HAPS November Virtual Meeting
November 13, 2021
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Dr Mike Gill
Professional Practice Fellow, Physiology, University of Otago
Dear Friends and Colleagues,

Welcome to the November 2021 Human Anatomy and Physiology Society (HAPS) Southern Regional Virtual Conference from everyone here at Forsyth Technical Community College in Winston-Salem, NC! Winston-Salem is in the Northwest Piedmont area of North Carolina and is quite beautiful this time of year.

We had hoped that we would be able to meet on our campus, but the Covid-19 pandemic has, once again, thwarted our plans to gather in person. We’ll miss the benefit of learning and meeting with such a diverse group of professionals face-to-face, but we have put together an excellent lineup of speakers and sessions that are sure to spark conversation and “a-ha” moments among us all. We also have some great poster and workshop submissions that we are sure that everyone will learn from, as well as find some take-aways that can be used in the classroom.

Since we are unable to share our campus and the other interesting sites of Winston-Salem with you, we hope you’ll enjoy this aerial view of our Main Campus.

We look forward to seeing everyone and hope that you enjoy the conference.

Sincerely,

Amy Bauguess
Host, 2021 HAPS November Regional Meeting
Instructional Coordinator, Human Biology at Forsyth Technical Community College
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<td>11:00 am – 12:00 pm</td>
<td>Update Speaker I: Hariom Yadav “Gut Microbiome: A Goldmine of Therapeutics and Biomarkers of Aging Related Metabolic Diseases”</td>
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Exhibitors & Sponsor

HAPS would like to recognize and thank our conference exhibitors and sponsors. Their generous support makes this conference possible.

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Abstract: The central research goal of my lab is to improve the understanding about mechanism(s) involved in gut microbiome-mediated pathology of metabolic diseases like diabetes, obesity, and aging, and to develop treatment options to prevent and/or cure these health ailments. To achieve this goal, my research program focuses on three major interconnected themes: 1. Define contribution of gut microbiome/virome on microbiome-gut-brain axis to regulate energy metabolism via modulating enteroneuroendocrine-immune axis 2. Development of human-origin probiotics 3. Study microbiome-drug interactions to modulate drug efficacy To accomplish the goals of our research projects, we use a combination of transgenic mice models of human disease, germ-free mice models, next generation sequencing, bioinformatics analyses in conjunction with bacteriological, biochemical, functional genomics, and ex-vivo and in-vitro models.

Bio: Dr. Yadav is Associate Professor of Neurosurgery and Brain Repair, and Director of USF Center for Microbiome Research. His research is focused on advancing understandings of how abnormalities in the gut can impact the brain functions which influence our learning, memory and food intake behaviors. Dr. Yadav’s team is designing innovative technologies of unique probiotics, prebiotics, synbiotics and postbiotics to modulate the gut microbiome, which in turn can reduce leaky gut and inflammation to ameliorate burden of age-related conditions in older adults. He uses personalized nutrition and microbiome approaches in clinical and preclinical studies. Dr. Yadav and his team-initiated Microbiome in aging Gut and Brain (MiaGB) study, which is investigating the role of gut microbiome in maintaining brain health while we are aging. Dr. Yadav’s research is supported by National Institutes of Health, Department of Defense and National Science Foundation. He has been awarded by several national and international awards for his research contributions and published more than 130 peer-reviewed publications.
Abstract: The ascending neuromodulatory systems that release the neurotransmitters dopamine, serotonin, and norepinephrine are critical for human brain function. Until recently, it was not possible to monitor the release of these neurotransmitters in the human brain with the temporal resolution necessary to investigate their role in encoding changes in human behavior and conscious experience. We have developed a novel approach, which we call ‘elastic net electrochemistry’, that permits continuous sub-second measurements of dopamine, serotonin, and norepinephrine (as well as other neurochemicals of interest). These first-of-their-kind recordings require electrodes implanted in the brain, thus we have deployed our approach in humans undergoing deep brain stimulation electrode implantation surgery and, more recently, in patients undergoing stereo-EEG monitoring. We have paired these novel measurements with tasks designed to investigate the computational underpinnings of human choice behavior and associated moment-to-moment changes in subjective experience. Simultaneously recorded dopamine and serotonin micro-fluctuations in the striatum are shown to encode computational signals critical for learning and ongoing adaptations in behavior. These neurochemically encoded signals correlate with moment-to-moment adaptations in behavior that are consistent with reactions to reward and punishment, but also the subjective experiences of “regret”, and “relief”. Direct, ultra-fast, intracranial monitoring of dopamine, serotonin and norepinephrine in the human brain is now possible. Going forward, such work is likely to provide unprecedented insight into how these neuromodulatory systems contribute to the changes in behavior and subjective feelings associated with psychiatric and neurological dysfunction.

Bio: Dr. Kenneth T. Kishida is an assistant professor in the Department of Physiology and Pharmacology and the Department of Neurosurgery at Wake Forest School of Medicine. Dr. Kishida earned a B.S. in Genetics from the University of California, Davis and his Ph.D. in Neuroscience at Baylor College of Medicine in Houston, TX. As a postdoctoral fellow, he developed technology that resulted in the world’s first real-time measurements of dopamine and serotonin release in the human brain during conscious decision-making behavior. He now uses this technology (‘human voltammetry’) and non-invasive neuroimaging tools (e.g., fMRI and MEG) paired with computational approaches to investigate basic and translational questions about the neural mechanisms underlying decision-making, conscious experience, and related psychiatric and neurological conditions in humans.
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Poster Presentations

Poster presenters will be available for questions during the poster presentation portion of the conference (3:25 pm – 4:25 pm) on the Poster Floor in Gatherly.

**Poster 1: But, Did You Learn Anything? A look at A&P I Material Retention During the Pandemic Era Learning Shift**

Presenter: Youlonda FitzGerald, Texas Woman's University, yfitzgerald@twu.edu
Co-Author: Karen Goodwin, Texas Woman's University, kgoodwin2@twu.edu

Does matriculation or method of instruction lead to differences in retention of A&P I content? Retention in A&P II students was assessed via correct answers from an online A&P I survey. ANOVA and descriptive statistics indicated a significant difference in retention between university of instruction (N=179, TWU, n=151, 6.12 correct; Other University, n=28, 5.29 correct, p=.021) and a non-significant difference in mode of instruction (N=179, in person, n=105, 6 correct; online, n=74, 5.97 correct, p=.920). The retention scores warrant further investigation to determine factors that contribute to the differences observed, and the development of steps to support retention deficiencies.

**Poster 2: The Emotional Effects of Cadaver Dissection and Students’ Coping Mechanisms**

Presenter: Kebret Kebede, Nevada State College, kebret.kebede@nsc.edu
Co-Authors: Wendi Benson, Nevada State College, wendi.benson@nsc.edu, Destiny Weislogel, Nevada State College, destinyweislogel@yahoo.com, Lauren Porter, Nevada State College, lauren.porter@nsc.edu

Cadaver Dissection is an integral educational tool for Anatomy and Physiology. The object of this research is to identify the initial emotional effects it has on students and their coping mechanisms. It also examines students’ perspective on the importance of cadaver-based Anatomy education. The original study was conducted in 2019 using a questionnaire taken by students of various majors. The sample consisted of 106 Nursing majors and 24 other majors (n=130). The striking result was that 89% of students identified a need for incorporating cadaver dissection into Anatomy, in-spite-of the emotional factors displayed initially. This is an ongoing study.

**Poster 3: Remote Learning: Making Connections Through Data Collection**

Presenter: Kimberly Loscko, Mount Carmel College of Nursing, kloscko@mccn.edu

Components of a remote laboratory program included customized weekly cloud-based physiology labs that allowed collection of heart rate; blood pressure; body temperature; and respiratory rate data collected by remote laboratory students through USB port physiologic sensors. A linear regression model was utilized to assess this approach to learning by evaluating student engagement, content acquisition, and subject matter proficiency in Anatomy and Physiology. Study participants included n = 59 nursing students. SPSS Statistics was used to analyze data collected through utilizing combined adaptive supplemental technologies in the synchronous online setting.
Poster 4: Community College Anatomy and Physiology Education Research (CAPER) Project Take 2!
Presenter: Chasity O’Malley, Nova Southeastern University, chasityomalley@gmail.com
Co-Authors: Kathy Bell, Salt Lake Community College, kathryn.bell@slcc.edu, Megan Deutschman, University of Minnesota, deuts153@umn.edu, Melaney Birdsong Farr, Salt Lake Community College, melaney.farr@slcc.edu, Ron Gerrits, Milwaukee School of Engineering, gerrits@msoe.edu, Suzanne Hood, Bishop's University, shood@ubishops.ca, Kerry Hull, Bishop's University, khull@ubishops.ca, Audrey Rose Hyson, University of Minnesota, hyson003@umn.edu, Murray Jensen, University of Minnesota, msjensen@umn.edu
The Community College Anatomy and Physiology Education Research (CAPER) project has been funded for a bigger, enhanced project. The original CAPER was a successful program that took an evidence-based teaching approach to provide instructors with useful techniques for enhancing engagement in their classrooms. Community College A&P instructors combined a professional development course with the design, implementation, and dissemination of a small-scale educational research project. In addition, data was collected from all participating students on learning and anxiety. Instructors learned about and implemented evidence-based instructional practices to promote student learning. In round 2, we’ve expanded the learning for our participants and the time frame, hoping to promote impactful changes in teaching. This poster will highlight aspects of the first round of CAPER and roll out the new, upgraded CAPER project.

Poster 5: Learning Analytics in Anatomy and Physiology Curriculum - A Daphnia Case Study
Presenter: Xyanthine Parillon, University of Houston Downtown, parillonx@uhd.edu
Learning analytics within the Analytic Framework guild analytics of higher education institutions toward supporting more effective practice. Sources of analytics within learning management systems have been identified. Quantitative and Qualitative distributions of programming for course design have be categorized. Practice is a concept identified as critical concept among other learning types of engagement using qualitative learning analytics. Studying heart rate using Daphnia is used as a case to apply learning analytics in relating to next generation science standards. In conclusion, learning analytics may critically inform curricula design for Anatomy and Physiology improvement.

Poster 6: Learning Styles and Learning Modalities in a First Year Physical Therapy Anatomy Course
Presenter: Kathleen Tallman, Azusa Pacific University, ktallman@apu.edu
Co-Authors: Grace Matsuda, Azusa Pacific University, gmatsuda@apu.edu, Susan Shore, Azusa Pacific University, sshore@apu.edu
Doctoral physical therapy (DPT) students are often kinesthetic learners. This study investigates a correlation between learning style and preference for three learning modalities (prosected cadaver, digital anatomy, or clay modeling). Fifty-eight PT anatomy students participated, completed a learning styles questionnaire in week 1 and a survey on learning modality preferences two weeks after final exams. One-fourth (23%) of students were purely kinesthetic learners. The majority (75%) had multimodal learning styles, all with a kinesthetic component. There was no significant difference in preference for learning modality based on learning styles. A multi-modal teaching approach may best support learning.
Workshop Presentations

Session 1: 12:05 – 12:50 pm ET

Workshop A: Teaching Physiology: How to Prioritize Hands-On Labs and Learning for Students in Any Location
Jasmine Anderson, BIOPAC Systems, Inc., jasminea@biopac.com
Sponsored by BIOPAC Systems, Inc.

Students need hands-on experience to learn critical physiology skills whether they attend labs in-person or remotely. Explore flexible solutions for a variety of course formats, including asynchronous and synchronous online courses, courses requiring social distancing in class, and remote learning from home. The Biopac Student Lab system, which includes hardware, software, and curriculum materials, provides an integrated life science teaching solution that works from anywhere. Key features include the following: Data recording from students’ own bodies, animals, or tissue preparations. Over 65 lessons covering topics such as ECG basics, nerve conduction velocity, EMG-controlled robotics, and functional near-infrared spectroscopy (fNIRS). A system ranked number one by HAPS for physiology teaching.

Workshop B: Incorporating HAPS Teaching Tips into your Supplemental Instruction Program for A&P
Carol Britson, University of Mississippi, cbritson@olemiss.edu

Peer-led supplemental instruction sessions have been used within A&P courses at my institution since 2011. While attendance is voluntary, a vibrant selection of activities has led to attendance by up to 40% of enrolled students, and attendees experience an overall 13% increase in the course grade. HAPS Teaching Tips that are physically engaging, connect with difficult topics, and are little to no cost are prioritized. New activities that can be modified for any topic (e.g, speed dating, (A&)Pictionary, Game of (A&)Phones, Headba(&p)nds, and Become the Concept Map) are regularly used. In this workshop I will show you how I develop the SI curriculum, work with SI leaders to create positive student experiences, and modify activities for in-person or remote engagement. We’ll also play a game of A&P speed dating.

Workshop C: Building Interactive 3D Anatomical Content for E-learning Using Photogrammetry
Jacob McClellan, Burrell College of Osteopathic Medicine, jacob.mcclellan@burrell.edu, Dillon Haughton, Burrell College of Osteopathic Medicine, dillon.haughton@burrell.edu, Bonny Ford, Burrell College of Osteopathic Medicine, bonny.ford@bcomnm.org, Jon Jackson, Burrell College of Osteopathic Medicine, jjackson@burrell.org

As part of a summer research experience bridging anatomical dissection and educational research, we developed an inexpensive workflow for generating digital 3D interactive anatomical models from photogrammetry images of human dissection specimens. The “boy, I wish we had those” need for such models was exposed (along with other limitations) during the “moved on-line” anatomical instruction of the COVID pandemic. This workshop shares our experience and our results in developing these models, and will engage interested anatomical educators with “how to” tips that will highlight the versatility of these virtual 3D specimens for anatomical teaching and assessment.
Workshop D: 3D Organon VR Anatomy: Features & Functions
Theodoros Zirogiannis, 3D Organon, marketing@3dorganon.com
Sponsored by 3D Organon
Explore all those exciting functions, features, and tools that make the 3D Organon VR Anatomy Software the most effective and valuable resource for teaching and self-directed learning of anatomy. Learn the benefits from 3D Organon VR Anatomy immersive learning and teaching.

Session 2: 2:35 – 3:20 pm ET

Workshop A: Applying HHMI BioInteractive’s Immune System Resource to Vaccines and Immunotherapies
Holly Basta, Rocky Mountain College, holly.basta@rocky.edu
Sponsored by HHMI BioInteractive
Between vaccine misconceptions and cutting-edge immunotherapies, working knowledge of the immune system has never been more essential. The Immune System interactive takes learners on a self-guided tour of the organs and cells of the immune system. They then explore the body’s response to an infection, discovering how the innate and adaptive responses are initiated and interact. This workshop will model one way to use the interactive in an undergraduate anatomy and physiology course: to help students understand how vaccines and immunotherapies work.

Workshop B: Best Practices for Teaching Anatomy and Physiology Lectures and Labs Online
Anthony Edwards, Tarleton State University, aedwards@tarleton.edu
Anatomy and physiology lectures and labs suffer from high rates of failures and withdrawals. In this engaging workshop, participants will learn strategies for increasing understanding of anatomy and physiology concepts and helping students develop skills that will help them be successful in this class and beyond.

Workshop C: Drive Engagement with Effective Digital Teaching
Steve Sullivan, Bucks County Community College and McGraw Hill, stephen.sullivan@bucks.edu
Sponsored by McGraw Hill
In the wake of the pandemic, the challenge of keeping students engaged in the content has become increasingly more prevalent. As a passionate instructor who has taught online since 2005, Dr. Stephen Sullivan has gained the experience and insight to effectively teach with digital. In this workshop, he will share the interactive tools he has built and assets he has found to be most engaging and educational for students of all levels. While highlighting these tools, he will share advice to implement these assets for the most successful and streamlined A&P course.
Session 3: 4:30 – 5:15 pm ET

Workshop A: Engaging Students in Anatomy and Physiology: Going Beyond Videos
Natalie Allen, OpenStax - Rice University, natalie.allen@Rice.edu

Sponsored by OpenStax
Anatomy and Physiology is a fascinating subject! There are wonderful videos to engage visual learners and content that can excite audible learners. There is so much more! There are opportunities for discussions, TikTok video demonstrations and group presentations. Anatomy and Physiology can make bones and flesh move. You will learn how instructors are making Anatomy and Physiology so very engaging in this presentation.

Workshop B: Best Practices for Recruitment and Retention in Summer Anatomy and Physiology Lectures and Labs
Anthony Edwards, Tarleton State University, aedwards@tarleton.edu

Many students enroll in anatomy and physiology courses in the fall, but are not prepared for the course or for college in general. Also, historically, courses are offered almost exclusively online in the summer in some colleges, even though students may not persist in a short, online course. In this interactive presentation, participants will learn about a summer program designed to serve two populations: students transitioning from high school and students who would be unlikely to complete a 5-week, online course.

Workshop C: Mindfulness in Anatomy and Physiology: The Body Scan and More
Edgar Meyer, University of Mississippi Medical Center, emeyer@umc.edu

Mindfulness practices are becoming popular aspects of work, curricular, and wellness routines. This occurrence is due to the fact that consistent use of mindfulness techniques affords individuals several mental and physical health benefits, such as reduced stress and anxiety, an increased ability to cope with stressful situations, and lower blood pressure and resting heart rates. This workshop will describe some mindfulness practices and explain ways in which they can be incorporated into anatomy and physiology courses or other curricular programs. Attendees will practice techniques such as the body scan and discuss how they might implement these practices in their classrooms.
Dear Friends and Colleagues,

On behalf of Forsyth Technical Community College and the Human Anatomy and Physiology Society (HAPS), I would like to thank you for participating in the HAPS Southern Regional Conference.

I would also like to thank the update speakers as well as the presenters of workshops and posters for their willingness to share their valuable time and knowledge with us during this conference and adapting it to a virtual format. In addition, anyone that helped with directly assisting workshop and poster presenters with navigating the virtual conference are truly appreciated.

This conference would not have happened without the support of HAPS and ASG (Association Services Group), with special thanks to Brittney Roberts, Caitlyn Hyatt and Peter English.

I would like to thank all of the participating exhibitors for their continued support of HAPS.

Finally, I would like to thank the leadership of Forsyth Technical Community College for their support of this conference. My heartfelt thanks goes to Dr. Torry Reynolds, Dean of Arts and Sciences, and Alice Rudolph, Department Chair of the Human Biology Department, for their valuable encouragement and input.

Thank you all so very much for making this conference a success.

Sincerely,

Amy Bauguess

Instructional Coordinator, Human Biology, Forsyth Technical Community College