

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 “Nepriylsin 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 Pittsburg
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 Delapunte	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 Louden	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!