote and conduct high-quality, multi-site clinical trials focused on key interventions in stroke prevention, treatment and recovery.

Wake Forest Baptist Health has partnered with 3 sites to develop the Western North Carolina (NC) StrokeNet. Our network includes 4 of the 6 comprehensive stroke centers in NC, the heart of the Stroke Belt: Wake Forest Baptist Health (RCC), Novant Forsyth Medical Center, Novant Presbyterian, and Mission Health. The referral and telestroke outreach of our network includes the Piedmont region and nearly all of NC west of the Piedmont, and part of southern Virginia, over 4 million individuals, 16,800 square miles, and over 4,000 stroke patients admitted to these hospitals per year.

The aims of the WFBH StrokeNet are 1) successfully implement StrokeNet trials in the Piedmont Triad and Western NC and design new stroke treatment trials; 2) Implement a novel approach for recruitment, retention, and outcome ascertainment through 2a) existing telemedicine networks for recruitment and outcome ascertainment; and 2b) Creating the Western NC Advocacy Committee that will include patient advocates, patients, EMS providers, and clinicians to establish best strategies for community engagement; and 3) Develop community outreach programs to engage rural and urban communities in our referral region in StrokeNet trials.

IN THIS ISSUE:

- ▶ WFBH Named StrokeNet Site
- ▶ In the News
- ▶ Achievements
- ▶ Announcements
- ▶ Funding and Awards
- ▶ Events and Speaking Engagements
- ▶ Publications
- ▶ Career Development Corner

 **Wake Forest**
School of Medicine

In the News

Wake Forest Baptist Health has received the American College of Cardiology's NCDR ACTION Registry Platinum Performance Achievement Award for 2018. Only 203 hospitals nationwide receive this great honor. **Dr. David Zhao**, Chief of Cardiovascular Medicine and director of the Heart and Vascular Center of Excellence, says that this is the highest award an institution can receive. To receive the award, our teams have demonstrated sustained achievement in the ACTION Registry for eight consecutive quarters and performed at the top level of standards for specific performance measures. <http://intranet.wakehealth.edu/In-the-Spotlight/2018/Wake-Forest-Baptist-Receives-Top-National-Recognition-for-Cardiovascular-Care.htm>

Achievements



Dr. Kavanagh

Associate Professor of Comparative Medicine, **Kylie Kavanagh, V.M.S.**, received recognition as the WFBMC May Leader of the Month. Dr. Kavanagh epitomizes what it means to be a compassionate and innovative member of the faculty. Read more about Kylie's nomination here

<http://intranet.wakehealth.edu/Departments/HumanResources/Recognition/Kylie-Kavanagh-May-Leader-of-the-Month.htm>



Dr. Hundley

The results are in and **Gregory Hundley, MD**, is the winner of the Established Clinical Investigator award for the 2018 faculty Research Awards Day. Prizes for Established Investigator are awarded to WFSM basic and clinical scientists at the full professor level who have made (a) major contribution(s) to their field(s) by a continuing line of research or a number of significant contributions that do not have

to be thematically related to each other. The award consists of a framed certificate and a monetary gift. The 2018 Mentoring Award will go to **David Herrington, MD, MHS**. To receive this award, nominees must have played a significant role in mentoring faculty in their trajectory in attaining a highly successful status as a researcher in the biomedical sciences. Faculty Research Awards Day will be held September 19, 2018 from Noon—1:00 pm in the Commons Conference Rooms. A full list of winners



Dr. Herrington

can be found at <https://ctsi.wakehealth.edu/faculty-research-awards>

Announcements

Congratulations to the PREP students who have been accepted into the Graduate Studies Program here at Wake Forest: **Pascaline Ezouah**: (MPH Program)-Tulane Univ. School of Public Health and Tropical Medicine (SPHTM); (MPH Program) Emory University Rollins School of Public Health; **Sara Arenas De Leon**: (PhD Program-Biomedical Sciences) University of New Mexico; **Yismelin Feliz-Mosquea**: (PhD Program-IPP) Wake Forest Graduate School of Arts & Sciences/School of Medicine; and **Mildred Perez**: (PhD Program-Biomedical Sciences) University of Alabama-Birmingham.



Dr. Cook

Katherine Cook, PhD, was awarded a Susan G. Komen Grant under the CCR New Treatments for Drug-Resistant Breast Cancer funding program, to support her research project entitled "Targeting the Unfolded Protein Response Pathway to Prevent Therapeutic Resistance."

Jasmina Varagic, MD, PhD, received the 3rd CVSC pilot award of \$20,000 for her project entitled "Ang-(1-12)/Chymase Axis and LV Function in Diabetes".



Dr. Varagic

Funding and Awards

Kylie Kavanagh, V.M.S., recently received great news that her revised RO1 application was reviewed favorably by the NHLBI, who hinted a "very optimistic" outcome. The title of her project is, "Adipose Mitochondrial Quality Control and Cardiovascular Function in Metabolically Healthy and Unhealthy Obese Monkeys."

David Soto-Pantoja, PhD, was awarded an early career investigator travel award from the American Society for Radiation Oncology and will give a talk at the meeting in Washington, DC titled "Anti-CD47 immunotherapy synergizes with ionizing radiation to reduce tumor growth and prevent metastasis"



Dr. Williams

Timothy Williams, MD and Jim Jordan, PhD, were awarded a DoD Precision Trauma Care Research award in collaboration with Participants outside of WF School of Medicine entitled “Endovascular Perfusion Augmentation for Critical Care (EPACC): Personalized and Adaptive Therapy for Resuscitation After Trauma”.



Dr. Jordan

The American Society of Nutrition Annual Conference was held in Boston this June and graduate student **Pooja Patil** gave an oral presentation titled, “Anti-Fibrotic and Anti-Oxidant Actions of a Muscadine Grape Extract Supplement on Hypertension-Induced Cardiac Damage.” Also present at the meeting, were graduate students **Marianne Collard, Jessica Mackert, and Omeed Rahimi**, who all presented posters focusing on their work with Muscadine grape extract. All of these graduate students are mentored proudly by Drs. Ann Tallant and Debra Diz.



Dr. Gwathmey-Williams

Congratulations to **TanYa Gwathmey-Williams, PhD**, on receiving the 2018 Arthur Guyton New Investigator Award at COSEHC (Consortium for Southeastern Hypertension Control) in New Orleans.

Events and Speaking Engagements

Women’s Health Research Day took place on April 11, 2018. Included in the many wonderful oral and poster presentations were graduate students **Marianne Collard’s** oral presentation and **Jessica Mackert and Fatima Ryalat’s** poster presentations. The topic of the student’s work centered around their research on Muscadine Grape Extract.

Debra Diz, PhD and Amy Arnold, PhD, co-chaired a successful ASPET symposium at Experimental Biology 2018 in San Diego (Cardiovascular Consequences of Metabolic Targeting in Obesity, April 21-25, 2018). **Dr. Diz, Tanya Gwathmey-Williams, PhD** and graduate student **Fatima Ryalat** all presented posters at the symposium.

David Herrington, MD, MHS, et al will present their abstract entitled, Eicosapentaenoic Acid is a Strong Predictor of Risk for Heart Failure in the Multi-Ethnic Study of Atherosclerosis at the Best of AHA Specialty Conferences at the American Heart Association Scientific Sessions in Chicago, IL in November.



Dr. Chappell

Congratulations to **Mark Chappell, PhD**, who has been invited to give two lectures: A . Ross McIntyre Cardio-Renal Lecture at the University of Nebraska Medical Center and Poisner Lecturship in Pharmacology at the University of Kansas School of Medicine.

The PREP Scholars Annual Symposium and Poster Day was held on June 12, 2018 at Biotech Place. The featured speaker was **Dr. David McIntosh**, Vice President & Chief Inclusion and Diversity Officer, Wake Forest School of Medicine.

Save the date! Wednesday, November 7, 2018, is the **Surgical Sciences 26th Annual Residents’ and Fellows’ Research Day**. Keep your eyes on the intranet for more details as the date approaches.

Career Development Corner

Please join us for 2018 Excellence in Cardiovascular Sciences (EICS) Summer Research Program Poster Symposium, on Friday, July 27th, from 9:30 to 11:00, in the Atrium at Biotech Place. Sixteen undergraduate students from all over the country have been working in our cardiovascular laboratories during the summer and they will present posters describing their summer studies. Light snacks will be served. The symposium will be followed by a brief ceremony, to provide the students with certificates celebrating their participation in our program. Join us and let these bright young students share with you their summer studies.

Recent CV COE Faculty and Fellow Publications March through June

During the last quarter, Wake Forest School of Medicine CV COE faculty published **65 manuscripts** in peer-reviewed journals including *Journal of the American Heart Association*, *JAMA Cardiology*, *Journal of Hypertension* and *Stroke*. A full list of these publications can be found at <https://www.ncbi.nlm.nih.gov/sites/myncbi/1JSeQsdreOokM/collections/55302217/public/>



Dr. Wagenknecht



Dr. Langefeld



Dr. Parks



Dr. Qureshi



Dr. Gomadam

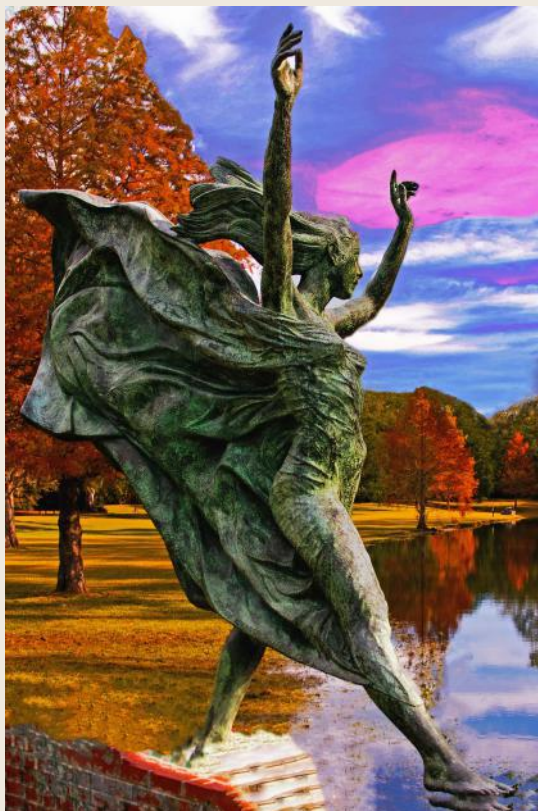
Dr. Lynne Wagenknecht et al published an article titled “FGF23 Concentration and APOL1 Genotype Are Novel Predictors of Mortality in African Americans with Type 2 Diabetes” in *Diabetes Care*.

Dr. Carl Langefeld et al recently published “Genome-Wide Study of Subcutaneous and Visceral Adipose Tissue Reveals Novel Sex-Specific Adiposity Loci in Mexican Americans in *Obesity*.

The manuscript titled “LRP1 Integrates Murine Macrophage Cholesterol Homeostasis and Inflammatory Responses in Atherosclerosis”, authored by **Dr. John Parks** et al, was published in *eLife*.

“American College of Cardiology/American Heart Association (ACC/AHA) Class I Guidelines for the Treatment of Cholesterol to Reduce Atherosclerotic Cardiovascular Risk: Implications for US Hispanics/Latinos Based on Findings From the Hispanic Community Health Study/Study of Latinos (HCHS/SOL)”, authored by **Dr. Waqas Qureshi** et al was recently published in *Journal of the American Heart Association*.

Dr. Pallavi Gomadam et al published a manuscript titled, “Blood Pressure Indices and Cardiovascular Disease Mortality in Persons with or without Diabetes Mellitus” in *Journal of Hypertension*.



On May 19, Mark Chappell, PhD, won first place in the 6th Annual Second Spring Art Show sponsored by Winston-Salem Arts Council. The Second Spring Arts Festival showcases creative accomplishments of those 60 plus and promotes Winston-Salem as the City of Arts & Innovation. The yearly celebration features visual and literary arts, demonstrations, music and dance and presentations from notable speakers and performers. Congratulations, Mark!

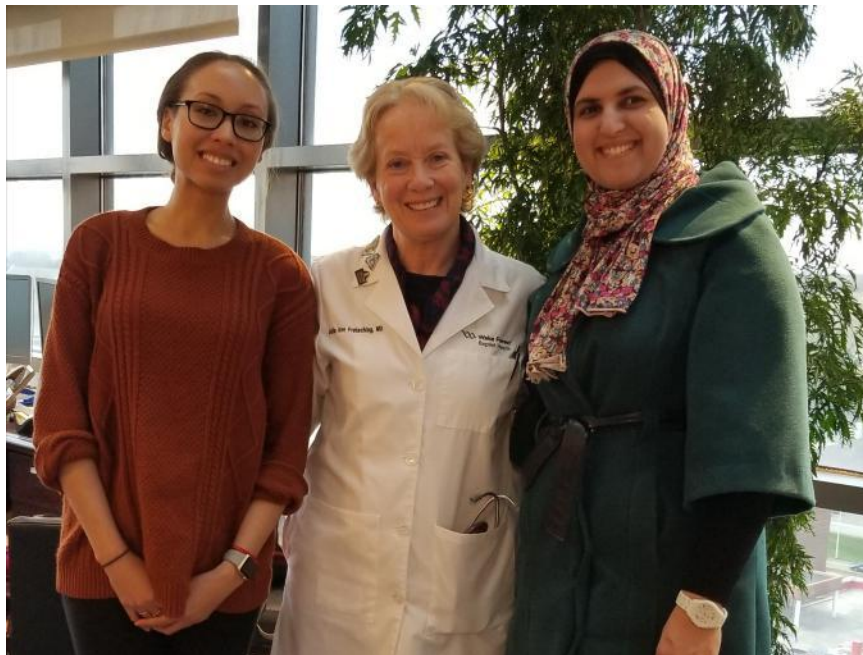
Good News!

Wake Forest School of Medicine Cardiovascular Sciences Center

First Quarter 2018



Dean's Research Symposia Showcases All-Star Array of CVSC Speakers and Trainee Posters



Dr. Julie Freischlag congratulates graduate students Alexa Hendricks and Fatima Ryalat

The Cardiovascular Sciences Center had the honor of participating in the Dean's Research Symposia series on February 21. The symposia was a great success, drawing in researchers institution wide. Representatives from Comparative Medicine, Cardiovascular Medicine, Hypertension, PHS, Vascular Surgery, Pediatrics, Molecular Medicine, and Gerontology highlighted the cast of speakers, while thirteen selected graduate students and trainees competed in a friendly poster competition. Attendees of the symposium were tasked with rating the posters using a 1-5 star voting range. In the end, graduate students **Alexa Hendricks** and **Fatima Ryalat** tied for the win. Congratulations Alexa and Fatima!

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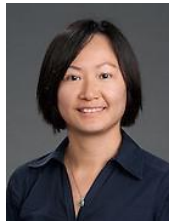
 **Wake Forest**
School of Medicine

In the News



Dr. Stacey

Brandon Stacey, MD, MS was interviewed by ACCEL, a subscription audio service of the American College of Cardiology, to discuss his recently accepted abstract titled, “Cardiac Stress Results Forecast Adverse Cardiovascular Events in High Risk Asymptomatic Middle and Older Aged Men: Identification of Silent Myocardial Ischemia in the Elderly.” Please visit the ACCEL website to subscribe and listen to Dr. Stacey’s interview <http://www.acc.org/education-and-meetings/products-and-resources/accel-audio>



Dr. Zhou

In December, **Li Zhou, MD**, gave a phone interview to US News & World Report in which she discussed soy protein and Cardiovascular Disease. In the interview, Dr. Zhou explained that soy beans can still be an excellent food choice for supporting heart health since the polyunsaturated fats found in soy are known to assist in lowering LDL. Read the interview here

<https://health.usnews.com/health-care/patient-advice/articles/2017-12-15/we-now-know-soy-cant-reduce-heart-disease-but-what-foods-can>



Dr. Zhao

Chief of Cardiovascular Medicine and Director of the Heart and Vascular Center of Excellence, **Dr. David Zhao**, recently spoke with US News and World Report regarding new research that suggests stenting may be no better than a placebo in reducing chest pain when angina is caused by “stable” angina. In the interview, Dr. Zhao states his concern that the results of this research and the message it sends are not necessarily consistent and could affect patients that truly do need stents that have a more serious disease. Read Dr. Zhao’s comments here <https://health.usnews.com/health-care/patient-advice/articles/2017-12-01/what-options-do-angina-patients-have-to-reduce-chest-pain>

Wake Forest Baptist Medical Center has been named as one of the **Top 50 Cardiovascular Hospitals** in the nation, according to IBM Watson Health. The deciding factors for ranking on the list were clinical outcomes for heart attack, heart failure treatments, coronary bypass, and angioplasty surgeries, as well as 30-day mortality and readmission rates. For more information, please visit <http://intranet.wakehealth.edu/In-the-Spotlight/2017/Wake-Forest-Baptist-Recognized-as-a-Top-Heart-Hospital.htm>

Achievements



Dr. DeBo

Ryne DeBo, MS, PhD received the 2017 Radiation Research Editors’ Award at the Annual Meeting of the Radiation Research Society in Cancun Mexico for his 1st authored manuscript “Late Effects of Total-Body Gamma Irradiation on Cardiac Structure and Function in Male Rhesus Macaques” published in the July 2016 issue of Radiation Research. A key figure from the manuscript was selected for the cover of the journal. Dr. DeBo received his PhD degree in Molecular Medicine and Translational Sciences in May 2017 and was a post-doctoral fellow in Comparative Medicine until January 2018 when he was hired as a Scientist in Prevention at the Juvenile Diabetes Research Foundation in New York City. Congratulations to Ryne for landing this ‘dream job’ as he has battled Type I diabetes for over 20 years and has been an avid fundraiser for the organization.



Dr. Burke

Already a prominent leader for Wake Forest School of Medicine, **Gregory Burke, MD**, Senior Associate Dean for Research and Professor of PHS, has accepted the additional role of Chief Science Officer of WFBMC. In this new role, Dr. Burke will utilize his extensive expertise and knowledge of PHS and clinical research to advance the health and wellness of our patients and communities. Also, **Lynn Anthony, MD**, previously Associate Dean, has accepted a promotion to Senior Associate Dean for Faculty Affairs. Dr. Anthony will continue to devote time to patient care, while also remaining the Section Head of Pediatric radiology. Congratulations to both Dr. Burke and Dr. Anthony.



Dr. Anthony

Announcements



Dr. Soto-Pantoja

David Soto-Pantoja, PhD, has been invited to chair the session “ECM of Inflammation, Infection, and Immunity” at the 2018 American Society for Matrix Biology Meeting on October 14-17, 2018, at the Red Rock Casino resort and Spa in Las Vegas, Nevada. He will also present a talk on his research involving CD47 and thrombospondin.

The Excellence in Cardiovascular Science (EICS) Summer Program has been renewed for 5 more years of funding (years 26-30). Congratulations to **Ann Tallant, PhD** and **Debra Diz, PhD** for this outstanding accomplishment.

Funding and Awards



Dr. Shaltout



Dr. Yamaleyeva



Dr. Register



Dr. Kitzman

The 2018 CVSC Pilot Award winners have been announced! Congratulations to **Hossam Shaltout, PhD** and **Liliya Yamaleyeva, MD, MS** for their proposal titled, “Novel Role for Apelinergic System in Autonomic Function in Preeclampsia” and **Thomas Register, PhD**, and **Dalane Kitzman, MD**, for their proposal titled, “Development of a Menopausal Nonhuman Primate Model of Diet and Drug Induced Vascular Dysfunction.”



Dr. Cook

Katherine Cook, PhD, received a Young Investigator Award METAvivor Foundation grant of \$50,000 for research into treatments for established metastatic breast cancer. The grant title is: “Dietary Considerations Effecting Lung Metastatic Therapeutic Responsiveness and Co-morbidities.”

Dr. Cook is also a collaborator with Dr. Pierre Vidi in Cancer Biology on a recently funded Department of Defense grant “Impact of a Community-Based Diabetes Prevention Trial on Epithelial Biomarkers of Breast Cancer Risk”.

David Soto-Pantoja, PhD also received a Young Investigator Award METAvivor Foundation grant of \$50,000 to target the receptor CD47 to enhance immune cell attack against metastatic breast cancer. His grant title is: “Anti-CD47 Immunotherapy as a Treatment for Metastatic breast Cancer”



Dr. Barnes

Erin Barnes, MD is the most recent recipient of the CTSI’s KL2 Mentored Career Development Award. The title of Erin’s project is “Development of an E.H.R. Case Identification Tool for Intravenous Drug Use Infective Endocarditis (IDU-IE). As a Research Scholar, Erin will receive 75% salary support for at least 2 years, up to \$35,000/year to support educational and research needs, an Individual Development Plan, and a multi-disciplinary mentoring team.

Events and Speaking Engagements

Debra Diz, PhD had the honor of being a speaker at the Center on Diabetes, Obesity and Metabolism Seminar Series on Monday, February 19th. The title of her presentation was “The Endocannabinoid – Angiotensin System: Partners in Cardiometabolic Risk.”

Hypertension & Vascular Research and Cardiovascular Sciences Center hosted a Red Dress Day Event on Tuesday, February 27th. Speakers included **Laura Cox, PhD**, and Kim Chidester, Director of Grassroots Mid-Atlantic Affiliate of the American Heart Association.

TanYa Gwathmey-Williams, PhD, and **Debra Diz, PhD**, will present an abstract on diversity-focused research training programs at the Understanding Interventions that Broaden Participation for in Science Careers to be held in Baltimore on March 2-4, 2018.

Hossam Shaltout, PhD, will be chairing the Women’s Health and Sex Differences Research Day Planning Committee for the upcoming ‘Translational Approaches to Cardiometabolic Syndrome in Women’ to be held Wednesday, April 11, 2018, 8am – 4:30pm, in the Commons Conference Rooms - Wake Forest Baptist Medical Center.

The Experimental Biology 2018 ASPET Symposium “Cardiovascular Consequences of Metabolic Targeting in Obesity”, co-chaired by **Amy Arnold, PhD** and **Debra Diz, PhD**, will be held in San Diego on Wednesday, April 25, 2018, 8:30 am – 11:30 am (topics include adiponectin, angiotensin(-17), energy balance and hypertension in obesity, endocannabinoids). Dr. Diz’s presentation will be titled: “The Endocannabinoid System and Cardiometabolic Risk Factors.”

Recent CV COE Faculty Publications December through February

During the last quarter, Wake Forest School of Medicine CV COE faculty published **70 manuscripts** in peer-reviewed journals including *The American Journal of Hypertension*, *Circulation*, *JAMA Cardiology* and *The American Journal of Cardiology*. A full list of these publications can be found at <https://www.ncbi.nlm.nih.gov/sites/myncbi/1JSeQsdreOokM/collections/54485045/public/>

Below are a few highlights from the list:



Bharathi Upadyha, MD



Lindsay Reynolds, PhD



Joseph Yeboah, MD



Tina Brinkley, PhD



Morgana Mongraw-Chaffin, PhD

Dr. Bharathi Upadyha et al published an article titled “Effect of Spironolactone on Exercise Tolerance and Arterial Function in Older Adults with Heart Failure with Preserved Ejection Fraction” in the *Journal of the American Geriatrics Society*.

Dr. Lindsay Reynolds et al recently published “Tobacco Exposure-Related Alterations in DNA Methylation and Gene Expression in Human Monocytes: the Multi-Ethnic Study of Atherosclerosis (MESA) in *Epigenetics*.

The manuscript titled “Association Between Mean Systolic Blood Pressure and Cardiovascular Outcomes in Diabetes Mellitus: ACCORD trial”, authored by **Dr. Joseph Yeboah** et al, was published in *Journal of Human Hypertension*.

“Long-Term Effects of an Intensive Lifestyle Intervention on Electrocardiographic Criteria for Left Ventricular Hypertrophy: The Look AHEAD Trial”, authored by **Dr. Tina Brinkley** et al was recently published in *American Journal of Hypertension*.

Dr. Morgana Mongraw-Chaffin et al published a manuscript titled, “Relation of Ectopic Fat with Atherosclerotic Cardiovascular Disease Risk Score in South Asians Living in the United States (from the Mediators of Atherosclerosis in South Asians Living in America [MASALA] Study) in *The American Journal of Cardiology*.

Career Development Corner

The Academic Journey meetings are held monthly, featuring a faculty member at Wake Forest School of Medicine or a visiting clinician/scientist from the Cardiovascular Sciences Center Seminar series. These meetings are designed for graduate and medical students/postdoctoral fellow and residents/junior faculty members to spend time with distinguished physicians and scientists from our institution or other academic institutions and learn about their journeys to becoming successful clinicians/research scientists/educators. Our most recent meeting was with Dr. James de Lemos from UT Southwestern. The next Academic Journey meeting will be held Thursday, March 15th, from 4 until 5, at Biotech Place. Our speaker will be Dr. TanYa Gwathmey-Williams, Assistant Professor in Surgery/Hypertension, Director of the Hypertension Core Laboratory and Co-Director of the Institutional Research and Career Development Award (IRACADA) and the Post-Baccalaureate Research Program (PREP). Future career journeys will feature Dr. Brian Griffin from the Department of Cardiovascular Medicine at The Cleveland Clinic (in May), and Dr. Stavros Drakos from the Division of Cardiovascular Medicine at the University of Utah (in June). Please watch your email for more details.

We are pleased to announce the successful renewal of the Excellence in Cardiovascular Sciences

training grant by the National Heart, Lung and Blood Institute, co-directed by Drs. Ann Tallant and Debra Diz. This program, which has been ongoing since 1993, provides funds for short-term training for minority undergraduate students to conduct cardiovascular research at our medical school, with the goal of facilitating their careers in biomedical research. If you would be interested in mentoring one of our summer participants, please contact Dr. Tallant (atallant@wakehealth.edu). In addition, a number of training grants were submitted in January, to support undergraduate, postgraduate and graduate students as well as postdoctoral fellows for training in biomedical research. Members of the Cardiovascular Science Center are either the directors or training mentors of these training programs. Thanks to all of you for your efforts in getting these training grants submitted, which are vital to the education and development of our students and fellows.

The Career Development Committee is glad to provide help with grant reviews/critiques prior to submission or during resubmission for early career stage investigators. If you would like assistance, please contact Dr. Ann Tallant (atallant@wakehealth.edu) and she will identify faculty who can critique your proposal and provide advice.

Recent CV COE Faculty Publications July through November

Over the last five months, Wake Forest School of Medicine CV COE faculty published **168 manuscripts** in leading peer-reviewed journals such as *Circulation*, *JACC*, *Hypertension*, *Human Molecular Genetics*, and *Nature Communications*. A full list of these publications can be found at <https://www.ncbi.nlm.nih.gov/sites/myncbi/1JSeQsdreOokM/collections/53833698/public/>. Below are a few highlights from the list:



Dr. Liu

Dr. Yongmei Lui et al, published an article titled "Blood Monocyte Transcriptome and Epigenome Analysis Reveal Loci Associated with Human Atherosclerosis" in *Nature Communications*.



Dr. Wagenknecht

Dr. Lynne Wagenknecht et al published an article in *The Journal of Clinical Endocrinology and Metabolism* titled, "Bone Mineral Density and Progression of Subclinical Atherosclerosis in African-Americans with Type 2 Diabetes."



Dr. Soliman

Dr. Elsayed Soliman et al recently published an article titled, "Effect of Intensive Blood Pressure Lowering on Left Ventricular Hypertrophy in Patients with Hypertension: SPRINT (Systolic Blood Pressure Intervention Trial)" in *Circulation*.



Dr. Mongraw-Chaffin

Dr. Morgana Mongraw-Chaffin et al, published an article in *The Journal of Clinical Endocrinology and Metabolism* titled, "CT-Derived Body Fat Distribution and Incident Cardiovascular Disease: The Multi-Ethnic Study of Atherosclerosis."

A Note from the Director's of the CVSC

The Cardiovascular Sciences Center annual report was submitted in August and the Directors met with Centers and Cores Administration: Drs. Wagenknecht and Burke, Terry Hales and Laurie Molloy. They were particularly pleased with our progress in establishing the elements of the new Center, the positive survey results and our newsletter.

Overall 85% of our members rated the CVSC Agree or Strongly Agree towards meeting the goals of a Center in the Annual Member Evaluation Survey. The initial faculty membership goal has been surpassed with ~100 faculty, staff and trainee members. Our administrative structure engages the CVSC Executive Advisory Committee (Appt, Burke, Bushnell, Edwards, Parks, Zhao) quarterly representing key clinical and research stakeholders to provide critical guidance concerning the activities of the Center. Sub-committees developed from member input at the inaugural luncheon (Tallant, Bertoni – Career Development; Shaltout, Jordan – Resources; Chappell, Tan – Pilot Grants) seek ongoing suggestions and member engagement to identify activities of interest and strategies to assist with development of programmatic areas of research.

From the responses in the Member Evaluation Survey, it was also clear that member awareness of ongoing activities could be better. We will use the Good News! to highlight many of the ongoing and special initiatives in the coming year. As a recap of FY17, activities included mentoring and professional development (Journeys presentations, facilitated Research Studio, by request grant reviews), sponsored seminars (guest speakers, Go Red Symposium), awarding of pilot grants (Hariom Yadav – co-funded with CDOM, Andrew South) and increasing EPIC/bioinformatics resources (Diego Malaver – analytics support). Administrative efforts contributed to the renewal of an existing cardiovascular focus T32 and two diversity focused R25s, facilitation of two responses to RFAs for AHA Strategically Focused Research Networks that led to additional grant submissions and collaboration for increasing resources in support of rodent cardiometabolic phenotyping. Remember to save the date for another Ignite conference on February 21st that will showcase early career stage faculty research as part of the Dean's Research Symposia Series.

Good News!

Wake Forest School of Medicine Cardiovascular Sciences Center

Third/Fourth Quarter 2017

Cardiovascular Medicine Grand Rounds Host Star Studded Line Up



Dr. Anand Rohatgi



Dr. Robert Weiss



Dr. Mukesh Jain

The Cardiovascular Medicine Grand Rounds have always been a highly attended conference, but this year, attendance has soared! With the addition of 12 guest speakers this academic year, it is hard to pass up! In conjunction with the CVSC (Cardiovascular Sciences Center), Cardiovascular Medicine has already hosted four high-profile guest speakers including Drs. Anand Rohatgi, Robert Weiss, Mukesh Jain, and Kenneth Ellenbogen. Each grand rounds seminar has been intriguing and informative, allowing attendees the opportunity to interact with the best and brightest in the field. Remember to save the date for upcoming speakers **Thomas Wang, MD** (Vanderbilt): January 19, 2018; **James de Lemos, MD** (UT Southwestern): February 9, 2018; **Nancy Sweitzer, MD, PhD** (U. of Arizona): March 23, 2018; **Bruce Psaty, MD, PhD, MPH** (U. of Wash.): April 6, 2018; and **Laura Newby, MD** (Duke): April 27, 2018; The Cardiovascular Medicine Grand Rounds are held every Friday at 7:30 am in the Medical School Board Room. Please contact Randi Sullivan (rdwhite@wakehealth.edu) to be added to the mailing list for reminders.

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- ▶ Funding Announcements
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- ▶ Director's Note

CVSC Honors and Awards



Drs. Hazzard, Freischlag, Opina, Barnes, and Rosenthal

Erin Barnes, MD (T32 Cardiovascular Medicine Research Fellow/ Instructor, Infectious Disease) and **Teresa Opina, MD** (T32 Gerontological and Geriatric Research Fellow) were named the inaugural

recipients of the William R. Hazzard Scholars Program Award. The program will consist of a two-year cycle in which participants who have completed their residency or fellowship positions will receive stipends, full tuition support to overcome financial barriers to clinical research training, and research and travel funds. It is anticipated that at least two scholars will be appointed for each funding cycle. Those interested in applying to the William R. Hazzard Scholars Program should contact Dr. David Herrington, Vice Chair for Research, Department of Internal Medicine.



Dr. Melendez

Giselle Melendez, MD was recently named the AAMC (Association of American Medical Colleges) Minority Faculty Scholarship recipient for 2017. This full scholarship will allow Dr. Melendez to attend the AAMC Minority Faculty Leadership Seminar in New Orleans, Louisiana in January 2018. The seminar is designed for early career racial and ethnic minority faculty and post docs, who aspire to leadership positions in academic medicine. This award was proudly presented on behalf of the Maya Angelou Center for Health Equity, Office of faculty Affairs, and the Office of Diversity & Inclusion.



Drs. Rangel, Franzil, and Smith

In September, Cardiovascular Medicine fellows **Drs. Jodie Franzil, Octavia Rangel, and James Smith** represented Wake Forest in the Cardiology Jeopardy competition at the NC/SC ACC chapter meeting. We are pleased to announce that they took first place, winning over Duke and UNC.



Dr. South

In September, **Andrew South, MD** was awarded the Hypertension Early Career Oral Award during the AHA Council on Hypertension in San Francisco, CA. Dr. South also received the Kidney in Cardiovascular Disease New Investigator Travel Award.

The 2017-2018 **Best Doctors in America®** list was announced in September and **312 Wake Forest Baptist Health** physicians made the cut. This list highlights the top 4 percent of the best doctors currently practicing in the United States. Included in this list were Wake Forest physicians from 36 different specialties, including Cardiovascular Disease, Thoracic Surgery, and Vascular Surgery. For the full list of Wake Forest physicians that were named, please visit <http://www.wakehealth.edu/bestdocs/>

Funding Announcements

Dr. David Soto-Pantoja has received a CBB PUSH pilot award for \$50,000 from the Wake Forest University Comprehensive Cancer Center for his proposal "Targeting CD47 Regulates Immunometabolism and Boosts Melanoma Immunotherapy."

Dr. Giselle Melendez's proposal titled "Extracellular Matrix Remodeling: A Novel Mechanism of Anthracycline-Induced Heart Failure" will be supported by the CTSI Ignition Fund Pilot Award in the amount of \$5,000.

Dr. Christina Hugenschidt (Asst. Prof.-Gerontology) has been awarded a NIH administrative supplement to Dr. Dalane Kitzman's R01-funded SECRET 2 trial. This was an administrative increase of \$138,683 and \$154,008 for the -16 and -17 budget years.

Dr. Santiago Ramirez recently received notice of award for a Diversity Supplement in the amount of \$95,713 to support his research on **Dr. Carlos Ferrario's** P01.

Dr. Tina Brinkley has been awarded funding for her grant titled "Improving Cardiac Rehabilitation Outcomes with Evidence-Based Obesity Treatment." This is an NIH/NHLBI project that will be funded through August

Student Activities and Achievements

Alexa Hendrix, a Neurosciences Program PhD student mentored by Dr. Debra Diz, received an F31 Individual Pre-doctoral Fellowship from National Heart Lung and Blood Institute. She also received her Notice of Award from National Institute of Neurological Disorders and Stroke for the F99/K00 Individual Predoctoral to Postdoctoral Fellow Transition Award. Alexa was accepted into the business and development internship where she will work at the Center for Technology Innovation and Commercialization. Alexa has also received a travel award to the American Heart Council on Hypertension Meeting in San Francisco where she gave an oral presentation entitled, "Central Angiotensin -(1-7) Treatment Attenuates ERK ½ Expression and Oxidative Stress in the Dorsal Medulla of Betamethasone-Exposed Sheep that Associates with Improved Blood Pressure and Baroreflex Sensitivity".

Omeed Rahimi, a graduate student in Drs. Ann Tallant and Patricia Gallagher's who co-founded EncepHeal Therapeutics, received an investment from the North Carolina Biotechnology Center's Small Business Research Loan Program worth \$150,000.

A'ja Duncan, a PRIME Scholar and post-doctoral fellow mentored by Dr. Debra Diz, accepted a position as a Physical Scientist (Forensic Chemistry) with the Department of Defense, Department of the Army in Fort G. Meade, MD.

Marianne Collard, graduate student mentored by Drs. Tallant and Gallagher, won the Student Silver Award for Basic Science at the 25th Annual Surgical Sciences Residents' and Fellows' Research Day. Her poster was titled 'Muscadine Grape Extract Inhibits Proliferation and Migration of Triple Negative Breast Cancer Cells in Association with a Reduction in MAPK Signaling and Hmnr Expression.'

Welcome to **Dr. Manuel (Mannie) Ramirez** (PRIME Scholar) and rotating graduate students **Alaa Bawaneh** (IPP), **Tiffany Newman** (MCB), and **Elizabeth Sterling** (MCB) working in Drs. Katherine Cook and David Soto-Pantoja's lab.

Events and Happenings



The second annual **William C. Little Symposium** was held October 7. This annual event is presented by The William C. Little Society in conjunction with the Heart and Vascular Center of Wake Forest University School of Medicine. Dr. Lou Dell'Italia (Professor and Associate

Chief of Staff for Research at UAB) gave the keynote address titled "Chymase Inhibition in Cardiovascular Disease: Closing the Gap of 'Residual Risk' in Clinical Trials." In addition, 7 current Wake Forest faculty and fellows and 2 former fellows also gave talks. The symposium is held in honor of Dr. William Campbell Little, who held the title of Chief of Cardiology at Wake Forest School of Medicine from 1989-2013. Along with his extensive list of accomplishments and awards, he published more than 270 peer-reviewed articles; 39 of which have been cited more than 100 times.

Career Development Corner

The next **Academic Journeys Seminar** will be held Thursday, December 14th, in the Commons Conference Rooms on the G floor of the Nutrition Center, from 4:00 pm until 5:00 pm. Our speaker will be **Dr. Lynne Wagenknecht**, Associate Director of Public Health Sciences, who will share her career journey with us. Future career journeys will feature outside invited faculty as well as additional faculty from WFSM who will share their experiences. All are invited to these talks—undergraduate, medical and graduate students, fellows, residents and faculty—and light refreshments will be served. Please watch your emails for future talks.

The Career Development Committee is glad to provide help with grant reviews/critiques prior to submission or during resubmission. If you would like assistance, please contact Dr. Ann Tallant (atallant@wakehealth.edu) and she will identify faculty who can critique your proposal and provide advice.

If junior (or senior) faculty would like to participate in the Career Development Committee for the CVSC or have ideas about services we can provide to further your career, please contact Dr. Ann Tallant—all ideas are welcome.

Good News!

Wake Forest School of Medicine Cardiovascular Sciences Center

Second Quarter 2017

Wake Forest Baptist Health Emergency Medicine Brings the HEART Score to EMS Providers

Wake Forest Baptist Health has partnered with three surrounding county EMS agencies to successfully launch a pre-hospital pilot implementation of the HEART Score, a tool designed to risk stratify patients with chest pain. This pilot aims to determine whether paramedics using the HEART Score and Abbott's i-STAT point-of-care troponin assay in the pre-hospital setting can achieve 98 percent sensitivity and negative predictive value for major adverse cardiac events during the index visit and at 30 days in patients with symptoms concerning for ACS.



Dr. Mahler

This pilot is built upon **Dr. Simon Mahler** and **Dr. Jason Stopyra's** extensive work with the HEART Pathway combined with a strong section of faculty EMS medical directors. This novel approach is the first use of point-of-care troponin analysis in the back of a moving ambulance. Abbott i-STAT Point-of-Care has provided funding for this study that has already enrolled over 25 percent of the target. The plan is to enroll through the spring of 2018.

Pre-hospital utilization of the HEART score has the potential to improve the accuracy of triage, speed care delivery to patients at high risk of adverse events, and increase the efficiency of their care once they arrive at a medical facility. It may even be the first step in shifting the clinical paradigm of low-risk chest pain evaluation away from the emergency department and into the hands of pre-hospital/mobile integrated health providers.



Dr. Stopyra with an EMS team member

IN THIS ISSUE:

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- ▶ CVSC Honors, Awards, Invited Lecturers
- ▶ Student Achievements
- ▶ CVSC Activities, Events
- ▶ Publications
- ▶ CVSC Pilot Award

CVSC Honors, Awards and Invited Lecturers



Drs. Herrington, Applegate, Libby and Zhao

Dr. Peter Libby, Mallinckrodt Professor of Medicine, Harvard Medical School and senior physician with Brigham and Women's Hospital, was the guest speaker at the inaugural William C. Little, MD, Cardiovascular Medicine Lecture held Friday, May 19, 2017. The title of Dr. Libby's presentation was "A Reassessment of the Mechanisms of the Acute Coronary Syndromes." Dr. Libby is a world-renowned leader in cardiovascular medicine. His clinical and research interests include vascular biology, atherosclerosis and preventive cardiology.



Drs. Wilson and Chappell

Mark Chappell, PhD, FAHA, professor in Hypertension and Vascular Research in the Cardiovascular Sciences Center, and co-authors **Drs. Bryan Wilson, Manisha Nautiyal, TanYa Gwathmey-Williams and James Rose** were awarded the 2016 Paper of the Year by the American Physiological Society for their

paper titled "Evidence for a Mitochondrial Angiotensin-(1-7) System in the Kidney." The study demonstrates that expression of an Angiotensin-(1-7) system, a key peptidergic pathway of the renin-angiotensin system (RAS) that exhibits beneficial cardiovascular actions, was localized to the renal mitochondria.

Dr. Bridget Brosnihan has been granted Faculty Emeritus status July 1, 2017, in recognition of her outstanding academic achievements and service towards the Bioanalytical Assay Core for over 25 years as a High Complexity Laboratory Director (CLIA). Dr. Brosnihan has actively participated in graduate and medical education and research mentoring throughout her career with accolades such as the Mentor of the Year Award by the Women's Health Center of Excellence at Wake Forest School of Medicine (2012) and Reidar Wallin Teaching Award from the Molecular Medicine and Translational Science Graduate Program (2014). She received numerous awards for her research, most notably the Lifetime Achievement Award of the Council for High Blood Pressure of the American Heart

Association (2008) and Lifetime Achievement Award for the Inter-American Society for Hypertension (2014). Since 1999, ten publications have received special recognition as among the most cited, with data featured as cover art or as having made significant impact in the field. Dr. Brosnihan retired from her current faculty position in Surgery/Hypertension June 30, 2017, but will remain active within the Core facility.

The **Biomarker Analytical Core** passed the CLIA recertification with no deficiencies. Recertification was held May 23, 2017, with the lab being cleared for two years. Directors of the Biomarker Analytical Core are **Drs. K. Bridget Brosnihan and TanYa Gwathmey-Williams**.

Dr. David Soto-Pantoja was awarded the Clinical Research Associate Director Pilot Fund through the Comprehensive Cancer Center for his project titled "Determine Whether CD47 is a Biomarker and a Target to Potentiate Responses to Immunotherapy" and obtained the Keystone Symposia Early Career Investigator Travel Award (ECITA) to present this work at the Keystone Conference on Integrating Metabolism and Immunity to be held in Dublin, Ireland. Dr. Soto-Pantoja was also selected to the 2018 Cohort of Keystone Symposia Fellows, which involves a year-long career development training as well as participation in the organization's Scientific Advisory Board.

Dr. Jennifer Jordan was accepted into the 2017 AAMC Early Career Women Faculty Leadership Development Seminar in Stevenson, Wash., this summer. Additionally, she was awarded a scholarship co-sponsored by the Office of Faculty Affairs and the Office of Women in Medicine & Science to attend the program.



Dr. Brosnihan



Dr. Gwathmey-Williams



Dr. Soto-Pantoja



Dr. Jordan

At the Internal Medicine Teaching Excellence Awards Ceremony on May 25, 2017, the following awards were given.

Master Teacher Awards: **Drs. Brandon Stacey and Bharathi Upadhy**

Student Voted Awards: Class of 2017 - The Leonard Tow Humanism Award: **Dr. Bharathi Upadhy**

Class of 2019 - Teaching Award: **Dr. Brandon Stacey**

Student Teaching Awards for Faculty: **Drs. Bharathi Upadhy and David Zhao**



Dr. Stacey



Dr. Upadhy



Dr. Zhao

Student Achievements

Alexa Hendrix, a Neurosciences Program PhD student working with **Dr. Diz**, received 1st Place in the Dolores C. Shockley Best Presentation Award in American Society for Pharmacology and Experimental Therapeutics (ASPET) poster presentation at the Experimental Biology meetings in Chicago in April 2017, with a monetary prize, complimentary registration to next year's meeting and a one-year appointment to the ASPET Mentoring and Career Development committee. The title of her presentation was "Fetal Betamethasone Exposure Markedly Attenuates the Protein Expression of Angiotensin Converting Enzyme 2 but not Dipeptidyl Peptidase 3 within the Brain Dorsomedial Medulla of Adult Female Sheep."

Marianne Collard, an IPP PhD student in **Drs. Tallant and Gallagher's** laboratory, won 3rd Place in the American Society for Nutrition Emerging Leaders in Nutrition Science Poster Competition under the Dietary Bioactive Components RIS and received a cash award. She will also be interning with Aridis Pharmaceuticals in San Jose, Calif., from mid-May to the end of August.

Two oral presentations were given by **Sierra Nance**, a PREP trainee working with **Dr. TanYa Gwathmey-Williams** at the Experimental Biology Meeting in April 2017. The first talk was entitled "Cardiometabolic Status in Obese African-American Women is Linked to Glycative Stress" in the Obesity and Metabolic Syndrome session. The second talk was titled "Soluble Dietary Fiber in Obesity-Associated Inflammation and Oxidative Stress in African-American Women" in the Nutritional Immunology and Inflammation session.

The 2017 Post-Baccalaureate Research Education Program (PREP) Scholars Research Symposium was held June 13, 2017.

David Soto-Pantoja, PhD, assistant professor, Cardiovascular Sciences/Comprehensive Cancer Center, was the keynote speaker and his talk was titled "My Career Pathway."

2016-17 PREP Participants working with CVSC faculty were:

1. **Yismeilin R. Feliz-Mosquea, BS** (Inter American University of Puerto Rico)
Mentors: **Katherine Cook, PhD/David Soto-Pantoja, PhD**
2. **Sierra A. Nance, BS** (Winston-Salem State University)
Mentor: **TanYa Gwathmey-Williams, PhD**
3. **Sierra L. Patterson, BS** (North Carolina State University)
Mentors: **Gagan Deep, PhD/Tina Brinkley, PhD**
4. **Ashley A. Smith Christensen, BA** (Cornell University)
Mentor: **David Soto-Pantoja, PhD**
5. **Lillian Zerihun, BS** (Duke University)
Mentor: **TanYa Gwathmey-Williams, PhD**

CVSC Activities And Events



Mr. Malaver

We would like to welcome **Diego Malaver, MAS**. Mr. Malaver recently graduated from the Institute for Advanced Analytics at North Carolina State University where he earned a Master of Science in Analytics degree. Prior to this, he grappled with biology and economics at the University of North Carolina at Chapel Hill. In addition to cultivating his skills as a scientist, he enjoys analyzing the NBA and building models that optimize offensive schemes throughout various eras of the sport. Mr. Malaver has a passion for solving challenging problems through teamwork and is eager to apply complex methods for large-scale data modeling to better health. He will be working with us as a biostatistician to assist with analytics and statistical information.



Dr. Rodriguez

Carlos Rodriguez, MD, MPH, FACC, associate professor, Department of Epidemiology and Prevention in the Division of Public Health Sciences, was named interim director of the Maya Angelou Center for Human Equity (MACHE) in May 2017. Dr. Rodriguez, who is also an associate professor of medicine, joined our faculty in 2011. The focus of Dr. Rodriguez's research is on cardiovascular health disparities, minority cardiovascular health, hypertensive heart disease and heart failure. He is the principal investigator of ECHO-SOL and ECHO-SOL2, which are national multi-center studies on cardiac structure and function in Hispanics/Latinos across the country. Dr. Rodriguez was awarded a perfect score from the National Institutes of Health for his grant application, which is a very rare accomplishment.



Dr. Berton

The second CVSC Academic Journeys Seminar Series was held on May 11, 2017, at Wake Forest Biotech Place. **Dr. Alain Berton** gave a presentation on the things that have led him to the position he holds today. The talk was well attended by students, fellows and faculty. The next Academic Journeys Seminar is scheduled for August 10, 2017, 4 pm, and will be held at Wake Forest Baptist Medical Center in The Commons. The speaker will be **Dr. W. Gregory Hundley**.



The AMPLATZER™ Amulet™ Left Atrial Appendage Occluder device

Under **Dr. Patrick Whalen's** leadership, we have enrolled our first two patients in the AMPLATZER™ Amulet™ study, and these patients have undergone implantation of the AMPLATZER™ Amulet™ Left Atrial Appendage Occluder. This study is looking at an alternative device to the Watchman™ for stroke prevention in atrial fibrillation patients who cannot take chronic anticoagulation. This Amulet PR Kit received IRB approval for site use on June 8, 2017.

Recent CV COE Faculty Publications April through June

During the last quarter, Wake Forest School of Medicine CV COE faculty published **140 manuscripts** in peer-reviewed journals including *JAMA*, *JACC*, *Circulation*, *Cell Report* and *American Journal of Medicine*. A full list of these publications can be found at <https://www.ncbi.nlm.nih.gov/sites/myncbi/1JSeQsdreOokM/collections/52965755/public/>.

Below are a few highlights from the list:



Dr. Parks



Dr. Jordan



Dr. Kritchevsky



Dr. Kitzman



Dr. Hundley



Dr. Soliman



Dr. Zhang



Dr. Barnes



Dr. Jao

Dr. John Parks published an article titled “Hepatocyte ABCA1 Deletion Impairs Liver Insulin Signaling and Lipogenesis” in the *Cell Report*.

Dr. Jennifer Jordan et al, published an article titled “Early Myocardial Strain Changes During Potentially Cardiotoxic Chemotherapy May Occur as a Result of Reductions in Left Ventricular End-Diastolic Volume: The Need to Interpret Left Ventricular Strain With Volumes” in the June 20th edition of *Circulation*.

Drs. Stephen Kritchevsky, Dalane Kitzman and Gregory Hundley et al, published an article in *Metabolism: Clinical and Experimental* titled “Racial Differences in Circulating Levels of the Soluble Receptor for Advanced Glycation Endproducts in Middle-Aged and Older Adults.”

Drs. Elsayed Soliman and Zhu-Ming Zhang et al, published an article in *The American Journal of Cardiology* titled “Usefulness of Maintaining a Normal Electrocardiogram Over Time for Predicting Cardiovascular Health.”

Dr. Erin Barnes is co-author of the article “Hospitalizations for Endocarditis and Associated Health Care Costs Among Persons with Diagnosed Drug Dependence – North Carolina, 2010-2015.” The article was published in the *Morbidity and Mortality Weekly Report (MMWR)*.

Dr. Geoffrey Jao co-authored the chapter titled “Heart Failure” in the book “*Cardiovascular Hemodynamics for the Clinician, 2nd Edition*,” published by Wiley Blackwell.

Announcing the CVSC Pilot Award Winners and the Next Deadline for Applications

In an effort to promote new areas or technologies for cardiovascular research (basic, clinical and population), as well as foster collaborative efforts or new collaborations, the Cardiovascular Sciences Center (CVSC) invited investigators to apply for funding through the CVSC Pilot Award Program.



Dr. South

Andrew South, MD, MS, was the first recipient of the CVSC Pilot Funding awarded in January 2017. Dr. South is an assistant professor in the Section of Pediatric Nephrology, Department of Pediatrics. His research interests focus on pediatric hypertension and the role of the renin-angiotensin system (RAS) in renal pathology. Dr. South was funded by the CVSC for his project titled “The Role of the Renin-Angiotensin System in Pediatric Hypertension,” which seeks to better define the relationship between hypertension and target organ damage in children and the potential role of Angiotensin-(1-7) as a mitigating factor.



Dr. Yadav

Hariom Yadav, PhD, is the recipient of the CVSC Pilot Funding award for July 2017. Dr. Yadav is an assistant professor in the Center for Diabetes, Obesity and Metabolism (CDOM). His research program focuses on the gut microbiome-mediated pathology of diabetes, obesity and cardiovascular diseases, as well as designing innovative strategies to modulate the microbiome-gut-brain axis against these pathologies.

We welcome Drs. South and Yadav as members of the Center and wish them the best in their ongoing research at Wake Forest School of Medicine.

Investigators are invited to apply for the next Pilot Funding Award by submitting their application through the ePilot electronic submission system by October 18, 2017. Please use this link to apply: <https://redcap.wakehealth.edu/redcap/surveys/?s=CRYX7TED39>.