

# GOOD NEWS!

Wake Forest University School of Medicine Cardiovascular Science Center

Spring 2022

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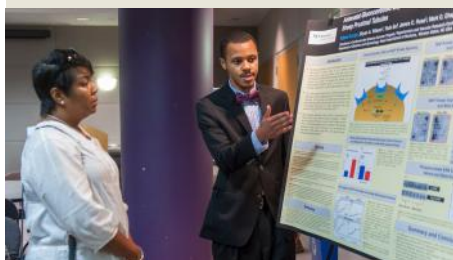
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## OBESITY IS NOT AUTOMATIC DIABETES



**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/m<sup>2</sup>), and over 650 million are obese (BMI >30 kg/m<sup>2</sup>)(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

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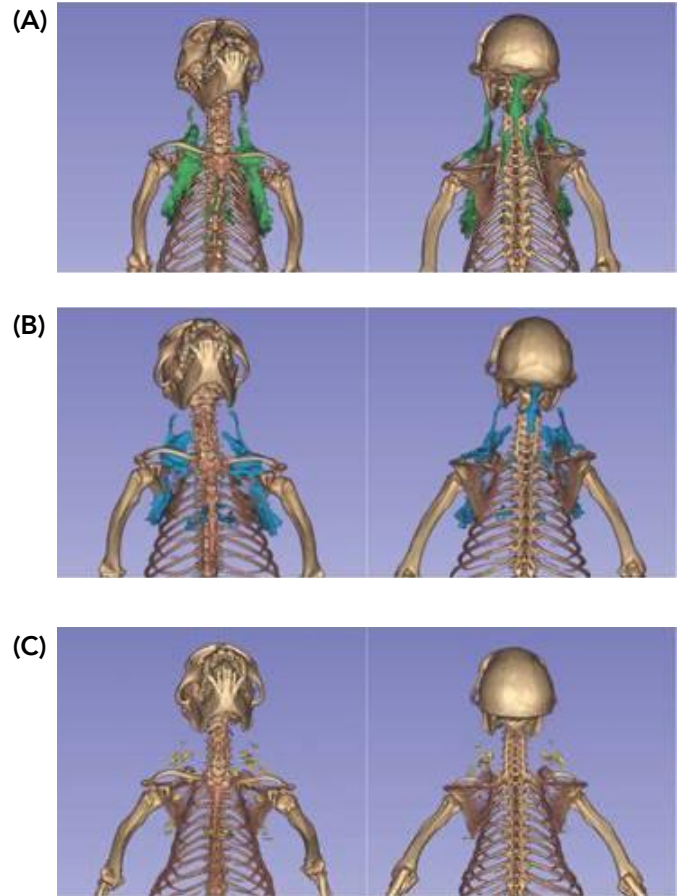


**Wake Forest University**  
**School of Medicine**

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**.

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## 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.

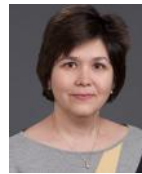
Goslen K, Hilton T, Raby K, Williams D, **Pisani B**. Pulmonary Hypertension and Diastolic Heart Failure in an Adolescent African-American Cantú Syndrome Patient.

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 Epi|Lifestyle 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!

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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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