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May 23 - 26, 2021

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**Poster Session III (Tuesday, 5/25 from 3:35 pm - 4:35 pm Eastern)** Hear Dr. Cindy Harley of Metropolitan University discuss her 2021 Instructor Research Survey re: student efficacy.

**Exhibitor Focus Groups (Monday + Tuesday, 5/24 + 5/25 from 5:30 pm - 7:00 pm Eastern)**
Hear from Stacy Vasquez, Professor of Biology at Dallas College/Mountain View campus regarding his experience using Visible Body’s publisher technology Courseware with his multi-tasking student body juggling work, family and education.

**Workshop Session 7 (Tuesday, May 25 from 11:45 am - 12:30 pm Eastern)** Watch a Visible Body product demo and speak with a representative to set up a free 2-week trial.

To read professor testimonials and request a free trial, visit:
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Welcome to HAPS 2021!

Who knew when we were in Portland in 2019 that we would be having our 2021 Annual Conference online! None of us would have even imagined it. But here we are and we are going to have an amazing conference this year. We have found a platform that will allow us to do all the things we normally do at an Annual – visit with friends, make new friends, learn a ton, and have fun doing it.

Normally at a HAPS Annual we split the update speakers section from the workshops. This is because the space requirements for each is very different with update speakers in a big space with the exhibits and the workshops at a partner university campus. Now that we are online we don’t need to worry about the physical space, so we can mix the update speakers with the workshops in a single day. So each of the four days will have both update speakers and workshops, with posters sprinkled in for good measure.

Posters will be handled differently this year as well. Each day a web page containing all the posters for that day will be available. Participants can read the posters during the day and then when the poster session opens, participants can go visit with the poster authors to talk about the posters, ask questions, and generally do all the things that normally happen in a poster session.

Our platform for the conference is called Gatherly, and it is designed to behave like an online hotel with lots of floors. You go to the elevators, choose a floor, and then move out of the elevator to join that floor’s activities. There will be a floor for update speakers, several floors for exhibitors, several floors for the 90 workshops that will be presented, and a floor for the 44 posters. And of course there will be a floor for just hanging out and visiting with friends. If you see a friend you move yourself over to the friend and you’ll automatically join a video chat – you can have up to 15 friends in these “huddles.”

But we know you can’t be tied to your computer full-time for four days. For this reason we have a phone based app called Pronto that we’ll be using to communicate. There are different groups being designed and you can always make more and invite friends to join. Need to go pick up the kids? You can still stay engaged with the Annual while out and about.

On behalf of all of the HAPS leadership and staff, I want to welcome you to HAPS 2021 and share our sincere hope that you have a great experience while you are here.

Sincerely,

Peter English, Ph.D.
Executive Director
The Human Anatomy & Physiology Society (HAPS) was founded in 1989, after three successful national conferences promoting communication among teachers of human anatomy and physiology at the college level. HAPS is an organization of Human Anatomy & Physiology instructors who strive for excellence in undergraduate instruction in Anatomy & Physiology. Increased growth of the Society necessitated securing an Executive Director and an organizational management firm to assist in the day-to-day administration of HAPS. However, HAPS remains primarily a volunteer organization.

The Board of Directors make the final policy decisions that steer the organization, but most of the work of HAPS is accomplished by the committees. All of these people (including the Conference Planning Committee) are unpaid volunteers. We encourage you to attend the meeting on Monday of any committee that interests you so you may discover first-hand how HAPS works and how you can get involved.

**HAPS Board of Directors 2020 - 2021**

- **President:** Wendy Riggs
- **Past President:** Mark Nielsen
- **President Elect:** Kyla Ross
- **Secretary:** Jacqueline Van Hoomissen
- **Treasurer:** Leslie Day
- **Central Regional Director:** Melissa Quinn
- **Eastern Regional Director:** Nanette Tomicek
- **Southern Regional Director:** Eric Sun
- **Western Regional Director:** Elizabeth Pennefather-O’Brien

- **Executive Director:** Peter English
- **Business Manager:** Caitlin Hyatt
- **Assistant Business Manager:** Brittney Roberts

**Standing Committees 2020-2021**

- **2021 Annual Host Committee Chair:** Melissa Quinn
- **Awards & Scholarships:** Chasity O’Malley
- **Cadaver Use:** Kelsey Stevens
- **Communications:** Anthony Edwards
- **Conference:** Jennifer Burgoon
- **Curriculum & Instruction:** Rachel Hopp
- **Diversity, Equity, and Inclusion:** Kathy Burleson
- **Fundraising:** Stacey Dunham
- **Safety & Animal Use:** Richard Simons
- **Steering Committee:** Cindy Wingert

**Special Committees and Programs 2020-2021**

- **Educator Editor-in-Chief:** Jackie Carnegie
- **Exam Program Leads:** Valerie O’Loughlin, Dee Silverthorn, Janet Casagrand
- **Executive Committee:** Wendy Riggs
- **Finances Committee:** Tracy Ediger
- **Nominating Committee:** Kyla Ross
- **Presidents Emeriti Advisory Committee:** Judi Nath

A list of contact information can be found on the governance area of the website ([http://www.hapsweb.org/?page=BoardofDirectors](http://www.hapsweb.org/?page=BoardofDirectors))
HAPS Presidents & Conference Coordinators

**Current President**
Wendy Riggs, 2020-2021

**President-Elect**
Kyla Ross, 2021-2022

**Past Presidents**
Mark Nielsen, 2019-2020
Judi Nath, 2018-2019
Ron Gerrits, 2017-2018
Terry Thompson, 2016-2017
Betsy Ott, 2015-2016
Tom Lehman, 2014-2015
Valerie O’Loughlin, 2013-2014
Dee Silverthorn, 2012-2013
Don Kelly, 2011-2012
Caryl Tickner, 2010-2011
John Waters, 2009-2010
Kevin Petti, 2008-2009
Margaret Weck, 2007-2008
Joseph Griswold, 2006-2007
Frederic Martini, 2005-2006
Sandra Lewis, 2004-2005
Philip Tate, 2003-2004
Michael Glasgow, 2002-2003
William Perrotti, 2001-2002
Henry Ruschin, 2000-2001
Christine Martin, 1999-2000
Steve Trautwein, 1998-1999
Kevin Patton, 1997-1998
Karen LaFleur-Stewart, 1996-1997
Robert Antony, 1995-1996
Wayne Carley, 1994-1995
Sandra Grabowski, 1993-1994
Gary Johnson, 1992-1993
Virginia Rivers, 1991-1992
Richard Steadman, 1989-1990

**This Year**
2021 – Virtual Conference (Melissa Quinn)

**Coming Attractions**
2022 – Ft. Lauderdale, FL
(Chasity O’Malley & Cheryl Purvis)
2023 – Albuquerque, NM (J. Mark Danley)
2024 – St. Louis, MO (Cinnamon Van Putte)

**Previous HAPS Conferences**
2020 – Virtual Conference (Jacqueline Carnegie)
2019 – Portland, OR (Jacqueline Van Hoomissen)
2018 – Columbus, OH
(Jennifer Burgoon & Melissa Quinn)
2017 – Salt Lake City, UT (Mark Nielsen)
2016 – Atlanta, GA (Kyla Ross & Adam Decker)
2015 – San Antonio, TX
(Anita Moss & Jason LaPres)
2014 – Jacksonville, FL (Lourdes Norman)
2013 – Las Vegas, NV (Kebret Kebede)
2012 – Tulsa, OK (Karen McMahon)
2011 – Victoria, BC, Canada (Peggy Hunter)
2010 – Denver, CO (Terry Harrison)
2009 – Baltimore, MD (Ellen Lathrop-Davis)
2008 – New Orleans, LA (Judy Venuti)
2007 – San Diego, CA (Kevin Petti)
2006 – Austin, TX (Mary Lou Percy)
2005 – St. Louis, MO (Margaret Weck)
2004 – Calgary, AB, Canada (Izak Paul)
2003 – Philadelphia, PA (Lakshmi Atchison)
2002 – Phoenix, AZ (Philip Tate)
2001 – Maui, HI (Frederic Martini)
2000 – Charlotte, NC (Nishi Bryska)
1999 – Baltimore, MD (Robert Smoes)
1998 – Fort Worth, TX (Theresa Page)
1997 – Toronto, ON, Canada (Henry Ruschin)
1996 – Portland, OR (John Martin)
1995 – St. Louis, MO (Kevin Patton)
1994 – Portsmouth, NN (Pam Langley)
1993 – Beaumont, TX (Wayne Carley)
1992 – San Diego, CA (Shirley Mulcahy)
1991 – Greenville, SC (Karen LaFleur-Stewart)
1990 – Madison, WI (Gary Johnson)
1989 – Reno, NV (Virginia Rivers)
1987/1988 – River Grove, IL (Robert Anthony)
HAPS Board of Directors
2020 - 2021

President
Wendy Riggs

Past President
Mark Nielsen

President-Elect
Kyla Ross

Secretary
Jacqueline Van Hoomissen

Treasurer
Leslie Day

Central Regional Director
Melissa Quinn

Eastern Regional Director
Nanette Tomicek

Southern Regional Director
Eric Sun

Western Regional Director
Elizabeth Pennefather-O’Brien
HAPS Committees
2020 - 2021 Committee Chairs

HAPS uses committees to further the goals and strategic vision of the Society. Each committee has a Chair who leads the committee, and a number of members who help make sure the work gets done. Pick a committee that interests you and come to the meeting at lunch on Monday, or just find a committee Chair and ask them what the committee is like. Benefits of HAPS include the welcoming nature of the Society and the inclusive nature of leadership.

**2021 Annual Host Committee**  
*Melissa Quinn*

Our committee oversees the coordination the 2021 Virtual Annual Conference.

**Cadaver Use Committee**  
*Kelsey Stevens*

We are charged with developing, reviewing, and recommending policies and procedures on the use of cadavers and human tissues and address issues pertinent to the development and maintenance of cadaver labs.

**Communication Committee**  
*Anthony Edwards*

We facilitate communication within HAPS, as well as outreach to non-members and potential members through various social media outlets.

**Conference Committee**  
*Jennifer Burgoon*

We actively encourage HAPS members to host an Annual or Regional Conference. We also provide advice and assistance to members who do host a HAPS conference.

**Curriculum & Instruction Committee**  
*Rachel Hopp*

We develop and/or compile resources that are useful for teaching A&P. We have helped members transition their classes to online delivery.

**Diversity, Equity, and Inclusion Committee**  
*Kathy Burleson*

The Diversity, Equity, and Inclusion (DEI) Committee develops best practices, resources, and professional development opportunities for inclusive education in anatomy and physiology, and advocates for inclusive practices within HAPS.
Fundraising Committee
*Stacey Dunham*
The Fundraising Committee works to help raise funds through both internal and external sources to support the mission and membership of HAPS.

Safety/Animal Use Committee
*Richard Simons*
We promote safety in the A&P laboratory with the HAPS Safety Guidelines.

Awards & Scholarships Committee
*Chasity O’Malley*
We administer the HAPS Awards & Scholarships Program.

Steering Committee
*Cindy Wingert*
We provide communication among the various committees of HAPS and enhance the ability of the committees to collaborate in furthering the aims of the Society.

Many of the committees will meet during the annual conference. This is a great opportunity to learn more about this aspect of HAPS. Come see what we’re about!
HAPS Special Committees and Programs
2020 - 2021 Chairs and Leads

**Executive Committee**
*Wendy Riggs*
We are the top elected officials of HAPS, setting policies and governing the Society.

**Nominating Committee**
*Kyla Ross*
We assemble a ballot of qualified candidates for election to the HAPS Board of Directors.

**Presidents-Emeriti**
**Advisory Board**
*Judi Nath*
Our members are all past HAPS Presidents and we serve as ambassadors at HAPS events and as advisors to the current HAPS leadership.

**HAPS Educator**
*Jacqueline Carnegie*
We oversee the peer-reviewed journal of HAPS, the *HAPS Educator*.

**Exam Program**
*Valerie O’Loughlin, Dee Silverthorn, & Janet Casagrand*
We develop, maintain, and manage the standardized HAPS exams and develop additional exams and/or exam questions as needed.
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HAPS 2021
Welcome to the *Fifteenth Season* of HAPS Institute!

HAPS Institute is the branch of HAPS that offers online courses for graduate credit or professional development. Throughout the year, participants have the opportunity to explore a variety of concepts at a deeper level and in a variety of flexible formats tailored to the busy schedule of working A&P professors.

HAPS-I focuses on concepts that are hard to understand, hard to learn, and hard to teach. Our short courses include both subject-specific content as well as practical teaching and learning methodology.

Participants who successfully complete HAPS-I courses earn either graduate biology credit through Alverno College in Milwaukee, WI, or choose to earn professional development certificates.

**Why would you want to participate in HAPS-I courses?**

Because you want to . . .

- Become a more effective teacher
- Brush up on a particular topic
- Get documented credit for your experience
- Gain access to expert faculty, presenters, and top-notch resources
- Strengthen your credentials in teaching A&P
- Improve chances for funding travel to a HAPS Conference
- Show students that you care about learning
- Learn new ways to teach the topics of A&P
- Enjoy the opportunity to contribute to a peer-reviewed publication

**You have a lot of questions, don’t you?**

Great! The HAPS-I staff is anxious to talk to you about our current offerings and future plans. This is YOUR professional development program, so please help us to make sure that we are meeting your needs! Contact Peter English at peter@hapsconnect.org with your comments, questions, or suggestions.

There’s also plenty of information about HAPS Institute on the [HAPS website](#) – look for the tab called “Graduate Credit Courses.”
Join us for the

**HAPS ONLINE Silent Auction**, sponsored by the HAPS FUNDRAISING Committee!

*All proceeds from the auction go towards supporting the Society!*

The online auction opened on May 16\(^{th}\) and will close on May 25\(^{th}\). Participants will bid on items during this time and the last bid placed before the auction closes will be the winning bid. Winners will be notified on May 26\(^{th}\).

To bid on an item, please [create an account](#).

**Visit the HAPS Silent Auction and bid on your favorite item!**

HAPS awarded 13 awards and scholarships totaling $6,925 to deserving HAPS members this year. These awards are funded primarily by member donations to HAPS, and if you participate in our silent auction, you can help support these awards too. Please visit the [HAPS Awards and Scholarships webpage](#) to learn more about the awards and scholarships we fund. You may qualify for one!

Even if you can't participate in the silent auction this year, you can help us continue to support our members by making a donation to HAPS.

No amount is too small (or too large!) [Donate today](#)!
The Human Anatomy and Physiology Society is happy to announce the following winner of the Sam Drogo Technology in the Classroom Award. This award is sponsored by ADInstruments.

Taziah Kenney
Taziah Kenney is a visiting assistant professor of Anatomy & Physiology at Thomas Jefferson University in Philadelphia is also pursuing her doctorate in education with a concentration in higher education leadership. Her doctoral research focus is the recruitment and retention of minority students within science fields.

Workshop 803: Workshop Floor C
To Agglutinate, or Not to Agglutinate, That is the Question? Tips & Tricks to Teaching Blood Typing Online
I have seen students struggle with in-person blood labs, so what happens when we take that in-person lab and are forced to create a remote lab? In this workshop, we will walk through some tips and tricks on how to keep students engaged and having FUN during a virtual blood lab.

About the Sam Drogo Technology in the Classroom Award:
In September 2010, HAPS lost a great friend. Our colleague Sam Drogo died shortly after doing one of the things he loved the most—teaching a lab full of Anatomy and Physiology students.
Sam's death has left an empty space at Mohawk Valley Community College, his home institution for over three decades. It has also left an empty space in HAPS. Sam was a long-time, devoted HAPS member, an active participant in the development of the HAPS Comprehensive Competency Test, and a consistent proponent of the use of technology in the classroom and laboratory.
In Sam's honor, ADInstruments established the Sam Drogo Technology in the Classroom Award. This is an annual award for a HAPS member who demonstrates the innovative use of technology to engage undergraduates in Human Anatomy and Physiology. The award is intended to encourage recipients to present a workshop at the HAPS Annual Conference on this innovative technology or on the use of technology in the classroom or laboratory.
Sam was a wonderful man. This award is a fitting tribute to him and we look forward to implementing it. Our thanks to ADInstruments for their generosity and our lasting thanks to Sam as colleague, mentor and teacher.
The Human Anatomy and Physiology Society is happy to announce the following winner of the Gail Jenkins Teaching and Mentoring Award.

This award is sponsored by Wiley.

Karen Groh
Karen Groh is an Associate Professor at Good Samaritan College of Nursing and Health Science, a hospital-based college in Cincinnati, Ohio, where she teaches Anatomy and Physiology to undergraduate Nursing students. Because she believes that genuine learning occurs when students are actively engaged in the learning process, she uses a mostly flipped classroom approach where students watch recorded lectures prior to class so class time can be used for active learning activities. Because many students find the abstract thinking of Anatomy and Physiology challenging, many of the activities involve hands-on and kinesthetic learning that help students bridge the gap between the concrete activities and the abstract thinking of Anatomy and Physiology. She uses a variety of manipulatives in her classes, including candy, pipe cleaners, toothpaste, tennis balls, Legos, beads, and her personal favorite, chocolate chip cookies.

Karen also believes that even rigorous classes should be fun, so her students might be found dancing the Heart Dance, doing a Chicken Dance to learn the cranial nerves, or role-playing excitation-contraction coupling, osmosis, or the layers of the integument. She has published many of the activities she has created in HAPS Educator and other sources. She is also a POGIL (Process Oriented Guided Inquiry Learning) facilitator. In her free time, she likes to hike in national parks and ride her bike. When she plays with her grandchildren, she doesn’t connect the play for Anatomy and Physiology concepts.

Workshop 702: Workshop Floor B - The Hardest Kindergarten Class You’ll Ever Take: Manipulatives in the Anatomy and Physiology Classroom

In kindergarten, manipulatives are used extensively to bridge the gap between abstract concepts and concrete forms. Educational research suggests that presentation of new knowledge in concrete forms followed by concreteness fading facilitates deep learning and allows learners to grasp complex topics. In this workshop, the use of manipulatives for teaching complex anatomy and physiology content will be explored. Participants will experience learning of one physiological concept using manipulatives and will discuss the benefits and limitations of this type of learning. Participants are asked to come to the workshop with a set of small objects such as coins, pebbles, or candy to use during the workshop. Suggestions for use of manipulatives in participants’ classrooms will be shared.

About the Gail Jenkins Teaching and Mentoring Award:
Gail was a dynamic and engaging instructor of anatomy & physiology and avid supporter of HAPS and its goals. Her death has left a hole in the hearts of many - her colleagues at Montgomery College, her publishing colleagues at Wiley, her HAPSters, her family and many friends. Gail loved teaching, and most of all, she loved being able to bring clarity to often difficult concepts for students to grasp. One of her favorite phrases with students was, “Let’s KISS this”. It meant - let’s “Keep it Simple, Sweetie”. When faced with a challenging concept, Gail would help her students KISS the topic by employing everyday analogies and/or props to visualize or un-pack the information. She provided a simple foundation on which the students could build and remember their newly acquired knowledge. No one got more use out of an old tube of toothpaste, a hot dog, a big red balloon, or a plate of chocolate chip cookies! Her students loved her for it.

In Gail’s honor, Wiley publishers in partnership with HAPS has established the Gail Jenkins Teaching and Mentoring Award. This is an annual award for a HAPS member who demonstrates use of engaging learning activities to help students truly understand and retain the more difficult Anatomy and Physiology concepts with kinesthetic and active learning strategies using inexpensive everyday props. The award is also designed to recognize those willing to mentor other instructors to also incorporate active learning to benefit more students.
The Human Anatomy & Physiology Society is happy to announce the following winners of the John Martin Second Timers Award.

Janay Dennis
Janay Dennis teaches at several institutions, with her home base being Mitchell Community College in Mooresville, North Carolina. When she is not teaching, she is practicing laboratorian who interprets sequencing chromatograms and participates in clinical dissections and autopsies on a regular basis. Her dedication to teaching, research, and clinical works allows her to bring a unique perspective to the classroom. When she is not working, you can usually find her tweeting and retweeting about random musings: @Quid_Pro_No.

Workshop 303: Workshop Floor C - #FliptheDiscussionBoard Challenge!
The hasty shift to online learning forced educators to find creative ways to keep students engaged in a mundane online learning environment. Quite often, the “go-to” activity is a discussion board. Discussion boards simulate the traditional classroom with a prompt, followed by student responses under stringent requirements. Social media affords instructors the opportunity to flip the discussion board concept around & build community amongst students. Given the increase of social media “challenges”, this concept was adopted in my A&P courses. Social media “challenges” involved musculoskeletal anatomy & special senses physiology. I will discuss how these “challenges” increased student engagement and retention online. Lastly, you will design your own social media challenge using current platforms.

Usha Sankar
Usha Sankar is an advanced lecturer in the Department of Biological Sciences at Fordham University where she has been teaching Human Physiology, among other courses such as Biochemistry and Anatomy since 2011. She received her Ph.D. from Weill Cornell Graduate School of Medical Sciences. She believes that human physiology is probably the most intellectually satisfying way to understand how the human body works and to bring critical thinking to improve one’s own health. Her interests include research in bridging the gap between teaching and learning and adopting evidence-based approaches to teaching and learning. She strongly believes in active learning techniques in class and bringing the students along in an exhilarating and satisfying exploration of the human body processes. She has published peer-reviewed journal articles as well as scientific communication articles. Her research interests include pedagogical innovations and the effect of air quality on human health. She is a huge Jeopardy fan and cherishes the opportunity to have met Alex Trebek who made being a nerd cool. Her other interests include listing to music, reading, and learning languages.

Poster 306 - Can In-Class Polling Predict Success in an Upper Division Human Physiology Course?
The ongoing pandemic demands that we pay extra attention to students’ engagement in remote classes. Active learning techniques in class improve student engagement but require all students participate to be successful. In-class polling is very useful to gauge student learning so that instructors can respond in timely fashion to ensure student comprehension. In my human physiology classes, an app-based polling technology that monitors student engagement and understanding of concepts elicits full participation. Analysis of polling data reveals the possibility of predicting the success of students in the final summative assessment and the ability to offer help to students early on.
Lauren Slone
Lauren Sloane holds a PhD in Biobehavioral Health from The Pennsylvania State University. After earning her doctorate, she completed a post-doctoral fellowship at the Sam and Ann Barshop Institute for Longevity and Aging Studies at the University of Texas Health Science Center at San Antonio. Her primary areas of expertise are in biomarkers of aging, healthspan, and animal models of aging. She currently is an Associate Professor of Biology at the State University of New York at Delhi, where she serves as the Program Director of Math and Sciences, and teaches undergraduate level biology and human anatomy and physiology courses.

Workshop 807: Workshop Floor G - A Creative Approach to Teaching Endocrine System Pathways
Students struggle with understanding endocrine pathways. To address this, an assignment was designed where students created posters by drawing connections to each of the major components of the pathways, including all organ and hormone names, functions of hormones, and feedback loops. This creativity increased understanding of the pathways, leading to greater comprehension of the endocrine system. As a result of pivoting to remote-teaching due to COVID-19, a new challenge to modify the assignment using virtual platforms was essential.

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The Human Anatomy & Physiology Society is happy to announce the following winners of the HAPS Conference Award.

Patrick Cafferty
Patrick Cafferty is a Senior Lecturer at Emory University, a four-year private research university in Atlanta, Georgia, where he teaches courses in introductory biology, human physiology, and developmental neurobiology. Prior to joining Emory, Patrick was a teaching and research post-doctoral fellow at the University of British Columbia (UBC) in Vancouver, Canada. Throughout his time at Emory, Patrick has sought out creative ways to promote student-faculty interactions. From 2012-2015, he lived on campus as a faculty-in-residence where he led a program called “Living an Active Lifestyle.” This program involved leading indoor cycling, running, and yoga sessions for his students. Since 2016, Patrick has held one of his four weekly office hours outside as a 3-4 mile group run called the “Active Office Hour.” In 2020, when classes transitioned to a completely online format in response to the COVID-19 pandemic, Patrick developed the “Artistic Office Hour” to promote casual social interactions using videoconferencing software. During the “Artistic Office Hour,” Patrick and his students meet online to color illustrations from discipline-specific coloring books or to work on personal art projects, relax, and chat.

Workshop 302: Workshop Floor B - Alternative Office Hours Promote Personal Faculty-Student Interactions
The transition to emergency online learning in response to the COVID19 pandemic in spring 2020 led students nationwide to feel socially isolated (Blankstein et al., 2020). Thus, when my institution announced online learning would continue during the fall semester, I developed the Artistic Office Hour to promote social interactions outside of class. During the Artistic Office Hour, students and I met weekly using Zoom videoconferencing software to color biological illustrations or to draw and chat. During this workshop, we will discuss the advantages of alternative office hours and brainstorm what alternatives might work best for you and your students.

Anthony Edwards
Anthony Edwards currently serves as Chair of the HAPS Communication Committee, leading a team of HAPSters nationwide keeping the membership informed through blogging, social media, email, and video. He previously served as HAPS Social Media Coordinator. Dr. Edwards earned a Bachelor of Science in Biomedical Science from Texas A&M University, a Master of Health Administration from the Texas A&M Health Science Center, and a Doctor of Educational Leadership and Policy Studies from Tarleton State University. Anthony has experience as a secondary science teacher at Huckabay ISD, Granbury ISD, and Fort Worth ISD, having also served as a science department chair at Granbury ISD.

Dr. Edwards currently serves as a Professor of Biology at Panola College, a community college in East Texas. There he teaches anatomy and physiology lectures and labs in face to face, hybrid, hy-flex, and online formats. Dr. Edwards has taught A&P 1, A&P 2, and Introductory A&P (one semester). Anthony also worked in higher education as a dual credit instructor for Hill College and Assistant Professor (of Health Professions Technology) and Director of Global Campus Outreach (Online Programs) at Tarleton State University. Before joining Panola College, Dr. Edwards served as Senior Vice President of Talent for the Fort Worth Chamber of Commerce, managing workforce and education initiatives. Anthony previously served in the Rotary Club of Fort Worth, Community Investment Cabinet for the United Way of Tarrant

continued on next page
County, and Board of Trustees for the Fort Worth Museum of Science and History, where he led the Technology Committee. Dr. Edwards currently serves on the board of the Carthage Improvement Corporation, supporting local economic and community development initiatives.

**Workshop 504: Workshop Floor D - Increasing Engagement and Completion in A&P**

In this interactive session, learn how to incorporate many strategies to increase completion and engagement in your A&P classes, including bellringers, exit tickets, online discussions, classroom concept checks, online laboratory exercises, video for lecture capture, student video assignments, as well as assignments completed with cloud-based documents, presentations, and forms.

**Melinda Fried**

Melinda Fried is currently a Practitioner in Residence at University of New Haven in West Haven, CT. She is the coordinator for the A&P program there. Prior to this appointment, she has worked at Quinnipiac University, Southern Vermont College, and Holyoke Community College teaching A&P since 2008. She has been a member of HAPS since 2016, attending annual conference in 2018 and 2019, and a regional conference online in 2020. In 2019 she presented a workshop on using Zombies to teach the CNS. She is also a chiropractor who has given seminars on anatomy and physiology to other chiropractors.

**Workshop 505: Workshop Floor E - Understanding the Action Potential**

Understanding a neuron’s action potential trips students up every semester. In this workshop, we’ll look at a different way of approaching and explaining the AP that can help students understand that it really is all about those gates (no trouble!).

**Burhan Gharaibeh**

Burhan Gharaibeh is an Appointment Stream faculty member at the Department of Biological Sciences, University of Pittsburgh. Prior to his current appointment, Dr. Gharaibeh worked as a Research Faculty in the Stem Cell Research Center, McGowan Institute for Regenerative Medicine and the Department of Orthopaedic Surgery, University of Pittsburgh. He also worked as a Senior Researcher at Biopatterning and Tissue Engineering Laboratory, Carnegie Mellon University (CMU). Dr. Gharaibeh teaches anatomy for the health profession, human physiology, physiology lab, and communicating in biological science for biology majors. He also teaches tissue engineering and biomedical technologies at the Department of Bioengineering. Gharaibeh received his PhD in Zoology from Texas Tech University in 1997. He also has an MSc in Zoology and a BSc in Biological Sciences, both from Yarmouk University in Jordan. Dr. Gharaibeh is a member of the Human Anatomy and Physiology Society. He is a journal reviewer for several prominent journals such as for Advances in Physiology Education, PLOS One, Tissue Engineering, Materials, Nature Science Reports, 3Biotech, Stem Cell Research and Therapy and Transplantation.
Poster 401 - Emerging Regenerative Medicine Themes Promote Student Engagement During the Cardiovascular System Anatomy and Physiology Classes

In teaching the cardiovascular system, the student-perceived difficulty of memorizing lists of structures and comprehending complex physiological processes presents a challenge. Adding relevant summaries from current articles on cardiomyoplasty, tissue-engineered grafts, decellularized hearts and others was found to be effective in enhancing student engagement, and analysis of student feedback from school evaluations showed that this addition was well-received. Further, the students thought clinical translations of current research was important for their prospective futures as health professionals. We suggest that while teaching the cardiovascular system, traditional textbook material be supplemented by new research findings in tissue engineering and related fields.

Amanda Haage
Amanda Haage is a second year HAPS member who started teaching anatomy in her first assistant professor position at the University of North Dakota in 2019. Over the last year she has developed a two-semester sequence of A&P from scratch, with a focus on integrating the experience on human diversity in her classes. She can be found on twitter - @mandy_ridd.

Workshop 802: Workshop Floor B - Integrating the Diversity of Human Experience with Human A&P
While intercultural competency is recognized as an essential part of many of our universities’ missions, it has often been relegated to something outside of STEM. We fail to commonly recognize how much of the diversity of human experiences is derived by both real and perceived diversity in human anatomy and physiology. This workshop will present a new, from scratch build of a 200-level large enrollment A&P course based on HAPS objectives completely integrated with human diversity topics. Every HAPS module has the potential to bring a first pass of essential intercultural competency training to our allied health students.

Sandra Hutchinson
Sandra Hutchinson is a Professor of Anatomy and Human Biology at Santa Monica College in California, and teaching anatomy, human biology, and occasionally genetics. Sandra is also an Ombuds at her community college. She is currently a faculty participant in a multi-year NSF grant program the strives to foster equity practices within STEM courses at her college.

Workshop 901: Workshop Floor A - Creating Connection and Community with a DEI Mindset in an Anatomy Course
Application of anatomy concepts can extend beyond the basic structures discussed in a textbook. By showing students the relevance of the course material to their lives, their interest, motivation, and learning can increase. Since the majority of our students will pursue allied health careers, and because my community college is a Title V HSI school, it was important for me to build awareness of equity and social justice issues into my anatomy course to create a supportive, informed learning community. In this workshop, I will discuss concrete examples of how to integrate these topics into the anatomy curriculum.
Robinlyn Wright

Robinlyn Wright is a scientist, educator and an advocate from Omaha, Nebraska. She has performed research for Tuskegee University, The National Institutes of Health National Cancer Institute, Boys Town National Research Hospital, Baylor College of Medicine and the University of Texas Medical Branch. She graduated from Tuskegee University with a Bachelor Science in Biology and the University of Nebraska Medical Center with a Medical Doctorate. She is the founder of the newly developing non-profit organization SayersCanHelpWright, Inc., whose mission is to provide healthcare for homeless individuals in Galveston County. Currently, she is employed as a Professor of Anatomy and Physiology and Microbiology at San Jacinto Community College in Pasadena, Texas and a part time Faculty Tutor at Houston Community College. Dr. Wright actively volunteers with Texas Department of Criminal Justice, Galveston County Jail and the Gulf Coast Mental Health Center.

Dr. Wright says, the greatest lessons she learned in life came from her professors. Furthermore, when she teaches, she strives to make the experience one her students will never forget. In her downtime, she enjoys spending time with her husband of 24 years, her bull terrier Lady, Rottweiler Debo and her Manx cats Shorti and Bobbi. Dr. Wright is an avid fisher, gardener and loves to sing.

Poster 302 - Generalized Adaptation Syndrome: An Icebreaker Lesson to Educate, Engage and Process Following the Capital Riot

Teaching on days after traumatic events is a discipline in pursuit of justice and equity. Thus, it is supportive of all learners, at this sociopolitical timepoint. Many Americans were unable to pull their eyes away from images of hundreds of protestors storming the U.S. Capitol building January 6, 2021. Constant exposure to images that generate fear, anxiety and distress can impose a heavy toll on people's minds and bodies. Physiologically, disturbing images can trigger a pattern known as the general adaptation syndrome (GAS). A lesson with Anatomy and Physiology students qualitatively compared their personal reactions and the known physiological responses of GAS as an introduction to the endocrine system.

Larry Young

Larry Young is Professor of Biology and Anatomy & Physiology for Polk State College, Lakeland, Florida since 2017. In addition to Anatomy & Physiology I and II, Larry teaches Biology of Sexuality and Gender and a non-majors course called Biological Issues. He works closely with the Polk State College Louis Stokes Alliance for Minority Participation (LSAMP) program. The program works with underrepresented minority students in STEM fields, giving them research, mentoring, academic support, and professional networking access to increase success and retention rates as they pursue advanced degrees in STEM. He also serves as the STEM Club Advisor for the college.

Larry has been an active member of HAPS since 2016. Larry currently serves on the Communication Committee, working with the Social Media team (he is the person behind many of the HAPS Facebook posts) and the DEI Committee leading various Town Hall events and co-led the Spring HAPS Book Club of Fatal Invention.


During the session participants will explore why incorporating tough conversations of social justice into an A&P curriculum is of importance in today's society and for inclusive teaching. The session will focus on the inclusion of race and racism into Integumentary System lessons through the use of Evolution, Anatomy, and current research.
HAPS 35th Annual CONFERENCE  
May 23 - 26, 2021  

Schedule of Events

Please note: all times are listed in EDT

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<tr>
<th>Time</th>
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<tr>
<td>10:30 AM – 10:45 AM</td>
<td>Welcome: Main Hall</td>
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| 10:45 AM – 11:40 AM | Update Seminar I: Main Hall            
Manu Platt, Georgia Institute of Technology and Emory University  
Sponsored by HAPS  
“Incorporating Racial Health Disparities, Research, and Biomedical Engineering into the Classroom” |
| 11:45 AM – 12:30 PM | Workshop Session 1: Workshop Floors A-H                                           |
| 12:35 PM – 1:40 PM  | First and Second Timer’s Event: First & Second Timer’s                             |
| 1:45 PM – 2:30 PM  | Workshop Session 2: Workshop Floors A-H                                           |
| 2:35 PM – 3:30 PM  | Update Seminar II: Main Hall            
Sarah Greene, Morehouse School of Medicine  
Sponsored by the American Association of Clinical Anatomists  
Amy Cohen Efron  
“Addressing Health Disparities Through Anatomy and Health Science Education: Bridging the Gap Between the Medical and Cultural Perspectives of Deafness” |
| 3:35 PM – 4:35 PM  | Visit with Exhibitors: Sponsor Exhibits, Premium Exhibits, and Standard Exhibits   |
| 3:35 PM – 4:35 PM  | Poster Session I: Poster Floor                                                     |
| 5:30 PM – 6:30 PM  | Welcome Reception: Welcome Reception Floor                                          
Sponsored by ADInstruments |
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| 10:45 AM – 11:40 AM | **Update Seminar III: Main Hall**  
Chris Basler, Georgia State University  
*Sponsored by HAPS*  
“Identifying Key Interactions Between Emerging RNA Viruses and Their Hosts” |
| 11:45 AM – 12:30 PM | Workshop Session 4: Workshop Floors A-H                                       |
| 12:35 PM – 1:40 PM | **Committee Meetings: Workshop Floors A-H**  
Awards & Scholarship Committee: Workshop Floor A  
Cadaver Use Committee: Workshop Floor B  
Communications Committee: Workshop Floor C  
Conference Committee Floor: Workshop Floor D  
Curriculum & Instruction Committee: Workshop Floor E  
Diversity, Equity, and Inclusion Committee: Workshop Floor F  
Fundraising Committee: Workshop Floor G  
Safety & Animal Use Committee: Workshop Floor H |
| 1:45 PM – 2:30 PM | Workshop Session 5: Workshop Floors A-H                                       |
| 2:35 PM – 3:30 PM | **Update Seminar IV: Main Hall**  
Nikki Jernigan, University of New Mexico  
*Sponsored by the American Physiological Society*  
“Vascular Effects of Hypoxia” |
<p>| 3:35 PM – 4:35 PM | Visit with Exhibitors: Sponsor Exhibits, Premium Exhibits, and Standard Exhibits |
| 3:35 PM – 4:35 PM | Poster Session II: Poster Floor                                                |
| 5:30 PM – 7:00 PM | Exhibitor Focus Groups                                                        |</p>
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<td>Synapse HAPS: Main Hall</td>
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<td>Inclusive Education in Anatomy and Physiology</td>
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<td>Workshop Session 7: Workshop Floors A-H</td>
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<td>Meet Your Regional Director: Workshop Floor H</td>
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<td>Melissa Carroll, DeSales University</td>
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<td>“Representation and Anatomical Diversity”</td>
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<td>Workshop Session 11: Workshop Floors A-H</td>
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| 2:35 PM – 3:30 PM    | Update Seminar VI: Main Hall  
Albert Chi, Oregon Health & Science University  
Sponsored by HAPS  
“Necessity as the Mother of Invention: Innovation and Health Challenges from COVID-19 to Bionic Arms” |
| 3:35 PM – 4:35 PM    | Visit with Exhibitors: Sponsor Exhibits, Premium Exhibits, and Standard Exhibits |
| 3:35 PM – 4:35 PM    | Poster Session IV: Poster Floor                                         |
| 5:30 PM – 7:00 PM    | Social: Main Hall                                                       |
Update Seminar I: Main Hall
Sunday, May 23 from 10:45 AM – 11:40 AM

Manu Platt
Sponsored by HAPS

Incorporating Racial Health Disparities, Research, and Biomedical Engineering into the Classroom

Abstract: Dr. Platt’s research centers on topics that are racial health disparities such as sickle cell disease, breast cancer, and HIV that have also taken his work to developing countries because health disparities in the United States tend to be global health problems. He uses this theme to train up a generation of scientist-activists; scientists that are able to speak to the broader public and translate scientific knowledge to communities that are disproportionately affected, meaning they also can understand the social determinants of health that drive health disparities, but always linking this to the cell and organ physiological aspects being taught in an undergraduate curriculum.

BIO: Dr. Manu Platt received his B.S. in Biology from Morehouse College and his Ph.D. from the Georgia Tech/Emory joint program in Biomedical Engineering. After postdoctoral training at MIT he returned to the faculty at Georgia Tech/Emory in Biomedical Engineering, where he has since been promoted and tenured. His research centers on proteolytic mechanisms of tissue remodeling during disease progression using both experimental and computational approaches. These diseases of focus are health disparities in the U.S., but global health concerns: pediatric strokes in sickle cell disease, personalized and predictive medicine for breast cancer, and HIV-mediated cardiovascular disease, which has taken him to South Africa and Ethiopia for collaborative work to find solutions for low resource settings. His work has been funded by NIH Director’s New Innovator Award, International AIDS Society, Georgia Cancer Coalition, and the National Science Foundation. Integrated with his research program are his mentoring goals of changing the look of the next generation of scientists and engineers to include all colors, genders, and backgrounds. Aligned with that goal, Dr. Platt, with Bob Nerem, co-founded and co-directs Project ENGAGES (Engaging the Next Generation At Georgia Tech in Engineering and Science), a program paying African-American high school students from Atlanta Public Schools to be researchers in Georgia Tech labs since 2013.
Update Seminar II: Main Hall
Sunday, May 23 from 2:35 PM – 3:30 PM

Sarah Greene
Sponsored by the American Association of Clinical Anatomists

Sarah Greene
Associate Professor
Morehouse School of Medicine
Atlanta, GA
sgreene@msm.edu

Amy Cohen Efron
abcohende@gmail.com

Addressing Health Disparities Through Anatomy and Health Science Education: Bridging the Gap Between the Medical and Cultural Perspectives of Deafness

Abstract: It is common practice in anatomy and physiology to present and discuss clinical correlations related to the structure and function content being studied. In the case of the ear and hearing, hearing loss is often presented as a pathology or something that is “wrong” with a patient. Education on the cultural perspective of deafness is largely absent from the training of future healthcare professionals, which has contributed to the health disparities and inequities that have been reported. Despite published findings of these health inequities, little has been done in the medical community to address these issues. In this presentation, we will discuss the activities we have implemented in our curriculum at Morehouse School of Medicine (MSM), as well as experiences that we have developed for the MSM community at large. These have included Deaf Culture panels, the development of an American Sign Language and Deaf Culture Student Interest Group, a Faculty Development Seminar, and most recently, the development of an eight-week seminar series on working with Deaf patients and their families. We will share how these activities were developed, and present data on how they have affected the knowledge and perspectives of those who have participated. We will then discuss the importance of fostering interest in healthcare professions in Deaf and hard of hearing youth, and how to make a classroom (virtual or in person) inclusive for Deaf and hard of hearing learners.

continued on next page
BIO: As an undergraduate student, Dr. Greene studied health science at Johnson State College (Johnson, VT) and medical biology at the University of New England (Biddeford, ME). During this time, she developed strong interests in teaching in the anatomical sciences. She went on to earn her Ph.D. in the Department of Anatomy and Neurobiology at Boston University School of Medicine (BUSM). Her research at BUSM focused on studying neuroimaging and neuropsychological biomarkers for Alzheimer’s disease, and as a faculty, her research interests transitioned to medical education. Dr. Greene is currently a student in the Sign Language Interpreting Program at Georgia State University, where she is working towards her goal of blending her interests in medical education, sign language, and Deaf culture to address the health disparities in the Deaf and hard of hearing communities. Dr. Greene began her academic career as a lecturer and laboratory instructor in Gross Anatomy in the Department of Cell Biology at the University of Massachusetts Medical School, and then went on to become an assistant professor in the Department of Neurological Sciences at the University of Vermont, where she also directed the Anatomical Gift Program. Dr. Greene began her position as an assistant professor at Morehouse School of Medicine in 2015 and is currently an associate professor in the Department of Pathology and Anatomy at Morehouse School of Medicine in Atlanta. Throughout her career, Dr. Greene has been dedicated to education and educational research in the anatomical sciences. Her interests are diverse and have included developing methods for making the most complex concepts in anatomy easier to understand, exploring student responses to working with anatomical body donors, and implementing and investigating the effects of incorporating training about working with Deaf and hard of hearing patients into medical curricula.

BIO: Amy Cohen Efron earned a specialist degree in School Psychology at Gallaudet University in Washington D.C. Amy started her professional career as a school psychologist in 1992, and she has worked for a non-profit organization, several state schools for the Deaf, and a residential treatment center for Deaf children for 28 years. As a long-time community activist, advocate, and most recently, artist; Cohen Efron founded the websites, “Deaf World As Eye See It” (2006-2012), and “AEfron Arts and Culture” (2018-present) where she can express her thoughts in English, American Sign Language and fine arts. Cohen Efron has published approximately 120 written posts and produced more than 140 ASL videos covering a wide range of Deaf-related subjects. As of 2015, Cohen Efron created over 300 artworks and participated in Inkttober Challenges over the last four years. Cohen Efron uses her artistic talents using various mediums (ink, watercolor, acrylic, oil, and digital) to elevate important issues from a unique perspective, as a Deaf Jewish woman. Amy lives with her beloved companion, a black lab/basenji mix, JR and she will always find time dabbling in arts and activism for a positive social change.
Identifying Key Interactions Between Emerging RNA Viruses and Their Hosts

Abstract: Emerging RNA viruses such as Ebola virus and SARS coronavirus 2 pose major threats to human health. Like all viruses, these are obligate parasites that can only propagate in living cells. Therefore, it is of interest to identify key points at which these viruses usurp key cellular pathways. I will discuss approaches we have taken to identify functionally important interactions between Ebola virus and SARS-CoV-2 proteins and host factors and the implications of these findings for pathogenesis and for therapeutic intervention.

BIO: Christopher F. Basler is the director of the Center for Microbial Pathogenesis within the Institute for Biomedical Sciences at Georgia State University. Dr. Basler obtained his Ph.D. from Albert Einstein College of Medicine in 1995. He became Professor of Microbiology at Icahn School of Medicine at Mount Sinai in New York City in 2013. He was elected Fellow of the American Academy of Microbiology in 2014. His major research interests are interactions between emerging RNA viruses and the host. Notable achievements include the identification and characterization of Ebola virus and Marburg virus proteins that block innate immune responses to promote virulence, participation in the reconstruction of the 1918 pandemic influenza virus and identification of potential therapeutic targets for SARS-CoV-2.
Vascular Effects of Hypoxia

Abstract: Compared to invertebrates, the increased body mass, complexity, and metabolic activity of vertebrate organisms are made possible by the evolution of a circulatory system which distributes oxygen (O2) to each cell of the body to maintain their viability and physiological functions. Reduced O2 availability, or hypoxia, can result in irreversible tissue injury or even cell death; the brain and heart being the most susceptible. The vascular response to hypoxia is a powerful mechanism to maintain organ function and to reduce the negative effects that hypoxia otherwise would produce. Pulmonary arteries constrict in response to hypoxia, whereas systemic arteries undergo dilation. These physiological responses reflect the need to improve gas exchange in the lung, and to enhance the delivery of blood to hypoxic systemic tissues. An important unresolved question relates to the underlying mechanism by which the vascular cells detect a decrease in O2 and translate that into a signal that triggers the functional response. We will discuss the acute and adaptive responses to hypoxia that are mediated by the vasculature and the mechanisms by which these adaptive responses are impaired in disease states.

BIO: Dr. Jernigan is a vascular physiologist. She received her Ph.D. from the University of New Mexico School of Medicine and did her post-doctoral training at the Cardiovascular-Renal Research Center at the University of Mississippi Medical Center in Jackson, Mississippi. Since returning to the University of New Mexico as faculty of the Department of Cell Biology and Physiology in 2008, Dr. Jernigan has built a highly successful NIH-funded research program that focuses on understanding the signaling mechanisms leading to cardiovascular disease. More specifically, she is interested in the alteration of vascular smooth muscle calcium handling and signal transduction that occurs with hypoxia-induced pulmonary hypertension, a fatal condition associated with chronic obstructive lung diseases, interstitial lung diseases, sleep apnea, and high-altitude exposure.
**Update Seminar V: Main Hall**

**Tuesday, May 25 from 2:35 PM – 3:30 PM**

*Melissa Carroll*

*Sponsored by the American Association for Anatomy*

Associate Professor  
DeSales University  
Center Valley, PA  
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**Representation and Anatomical Diversity**

**Abstract:** Enough already! I know what you might be thinking, 2020 magnified social unrest, incivility, and the need for equity and inclusion - but can we talk about something else, please? Personally, as an underrepresented minority in anatomy, I believe that we are missing the bigger picture regarding our impact. Representation in anatomy includes the images we use in our texts or atlases and the donor-cadavers we dissect, in addition to our social, cultural, neurocognitive, and ethnic backgrounds. Anatomical diversity includes our differing pedagogies, teaching modalities, structural variants, and our student groups’ conceptual or performance needs. Including anatomy use for medical, rehabilitation, engineering, and other professional degree-granting programs that use anatomical science to achieve a discipline-specific outcome. This seminar will challenge you to think about representation and anatomical diversity more broadly; hopefully in a way to make an immediate impact on your metacognitive approach to teaching and learning in anatomy.

**BIO:** Melissa A. Carroll, Ph.D., MS, is an Associate Professor in the Doctor of Physical Therapy (DPT) Program at DeSales University. She is also the Director of the Anatomical Laboratory and the Research Coordinator for the DPT Program. Melissa currently teaches cadaveric anatomy and neuroscience, with integrated embryology and physiology. She also teaches evidence-based practice and research methodology while also mentoring students each year through a clinically-based or education research project, often in collaboration with a community partner. Her research agenda is varied, and she has published or presented in areas of ceroplastics (anatomical waxes), medical history, and pelvic anatomy. In 2017, she and her student group were awarded the Best Original Research Award at the Pennsylvania Physical Therapy Association Annual Conference. She served as Chair of the Cadaver Use Committee for the Human Anatomy and Physiology Society (HAPS) from 2013-2016 and was the recipient of an Educational Outreach Grant from AAA in 2012. Melissa holds membership in the American Association for Anatomy (AAA), HAPS, the American Association of Clinical Anatomists (AACA), and associate membership in the American Physical Therapy Association (APTA). Melissa currently serves on the Committee for Early Career Anatomists (CECA) of AAA and is the founder of Black in Anatomy.
Update Seminar VI: Main Hall
Wednesday, May 26 from 2:35 PM – 3:30 PM

Albert Chi
Sponsored by HAPS

Associate Professor
Oregon Health & Science University
Portland, OR
chia@ohsu.edu

Necessity as the Mother of Invention:
Innovation and Health Challenges from COVID-19 to Bionic Arms

Abstract: Dr. Chi's talk takes us on a journey describing the crossroads between advance surgery and cutting edge technology and how it applies to patients with injuries. We will meet some of Dr. Chi's patients and learn about how he and his team have used 3D printing to make breakthrough technology accessible and affordable to anyone in need. Finally, we'll hear about how the recent COVID-19 pandemic led Dr. Chi's lab to create a 3-D printed ventilator capable of basic and advanced life support with the goal of providing accessibility to all communities.

BIO: Albert Chi, MD, MSE, FACS is a critical care physician, trauma surgeon, retired Navy commander and biomedical engineer. His research has been revolutionizing the field of prosthetics, which was motivated by observing the destruction of war and the countless lives forever altered through the loss of limbs. This journey led him to become one of the nation's leading experts in developing advanced, inexpensive prosthetics using 3D printing technology. This technology has served children with upper extremity congenital limb loss and the development of a 3D-printed exoskeleton for individuals that have experienced stroke. In face of the recent COVID-19 pandemic, Dr. Chi's lab created a 3D-printed ventilator capable of basic and advanced support with the goal of providing a technology accessible and effective to any community that needed it.
Synapse HAPS! Inclusive Education in Anatomy and Physiology

Tuesday, May 25 is SYNAPSE time. This year’s theme is Inclusive Education in Anatomy and Physiology. Please join us and show your support as we provide a fast-paced series of 5-minute elevator speeches.

Burhan Gharaiheb – Race and Medicine for Anatomy and Physiology Undergraduates
Race is a term that is invoked on a daily basis and racial discrimination affects the lives of people of color. However, the Human Genome Project has shown that there is no meaningful biological basis for race. Conventional wisdom from racialized medicine not supported by current, evidence-based data can lead to errors in diagnosis and mismanagement of disease. As anatomy and physiology educators, we are in a great position to discuss lack of data regarding a biological basis of race and emphasize the negative impact of invoking race in medical care. Sound discussions with undergraduates and changes in our syllabi and lecture material can provide critical, objective education and are essential for promoting antiracist education, equity, and inclusion.

Marisol Lopez – The potential Life Experiences of a Second-Generation Latina in STEM
The representation of Latinx in the STEM fields is lower than their national demographic representation. Among the major factors contributing to this lack of equity in representation of Latinx in STEM fields are their lower college graduation rate and their increased likelihood to leave a STEM major. This story will follow the life trajectory of a fictitious Latina as she pursues a career in a STEM field. The barriers and challenges that she faces as she enters the world of higher education and academia will be discussed. Systems of support and mentoring throughout her life will keep her grounded to her life goals. Her job will not be done until she paves the way for more Latinas like her to access the world of STEM higher education.

Meaghan MacNutt – A Small Step Towards Decolonizing A&P: Examining the Structure and Function of Indigenous Land Acknowledgements
Land acknowledgements are one important component of decolonizing higher education. They work against the historic erasure of Indigeneity from our classrooms, and they signal respect for Indigenous peoples and cultures. There is no universal script for authentically expressing gratitude and reflecting on one's role in a colonial system; as a non-Indigenous person, I'm still figuring out how to do this in a meaningful way. Here I'll offer a guided dissection of some land acknowledgements I use professionally. By examining the structure and function of their components, I hope to motivate and empower you to offer your first land acknowledgement, or to deepen your practice of acknowledging the territories where you live and teach.

Jill Kirby – Dis-a-What?
The World Health Organization reports that about 15% of people worldwide are living with some form of disability. What does this even look like? What does this mean for us as professors of Anatomy and Physiology? Let’s talk about how we can even the playing field for all of our students while also preparing them to be more inclusive humans.

Heather Billings – What's the Buzz on Sexual Orientation?
This presentation will provide a condensed update on current research progress on sexual orientation. Discussion of open questions will be included.

Juno Farnsworth – Gender-Neutral Language in the Endocrine and Reproductive Systems
Much of our material is traditionally divided into male and female, but it doesn't have to be. Sometimes a simple shift in terminology can make people who don't fit into a classic sex or gender feel more included.

Kebret Kebede – Overlooked Minority Contributions to Science
It is imperative that the significant contributions of minorities are mentioned during the lectures to create a broader awareness. For example, when we are looking at x-rays with images of the various types of fractures, we are reminded of a polish female scientist who discovered x-rays which made the diagnosis possible. She was awarded not one but two Nobel prizes which is an incredible achievement in itself. Minority scientists have contributed to the advancement of science with inventions such as the cardiac pacemaker, urinalysis machine, blood banks, steroid meds used in arthritis, laser cataract surgery and monoclonal antibodies for the treatment of cancer.
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Poster Presentation Abstracts

Poster Session 1: Sunday, May 23 from 3:35 pm – 4:35 pm

Poster 101
Grade 5/6 Aging Awareness Escape Room
Zoe Soon, University of British Columbia, zoeanne soon@ubc.ca
Co-Author: Jun Yamanaka, University of British Columbia Okanagan, juny089@gmail.com
An Aging Awareness Escape Room was designed for students to partake in, which consisted of 5 stations with 2 or 3 challenges in each station. Each activity depicted anatomical and physiological problems that typically arise due to aging. Student teams filled in their Aging Simulation Worksheet as they went through each Escape Room’s activity. This was followed by a student focus group session to gauge their gained knowledge as well as their enjoyment levels of each activity. In addition, students answered questions to determine whether they had experienced any changes in feelings of empathy or understanding towards the elderly.

Poster 102
Elementary School Children Can Teach Biomedical Sciences to Their Peers - A Collaboration Between University and Young Scientists
Derek Scott, University of Aberdeen, d.scott@abdn.ac.uk
Co-Author: Fiona Murray, University of Aberdeen, fmurray@abdn.ac.uk
The Scottish Government published a strategy in 2017 that recommended increasing science education at elementary school level. We aimed to develop a series of activities for elementary school pupils (ages 5-6 years old) and teachers, with children encouraged to take the lead in presenting what they had learned. Activities were designed to use only paper or fabric so that they could be completed at home during lockdown. This pilot study demonstrated that involving elementary school students in biomedical learning activities can foster leadership, improve presentation skills, encourage pupil-led research and stimulate interest in science at a very young age.

Poster 103
Improving Understanding of Female Pelvic Anatomy by Using Interactive Cross-Sectional Drawings and Clinically Relevant Ultrasound Images
Liliya Ryschak, Nova Southeastern University, lryschak@nova.edu
Co-Authors: Camille Acra, Nova Southeastern University, ca1430@mnysu.nova.edu, Anastasia Mashukova, Nova Southeastern University, amashukova@nova.edu, Yuri Zagvazdin, Nova Southeastern University, yuri@nova.edu, Jordyn Troop, Nova Southeastern University, jt1553@mnysu.nova.edu, Cheryl Purvis, Nova Southeastern University, cpurvis@nova.edu
The objective of this poster is to increase students’ engagement and improve understanding of female pelvic anatomy by using clinically relevant sonographic images and interactive cross-sectional drawings. Students are shown traditional anatomical illustrations from textbooks in color. To introduce the concept of various cross-sectional planes, we use midsagittal, Right, Left, and transverse views. Students are given unlabeled cross-sectional drawings and asked to label them, using traditional anatomical illustrations for reference. To increase student awareness about different appearance of the same anatomical structures upon changing the scanning planes using an ultrasound transducer, additional cross-sectional drawings are paired with corresponding ultrasound images.

Poster 104
Utilizing a Three-Drawing Learning Strategy as a Self-Assessment Tool for Study of Anatomical Structures
Jany Cabezas, Indiana University, jancabez@iu.edu
Co-Author: Michael Goodwin, Indiana University, migeood@iu.edu
In a visual science like anatomy, drawing can help students retain and retrieve knowledge. Students in an Anatomy study skills course implemented this strategy through a three-drawing approach which focused on the relationship of the tibia and fibula; exploring left/right, lateral medial aspects, and testable features of bones. Each template centered on different goals: “what you think you know” vs. “what you see” vs. “what you learned” to facilitate comparison of perceived knowledge vs. learned content. This encouraged self-regulation, active learning, observation, and self-assessment with notable differences in distinctive structure of lateral vs. medial malleolus and shape of tibia vs. fibula.
Poster 105
Heart Rate Rhythm and Personality
Wade Warren, Louisiana College, wade.warren@lacollege.edu
Co-Author: Ragan Delrie, Louisiana College, ragan.delrie@lacollege.edu
Heart rate variability (HRV) can be defined as the heart’s beat-to-beat fluctuations. HRV is a complex physical phenomenon that is primarily influenced by the autonomic nervous system and can be correlated with personality types. In this study, 48 hour continuous recordings of heart rate were obtained from 8 healthy adults. Subjects also completed 5 different online personality tests. All subjects showed daily rhythms of both heart rate and HRV. HRV peaks during the night correlate with extroversion. This study demonstrates a reliable technique for continuously recording heart rate and correlates daily rhythms of HRV with personality types.

Poster 106
The Effect of Depression and Exercise on The Autonomic Nervous System Activity
Chinenye Anako, Georgian Court University, canako@georgian.edu
Depression is a devastating disease with increasing incidence globally. Depression is caused by imbalance of neurotransmitters in the brain, and exercise can increase these neurotransmitters ultimately decreasing the symptoms of depression. Depression leads to an imbalance of the autonomic nervous system by decreasing the parasympathetic nervous system and increasing the sympathetic nervous system activity. The autonomic nervous system activity can be monitored using heart rate variability (HRV) measurements. Previous studies have assessed the effects of depression on HRV, but the literature presents little information on the effect of exercise on HRV in depressed individuals. The results of this study show a decrease in HRV, and specifically parasympathetic nervous system activity markers in depressed individuals. Exercise was found to increase HRV, and parasympathetic nervous system markers on HRV. Improved HRV markers were found in physically active individuals who met depression criteria as well as individuals who did not. The study shows that depression leads to imbalance of the autonomic nervous system and that exercise improves the balance of the autonomic nervous system. Exercise should therefore be recommended as an adjuvant treatment to decrease the symptoms of depression and improve the balance of the autonomic nervous system activity on the heart.

Poster 107
Analysis of Educational Outcomes in Human Anatomy Labs During the COVID-19 Pandemic: How Histology Grades Varied Among Students in Different Lab Settings (Face-to-Face Versus Remote-Synchronous Online Delivery)
Brayden Koch, Southern Utah University, bhkoch98@gmail.com
Co-Author: Mary Jo Tufte, Southern Utah University, tuftem@suu.edu
After the COVID-19 pandemic forced some Human Anatomy lab sections to transition to online remote-synchronous learning, a quantitative study was performed analyzing the effects of modality differences (in-person vs. online) on student grade performances relating to histology quiz grades. Average student histology quiz grades from 27 consecutive semesterly sections for both in-person and online remote-synchronous labs were analyzed and modality differences compared. A significant difference in mean student histology quiz scores taken in-person versus quiz scores taken online was found. The results of this study demonstrate the superiority of a face-to-face setting for learning histology in a Human Anatomy lab.

Poster 108
To IRB or Not to IRB - The Collection of a Small Patient Data Sample
Lopa Patel, MCPHS University, lpate3@stu.mcphs.edu
Co-Authors: Juhi Patel, MCPHS University, jpatel13@stu.mcphs.edu, Nalini Broadbelt, MCPHS University, nalini.broadbelt@mcphs.edu, Michelle Young, MCPHS University, michele.young@mcphs.edu
Student contribution to research is an important aspect for their education. This can be accomplished with or without the use of a research laboratory. Students at MCPHS University in Boston wished to collect renal levels of patients who have chronic kidney disease (CKD) - pre-Covid-19, during, and post-COVID-19 - to create a teaching case study. If not already in place, the use of Institutional Review Board (IRB) of record to collect patient data takes too long for a fifteen (15)-week semester research project/directed study. To be able to collect a small data sample for educational experience, a full IRB process can be replaced by collecting unidentifiable patient data to shorten the timeline with a consent form for patients and an IRB approval form. The aim of this presentation is to lay out the method developed to collect 2-5 patient data for the use in writing a teaching case study.
Poster 109
Using Simulation To Teach Physiologic Pathology
Roy Meyers, Skidmore College, rmeyers@skidmore.edu

Simulations provide physiologic pathology students with the ability to investigate mechanisms of cause and to increase their depth of understanding via asking “what-if” questions. We investigate simulations of 1) edema due to proteinuria, 2) cardiomyopathy and 3) pheochromocytoma with an eye toward strategies of use in teaching physiologic pathology. The use of simulated patients and of possible independent group student work is also discussed. As time allows, selected examples from among other cardiovascular, renal, fluid balance, respiratory, acid-base balance or thermoregulatory pathologies will also be available.

Poster 110
Student Perspective – The Creation of a Case Study
Nalini Broadbelt, MCPHS University, nalini.broadbelt@mcphs.edu
Co-Authors: Amitoj Sawhney, MCPHS University, amitoj103@gmail.com, Michelle Young, MCPHS University, michelle.young@mcphs.edu

The creation of this case study involved using the student’s own brother’s real-life case to develop a unique case study that would tie in various cardiovascular diseases to be used in teaching in the classroom. In addition to the original case files and ECG, collaborative efforts with doctors and various professors were required to have a detailed understanding of the complexities of this case, and to better comprehend the treatments provided at the time for the patient. “The Breathless Heart” shows how multiple cardiovascular diseases and defects can augment the severity of the heart’s condition, and that medical cases rarely present with just one definitive condition that can be treated in a predetermined manner.

Poster Session 2: Monday, May 24 from 3:35 pm – 4:35 pm

Poster 201
Case-Based Critical Thinking Exercises to Improve Student Learning and Engagement in a Hybrid A&P Course
Jennifer Stokes, Southwestern University, stokesj@southwestern.edu

An A&P course was redesigned to accommodate remote learning during the COVID-19 pandemic. The course was converted to flipped-classroom design and included synchronous in-person and virtual class sessions. Required biweekly virtual small group sessions allowed students to collaborate on case-based critical thinking problems. The exams were modified to include an open-book take-home case study in addition to the timed objective exam. I will discuss student perception of the case-based exercises and compare student assessment scores on the take-home exam and the objective exam.

Poster 202
The Sudden Move to Online Final Examinations in the Middle of the 2020 Winter Term: Student Feedback and a Comparison of Summative Examination Outcomes
Jacqueline Carnegie, University of Ottawa, jcarnegi@uottawa.ca
Co-Authors: Magdalena Vuletic, University of Ottawa, mvule070@uottawa.ca, Joanne Savory, University of Ottawa, joanne.savory@uottawa.ca

In March-2020 A&P instruction moved to recorded lectures and online exams. Student feedback was collected via anonymous survey and multiple-choice question (MCQ) difficulty and discrimination values compared between 32 MCQs (1/3 of each exam) common to a previous closed-book, proctored exam and the 2020 open-book, unproctored exam. Students reported anxiety related to the new exam format, but also a sense of improved performance. Most reported consulting their notes or textbook during the exam but rarely searching the internet for answers. The unproctored MCQs demonstrated higher success (85.4% versus 70.7%) and a reduced ability (p < 0.05) to discriminate between stronger and weaker students.

Poster 203
A Mixed-Methods Study Exploring Anatomy Coursework as a Prerequisite for Nursing School Admission at Indiana University Bloomington
Amberly Reynolds, Sam Houston State University, amberly.reynolds@shsu.edu

Student Information Systems data (2008-2019) was analyzed to explore pre-nursing student course success with correlation to admisions into the BSN. Only 24.1% of IUB pre-nursing students are accepted into the IUB BSN. Students who achieve an A in ANAT-A215 are most likely to be admitted (81.7%). Qualitatively anatomy is important for nursing but of most importance for students is achieving an A. Pre-nursing students not admitted to nursing move across majors with 22.4% choosing the School of Public Health and 40.3% leave IUB without a degree. Changes in nursing admission standards and advising pre-nursing students may be needed.
Poster 204
Using Team-Based Learning to Facilitate and Assess Student Understanding of Multiple Biomarkers in Stress Physiology
Kristin Gosselink, Burrell College of Osteopathic Medicine, kgosselink@bcomnm.org
Co-Authors: David Rodenbaugh, Burrell College of Osteopathic Medicine, drodenbaugh@burrell.edu, Michael Woods, Burrell College of Osteopathic Medicine, mwoods@burrell.edu, Pedro Del Corral, Burrell College of Osteopathic Medicine, pdelcorral@burrell.edu, Richard Selinfreund, Burrell College of Osteopathic Medicine, rselinfreund@burrell.edu
Understanding complex physiological concepts is a critical component of medical student success, yet the integration of systems remains challenging. We used team-based learning (TBL) to assess medical knowledge and reasoning in an endocrinology and reproductive systems course. First-year osteopathic medical students (n=151), arranged in small groups, were guided through a TBL on the mechanisms and consequences of stress. Prior adrenal gland physiology content was provided, along with supplemental readings. Readiness assessment test scores averaged 61±1.5% when students answered individually, but increased to 96±0.3% with team testing. We were able to identify and address points of confusion and common misconceptions.

Poster 205
CAPER (Community College Anatomy and Physiology Education Research) Evaluating Active Learning Strategies in an Online Environment During a Global Pandemic
Kim Van Vliet, St. Johns River State College, kimvanvliet2@gmail.com
Education researchers advocate for active learning practices in postsecondary STEM courses. As education shifted from the classroom to the online environment due to COVID-19, we used polling questions in the Zoom classroom to engage A&P I students and evaluate their progress. The MSLQ survey was used to evaluate self-efficacy, metacognition, motivation to learn, and anxiety, which may affect student progress. This study of A&P students at St. Johns River State College, a predominantly 2-year college, provides data for this unique student population and what they found helpful to facilitate learning and student success online.

Poster 206
The Effect of Cooperative Quizzes on Student Performance and Anxiety in Community College Human Physiology Classes
Kathy Bell, Salt Lake Community College, kathryn.bell@slcc.edu
Co-Authors: Ron Gerrits, Milwaukee School of Engineering, gerrits@msoe.edu, Suzanne Hood, Bishop’s University, shood@ubishops.ca
Community college students come from a variety of backgrounds and have different levels of educational preparedness. Historically, retention rates of students in human physiology courses have been low. This study, which was part of the NSF-funded CAPER project, introduced cooperative quizzes into community college human physiology classes to determine if they improved student exam performance and decreased student anxiety. The cooperative quizzes were intended to be given in face-to-face classes but were adapted for broadcast classes. In the sample studied, cooperative quizzes did not significantly impact exam grades nor anxiety, but multiple students reported a preference for these quizzes.

Poster 207
Metacognitive Learning Strategies Improve Students’ Metacognitive Skills and Course Performance in Human Anatomy and Physiology at a Two Year College
Chasity O’Malley, Nova Southeastern University and Palm Beach State College, comalle0@nova.edu
Co-Authors: Kyla Ross, Georgia Tech, kross@hapsconnect.org, Kerry Hull, Bishop’s University, khull@hapsconnect.org, Olivia Page, Bishop’s University, pageolivia@icloud.com, Suzanne Hood, Bishop’s University, shood@ubishops.ca, Murray Jensen, University of Minnesota, mjsjensen@umn.edu
Metacognitive learning strategies are one approach to improving student success in Human Anatomy and Physiology. This study examined the outcomes that resulted from giving students tools for success by introducing them to metacognition. A one hour session discussing metacognitive learning strategies was presented for the students. Topics included methods for changing student studying habits to be more efficient and to retain a deeper level of understanding of the material. This poster will present the specific techniques given to the students for studying, along with the research study design. Available data may include students’ levels of metacognition and evidence of success of the sessions.
Assessment and Course Outcomes of a CURE-Embedded STEM Course at Wesley College
Erin Perchiniak, Wesley College, erin.perchiniak@wesley.edu
Co-Authors: Kassandra Dieter, Wesley College, kassandra.dieter@email.wesley.edu
Students participating in undergraduate research are more likely to be engaged in coursework and pursue careers in STEM related fields. Students in Cell Biology participated in a CURE centering on the molecular pathways regulating proper AchR signaling in C. elegans. A pre and post-test survey was designed focusing on: demographics, STEM career interest, and experience with technical and subject based skills. Data was compiled and analyzed to learn how this CURE affected student interest in STEM careers as well as comprehension of advanced biological concepts. Data will be used for future design of courses including Anatomy and Physiology.

Examining the Impact of Case Studies on Student Learning, Interest, Motivation, and Belonging in Undergraduate Human Physiology
Mackenzie Pekary, Cal Poly Pomona, mmhays@cpp.edu
Previous research suggests using case studies may improve student comprehension, but little is known about how case studies affect student interest, motivation, and belonging. This study investigated the impact of using case studies in human physiology, a critical foundational course. Results showed that students in the treatment section received higher overall grades, higher scores for all three posttest content assessments, combined higher level Bloom's questions on those assessments, interest, motivation, and belonging to course when compared to at least one, and in most cases both, of the comparison sections. Few interactions between course section and demographic groups were found.

Promoting Critical Reading and Focused Note-Taking in Entry- and Upper-Level Courses
Tessa Brooks, Doane University, tessa.durhambrooks@doane.edu
An important factor determining the success of students in a flipped course is that they come to each class session with some understanding of the topics to be applied. This often means students need to change the way they study, moving toward a more active effort to build understanding of basic concepts before class sessions. This poster describes the use of collaborative or individual note-taking centered around weekly learning goals to promote this type of study outside of class. Both types of note taking build skills that students take with them into future courses, including those taken in professional school.

Reflection and Correction in Undergraduate Histology: Observations From a Flipped Classroom
Joseph Comber, Villanova University, joseph.comber@villanova.edu
Undergraduate Histology courses pose unique challenges to students since these rely heavily on visual interpretation and understanding. In general, students begin these courses trying to memorize information, demonstrating that they are not developing a deep interconnected understanding of structure and function. To determine if reflection and correction could improve learning and understanding, students were asked to reflect on their coursework after quizzes or exams. Reflections were combined with correction opportunities that are also demonstrated to enhance learning. Overall feedback from students was positive, and individual student reflections demonstrate tangible impacts to study schedule, study habits, and engagement with the material. Reflection and correction are likely straightforward methods to further engage students and enhance learning, especially in complex courses in anatomy and physiology.

Students Improve Course Performance and Perception of Learning When Engaged in Active Learning Outside of a Flipped Undergraduate Anatomy Course
Amy Gyorkos, Albion College,agyorkos@albion.edu
Flipped classrooms improve student academic performance, attitude and perception across many disciplines. The flip allows for more active learning inside the classroom, but traditionally resorts to passive learning outside of the classroom. This study assesses academic performance and student perceptions when engaged in active learning outside of a flipped undergraduate Human Anatomy course. Two consecutive years were compared between out of classroom activities in control (reading) and experimental (interactive lessons) groups. The experimental group improved final grade DFWI score by 38% when compared to controls and perceived an increase in performance on assessments and understanding and confidence in coursework.
**Poster 301**  
*Strategies for Successful Implementation of HyFlex Course Design for Introductory A&P*  
Seena Mathew, University of Mary Hardin-Baylor, ssjmathew@yahoo.com  

HyFlex is a course design model that presents the components of hybrid learning (which combines face-to-face with online learning) in a flexible structure that gives students the option of attending sessions in the classroom or participating online. In the “flexible hybrid” design, several challenges arise such as how to engage all learners and how to manage interactions of student in-class and online. Some strategies that helped ensure successful classroom management included: 1) creating online modules for each topic 2) engaging students through open ended questions 3) promoting student interactions using breakout rooms 4) playing games where students compete (in-class vs online) and 5) require weekly reflections on what was learned or what material students struggled with. Results from surveys demonstrate appreciation of work put into classroom design and the amount of quality interactions had while in class.

**Poster 302**  
*Generalized Adaptation Syndrome: An Icebreaker Lesson to Educate, Engage and Process Following the Capital Riot*  
Robin Wright, San Jacinto Community College, robin.wright@sjcd.edu  

HAPS Conference Award Winner Presentation  

Teaching on days after traumatic events is a discipline in pursuit of justice and equity. Thus, it is supportive of all learners, at this sociopolitical timepoint. Many Americans were unable to pull their eyes away from images of hundreds of protestors storming the U.S. Capitol building January 6, 2021. Constant exposure to images that generate fear, anxiety and distress can impose a heavy toll on people's minds and bodies. Physiologically, disturbing images can trigger a pattern known as the general adaptation syndrome (GAS). A lesson with Anatomy and Physiology students qualitatively compared their personal reactions and the known physiological responses of GAS as an introduction to the endocrine system.

**Poster 303**  
*Using Game of Thrones to Teach Neurophysiology and Neuropharmacology During Lockdown*  
Derek Scott, University of Aberdeen, d.scott@abdn.ac.uk  
Co-Authors: James Hislop, University of Aberdeen, james.hislop@abdn.ac.uk, Fiona Murray, University of Aberdeen, fmurray@abdn.ac.uk, Dawn Thompson, University of Aberdeen, dthompson@abdn.ac.uk  

During the pandemic, there was a requirement to provide additional synchronous live tutorials that would engage students whilst encouraging them to problem-solve and use their imagination. We also wanted memorable topics where students would actively participate and apply what they had learned in classes. Given the popularity of Game of Thrones and use of poisons running throughout the TV series, we used different storylines to get the students to work out how fictional poisons/drugs might affect nervous system function. Informal student feedback indicates this form of tutorial using 'pop culture' references is a desirable method of teaching advanced medical sciences.

**Poster 304**  
*Exploring Personality Types and Strengths in First Year Occupational Therapy Students and First Year Physical Therapy Students: How the Anatomical Sciences Have Persevered Amid COVID-19*  
Sarah Cushion, Nova Southeastern University, sc2917@mynsu.nova.edu  
Co-Authors: Vania Arboleda, Nova Southeastern University, va378@mynsu.nova.edu, Jordyn Troop, Laramie County Community College, jt1553@mynsu.nova.edu, Amanda Knowles, Nova Southeastern University, ak1607@mynsu.nova.edu, Camille Arca, Nova Southeastern University, camille.acra@gmail.com, Anastasia Mashukova, Nova Southeastern University, amashukova@nova.edu, Yuri Zagvazdin, Nova Southeastern University, yuri@nova.edu, Cheryl Purvis, Nova Southeastern University, cpurvis@nova.edu, Amar Gill, Nova Southeastern University, ag2866@mynsu.nova.edu  

Anatomical sciences require an interactive learning environment that requires team building. Group dynamics can determine the success of a team depending on key elements, such as various personalities (Ioanna et al., 2016). Considering COVID-19, many workspaces are now virtual, creating an atmosphere with limited interactions. In this study, the personality profile test was completed by 52 first-year occupational therapy students and 45 first-year physical therapy students (Bowles, Silvano, and Silvano, 2005). This test indicated the most common personality type was Emotional Helpers. The Strengths assessment (Rath, 2007) was also done by these students, revealing the most common strength was Empathy.
Poster 305

Using Personal Preference Profile Tests to Empower Team Dynamics: A Discovery of Individual Strengths and Personality Types Among Students Pursuing Careers in Healthcare

Cheryl Purvis, Nova Southeastern University, cpurvis@nova.edu
Co-Authors: Amanda Knowles, Nova Southeastern University, ak1607@mynsu.nova.edu, Amar Gill, Nova Southeastern University, ag2866@mynsu.nova.edu, Jordyn Troop, Nova Southeastern University, jt1553@mynsu.nova.edu, Sarah Cushion, Nova Southeastern University, sc2917@mynsu.nova.edu, Camille Arca, Nova Southeastern University, camille.arca@gmail.com, Anastasia Mashukova, Nova Southeastern University, amashukova@nova.edu, Yuri Zagvazdin, Nova Southeastern University, yuri@nova.edu

With the current increase in online education formats, the need for efficient communication and teamwork is greater than ever. In order to build a productive and cohesive educational environment, knowledge of individual strengths and personality types is paramount to success. In this project, 122 first-year optometry students took a strengths inventory and positive psychology-based personal preference profile test. These assessments revealed how students can utilize their respective assets to maximize team dynamics. Our results found that a significant percentage of pre-healthcare students identified under the personality subcategory, Emotional Helpers.

Poster 306

Can In-Class Polling Predict Success in an Upper Division Human Physiology Course?

Usha Sankar, Fordham University, usankar@fordham.edu

The ongoing pandemic demands that we pay extra attention to students’ engagement in remote classes. Active learning techniques in class improve student engagement but require all students participate to be successful. In-class polling is very useful to gauge student learning so that instructors can respond in timely fashion to ensure student comprehension. In my human physiology classes, an app-based polling technology that monitors student engagement and understanding of concepts elicits full participation. Analysis of polling data reveals the possibility of predicting the success of students in the final summative assessment and the ability to offer help to students early on.

Poster 307

Casing Out Student Learning and Buy-in: Case Studies – Let’s Get Visual and Interactive!

Zoe Soon, University of British Columbia Okanagan, zoeanne.soon@ubc.ca

For a 2nd year Nursing Pathophysiology course, I created case studies that were visual, hands-on, as well as electronically interactive, enabling instant feedback and opportunities to review again. I will share results of pre-tests, post-tests, student satisfaction surveys, and final exam grade improvements. It is well known that students find the realistic nature of case studies to be compelling and can be used to foster mastery of course content. I wanted these practice exercises to be interesting, engaging, memorable, and helpful in reviewing challenging topics. Case studies include Osteoporosis, Fracture, Heart Disease, Peptic Ulcers, Endocrine Homeostasis, and Diabetes.

Poster 308

Effectiveness of Visible Body for Teaching Anatomy and Physiology

Cynthia Harley, Metropolitan State University, cindy.harley@metrostate.edu

Sponsored by Visible Body

We investigated the effectiveness of the use of Visible Body (VB) for the instruction of Anatomy and Physiology prior to the pandemic. We surveyed instructors who taught at least one semester using VB and one without. In comparing grade data, we have found that, on average, grades increase with VB use. Specifically, we note a significant increase in As with a corresponding decrease in Bs and Cs. In all cases, VB is associated with an increase in median grade and a decrease in DFW rate. Together, these results suggest that student performance is increased through VB use.

Poster 309

Providing Alternative Access to Course Content: Bypassing Two Factor Authentication

Bob Duerst, University of Wisconsin - Eau Claire, duerst@uwec.edu

Many organizations utilize learning management systems to deliver course content. To maintain security, it is becoming increasingly common to require secondary authentication from a phone in order to log in. To increase ease of access (and reduce phone related distractions) the course presentations, lecture recordings, lab objectives, teaching model answer keys, and examination dates were provided via a shared spreadsheet on the LMS. Students were instructed to save the spreadsheet link as a bookmark in their web browser. This poster explores student perceptions in response to providing alternative access to the course content outside of the required learning management system.
Using Embedded Questions to Encourage Completion of Reading Assignments
Jacqueline Phillips, Temple University, jacqueline.phillips@temple.edu
To encourage students to complete their assigned readings, I used the novel concept of embedding questions directly in our chapter readings online. We openly licensed textbook, which can be easily edited. The textbook was uploaded into our online engagement platform, through which different types of questions were integrated throughout our text. Questions were assigned to be due shortly before the start of classes and monitored for completion and success. After the semester, students were surveyed to gain insight into how these questions impacted their readings and studying, which proved positive results.

Emerging Regenerative Medicine Themes Promote Student Engagement During the Cardiovascular System Anatomy and Physiology Classes
Burhan Gharaibeh, University of Pittsburgh, burhan@pitt.edu
Co-Author: Laurel Roberts, University of Pittsburgh, laurel.roberts@pitt.edu
HAPS Conference Award Winner Presentation
In teaching the cardiovascular system, the student-perceived difficulty of memorizing lists of structures and comprehending complex physiological processes presents a challenge. Adding relevant summaries from current articles on cardiomyoplasty, tissue-engineered grafts, decellularized hearts and others was found to be effective in enhancing student engagement, and analysis of student feedback from school evaluations showed that this addition was well-received. Further, the students thought clinical translations of current research was important for their prospective futures as health professionals. We suggest that while teaching the cardiovascular system, traditional textbook material be supplemented by new research findings in tissue engineering and related fields.

Successful Mentoring of Interprofessional Student Research
Nalini Broadbelt, MCPHS University, nalini.broadbelt@mcphs.edu
Co-Author: Michelle Young, MCPHS University, michelle.young@mcphs.edu
Research is integral to career exploration, building transferable skills, and contributing to knowledge. This project was designed to be inclusive of the student's research interest and the partnership between faculty members and clinicians of varying disciplines. Armed with their hypothesis students seek out the academic databases and/or paperwork/forms needed, as well as experts in the field, to conduct interviews, experiments, and collect data. Deadlines, expectations, especially the presentation of their work at conference drives this process. The method of starting, building and maintaining interprofessional education (IPE) and interprofessional collaborative practices (IPCP) will be addressed via lesson learned, facilitators and barriers to collaboration.

CAPER (Community College Anatomy and Physiology Education Research) Project: Self-Efficacy, Metacognition and Anxiety of First-Generation College Students Taking an Online Synchronous Anatomy and Physiology Night Class
Dana Smith, St. Johns River State College, danasmith@sjrstate.edu
Studies have shown that increased student self-efficacy and metacognition correlate with improved performance, effort and perseverance, while anxiety has been shown to have a negative impact on student learning. During the 2020 COVID-19 pandemic, many in-person courses were converted to synchronous online courses to help facilitate the online transition for state college students. The MSLQ survey was used to evaluate self-efficacy, metacognition and other factors such as anxiety. Our data suggest that first-generation college students taking an online synchronous anatomy and physiology night class had higher self-efficacy and metacognition, while also exhibiting lower anxiety, compared to non-first-generation day class students.

Lessons Learned Online: Rolling with it for Next Year - Rethink, Reuse, Repurpose, Rejuvenate
Zoe Soon, University of British Columbia Okanagan, zoeanne.soon@ubc.ca
My dreams and aspirations for this last academic year were tinged with nervousness as we all jumped online to teach courses. In my case I’ll share everything I planned for my large (200+) classes as well as, everything that worked, the pleasant surprises, and the plans/activities that fell to the wayside. Looking ahead to next year, some of us may be thinking of taking a blended or flipped approach or perhaps even staying online. I’ll share survey results from my students this year as to what resources should be kept as well as potential future formats for instruction.
Poster 405
CAPER (Community College Anatomy and Physiology Education Research) Project: Student Perceptions of the Efficacy of Real-Time Polling in the Online Anatomy & Physiology Learning Environment
James McCaughern-Carucci, St. Johns River State College, jamesmccaugherncarucci@sjrstate.edu
Student engagement in online courses has long been an area of concern, recently compounded by the Coronavirus Pandemic which drove many schools to move courses online. Students who would not ordinarily take online courses were thrust into an unfamiliar learning environment. Real-time polling is one methodology to assess student engagement, participation and learning. In this study, we utilized real-time polling in the Anatomy & Physiology I online classroom environment to gauge participation and learning. In addition, students were surveyed to assess their own perceptions of real-time polling and whether they felt there was efficacy in the active learning strategy.

Poster 406
Technological Resource Availability for Students During COVID-19 Pandemic
Cheryl Hill, University of Missouri, hillche@umsystem.edu
Co-Authors: Chalachew Seyoum, University of Missouri, seyoumc@health.missouri.edu, Kristen Prufrock, University of Missouri, kristen.prufrock@health.missouri.edu
During the COVID-19 pandemic, delivery of educational content is predicated on student access to technology, including reliable internet, computers and/or tablets. Surveys were administered to anatomy students at the University of Missouri during the spring 2020 and 2021 semesters to determine what resources students had at available for their use. Results indicate that a small but significant portion of the students did not have adequate and reliable technology to access course materials, exams and online meetings. These results should inform instructors' decisions on teaching platforms, exams, and class meetings used to deliver anatomy and physiology content.

Poster 407
Guided Inquiry Group Learning During Online Broadcast Instruction
Vicky Rands, Salt Lake Community College, vicky.rands@slcc.edu
Co-Authors: Suzanne Hood, Bishop's University, shood@ubishops.ca, Murray Jensen, University of Minnesota, msjensen@umn.edu, Ron Gerrits, Milwaukee School of Engineering, gerrits@msoeu.edu
Guided Inquiry is an active learning technique that features collaborative group learning with a structured set of models and questions for students to evaluate. Moving this evidence-based learning technique to the online format presents challenges. The organic flow of information is more difficult to replicate, leading to questions about the effectiveness of this approach during online instruction. This study looks at the online delivery of a Sliding Filament Guided Inquiry lesson and student retention of information during 2 Semesters of Anatomy Classes at Salt Lake Community College. Analysis of test questions related directly to the lesson were evaluated between groups receiving guided inquiry or a lecture presentation of the same material. Preliminary results from Fall Semester look promising. In addition, recommendations for adapting Guided Inquiry to the online environment will be included in the poster.

Poster 408
Impact of Lack of In-Class and Online Activities Due to COVID-19 on Anatomy and Physiology Class Average in Nursing Students
Raj Narnaware, Grant MacEwan University, neumeierm@macewan.ca
Co-Author: Paul Chahal, Grant MacEwan University, chahalp@macewan.ca
Teaching and learning of anatomy and physiology are greatly affected by the COVID-19 pandemic over the last year. Due to shifting face-to-face classes and labs to virtual learning, active learning activities could no longer be used. Using the virtual teaching and learning modality, the present study shows that the mean class average of anatomy and physiology midterms and final examinations in the post-COVID-19 period was significantly higher (P<0.001) compared to their pre- COVID-19 class average. Virtual teaching of these subjects also significantly (P<0.02) increased their Grade Point Average in both subjects and both semesters compared to the Fall-2019 semester. The present study demonstrates that due to a strict lockdown, self-isolation, and lack of social interactions, students either spent more time studying these subjects or took advantage of the lack of online supervision of their exams which may have increased their class average and GPA.
Poster 409

**Student Experiences with Online Learning in a First Year Anatomy and Physiology Course**

Jacqueline Carnegie, University of Ottawa, jcarnegi@uottawa.ca

Co-Author: Ishika Tripathi, University of Ottawa, itrip078@uottawa.ca

COVID-19 has required that face-to-face teaching often be replaced with pre-recorded lectures supported by synchronous online office hours. This project explored student experiences with online learning in a large (n=381) undergraduate A&P class using anonymous surveys and tracking of recorded lecture attendance. While some students welcomed the flexibility of asynchronous learning, others struggled to stay on schedule. Almost 60% of students watched all or part of the lectures multiple times while less than 15% demonstrated minimal online engagement. Decreasing trends in engagement and on-time lecture viewing as the term progressed are explored as we investigate ways to maintain motivation over a distance.

Poster 410

**The Effects of Music and Songs on Learning in Anatomy and Physiology**

Jason Craddock, Florida Gulf Coast University, jcraddock@fgcu.edu

Co-Authors: Amy Lehigh, Southern Technical College, alehigh@southerntech.edu, Seth Cohen, Florida Gulf Coast University, sclcohen3504@eagle.fgcu.edu

The learning and retention of various structures in anatomy can be a challenge in undergraduate Anatomy and Physiology courses. Music and songs have been described as a mechanism to enhance the learning and recollection of information. Students in Anatomy and Physiology I courses were randomly assigned to either a test group or a control group. The test group were given songs to help in the learning and review of course materials during specific lab sessions. The test group also had access to the songs for the remainder of the semester. The control group was not provided the materials. The outcomes of quizzes and exams were compared between the two groups.

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**Sponsored by BIOPAC Systems, Inc.**  
Lessons from Lockdown: How to Get Students Engaged in Any Environment

**201 (Workshop Floor A)**  
Teaching the Biology of Skin Color as a Tool to Deconstruct Race Based Medicine

**301 (Workshop Floor A)**  
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Designer Dissections: Tailor-Made for a Career in Anatomical Sciences and Future Healthcare Professionals Post-COVID-19 Pandemic

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Teaching A&P Online Using Both Hands-On and Digital Components

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Alternative Office Hours Promote Personal Faculty-Student Interactions

**103 (Workshop Floor C)**  
Why Are My Exam Questions on the Internet? Combat Student Use of ‘Tutoring’ Websites During Exams

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Anatomy Yoga

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Turning Traditional Labs into a Project Based Learning and Research Experience

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Flip Your A/B Lab by Using a Lab Subscription Service

**305 (Workshop Floor E)**  
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Big Ideas: Helping Students Connect Core Concepts in A&P

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SimBio Tutorials on Action Potentials and on Transcription and Translation

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Diabetes as a Model to Understanding Normal Physiology |
Workshop Abstracts

Session 1: Sunday, May 23 from 11:45 am – 12:30 pm

101: Workshop Floor A
Lessons from Lockdown: How to Get Students Engaged in Any Environment
Jasmine Anderson, BIOPAC Systems Inc., jasminea@biopac.com
Sponsored by BIOPAC Systems, Inc.
Engaging students is the key to successful learning. Last year, new and experienced professors struggled to engage students on and off campus. Now it is time to plan for success in changing circumstances. Join us for a lively discussion of how Biopac Student Lab technology turned instructor’s struggles into successes. We’ll share stories from the trenches and demonstrate tools for flexible instruction, both in-person and remote. Learn new ways to augment your physiology curriculum and engage students with stimulating project-based learning and active learning with Biopac Student Lab.

102: Workshop Floor B
Designer Dissections: Tailor-Made for a Career in Anatomical Sciences and Future Healthcare Professionals Post-COVID-19 Pandemic
Vania Arboleda, Nova Southeastern University, va378@mynsu.nova.edu, Sarah Cushion, Nova Southeastern University, sc2917@mynsu.nova.edu, Cheryl Purvis, Nova Southeastern University, cpurvis@nova.edu
“Designer Dissections,” is a novel approach to teaching anatomical sciences. This concept can be applied to pre-health majors taking human cadaver dissection courses. Early identification of students interested in healthcare increases their likelihood of a successful academic journey. Giving students dissection experience in a specific anatomical region can captivate their enthusiasm in a healthcare specialty. Furthermore, this model may encourage student involvement in research, develop positive mentor-mentee relationships, and strengthen their knowledge in their specialty of interest. Our unique proposal also addresses the growing gap in anatomical knowledge and its possible long-term effects on patient care (Arboleda et al. 2021).

103: Workshop Floor C
Why Are My Exam Questions on the Internet? Combat Student Use of ‘Tutoring’ Websites During Exams
Jennifer Burgoon, The Ohio State University, jennifer.burgoon@osumc.edu, Jeremy Grachan, The Ohio State University, grachan.1@osu.edu, Madeline Parker, The Ohio State University, parker.801@osu.edu
Online ‘tutoring’ websites boast possessing thousands of experts available for rapid round-the-clock assistance. In an era of social distancing and online instruction, use of these sites has risen dramatically due to the pandemic. Although many of these sites have honor codes prohibiting cheating, students having access to an answer in a very short period has led to many instructors finding their exam questions posted on these sites. In this workshop, we will discuss how to prevent your questions from being posted, how to search for your questions, and what to do once your questions appear on one of these sites.

104: Workshop Floor D
Creatively Using Discussion Boards to Engage Students, Inspire Learning, and Build Community!
Cynthia Drake, Delta College, cynthiadrake@delta.edu
Having trouble creating a sense of community in an online or hybrid class? Have you tried Discussion Boards but found them time consuming to grade and busy work for students? Learn how you can make Discussion Boards work for the students and avoid just generating “busy work” for students and faculty alike. Use Discussion Boards to facilitate collaboration, create a sense of community, and cultivate a student generated catalog of shared learning resources. This method has been used in an A&P asynchronous online class, but could be used in any discipline.

105: Workshop Floor E
The Power of Analogy-Based Learning in Science
Hisham Elbatarny, St Lawrence College and Queen’s University, helbatarny@sl.on.ca
Analogies are useful pedagogical tools to introduce new and difficult concepts to students by building connections to resembling things from our daily life. Research has shown that applying analogies during the learning process facilitates the development of higher order thinking. The goal of this study was to objectively evaluate students’ perspectives on the impact of these analogies on enhancing students’ understanding of difficult concepts. I also aim to present a number of structural and functional analogies and metaphors which I have created and included in several science courses such as anatomy, physiology, clinical chemistry, and pathophysiology.
106: Workshop Floor F
Big Ideas: Helping Students Connect Core Concepts in A&P
Kevin Patton, Elsevier, kevin@lionden.com, Frank Bell, Elsevier, fbell@nycc.edu, Terry Thompson, Elsevier, terrathompson@gmail.com, Peggie Williamson, Elsevier, peggielwilliamson@gmail.com
Sponsored by Elsevier.
We all want students to recognize core concepts and connect them across topics as they progress through the A&P course. In this workshop, we explore several practical, simple, and effective strategies that help students find the “big ideas” and learn how to relate these basic principles to new topics. We describe specific schemes facilitated by the instructor and/or by individual students or study partners, giving concrete examples. Participants then briefly work together as a group to explore and refine a list of big ideas in A&P and strategies to connect them.

107: Workshop Floor G
Diversity, Equity, and Inclusion (DEI) in the Classroom Part 1: Faculty Perspective
Lauren Sloane, State University of New York - Delhi, sloanelb@delhi.edu, Jill Kirby, Lipscomb University, jill.kirby@lipscomb.edu, Jonathan Wisco, Boston University School of Medicine, jjwisco@bu.edu, Marisol Lopez, Edgewood College, melopez@edgewood.edu
An inclusive classroom can be a goal of educators to increase student motivation and academic success. Utilization of tools in the classroom with regard to course/curriculum design, pedagogies, and mentoring can help create a learning environment where every student feels welcome. This is the first of a two-part workshop on DEI that will share methods from different types of institutions, which have been successful in creating an inclusive environment for students and faculty. The goal is to bring awareness to tools educators already use to create more inclusive learning environments, and to provide an opportunity to share them.

Session 2: Sunday, May 23 from 1:45 pm – 2:30 pm

201: Workshop Floor A
Teaching the Biology of Skin Color as a Tool to Deconstruct Race Based Medicine
Sally Aboelela, Columbia University, sa2242@columbia.edu
Race-based-medicine is rooted in the idea of “racial essentialism”; that racial groups are biologically distinct groups of humans determined by genes. The translation of this erroneous idea into clinical practice is deeply rooted in American medical history and has led to grave inequities in care and health outcomes for people of color. Racial categories are a social construct with little basis in biology, evidenced by their simplicity (black vs. white vs brown) and inconsistent (frequently invalid) assignments to individuals. At best, the use of racial categories in research and medicine is a poor place holder for more meaningful anatomical or physiological differences between individuals. As anatomy and physiology educators, we are in a position to highlight the falsehood of “racial essentialism” and replace it with a more accurate and useful perspective on the biological diversity present within the species of Homo sapien. In this workshop we will use a lesson on the biology and evolution of the variations in human skin pigmentation as a model for deconstructing racial essentialism. This powerful lesson will inform students on the origins of humans and help them identify a genuine physiologic difference between individual people that can be applied to clinical practice to reduce health disparities rather than worsen them.

202: Workshop Floor B
Teaching A&P Online Using Both Hands-On and Digital Components
Rachael Barksdale, Carolina Distance Learning, rachael.barksdale@carolina.com, Shannon McGurk, Carolina Distance Learning, shannon.mcgurk@carolina.com
Sponsored by Carolina Distance Learning
Teaching A&P online can be done and it can be done well! Join Carolina Distance Learning to explore a virtual walkthrough of a digital A&P lab from a student’s point of view. Discuss with us all of the possibilities of at-home dissection for students taking online lab science courses. You will leave this workshop with new ideas for your A&P online course design that will have excellent structure and function.

203: Workshop Floor C
Anatomy Yoga
Philomena Behmer, Pennsylvania College of Health Sciences, pmbehmer@pacollege.edu
This workshop explores how embodied learning, a process of creating new knowledge through body engagement, can be used to teach and learn anatomy and physiology (A&P). Participants will be guided through an A&P focused gentle chair yoga class and will leave the session with specific examples of how to incorporate meaningful learning moments into A&P classes.
204: Workshop Floor D
Turning Traditional Labs into a Project Based Learning and Research Experience
Aaron Bunker, Morningside College, bunkera@morningside.edu
Sponsored by ADInstruments, Inc.
This workshop/presentation will outline the steps taken to transform traditional labs in a General Physiology course into an inquiry-based research project that spans the entire semester. Participants will view how traditional labs can be used as starting point and how Powerlab-LabChart can be capitalized on as a learning tool for the research project. Participants will have time for Q&A, for brainstorming together, and sharing of ideas with each other.

205: Workshop Floor E
Flip Your A/B Lab by Using a Lab Subscription Service
Lauren Giles, Mercyhurst University, lgiles@mercyhurst.edu
Sponsored by ADInstruments, Inc.
This workshop shows how one instructor used AD Instruments’ LT Lab Subscription service to flip her A&P labs while running an A/B split. The demonstration will include personalization of material in and general use of the LT platform.

206: Workshop Floor F
The Anatomist’s Apprentice: Reflections on Building a Body of Knowledge
Kristen Platt, University of Kentucky, platt.kristen@uky.edu, April Hatcher, University of Kentucky, arich3@uky.edu
Gross anatomy is a field traditionally fashioned in the apprenticeship model, where one burgeoning anatomist learns from their senior mentor(s). However, we often abandon this type of training once our formal education has been achieved. In this session, the presenters will share their reflections on a recent renewal of their roles as apprentices, how that came to be, and what curricular changes ensued. The session will prompt the participants to reflect on lessons learned as apprentices and as mentors. Educators at all stages of their careers will trade seeds of innovation to promote curricular enhancement and cultivate future collaborations.

207: Workshop Floor G
Diversity, Equity, and Inclusion (DEI) in the Classroom Part 2: Student Perspective
Lauren Sloane, State University of New York - Delhi, sloanelb@delhi.edu, Marisol Lopez, Edgewood College, melopez@edgewood.edu, Jonathan Wisco, Boston University School of Medicine, jjwisco@bu.edu, Jill Kirby, Lipscomb University, jill.kirby@lipscomb.edu, Fernanda Alayo, Edgewood College, Alexander In, Boston University, Kaye-Alese Green, Boston University, Mckenzie Allen, Lipscomb University, Rojeda Merani, Lipscomb University, Sabrina Richards, State University of New York – Delhi, Jackie Graham, State University of New York-Delhi
Inclusive classrooms can be the goal of educators, and desired by every student in order to feel a valued part of the learning community. How do we make sure our teaching practices are reaching our diverse student population? This is the second of a two-part workshop on DEI that will include a panel of students from different types of institutions to hear about their perspectives on inclusivity in the classroom. The goal is for educators to hear students’ perspectives, understand the importance of providing inclusive learning environments, and consider approaches that might be useful in one’s own classroom or mentoring environment.

Session 3: Sunday, May 23 from 4:40 pm – 5:25 pm

301: Workshop Floor A
EKGs and Heart Conduction
Jacob Babb, Michigan State University, babbjaco@msu.edu, Ryley Mancine, MSUCOM, ryleymancine@gmail.com
Introducing the cardiac conduction system is essential for any anatomy course. We will provide a basic overview of the cardiovascular conduction system, key cardiac vasculature relevant to EKGs, and an introduction to understanding and interpreting EKGs. A focus will be placed on using EKGs for heart rate and rhythm regularity, identifying heart blocks, and identifying STEMI and how to locate the lesion based upon the strip reading. By doing this, we will introduce the concept of cardiac conduction to an undergraduate-level audience and provide learners with real-life knowledge about the utilization of the cardiac conduction system in the real world.
302: Workshop Floor B
Alternative Office Hours Promote Personal Faculty-Student Interactions
Patrick Cafferty, Emory University, pcaffer@emory.edu
HAPS Conference Award Winner Presentation
The transition to emergency online learning in response to the COVID19 pandemic in spring 2020 led students nationwide to feel socially isolated (Blankstein et al., 2020). Thus, when my institution announced online learning would continue during the fall semester, I developed the Artistic Office Hour to promote social interactions outside of class. During the Artistic Office Hour, students and I met weekly using videoconferencing software to color biological illustrations or to draw and chat. During this workshop, we will discuss the advantages of alternative office hours and brainstorm what alternatives might work best for you and your students.

303: Workshop Floor C
#FliptheDiscussionBoard Challenge
Janay Dennis, Mitchell Community College, jdennis@mitchellcc.edu
John Martin Second Timers Award Winner Presentation
The hasty shift to online learning forced educators to find creative ways to keep students engaged in a mundane online learning environment. Quite often, the “go-to” activity is a discussion board. Discussion boards simulate the traditional classroom with a prompt, followed by student responses under stringent requirements. Social media affords instructors the opportunity to flip the discussion board concept around & build community amongst students. Given the increase of social media “challenges”, this concept was adopted in my A&P courses. Social media “challenges” involved musculoskeletal anatomy & special senses physiology. I will discuss how these “challenges” increased student engagement and retention online. Lastly, you will design your own social media challenge using current platforms.

304: Workshop Floor D
Using Inclusive Language When Teaching “Reproductive” A&P
Camille Freeman, Maryland University of Integrative Health, cfreeman@muih.edu
Using gender-inclusive language can be a challenge when teaching about the menstrual cycle, pregnancy, and various anatomical bits and pieces that are traditionally associated with male or female bodies. In this workshop, we’ll explore strategies for using more inclusive language in our teaching and assignments. Updating our language is a work in progress for many faculty; you are welcome in the session if you are a beginner in this area, and you are welcome if you are more practiced and would like to share advice or suggestions.

305: Workshop Floor E
Adverse Health Effects from Exposure to High Levels of PM2.5
Sandy Lewis, Pierce College Puyallup, proflewis66@gmail.com
PM2.5 (air particulates smaller than 2.5 microns in diameter) is of great concern in air-polluted areas. This workshop will cover the various body systems adversely affected by inhaling high levels of ambient PM2.5 and the resulting serious diseases. Recent research on this topic will be highlighted, including the results of the presenter’s doctoral study on the relationship between PM2.5 and cancer incidences in interior Alaska. Additionally, the question of how frequent exposure to PM2.5 may be impacting COVID-19 mortality rates will be discussed. This is a great teaching topic for the respiratory and cardiovascular systems.

306: Workshop Floor F
SimBio Tutorials on Action Potentials and on Transcription and Translation
Eli Meir, SimBio, meir@simbio.com
Sponsored by SimBio
SimBio develops research-backed, simulation-based virtual labs for college biology classes. In this workshop, we’ll demo Action Potentials Explored, a tutorial lab for introductory biology and neurobiology classes which explores how neurons use action potentials to communicate, and how ion channels generate action potentials. We’ll also introduce our new Transcription and Translation Explored lab, where students learn the steps and processes of transcription, RNA processing, and translation using a variety of engaging interactives. Transcription and Translation Explored is free for class use in 2021, and all participants can receive free evaluation software during the workshop.
307: Workshop Floor G
Brachial Plexus Cadaver Prosection
Daniel Olson, Northern Illinois University, drolson@niu.edu, Mary McGinn, Northern Illinois University, mmcginn3@niu.edu
This workshop provides a tutorial for prosection of the brachial plexus for use in teaching cadaver based human anatomy. Extensive videos of the process are accompanied by voice and print directions. Also included are repair techniques for nerve breakage. Finally, this tutorial provides suggestions for displaying the cadaver for student self-study and student materials for learning the nerves of this region.

Session 4: Monday, May 24 from 11:45 am – 12:30 pm

401: Workshop Floor A
Integrating Nutrition and Metabolism in Teaching Metabolism to Pre-Health and Nursing Students
James Clark, Los Medanos College, jclark@losmedanos.edu
Metabolism and nutrition are interrelated factors of human physiology, so much to the point that they cannot be thought about independent of each other. However, the approach taken in presenting concepts of metabolism leads to questions about how well the interrelationship is understood. The presentation will discuss concepts of nutrition and metabolism, addressing common misconceptions interwoven into conversations about the applications related to health and fitness. Along with looking at how to incorporate the interrelationship between metabolism and nutrition in teaching physiology that can be used to assist student understanding both the concept and the applications in real-world scenarios.

402: Workshop Floor B
Building Human Joints... On a Budget!
Molli Crenshaw, Texas Christian University, molli.crenshaw@tcu.edu
While it is important for students to spend time learning joint anatomy in lab, models of human joints are costly and take up storage space. I have written a series of activities where students learn to assemble the components of human joints using the bones they study in the labs, and some inexpensive dollar store materials. I will also demonstrate how these labs can be modified for an online course, when students do not have access to life-size bones. Attendees will be provided with copies of the exercises I have written to go along with these labs.

403: Workshop Floor C
A Year in Review: Collaborative Learning in Online Versus In-Person Courses
Tracy Ediger, Georgia State University, tediger@gsu.edu
Team-based active learning assignments developed for Human Anatomy & Physiology 2 were delivered in the classroom during Spring 2020, with six assignments completed prior to pandemic-related campus lockdown. To encourage active learning and foster community in the asynchronous, online delivery modality of Fall 2020, weekly groupwork was assigned, with student groups meeting on their own. In Spring 2021, online instruction continued, but with scheduled, synchronous virtual sessions, and team-based assignments were implemented within breakout sessions. This workshop will discuss the instructor experience of these three different groupwork formats.

404: Workshop Floor D
Sex and Gender Aren't Binary, Yo! And Here's Why...
Anya Goldina, Elizabethtown College, goldinaa@etown.edu, Jonathan Wisco, Boston University School of Medicine, jwisco@hapsconnect.org, Heather Billings, West Virginia University, hbillings@hsc.wvu.edu
Non-binary and transgender people are discriminated against and persecuted by those that claim “biological sex” is strictly binary. However, sex and gender determination involve complex interactions among genetic, epigenetic, and endocrine factors. Each of these factors has direct influence on development and maintenance of the genital tract and brain. In this workshop, we will present evidence-based studies of genetic and endocrine mechanisms that regulate and contribute to the development of sex organs and gender identity. Our discussion will highlight current knowledge gaps and address common misconceptions to promote up-to-date, inclusive lessons on sex and gender.
405: Workshop Floor E
**Synchronous Learning Combining Multiple Technologies**  
Kimberly Loscko, Mount Carmel College of Nursing, kloscko@mccn.edu

*Sponsored by ADInstruments, Inc.*

Combined technologies were implemented in a synchronous online first year Anatomy and Physiology course. Components of the laboratory program included combining customized weekly cloud-based physiology labs; iPads and Apple pencil technology; and whiteboard applications to enhance student engagement and learning. A linear regression model was utilized to assess this approach to learning by evaluating student engagement, content acquisition, and subject matter mastery in Anatomy and Physiology. Study participants included n = 94 nursing students. SPSS Statistics was used to analyze data collected through utilizing combined adaptive supplemental technologies in the synchronous online setting.

406: Workshop Floor F
**The Multi-Modal “Classroom”**  
David Lott, Clarion University, dlott@clarion.edu

The Multi-Modal “classroom” provides an abundance of opportunities to get students engaged in course material. Through the use of technology within the classroom, face-to-face, as well as virtual students, can more easily share their ideas and become more active participants in the learning process.

407: Workshop Floor G
**What Really Works? Let’s Decrease Technology and Increase Learning**  
Amie Yenser, Penn State Hazleton, alv10@psu.edu

Classroom technology has become pervasive over the last decade. While there are undeniable benefits of technology, pedagogy should remain at the forefront of what drives teaching strategies. This workshop highlights my transition from clickers to virtual reality back to good old fashioned paper and pen questions, group discussions, and classroom demonstrations. This workshop will include simple techniques for explaining difficult concepts from a ‘big picture’ scope. Scaffolded question sheets will be shared that reinforce understanding of concepts rather than simple memorization. The best part: all activities take less than 10 minutes so engaging, active learning can fit into your lectures!

Session 5: Monday, May 24 from 1:45 pm – 2:30 pm

501: Workshop Floor A
**Help! What Are My Digital Options for A&P Lab?**  
Nahel Awadallah, Nash Community College, nahel.awadallah@gmail.com

Advanced lab simulations are perfect assets to move your wet lab online. In many ways, virtual labs can replace and/or supplement traditional laboratory experiments. Virtual labs improved mastery of the assigned learning objectives for my students. This past year, I was able to integrate virtual labs in lecture and add collaborative activities. Virtual labs integration enhanced student learning and engagement in my traditional, hybrid, and synchronous and asynchronous online courses. The presentation will discuss the assigned virtual labs for my courses, lab assessments, lecture enhancements using virtual labs, and accessibility.

502: Workshop Floor B
**Modeling the Nervous System: An Active Learning Project**  
Kathy Burleson, Hamline University, kburleson01@hamline.edu

We designed a month-long nervous system modeling activity that integrated somatic, autonomic, and sensory pathways into a comprehensive final model. Students worked through guided question packets, researched pathways, and sketched the corresponding routes onto human body templates, completing six pathways from stimulus to response on one full-sized poster. Student learning was assessed via final exam scores as well as open-ended and Likert-scale perception questions. While exam scores remained consistent with prior semesters, feedback suggested the modeling activity was a valuable learning tool that improved student understanding of the nervous system as well as their research skills.
503: Workshop Floor C
From Isolated Data-Analysis Tasks to General Skills: Bridging the Gap with Question Templates
Gregory Crowther, Everett Community College, gcrowther@everettcc.edu

Sponsored by ADInstruments, Inc.

Analyzing real physiological data has profound educational value, yet even well-designed activities have limitations. For example, some students proceed successfully through a set of questions, but then struggle to answer related questions about a different dataset. Moreover, if labwork is not explicitly connected to high-stakes lecture tests, it may be taken less seriously by some students, who may let group-mates do most of the work. In this workshop, we will explore how these challenges can be mitigated by question templates that present specific data-analysis tasks as examples of more general problems that may easily be included on lecture-style tests.

504: Workshop Floor D
Increasing Engagement and Completion in A&P
Anthony Edwards, Panola College, dracedwards@gmail.com

HAPS Conference Award Winner Presentation
In this interactive session, learn how to incorporate many strategies to increase completion and engagement in your A&P classes, including bellringers, exit tickets, online discussions, classroom concept checks, online laboratory exercises, video for lecture capture, student video assignments, as well as assignments completed with cloud-based documents, presentations, and forms.

505: Workshop Floor E
Understanding the Action Potential
Mindi Fried, University of New Haven, mfried@newhaven.edu

HAPS Conference Award Winner Presentation
Understanding a neuron's action potential trips students up every semester. In this workshop, we'll look at a different way of approaching and explaining the AP that can help students understand that it really is all about those gates (no trouble!).

506: Workshop Floor F
Meaningful Online Synchronous Review Sessions
Tom Lehman, Coconino Community College, tom.lehman@coconino.edu

Here are a few formats for offering online synchronous review sessions that students will find meaningful. Their time is as valuable as yours, so these sessions should be of value to both you and them (without being a bunch of busywork for either). Attendees should have materials to build or draw a body and demonstrate anatomical planes and directions (i.e., stuffed animal, clay, yarn, building blocks).

507: Workshop Floor G
Gross Anatomy Labs During the Pandemic and Beyond
Kelsey Stevens, Briar Cliff University, kelsey.stevens@briarcliff.edu, Jeremy Grachan, The Ohio State University, grachan.1@osu.edu, Bridgett Severt, Wright State University, bridgett.severt@wright.edu, Jonathan Wisco, Boston University School of Medicine, jjwisco@bu.edu, Catherine Mattinson, Northeast Ohio Medical University, cmattninson@neomed.edu
The COVID-19 pandemic has introduced many new challenges and changes not only in daily life, but also in academia. This workshop will include discussions on how to approach institutional safety requirements, social distancing, student to donor ratios, PPE protocols, and facility maintenance. Furthermore, discussions covering anatomy lab distance learning alternatives such as videos, the pros and cons of recording or purchasing cadaver videos or other online cadaveric tools, and assessments will be included in this presentation. Consequently, the HAPS Cadaver Use Committee would like to offer and discuss strategies on how to conduct anatomy labs safely and effectively during this global health crisis and in the future.

508: Workshop Floor H
Gender, Sex and Sexuality Inclusion in Anatomy & Physiology Education
Amy Toulson, Holyoke Community College, atoulson@hcc.edu

This workshop will address ways to incorporate gender, sex and sexuality (GSS) diversity into A&P education. We will discuss overlapping terms used for both gender and sex and explore ways to clarify that language. Participants will then learn to identify sources of language bias against sexual orientation, trans/gender nonconforming people in A&P materials. We will finish by exploring GSS inclusive approaches to teaching A&P focusing on the reproductive and endocrine systems. Participants are encouraged to bring materials they use in class to identify the ways these materials can be modified to be GSS inclusive.
Session 6: Monday, May 24 from 4:40 pm – 5:25 pm

601: Workshop Floor A
Preparing and Submitting Your A&P Teaching Portfolio and Promotion Dossier
Carol Britson, University of Mississippi, cbritson@olemiss.edu
Has another academic year gone by in which you have worked hard but came up short documenting that work? Will another HAPS conference come and go without firms plans for how you will use, assess, and share what you are learning here? Find answers to those questions in this workshop where I will present successful strategies to document your classroom innovations, teaching effectiveness, and the impact you have made on your students. Tips for preparing annual narratives and reflective statements documenting the career arc of your professional development as part of a promotion dossier will be included and discussed.

602: Workshop Floor B
Revamping A&P Labs in a Post-COVID-19 World
Vyacheslav Dushenkov, Hostos Community College, vdushenkov@hostos.cuny.edu, Zvi Ostrin, Hostos Community College, zostrin@hostos.cuny.edu
The workshop will examine how A&P labs were transformed from an in-person to fully online modality during the pandemic, and explore the significance of this experience for future online lab implementation. In the emergency, our A&P faculty scrambled to substitute for the hands-on experience by compiling lab worksheets, virtual microscopy exercises, and collections of free virtual lab links. However, these components did not fully replicate the in-person labs. Based on this experience, it appears that histology could be readily taught fully online, reserving the in-person lab for dissections, anatomical models, and physiology.

603: Workshop Floor C
Wait Wait, Don’t Tell Me - HAPS Version
Jon Jackson, Burrell College of Osteopathic Medicine, jjackson@burrell.edu, Anthony Weinhaus, University of Minnesota, weinh001@umn.edu, Bill Perrotti, Mohawk Valley Community College, wperrotti@mvcc.edu
Modeled after NPR’s popular Wait, Wait, Don’t Tell Me news quiz, this light-hearted workshop will feature audience and panel back-and-forth in friendly competition over topics germane to the history of Physiology and Anatomy as well as recent headlines from the science news and science journals. Be prepared to Laugh and Learn!

604: Workshop Floor D
LGBTQ Inclusive Teaching - Why Language Matters
Juanita Jellyman, California State Polytechnic University at Pomona, jkjellyman@cpp.edu, Heidi Schutz, Pacific Lutheran University, schutzha@plu.edu, Nicole Browning, Brenau University, nbrowning@brenau.edu, Meaghan MacNutt, Quest University Canada, meaghan.macnutt@questu.ca
The Diversity, Equity, and Inclusion (DEI) Committee shares the importance of inclusive language for our LGBTQ students. This interactive workshop will offer some examples of how to incorporate inclusive language into your learning objectives and the teaching of different organ systems. Please join us as we reflect on the ways inclusive teaching practices support student success.

605: Workshop Floor E
Teaching Anatomy is Easier than Ever with APR Assignment
Michael Koot, McGraw Hill, michael.koot@mheducation.com
Sponsored by McGraw Hill
Anatomy & Physiology Revealed (APR) has helped students in A&P and human anatomy courses for more than 17 years with virtual dissection, anatomical models, animations, histology, radiology, and 3D rotatable models. Instructors can now create their own, customized assignments using all of the content from APR in the McGraw Hill Connect platform. These auto-graded activities will also integrate into your gradebook. This session will show you how to build your own customized anatomy assignments; highlight the reporting features of APR; and discuss different use cases for in-person, hybrid, or online courses.

606: Workshop Floor F
Understanding Cranial Nerves - A Story of Development and Evolution
Mark Nielsen, University of Utah, marknielsen@bioscience.utah.edu
The structure of cranial nerves arise from elegant patterns that emerge during the evolution of the vertebrates and the development of the individual. Understanding these patterns will bring clarity to the structure and distribution of the cranial nerves and allow you to help your students better understand cranial nerves and their relationships to spinal nerves.
Lesson Learned from the Development and Implementation of an Interprofessional Case Learning Project (ICLP)
Michelle Young, MCPHS University, michelle.young@mcphs.edu, Nalini Broadbelt, MCPHS University, nalini.broadbelt@mcphs.edu
Interprofessional collaboration is essential for our student’s success in their selected program/s and postgraduate life. These types of experiences have been shown to improve student’s interprofessional competences - communication skills, teamwork abilities, ethical practices and understanding other team members’ roles and responsibilities - as well as their theoretical knowledge and increase student achievement within their discipline. We developed and tested a unique pedagogical idea, interprofessional case learning project (ICLP) that encompassed a multi-disciplinary approach involving biology, chemistry and public health. The goal was to provide students and faculty with the opportunity to experience interprofessional collaborative practices that would encourage questioning, discredit misconception, connect concepts and make inferences, generate new ideas and encourage shared decision making.

Lt & Lt Sensors for Remote, Hybrid, and On-Campus Physiology Labs
Jacqui Sue, ADInstruments, Inc, j.sue@adinstruments.com
Sponsored by ADInstruments, Inc.
Lt Sensors in combination with our online learning platform Lt, provide an integrated lab solution with all the content, hardware, and software you need to run your physiology course in remote, hybrid, or on-campus settings. In this workshop we’ll break down how the lab space has changed this year, and how Lt and Lt Sensors can help bridge the gap between traditional face-to-face, and remote learning methodologies. We’ll look at how these tools can be used to provide an authentic lab experience for educators that may need flexibility to move between face to face and remote teaching.

Equity Beyond the Classroom: Best Practices in Cross-Race Mentoring
Da’Quan Craven, Indiana University, ddcraven@iu.edu, Jessica Byram, Indiana University, jbyram@iu.edu
This workshop is designed to introduce best practices for cross-race mentoring, so that teachers and faculty members can have a greater positive impact on the psychosocial development of underrepresented students pursuing careers for which anatomy is the foundation. Common issues that arise in cross-race mentoring will be highlighted and participants will be introduced to our locally-developed Mentoring Relationship Compatibility Template (MRCT). This session will be a safe space for the required participation in: (a) critical group dialogue about cross-race mentoring, (b) breakout sessions to use and experience MRCT, and (c) providing feedback to the session leaders about the sessions’ success.

The Hardest Kindergarten Class You’ll Ever Take: Manipulatives in the Anatomy and Physiology Classroom
Karen Groh, Good Samaritan College of Nursing and Health Science, karen.groh@email.gscollege.edu
In kindergarten, manipulatives are used extensively to bridge the gap between abstract concepts and concrete forms. Educational research suggests that presentation of new knowledge in concrete forms followed by concreteness fading facilitates deep learning and allows learners to grasp complex topics. In this workshop, the use of manipulatives for teaching complex anatomy and physiology content will be explored. Participants will experience learning of one physiological concept using manipulatives and will discuss the benefits and limitations of this type of learning. Participants are asked to come to the workshop with a set of small objects such as coins, pebbles, or candy to use during the workshop. Suggestions for use of manipulatives in participants’ classrooms will be shared.

Technology: Friend or Foe? Adapting During the Pandemic
Laylonda Maines, Front Range Community College, laylondamaines@gmail.com
Have you ever gone to a workshop or training and struggled to implement new strategies? Are you having difficulty connecting with your students? Do you want to keep up student retention and engagement without sacrificing rigor and content? If “yes” to any of these, then this workshop is for you. We will engage in an authentic conversation about how I mitigated these issues in my Anatomy & Physiology classes. I will introduce my “pandemic clause”, give real-life tactics, and examine specific issues. Course design, pedagogy, and development can offer a way to make the technology work for you. Let’s Talk!
704: Workshop Floor D
**Integrate Visible Body with Ease & Joy: Virtual Labs, Homework, and LMS Integration**
Mary Ness, Visible Body, mary.ness@visiblebody.com

**Sponsored by Visible Body**
Instructors who use Visible Body Courseware see significant improvements in student engagement and performance. Grades are going up a whole letter and DFW rates are decreasing! This workshop will show you how to easily incorporate Visible Body Courseware into your classroom. You will see hands-on virtual auto-graded A & P labs and our new Canvas and BlackBoard Integrations. You’ll also learn how to customize and annotate 3D models according to your lab and lecture needs as well as easily share them with your students across multiple platforms: web (PC/Mac), phones and tablets.

705: Workshop Floor E
**The Effect of Mindful Breathing Exercises on Testing Anxiety and Student Performance in Formal Exams**
Peter Reuter, Florida Gulf Coast University, preuter@fgcu.edu, Rob Sillevis, Florida Gulf Coast University, rsillevis@fgcu.edu

Anatomy & Physiology I lab sections were randomly assigned to control or test group. Students in the control group took their tests as usual, students in the test group participated in a guided 5-minute mindful breathing exercise before each test. Students in both groups completed a twenty question Anxiety State Self-Evaluation Questionnaire at the beginning of each test. Our workshop will describe the study design and report on the outcome as far as grades are concerned. We will also share the results of the Anxiety State Self-Evaluation Questionnaires and what it can tell us about students' emotional state before each exam over the course of a semester.

706: Workshop Floor F
**Let's Talk Donor Dignity**
Amberly Reynolds, Sam Houston State University, amberly.reynolds@shsu.edu

At HAPS 2019, I presented on the Native American perspective of donors, and having worked at various institutions there are a range of programs to honor donors. What does that mean, to honor donors? What can we do when the donors are virtual? Anatomists and students value exposure to donors, but what can we do to strengthen the emotional intelligence and understanding of the donor for our students? This workshop will explore different institutional ceremonies for donors and include discussion on how to invest our students in the experience of anatomy via donor whether that be in-person or virtual.

707: Workshop Floor G
**Using Group Learning to Enhance Understanding of Skeletal Muscle Fiber Physiology: From Excitation to Relaxation**
Rosemary Stelzer, University of Wisconsin-Milwaukee, rveber@uwm.edu

This presentation will guide participants through a short group learning exercise describing the steps of skeletal muscle contraction. During this session, participants will model this group learning activity.

708: Workshop Floor H
**How Can We Standardize Anatomy Education in Health Science and Medical Education?**
Kelsey Stevens, Briar Cliff University, kelsey.stevens@briarcliff.edu

HAPS serves a diverse group of educators who teach in nearly every level of academia, each presenting unique challenges. One particular difficulty may occur when biomedical scientists are asked to create curriculum for graduate health professions courses, while they themselves have little experience in the clinical field. With the pressures of institutional accreditation and board pass rates, it is imperative that the HAPS membership work together to create a community that can provide guidance to these individuals. The following workshop will include a discussion regarding concerns associated with teaching anatomy and physiology to graduate health professions or medical students.
Session 8: Tuesday, May 25 from 1:45 pm – 2:30 pm

801: Workshop Floor A
The HAPS Book Club Promotes Discussions of Equity and Builds Community
Patrick Cafferty, Emory University, pcaffer@emory.edu, Kathy Burleson, Hamline University, kburleson@hapsconnect.org, Burhan Gharaibeh, University of Pittsburgh, burhan@pitt.edu, Jacquie Van Hoomissen, University of Portland, jvan@hapsconnect.org, Lawrence Young, Polk State College, lyoung@polk.edu
The HAPS book club was established to create a space for learning about the role of racism in science as a way to inform our work as anti-racist educators. Since fall 2020, members met monthly online to discuss readings from two recent books on racism in science. This workshop will discuss the book club structure, how it serves HAPS members, and major take-home messages from each of the books. Finally, we will discuss how the book club enabled members to critique race science and make changes in classes and daily lives.

802: Workshop Floor B
Integrating the Diversity of Human Experience with Human A&P
Amanda Haage, University of North Dakota, amanda.haage@und.edu
HAPS Conference Award Winner Presentation
While intercultural competency is recognized as an essential part of many of our universities’ missions, it has often been relegated to something outside of STEM. We fail to commonly recognize how much of the diversity of human experiences is derived by both real and perceived diversity in human anatomy and physiology. This workshop will present a new, from scratch build of a 200-level large enrollment A&P course based on HAPS objectives completely integrated with human diversity topics. Every HAPS module has the potential to bring a first pass of essential intercultural competency training to our allied health students.

803: Workshop Floor C
To Agglutinate, or Not to Agglutinate, That is the Question? Tips & Tricks to Teaching Blood Typing Online
Taziah Kenney, Thomas Jefferson University, taziah.kenney@jefferson.edu
Sam Drego Technology in the Classroom Award Winner Presentation
I have seen students struggle with in-person blood labs, so what happens when we take that in-person lab and are forced to create a remote lab? In this workshop, we will walk through some tips and tricks on how to keep students engaged and having FUN during a virtual blood lab.

804: Workshop Floor D
Autopsy.Online
Ben Margolis, Autopsy.Online, info@autopsychicago.com
Sponsored by Autopsy.Online
Learn about Autopsy.Online, an interactive, searchable, teaching video-database of autopsy casework. The physician-developer, Dr. Ben Margolis provides a site demonstration. Discuss the platform as a unique resource challenging the digital paradigm (all cases are real); as a distance learning option (students work collaboratively like anatomy lab); and as a flexible classroom tool (combining didactics and discovery). Explore the site’s many features: multi-mode search function, interactive anatomy pins, curriculum option, question-guide, digitized histology, and more. Learn how this site make the body accessible; enhances understanding of anatomic relationships and physiology processes; and motivates student interest with real-world clinical context.

805: Workshop Floor E
Making the Endocrine System Fun: Build a Diabetes Game
Rebecca Polich, Rocky Mountain College, rebecca.polich@rocky.edu
Assessment of student learning in an upper-level undergraduate anatomy and physiology course revealed shortcomings in endocrine system learning objectives. To address these shortcomings, we challenged students to create a game about diabetes. First, in a partially-flipped classroom, students explored resources on type I and type II diabetes. They then summarized and presented their learning and created a game designed to be played by a non-expert. Through gameplay, the player learns about diabetes and the endocrine system as a whole. In this hands-on session, we provide the materials necessary for you to craft and assess a diabetes game with your students.
806: Workshop Floor F
On the Same Page with ‘Dare to Lead’: Inclusive, Authentic, and Brave Leadership Training
Kyla Ross, Georgia Institute of Technology, kyla.t.ross@gmail.com, Elizabeth Pennefather-O’Brien, Medicine Hat College, eobrien@hapsconnect.org
Sponsored by HAPS
Want to learn more about yourself and your working environment so that you can engage in brave conversations with your colleagues while not sacrificing your own values? If so, then join us for a workshop that explores key findings from Brené Brown’s research on courage, vulnerability, shame, and empathy. Those attending will 1) explore the myths of vulnerability, 2) learn tools to effectively build trust with others, and 3) learn how to rise strong in the face of adversity. Join us as members of the HAPS leadership team share their own experiences with learning and applying these tools in our professional lives. Learn how you too can build a stronger, more inclusive, and more authentic community in the workplace.

807: Workshop Floor G
A Creative Approach to Teaching Endocrine System Pathways
Lauren Sloane, SUNY Delhi, sloanelb@delhi.edu
John Martin Second Timers Award Winner Presentation
Students struggle with understanding endocrine pathways. To address this, an assignment was designed where students created posters by drawing connections to each of the major components of the pathways, including all organ and hormone names, functions of hormones, and feedback loops. This creativity increased understanding of the pathways, leading to greater comprehension of the endocrine system. As a result of pivoting to remote-teaching due to COVID-19, a new challenge to modify the assignment using virtual platforms was essential.

Session 9: Tuesday, May 25 from 4:40 pm – 5:25 pm

901: Workshop Floor A
Creating Connection and Community with a DEI Mindset in an Anatomy Course
Sandra Hutchinson, Santa Monica College, hutchinson_sandra@smc.edu
HAPS Conference Award Winner Presentation
Application of anatomy concepts can extend beyond the basic structures discussed in a textbook. By showing students the relevance of the course material to their lives, their interest, motivation, and learning can increase. Since the majority of our students will pursue allied health careers, and because my community college is a Title V HSI school, it was important for me to build awareness of equity and social justice issues into my anatomy course to create a supportive, informed learning community. In this workshop, I will discuss concrete examples of how to integrate these topics into the anatomy curriculum.

902: Workshop Floor B
Navigating a Quick Flip to Online: Incorporating your Existing Complete Anatomy Content into Your LMS
Christopher Marks, University of Mount Union, markscp@mountunion.edu
Sponsored by Elsevier
The quick flip to online during the global pandemic that began in early 2020 brought challenges to everyone trying to deliver anatomy content. This workshop will document how the quick flip to online impacted content delivery in a traditional two semester sequence of anatomy and physiology in an undergraduate setting. The presentation will highlight how recent updates in Complete Anatomy allowed for seamless LMS integration.

903: Workshop Floor C
HAPS Exam Program 2021 Update: Secure, Proctored, Online A&P and Stand-Alone Anatomy Exams, and Development of Physiology Learning Outcomes
Valerie O’Loughlin, Indiana University, vdean@indiana.edu, Janet Casagrand, University of Colorado-Boulder, janet.casagrand@colorado.edu, Dee Silverthorn, University of Texas at Austin, silverthorn@utexas.edu
Sponsored by HAPS
Having difficulties securely assessing your students in an online environment? Want to compare your class performance with others across North America? Interested in assessing learning gains, knowledge retention, or equity and diversity issues in learning? HAPS (with ProctorU) offers secure, online, proctored A&P and stand-alone human anatomy exams. In this session, we describe these validated HAPS exams, secure online testing platform and proctoring options. We explain how to order exams and provide examples of ways to utilize and fund them at your institution. We will also update you on the development of stand-alone physiology learning outcomes and human physiology exam.
Active Learning in Online A&P Labs: The Body Builder Project
Ann Raddant, University of Wisconsin-Milwau, ann.raddant@gmail.com
The primary learning outcome for my A&P 2 course is quite simple: explain basic anatomical and physiological concepts and integrate these into a working model of the human body. As students study the human body in a systems-based approach, they often lose sight of the bigger picture. The Body Builder Project is an active learning project that helps students develop an understanding of basic human gross anatomy. Students draw and label organs and vessels, then use their drawings to perform higher-level activities that draw on their knowledge about multiple organ systems.

Female Pelvic Anatomy - From Comparison To Understanding
Liliya Ryschak, Nova Southeastern University, lryshchak@nova.edu
As basic science educators teaching future health care professionals, we all face the same challenge. How do we teach fundamental concepts and capture student interest? Our project focuses on increasing student engagement by using clinically relevant sonographic images and interactive cross-sectional drawings. Initially students are shown traditional anatomical illustrations from textbooks in color. To introduce the concept of various planes of section, students are given unlabeled cross-sectional drawings in black and white. To highlight regional anatomy, reinforce key concepts and increase student engagement, the class is asked to label the drawings using anatomical illustrations for reference. To establish important clinical correlations, students are shown relevant ultrasound Images. Our current study includes anatomy of the female pelvic region.

Student Collaboration in the Online Classroom
Melanie Schroer, Stockton University, melanie.schroer@stockton.edu
In a face-to-face Anatomy and Physiology (A&P) course, students naturally form close-knit communities through laboratory work and study, tackling the bulk and complexity of the content together. Because routine personal interactions are rare if not absent from the virtual learning environment, the instructor becomes the impetus of valuable teamwork. The A&P instructor may employ video response systems and cloud computing tools to increase student engagement with each other and the content. In this workshop, I will introduce vetted activities which promote synchronous and asynchronous collaboration. Student feedback and performance associated with these exercises will be presented.

Finally! All the Necessary Digital Lab and Lecture Resources Organized in One Site!
Steve Sullivan, Bucks County Community College, ssullivandc@gmail.com
Sponsored by McGraw Hill
The brand new “A&P Lab Suite” is a standalone platform of reliable, organized, assessable, accessible, and affordable anatomy and physiology lab simulations combined with a myriad of resources for the lecture component of your course. A&P Lab Suite be used with any text or OER materials. Assign realistic, interactive physiology labs as well was engaging human cadaver dissection activities, which can all be assessed with ready-to-go quiz questions. Meanwhile, solidify their grasp on lecture content with tutor videos targeted at A&P’s key concepts and adaptive learning tools to make sure they get it.

Integrating Social Justice and A&P: How Race and Racism Can Be Discussed Through the Integumentary System
Larry Young, Polk State College, lryoung@polk.edu
HAPS Conference Award Winner Presentation
During the session participants will explore why incorporating tough conversations of social justice into an A&P curriculum is of importance in today’s society and for inclusive teaching. The session will focus on the inclusion of race and racism into Integumentary System lessons through the use of Evolution, Anatomy, and current research.
Session 10: Wednesday, May 26 from 11:45 am – 12:30 pm

1001: Workshop Floor A
Peer Reviewed Physiology Labs Your Students Can Complete Anywhere
Wes Colgan III, Backyard Brains, wes@zcanalytics.com, Greg Gage, Backyard Brains, gagegreg@backyardbrains.com
Sponsored by Backyard Brains
Backyard Brains pioneered portable, low cost, easy-to-use physiological data recorders over a decade ago. Over 100 peer reviewed journal articles, nine TED talks, and thousands of successful students demonstrate the effectiveness of our tools. Your students can collect data anywhere on smart phone, tablets, Mac or PC, no internet connection required. This enables your students to record physiological signals from muscles (EMG), from the heart (ECG), from the eyes, (EOG) and the brain (EEG) essentially anywhere. We will demonstrate our new Human Physiology curriculum collection designed specifically for remote learning.

1002: Workshop Floor B
HAPS Teaching Tips
Rachel Hopp, University of Louisville, rachel.hopp@louisville.edu, Wendy Rappazzo, Harford Community College, wrappazzo@harford.edu
Sponsored by HAPS
Are your students struggling with certain topics in A&P? Leaders from the HAPS Curriculum and Instruction Committee will guide you through identifying learning outcomes related to the topic and appropriate resources on the HAPS Teaching Tips website which will engage students and improve mastery of the topic. The format of the Teaching Tips has recently been revised and now includes an instructor’s guide and formative assessment. Tips for the Urinary, Cardiovascular, and the Reproductive Systems will be showcased. Do you already have great activities for your classes? We will also explain how to submit a Teaching Tip to HAPS.

1003: Workshop Floor C
Using Virtual Whiteboards to Promote Engaging and Interactive Online Anatomy and Physiology Labs
Tim McGuire, Delta College, timothymcguire2@delta.edu
How can instructors effectively teach interactive labs using anatomical models, dissections and physiological mechanism analysis in an online environment? How can students effectively learn course material online using methods that maintain academic rigor and ensures learning outcomes are appropriately met? One solution is delivering engaging and interactive online lab experiences to students using virtual whiteboards. These technologies allow instructors to guide and work beside students by interactively participating in group anatomical model identification, instructor-led dissections and diagram analysis of physiological mechanisms. Virtual whiteboards provide interactive elements for students who can simultaneously participate in dissection, model identification and physiological mechanism analysis by drawing/labeling/identifying/diagramming anatomical structures and key physiological concepts. Students can also respond simultaneously with other students all while the instructor can view, monitor and interact similar to being face to face in the A&P lab, providing an engaging, effective A&P experience that prioritizes interaction and creates conditions for meaningful learning.

1004: Workshop Floor D
The Culture Inside: Mutual Influences Between Anatomy and Physiology and Religious and Other Cultural Practices
Edgar Meyer, University of Arkansas for Medical Sciences, ermeyer@uams.edu
The incorporation of diversity and inclusion goals into the revised HAPS Learning Goals has been discussed, given the importance of promoting diversity, equity, and inclusion standards at institutions of higher learning. Individual cultural and religious, spiritual, or secular differences should be respected in anatomy and physiology (A & P) courses. This workshop will include brief introductions to religious and other cultural impacts on A & P throughout history. Participants will engage in activities using examples of A & P structures, terms, or discoveries to research and discuss their influences from various religions and other cultural practices and vice versa.
Women in Anatomy & Physiology Discussion Panel Workshop
Melissa Quinn, The Ohio State University, quinn.269@osu.edu, Valerie O’Loughlin, Indiana University, vdean@indiana.edu, Beth Kersten, State College of Florida Manatee-Sarasota, kersteb@scf.edu, Janay Dennis, Mitchell Community College, jdennis@mitchellcc.edu, Soma Mukhopadhyay, August University, smukhopadhyay@augusta.edu
Women in STEM face challenging sets of circumstances that can alter their educational journeys and career paths. Although women make up more than half the college-educated workforce, only 28% of the STEM workforce is women. While these numbers have improved over the last two decades, women still face many obstacles in these male-dominated fields. This workshop brings together a panel of inspiring women at different points in their careers to discuss their points of view related to their triumphs and obstacles. Whether you are a woman in STEM or an ally, come join us with your questions and shared experiences.

Using Fun Activities to Learn About the Function of the Organelles
Julia Schmitz, Piedmont University, jschmitz@piedmont.edu
Looking for fun and new ways to help your students learn about organelles’ functions? This workshop will engage the audience in different activities to teach about the organelles to their students, either virtually or during in-person instruction. Activities include having the students come up with analogies of organelles to a city, finding objects to represent the functions of the organelles, and researching diseases that result in a malfunction of specific organelles, which will provide your students with an understanding of the interworkings of organelles.

Student Advice for Succeeding in A&P Courses
Justin Shaffer, Colorado School of Mines, jshaffer@mines.edu
Instructors often given advice to students for how to succeed in their courses, but students may also give advice for success. In this study we sought to determine what kinds of advice students give for success in anatomy and A&P courses. We found that students most commonly gave advice on general studying tips, what to expect in the courses, interacting with peers, and giving positive support. In this workshop we will provide an overview of the types of advice that students gave and present recommendations for how to implement the advice in your courses.

Teaching a Diverse Population
Lina Byrne-Dugan, Thomas Jefferson University, lxb307@jefferson.edu
This workshop gathers perspectives from the neurodiverse populations and focuses on three key communities: 1. Autism 2. LGBTQIA 3. Refugees & Immigrants. Their lived experiences are inherently valuable; thus, their voices can bring richness and depth to our own experiences. This workshop is designed to help you leverage their insights for a connected and inclusive classroom. It is structured around three objectives: 1. Summarize the current research available for each population 2. Highlight the depth of insights each population brings forth. 3. Learn fundamental strategies that strengthen their voices when applied consistently.

Poland Study Abroad: Bridging the Gap Between Disciplines and Cultures
Ewa Gorski, Community College of Baltimore County, egorski@ccbc.edu
Two years of planning, many discussions and revisions resulted in a successful multi-disciplinary Study Abroad Program. This presentation will include an overview of the steps required for designing a study abroad program as well as lessons learned from leading the “Human Anatomy in Poland” Study Abroad Program. The importance of interdisciplinary collaboration and bridging the gap between cultures in the 21st Century will also be discussed.
Enhancing Active Learning from a Distance: Designing Interactive Digital Worksheets
Katrina Porter, Penn State Fayette, klp5517@psu.edu
Active engagement with A&P course material is vital for student retention of information; however, this can be challenging in the remote learning environment. Creating and using Interactive Worksheets with digital manipulatives is a novel way to implement active learning for students at home. With thoughtful design, these assignments may also be used to teach effective study strategies to your students. In this workshop, you will learn the basics of creating Interactive Digital Worksheet assignments in slide-sharing platforms, tailored to your specific course content, as well as how to seamlessly assign, distribute, grade, and return these activities to your students.

Finding Your Footing: Being New at an Institution
Amberly Reynolds, Sam Houston State University, amberly.reynolds@shsu.edu
This workshop will be dedicated to helping new instructors or up-and-coming teachers to find their footing. How do we navigate an institution, human resources, the hiring process, appropriate documentation needs and a myriad of other concerns that occur from the job hunt to hiring? Discussion-based and resources provided, this workshop aims to help those beginning their career in anatomy and/or physiology find their footing. We will discuss the importance of learning about one's school, reaching out beyond your office, engaging students, staff, and faculty while also discussing the difficulties of being the new person on campus.

The Impact of a Lesson on Weight Stigma on Physical Therapy Students: Why We Should Discuss Weight Stigma When We Discuss Weight with Our Students
Krista Rompolski, Moravian College, rompolskik@moravian.edu
As A&P educators, we have a responsibility to foster integrity, respect and compassion for all people, regardless of body size. Weight stigma is defined as negative attitudes, beliefs and judgments toward individuals who are overweight and obese and is gaining recognition as one of the social determinants of health. Weight stigma is prevalent among healthcare professionals, educators and students. In this workshop, we will review the perceptions of a weight stigma lesson among Doctor of Physical Therapy students, discuss the prevalence of weight stigma in health education and discuss ways to address weight bias in anatomy and physiology courses.

Hypothalamus-Pituitary and Beyond: Hormones to Memorize or Biological Design "Stories" to Tell
David Temme, University of Utah, temme@biology.utah.edu
Is the regulatory maze within the hypothamic-pituitary axis too daunting to ask students to go beyond listing names and basic connections? Not if more basic patterns exist! Here I focus on three: (1) signaling connections that regulate body-levels of the three lipid-soluble hormones all share the same design, and each adjusts some aspect of an individual's readiness; (2) the two designs regulating body-levels of larger water-soluble hormones share a unique feature, and adjust when to and when not to (timing); and (3) the two short peptides released from the posterior pituitary represent two sides of one story: adjusting social boundaries.

Products and Supplies for Anatomy and Physiology Using Remote, In-Person, and Hybrid Instructional Delivery Methods
Jennie Baker, Carolina Biological Supply Company, jennifer.baker@carolina.com, Candace Berkley, Carolina Biological Supply Company, candace.berkley@carolina.com
Sponsored by Carolina Biological Supply Company
Are you teaching remotely, returning to the classroom, or using a combination of the two methods? Join Carolina Biological to learn about new physiology educational tools and resources to facilitate learning and enhance student experiences during these changing times. Single-station teaching kits, virtual labs, physiological infographics, and more will be demonstrated and discussed.
1202: Workshop Floor B
Teaching A&P in a Post-Pandemic World
Serina Beauparlant, Pearson, serina.beauparlant@pearson.com, Debbie Schmidt, Hocking College, debbie.schmidt@pearson.com, Terry Austin, Temple College, terry.austin@pearson.com, Judi Nath, Penn State University, jnath@hapsconnect.org, Shawn Macauley, Muskegon Community College, shawn.macauley@muskegoncc.edu
Sponsored by Pearson
Join Pearson to examine the state of the A&P lecture and lab courses in light of recent mandatory changes, and the likely future evolution of these courses as things normalize in a post-pandemic world. We'll examine the challenges posed by moving lecture and lab courses online, best practices that emerged, and ongoing strategies, tools, and resources that have served members well and that they're likely to retain as they move forward with face-to-face, hybrid and online courses.

1203: Workshop Floor C
Anatomy and Physiology, Convergence of Art and Science: The Student Perspective
Anya Goldina, Elizabethtown College, goldinaa@etown.edu, Rebecca Kruse, Elizabethtown College, kruser@etown.edu, Carol Costa Ouimet, Elizabethtown College, ouimetc@etown.edu
Integration of arts and humanities into the science curriculum can help train healthcare workers develop emotional intelligence, empathy, and communication skills. These “soft” skills can give medical professionals the tools to help patients from diverse backgrounds with various physical and emotional needs. In this workshop we discuss ways in which we incorporate arts into our A&P course through creative extra credit assignments to empower students to apply course content by developing community outreach, art exhibits, and education events. We will also present data reflecting student perspective on the educational value of these assignments.

1204: Workshop Floor D
Bioethics Discussion Forums in an Anatomy & Physiology Course
Stephen Sarikas, Lasell University, ssarikas@lasell.edu
Given the high volume of information packed into the anatomy & physiology curriculum, there is scant opportunity for students to reflect and critically analyze the material they learn. In this workshop you will learn how a discussion forum is used as a vehicle to encourage students to offer careful personal reflection on and critical analysis of important ethical issues in medicine and science. Topics to be covered will include organ donation, the use of steroids in sports, and Covid-19 vaccination. This will be an interactive session during which participants will be asked to consider their own views on these topics.

1205: Workshop Floor E
Soapmaking 101 – Exploiting COVID-19 to Teach Practical Science and Analytical Skills Remotely
Derek Scott, University of Aberdeen, d.scott@abdn.ac.uk
COVID-19 safety measures prevented medical science students from undertaking a range of standard physiological labs. Students requested that other ways be found to provide them more practical skills/analytical experience, even when working remotely. Given the press regarding handwashing and its effectiveness against COVID-19, we developed a soapmaking practical, streamed live from the lecturer’s kitchen that allowed us to address student needs, developing a compressed version they could undertake during their limited classroom laboratory time if they were on campus. We used this practical as a platform for numeracy, analytical skills, health and safety, COVID-related physiology, toxicology and careers discussion.

1206: Workshop Floor F
Developing Online Labs with 3D Printing
James Sweet, Eastern Michigan University, jsweet@emich.edu, Frank Fedel, Eastern Michigan University, ffedel@emich.edu, Laura Sweet, Eastern Michigan University, lsweet1@emich.edu
Understanding of material is gained from the ability of the student to independently apply themselves into complex meaningful situations instead of isolated skill sets. (Heinerichs et al, 2013) These constructs provide students to utilize their learning styles to support a better understanding of theory and its utilization in clinical assessment. This proposal considers the use of a 3d printed anatomical hip model, furthered by an inexpensive casting technique, to allow students to construct the hip joint as presentational tools for palpatory anatomy online environments. In addition, the use of casted anatomical model is relatively new in the health care academic setting, this proposal will allow attendees the ability to address visual learning and provide an opportunity for student hands-on dissemination within the online environment.
1207: Workshop Floor G
Interactive Digital Lab Solution
Dreis Van Landuyt, Van-Griner Learning, dreis@van-griner.com, Brenda Schwieterman, Van-Griner Learning, brenda@van-griner.com
Sponsored by Van-Griner Learning
This workshop will focus on LabRight, a custom online platform for A&P labs. With integrated 3-D images, simulations, auto-graded questions and study tools, it is ideal for all lab environments, face-to-face, hybrid or virtual. Start with our library of labs or include your own labs, a team will set it up for you, including LMS integration. It works on PCs, Macs, tablets and smartphones. It can also be accompanied by a print manual.

1208: Workshop Floor H
Diabetes as a Model to Understanding Normal Physiology
Nichole Warwick, Clatsop Community College, nwarwick@clatsopcc.edu
The US maintains its rank as the country with 3rd highest number of Diabetes Mellitus cases, with 31 million Americans effected as of November 2019. This disease impacts nearly every body system and alters normal physiology. As such, this provides an interesting learning opportunity to students to reinforce their knowledge of normal physiology and to begin to understand how normal physiology can break down in the disease process. Participants in this workshop will gain some background on this disease, and be provided sample case studies that have been used in my classes.
Thank You to our HAPS 2021 Annual Conference Committee!!!

Annual Conference Chair: Melissa Quinn

Annual Conference Committee:
Jennifer Burgoon  Mark Nielsen
Kyla Ross  Jacqueline Van Hoomissen

Special Thanks to...
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Association Services Group (ASG)
HAPS Board of Directors, Steering Committee, and Executive Director

Although this year’s conference might not have looked the same as in years past, it has been especially meaningful. We have all found ways to continue to maintain our connections and our friendships and we hope you all have greatly enjoyed this week and found opportunities to connect. Thank You All!
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