Promoting Excellence in the Teaching of Human Anatomy and Physiology

38th Annual Conference

May 25 - 29, 2024
St. Louis, Missouri

Promoting Excellence in the Teaching of Human Anatomy and Physiology
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Thank you ..................................................................................................................................... IBC
Welcome to St. Louis! This conference marks my second year as the HAPS Executive Director. I am excited to join all of you for another enjoyable, educational, and uplifting four days of learning and community engagement. This gathering of HAPSters from around the globe presents a wonderful and meaningful opportunity for all of us to come together as faculty, colleagues, and friends. It is also an excellent opportunity to learn more about the exceptional programs and products offered by our partnering vendors who collectively support the excellent work we do in our classrooms.

The theme of “coming together” has been central to HAPS this past year as we have been focused on coming together to advance our mission. HAPS has always offered numerous opportunities for everyone to come together in a way that suits them best. Whether it’s attending a Virtual, Regional, or Annual Conference in person, taking one of our continuing education courses, participating in our Book Club, attending town halls and webinars, enhancing your skills for success in our Leadership Academy, accessing Teaching Tips, the HAPS Exam, or HAPS Learning Outcomes to utilize in your classrooms, or deepening your knowledge of best practices with a warm cup of tea or coffee in one hand and the *HAPS Educator* journal in the other, there’s something for everyone! This past year our membership and leaders have come together on two important projects; reimagining of our HAPS website to better serve our members and beginning the important process of updating our strategic plan. As an educational society, we aim to provide offerings that are valued by our members, and we prioritize bringing members together in everything we do. With so much happening in HAPS, we hope you find your special place within our community.

We have an amazing array of opportunities organized by our Conference Planning Committee and its Chair, Cinnamon VanPutte. A big thank you to the committee for their vision and organization of the Annual Conference. The first two days of the conference will be held at the Marriott St. Louis Grand and will feature eight update speakers. During breaks between the update speakers, we will have 96 poster presentations and 26 dedicated exhibitors who are here to connect and engage with our members. This is a great opportunity to seek them out and learn about their latest products that can assist you in your work. Please also consider joining the HAPS Leadership and all our members for our annual General Business Meeting, which is open to all members. We will also celebrate Award Winners at this event, so there will be good energy all around! For the workshop portion of the Conference, we will transition to Southern Illinois University Edwardsville. With a selection of more than 95 workshops spanning two days, you’ll have ample opportunities to participate in small, interactive sessions that are certain to ignite your passion for teaching Anatomy & Physiology.

To assist you with your planning, the 2024 App is available for your use once again. It is an excellent way to connect and engage with conference attendees and find important information, schedules, and contacts. Download it to your smartphone or tablet and explore its features! The entire conference schedule is in the App, and you can use it to build your own personal schedule for our four days together.

On behalf of the HAPS Leadership and staff, welcome to St. Louis! We are delighted you could make it. Please don’t hesitate to reach out to connect in the coming days.

With much appreciation for all you do to advance excellence in education,

Jacquie Van Hoomissen, PhD
Executive Director
May 25, 2024

Human Anatomy & Physiology Society (HAPS)
2024 Annual Conference

Greetings:

As Mayor of the City of St. Louis, it is my special pleasure to welcome the Human Anatomy & Physiology Society 2024 Annual Conference to St. Louis. We are confident you will find it a perfect setting for your conference.

Backed by a tradition of proven hospitality and excellent facilities, we consider it a privilege to provide an inspiring and stimulating atmosphere for your meeting. I wish you a wonderful convention experience in which you connect, learn, and share your contributions with other attendees and guests.

I am delighted that you have chosen St. Louis to host your conference this year. While you are here, I invite you to enjoy all that our city has to offer. I encourage you to visit our museums, monuments, restaurants and diverse neighborhoods. Just a short walk from your conference hotel, the Marriott St. Louis Grand, is the historic Gateway to the West Arch and National Park. While here, you may wish to include a visit to Soldiers Memorial Military Museum, Forest Park with its many museums and of course, the iconic Busch Stadium, home of the St. Louis Cardinals.

On behalf of the residents of St. Louis, I wish you a successful and enjoyable conference and a memorable time in our city.

Sincerely,

Tishaura O. Jones
Mayor, City of St. Louis
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** makes 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 of any committee that interests you so you may discover first-hand how HAPS works and how you can get involved. **Check out page 89 to see when and where the committee meetings will take place during lunch on Saturday.**

<table>
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<tr>
<th>HAPS Board of Directors 2023 – 2024</th>
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<tr>
<td><strong>President:</strong> Kerry Hull</td>
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<tr>
<td><strong>Past President:</strong> Eric Sun</td>
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<tr>
<td><strong>President Elect:</strong> Melissa Quinn</td>
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<tr>
<td><strong>Secretary:</strong> Carol Britson</td>
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<tr>
<td><strong>Treasurer:</strong> Tracy Ediger</td>
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<tr>
<td><strong>Central Regional Director:</strong> Hisham Elbatarny</td>
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<tr>
<td><strong>Eastern Regional Director:</strong> Nanette Tomicek</td>
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<td><strong>Southern Regional Director:</strong> Cindy Wingert</td>
</tr>
<tr>
<td><strong>Western Regional Director:</strong> Hiranya Roychowdhury</td>
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<tr>
<td><strong>Executive Director:</strong> Jacqueline Van Hoomissen</td>
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<td><strong>Business Manager:</strong> Caitlin Hyatt</td>
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<td><strong>2024 Annual Host Committee Chair:</strong> Cinnamon VanPutte</td>
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<td><strong>Anatomical Donor Stewardship:</strong> Kelsey Stevens</td>
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<tr>
<td><strong>Awards &amp; Scholarship:</strong> Chasity O’Malley</td>
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<td><strong>Communications:</strong> Caitlin Burns</td>
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<td><strong>Conference:</strong> Edgar Meyer</td>
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<td><strong>Curriculum &amp; Instruction:</strong> Abbey Breckling</td>
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<td><strong>Diversity, Equity, and Inclusion:</strong> Juanita Jellyman</td>
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<tr>
<td><strong>Fundraising:</strong> Stacey Dunham</td>
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<tr>
<td><strong>Welcoming &amp; Belonging:</strong> Melissa Quinn</td>
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<td><strong>Steering Committee:</strong> Larry Young</td>
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<th>Special Committees and Programs 2023 – 2024</th>
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<td><strong>Exam Program Leads:</strong> Janet Casagrand, Valerie O’Loughlin, Dee Silverthorn</td>
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<tr>
<td><strong>Executive Committee:</strong> Kerry Hull</td>
</tr>
<tr>
<td><strong>Finance Committee:</strong> Ron Gerrits</td>
</tr>
<tr>
<td><strong>Nominating Committee:</strong> Melissa Quinn</td>
</tr>
<tr>
<td><strong>Presidents Emeriti Advisory Committee:</strong> Kyla Ross</td>
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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**
Kerry Hull, 2023-2024

**President-Elect**
Melissa Quinn, 2024-2025

**Past Presidents**
Eric Sun, 2022-2023
Kyla Ross, 2021-2022
Wendy Riggs, 2020-2021
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**
2024 – St. Louis, MO (Cinnamon Van Putte)

**Coming Attractions**
2025 – Pittsburgh, PA
(Burhan Gharaibeh & Natasha Baker)
2026 - Kansas City, KS (Todd Gordon)

**Previous HAPS Conferences**
2023 - Albuquerque, NM (Mark Danley)
2022 - Fort Lauderdale, FL
(Chasity O’Malley and Cheryl Purvis)
2021 – Virtual Conference (Melissa Quinn)
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
2023 - 2024

President
Kerry Hull

Past President
Eric Sun

President-Elect
Melissa Quinn

Secretary
Carol Britson

Treasurer
Tracy Ediger

Central Regional Director
Hisham Elbatarny

Eastern Regional Director
Nanette Tomicek

Southern Regional Director
Cindy Wingert

Western Regional Director
Hiranya Roychowdhury
HAPS Committees

2023 - 2024 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 Tuesday, 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.

2024 Annual Host Committee
Cinnamon Van Putte
Our committee oversees the coordination of the 2024 Annual Conference.

Anatomical Donor Stewardship 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.

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

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

Conference Committee
Edgar Meyer
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
Abbey Breckling
We develop and/or compile resources that are useful for teaching A&P. Recent and ongoing projects include the development of learning outcomes and compilations of a list of useful software and websites. We also have subcommittees looking at A&P lab outcomes and accommodations for students with disabilities.
**Diversity, Equity, and Inclusion Committee**

**Juanita Jellyman**

We develop best practices, resources, and professional development opportunities for inclusive education in anatomy and physiology. As well as advocate for and ensure inclusive practices within the organization and at HAPS events.

**Welcoming and Belonging Committee**

**Melissa Quinn**

Our goals are:
1. To help to create an environment of inclusion and promote a sense of belonging within the membership.
2. Promote outreach to engage membership throughout the organization.
3. Increase HAPS general membership.
4. Increase active participation of membership.
5. Increase membership retention.

**Fundraising Committee**

**Stacey Dunham**

The Committee organizes fundraising activities.

**Steering Committee**

**Larry Young**

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, as well as present posters with information about their activities and projects. The annual conference is a great opportunity to learn more about this aspect of HAPS. Come see what we’re about!
HAPS Programs
2023 - 2024 Program Leads

Executive Committee
Kerry Hull
We are the top administrators of HAPS, setting policies and governing the Society.

Finance Committee
Ron Gerrits
We are responsible for reviewing HAPS’ investments, disbursements and financial strategies in all programs and all accounts. Using this information, we make recommendations to the Board.

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

Nominating Committee
Melissa Quinn
We assemble a list of qualified candidates for election to the HAPS Board of Directors.

Presidents-Emeriti
Advisory Board
Kyla Ross

Exam Program
Valerie O’Loughlin, Dee Silverthorn, & Janet Casagrand
We develop, maintain and manage standardized HAPS exams.
Jan 1-Dec 31, 2023
Thank You for Your Donation!

WITH YOUR GIFT, YOU HAVE PLAYED AN IMPORTANT ROLE IN SUSTAINING AND BUILDING OUR HAPS COMMUNITY

$5000+
Linked Learning Systems

$1,000+
Collective Donors from HAPS Silent Auction
   Valerie O’Loughlin
   Mark Nielsen

$500+
Anonymous Donors
   Collective Donors from HAPS Fun Run
   Gary Johnson
   Elizabeth Pennefather-O’Brien

$250+
Collective Donors from HAPS Yoga
   Valerie Harper
   Kyla Ross
   Hiranya Roy Chowdhury
   Nanette Tomicak

$100+
Abbey Breckling
   Gaylen Edwards
   Anne Geller
   Ron Gerrits
   Paul Krieger
   Bill Perrotti
   Wendy Riggs
   Steve Sullivan
   Eric Sun
   Jacque Van Hoomissen
   Larry Young

$50+
Amy Bauguess
   Jackie Carnegie
   Lacy Cleveland
   Mary Davison
   Dana Hansen
   Kerry Hull
   Beth Kersten
   Barbie Klein
   Lori Smith
   Stacey Wainwright
   Crystal Wheeler
   Graham Whiteside

Up to $49
$405 contributed by 23 donors
Exhibitor Space Layout

(26) ROUNDS OF 8

114 115 214 215 314 315
112 113 212 213 312 313
108 109 208 209 308 309
106 107 206 207 306 307
102 103 202 203 303 301
100 101 200 203 301

SILENT AUCTION 11'-7"

ENTRANCE

ENGLISH
HAPS 2024 Exhibitors

3D Organon .......................................................................................................... 107/109
3D Organon pioneers medical and healthcare education, revolutionizing learning across virtual reality, desktop, tablet, and mobile devices. Boasting lifelike models, interactive tools and features, immersive environments, and a multilingual knowledge base, it bridges theory and application, making medical education globally accessible. It is trusted by over 1000 prestigious institutions. It is recognized by industry leaders like HTC's Cher Wang and Meta's Mark Zuckerberg. 3D Organon's innovations have been featured in keynotes and highlighted by leading publications.
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New York City, NY 10007
marketing@3dorganon.com

ADInstruments ..................................................................................................... 306/308
At ADInstruments we create simple, flexible tools to help educators and their students record and analyze data quickly and efficiently.
4360 Arrowswest Dr
Colorado Springs, CO 80907
719-306-0382
a.frank@adinstruments.com

AIBODY ......................................................................................................................... 113
AIBODY is the most powerful digital physiology platform in the world. We offer highly interactive, AI-powered simulation-based learning tools.
2-4 Sampson Street, Wapping
London, E1W1NA, United Kingdom
kiril.tasseff@aibody.io

Anatomage ........................................................................................................... 101/103
Anatomage, Inc. transforms standard anatomy learning through an ecosystem of 3D anatomy hardware and software by allowing users to visualize anatomy at the highest level of accuracy.
3350 Thomas Rd, Suite 150
Santa Clara, CA 95054
408-855-1474
tracy.tang@anatomage.com

Anatomic Excellence ................................................................................................... 206
Anatomic Excellence, LLC is the exclusive, full range agent for Dr. Gunther von Hagens Plastinated Human Tissue Specimens in the USA, Canada & Caribbean. We are committed to working with our customers to help them establish a collection of ethically procured and prepared specimens that meet the anatomical needs of your program and enhance learning opportunities for your students.
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Savannah, GA 31410
912-661-8655
graham@anatomicexcellence.com

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Anatomy in Clay ...........................................................................................................202
For over 30 years, the ANATOMY IN CLAY Learning System has provided the most effective, informative and relevant anatomy education through the power of hands-on learning. We are passionate about advancing the study of anatomy and creating success for both students and teachers alike.
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Louelnd, CO 80588
970-667-9047
stephanie@anatomyinclay.com

BIOPAC Systems ...........................................................................................................200
Increase student engagement with Biopac Student Lab, an integrated life science teaching solution that includes hardware, software and curriculum materials for undergraduates to record data from human, animal, or soft tissue preparations. Over 65 customizable lessons available in Biopac Student Lab, in use by top universities around the world.
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Goleta, CA 93117
805-685-0066 ext151
brendad@biopac.com

Body Viz ........................................................................................................................214
Explore the innovative BodyViz 7, featuring the revolutionary BodyViz Atlas and new user interface, empowering students to virtually dissect real anatomy with ease through learning modules on the BodyViz Portal. Don't miss the chance for an exclusive hands-on experience at Booth 214.
8805 Chambery Blvd, Suite [300-242]
Johnston, IA, 50131
1-877-296-4111
taylorcarlson@bodyviz.com

Carolina Biological Supply ..........................................................................................106
Carolina offers models and skeletons that provide teachers with the most anatomically accurate and effective teaching aids on the market. The Anatomy and Physiology series from Carolina Distance Learning includes 23 lab investigations covering topics such as cell structure and function, blood typing, and identifying major organs and systems.
2700 York Rd
Burlington, NC 27215
336-538-6231
penny.canady@carolina.com

Carolina Distance Learning .........................................................................................108
Carolina offers models and skeletons that provide teachers with the most anatomically accurate and effective teaching aids on the market. The Anatomy and Physiology series from Carolina Distance Learning includes 23 lab investigations covering topics such as cell structure and function, blood typing, and identifying major organs and systems.
2700 York Rd
Burlington, NC 27215
336-538-6231
penny.canady@carolina.com

Cengage ....................................................................................................................... 212
Cengage, the U.S. Higher Education business of global education technology company Cengage Group, serves millions of instructors, learners, and institutions. We deliver affordable, high-quality digital products and personalized support to power learning individually and at scale. Our customer-centered approach enables innovation, including Cengage Unlimited, the first and only all-access digital subscription for textbooks and course materials. Our textbooks, homework tools and flagship online learning platforms, MindTap and WebAssign, help educators and students achieve their goals.
5191 Natorp Blvd
Mason, OH 45040
815-585-1397
jessica.vladimirov@cengage.com

continued on next page
**CR Model Repair** ......................................................... 102
We specialize in the restoration and repair of educational models, offering services that range from minor damages, magnetizing, and recreating missing pieces.

211 W Markes St
Piper City, IL 60959
847-912-5343
cjrebou@crmodelrepair.com

**Elsevier** .............................................................................. 301
Every day, research and health professionals dedicate themselves to improving outcomes for communities, patients and society at large. Elsevier is committed to quality and innovation to improve the value we deliver to researchers, research leaders, healthcare professionals and educators in an open, inclusive and collaborative manner.

1600 JFK Blvd
Philadelphia, PA 19103
267-582-5257
m.arndt@elsevier.com

**HAPS Educator** .................................................................. 115
The **HAPS Educator** is the official publication of the Human Anatomy and Physiology Society. With three editions annually, the journal is a platform for educators to publish peer-reviewed articles pertaining to their educational research, their teaching innovations, and/or the literature pertaining to an A&P concept area. We welcome opportunities to help new authors get started and are always pleased to integrate new reviewers into the **HAPS Educator** community. We can be reached at editor@hapsconnect.org.

**HAPS Fundraising** ................................................................ 100
Donations to HAPS are tax-deductible contributions to projects that support professional development programs for A&P teachers that enhance the quality of human A&P instruction. Why donate? Here’s just one of many reasons: Your support of HAPS will help fund a deserving graduate student to attend and present at the HAPS Annual Conference. Awards and Scholarships include: HAPS Conference Travel Award, John Martin Second Timers Award, Sam Drogo Technology in the Classroom Award, Gail Jenkins Teaching and Mentoring Award, and the Marieb, Hoehn, and Haynes Award for Diversity, Equity, and Inclusion.

**HAPS Leadership** ................................................................. 114
The HAPS Leadership welcomes all members to join them at their table. Come learn about HAPS programming, connect with the leadership, and how to engage with the broader HAPS community. Plus...there is free HAPS bling.

**iWorx Systems & Plymouth State Univ** ................................. 313
iWorx provides lab teaching kits for human physiology that include everything you need to conduct a comprehensive lab course. The kits are complete and easy to use so faculty and students can concentrate on concepts along with creative learning and conducting student research.

62 Littleworth Road
Dover, NH 03820
603-617-2575
judid@iworx.com

**McGraw Hill** ...................................................................... 203
As a leading global education company, our mission is to partner with educators, learners, and professionals to help them access all the value that education can offer, no matter where their starting points may be. Through high-quality, trusted content developed with world-class authors – and flexible tools such as interactive 3D models, physiology simulations, cadaver dissection tools, and much more that meet the needs of different teaching and learning styles – our digital platforms adapt to help meet learners where they are, and advance with them as they progress toward their goals.

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New York, NY 10019
563-235-3018
april.wolter@mhedu.com
Northeast College of Health Sciences ......................................................... 207
Northeast College of Health Sciences in Seneca Falls, NY is recognized as a leading institution for the education and training of healthcare professionals, and its graduate and undergraduate programs in areas such as chiropractic, nutrition, human anatomy instruction, radiologic technology, diagnostic medical sonography, health care administration, and massage therapy. The health sciences are rooted in a commitment to academic excellence, leadership, and professional best practices.
2360 State Route 89
Seneca Falls, NY 13148
315-835-5314
cpluretti@northeastcollege.edu

Nova Southeastern University .................................................................  215
NSU Master of Biomedical Sciences
954-262-1198
mbeckler@nova.edu

Pearson ................................................................. 312/314
Learning is no longer a stage of life, it’s a lifelong journey. One that people expect to lead to real growth and impact. They’re looking for experiences that give them flexibility to jumpstart a new future, but don’t often know where to look. That’s where Pearson comes in. In a landscape that is rapidly changing, we’re leading the charge. Because learning isn’t just what we do, it’s who we are. Learn more at pearsonplc.com
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staci.castleberry@pearson.com

Pochy’s Ventures Inc, LRNR ................................................................. 315
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Richmond., CA 94801
551-333-5505
Customersupport@lrnfast.com

Syndaver ................................................................. 112
The world’s leading manufacturer of Synthetic Anatomy models.
8506 Benjamin Road
Tampa, FL 33634
813-600-5530
c.revilla@syndaver.com

Toltech ................................................................. 307/309
Touch of Life Technologies (Toltech) is focused on improving healthcare through better education and training. Since 1998 Toltech has been developing and selling solutions for anatomy education and VR-based medical procedure simulators
12635 E Montview Blvd Ste 350
Aurora, CO 80045
720-505-2831
pat.scherzinger@toltech.net

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Top Hat .........................................................................................................................208
As the leader in student engagement solutions for higher education, Top Hat enables educators to employ
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6479931595
danielle.leboff@tophatmonocle.com

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Van-Griner creates custom print, digital or hybrid A&P lab manuals at student-friendly prices. We have labs, images
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971.268.0639
kmartin@vernier.com

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Visible Body creates interactive A&P and biology products for the web and mobile devices. Courseware offers a
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516-761-9889
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Celebrating 21 Years of APR!

Please join us in the celebration of this important milestone at the McGraw Hill Booth
(Booth # 203) for your chance to win several prizes!

Learn about our exciting new updates including:
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☐ New physiology simulations
☐ Timed, lab practical quizzes
Our Conference Sponsors
HAPS would like to thank all of our Annual Conference sponsors for their generous support.

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Don’t forget to attend our upcoming Regional Meetings!

Southern Regional Meeting
October 12, 2024
Florida Southern College
Lakeland, Florida

Western Regional Meeting
October 26, 2024
Colorado School of Mines
Golden, Colorado

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Thank you for joining us!
Welcome to the 18th 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 info@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 “Current Course Offerings.”

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ANATOMIC EXCELLENCE IS PROUD TO BE A 2024 HAPS CONFERENCE SILVER SPONSOR
Join us for the **HAPS Silent Auction, Yoga and 2K & 5K Fun Run/Walk**

Sponsored by the HAPS FUNDRAISING Committee!

The **Silent Auction** will open on **Sunday, May 26 in the Exhibit Hall.**
You’ll have until **6:15 PM** to bid on your favorite item. Items can be paid for at the registration desk (Majestic Foyer) and picked-up in the Exhibit Hall on Monday, May 27 from 8:00 AM until 3:00 PM. Any item not claimed by 3:00 PM will be forfeited and saved for a future Silent Auction event.

The **Fun Run/Walk** is scheduled for **Monday, May 27th from 7:00 – 8:30 AM.**
To register, please visit the HAPS Fundraising Table in the Exhibit Hall.
Once registered, everyone will meet in the lobby of the Hotel and be given a map of the route. The run/walk will start and finish at the Hotel.

Additionally, **Yoga** will be offered at the same time as the Fun Run/Walk, on **Monday, May 27th from 7:00 – 8:30 AM.** To register, please visit the HAPS Fundraising Table in the Exhibit Hall.
Once registered, everyone will meet in the Crystal Ballroom Foyer to participate.

All proceeds from the auction and fun run/walk go towards supporting the education and awards programming of the Society!

**Donations to HAPS help us provide scholarships to attend Annual Conferences!**
This year, HAPS awarded 15 scholarships totaling $25,465.
These awards are funded primarily by member donations to HAPS.
Make sure to visit the HAPS Silent Auction and Fundraising Table in the Exhibit Hall!
Help us continue to support our colleagues by making a donation or pledge.
No amount is too small (or too large). You can also donate at any time on the HAPS Fundraising webpage ([http://www.hapsweb.org/page/HAPSFundraising](http://www.hapsweb.org/page/HAPSFundraising)).
The Human Anatomy & Physiology Society is happy to announce the following winners of the HAPS Conference Travel Award.

**Caitlin Burns** is the Chairperson of the Biology & Chemistry Department, an Associate Professor of Biology at County College of Morris (CCM), Randolph, NJ, and serves as the Chairperson of the HAPS Communications Committee. Burns holds a B.S. in Biological Sciences from Rowan University, a M.S. in Molecular Biology from Montclair State University, and is Quality Matters Certified. The primary courses she instructs are Anatomy and Physiology I and II and has also taught General Biology I and II, Human Biology, and Concepts in Biology courses. Burns has taught courses in face-to-face, hybrid, and online course modalities. She continually investigates ways to increase student success in anatomy and physiology courses.

Workshop: A608
**Effective practices to support student success in anatomy and physiology courses**

This workshop will introduce several strategies that have been successfully implemented in Anatomy and Physiology I and II at County College of Morris that aim to enhance the student learning experience and increase student success. Strategies include academic advisement, standardization of curriculum in lecture and laboratory, and extensive student support options outside of the classroom. Some of these student support options include an orientation session, tutoring center opportunities, utilization of publisher and virtual resources, and a student performance improvement plan.

**Patrick Cafferty** is an Associate Teaching Professor at Emory University, a four-year private research university in Atlanta, Georgia, where he serves as Director of Undergraduate Studies in the Department of Biology. Patrick teaches introductory biology, human physiology, and developmental neurobiology courses to biology and neuroscience and behavioral biology majors. Throughout his time at Emory, Patrick has sought out creative ways to promote student-faculty interactions including running, drawing, and playing card games with his students and he studies how best to promote teamwork behavior in the classroom. Patrick has been an active member of HAPS since 2013, is currently a member of the HAPS DEI committee, and has co-led the HAPS Book Club readings of “Evolution Gone Wrong” and “Unwell Women” this academic year.

Workshop: A603
**A Journal Club Project to promote teamwork and read the primary literature**

Many undergraduate students receive little guidance on how to critically read, interpret data within, or present information from primary literature before they begin senior independent research experiences or enter professional or graduate school. To provide guidance on reading and formally presenting scientific information, I incorporated a multi-part Journal Club Project into my class. In this project, students worked in teams throughout the semester to present research papers to the rest of the class, and incorporated peer and instructor feedback into their work. During this workshop, I will share instructions, rubrics, and how I assessed the impact of the project.

continued on next page
Carla Carr is an Instructional Associate Professor in the Department of Biology at the University of Mississippi. Before joining UM, she completed her Ph.D. at the University of North Texas and taught lower-division science courses at different institutions, including serving as an A&P lab coordinator. Currently, she teaches A&P and is engaged in a collaborative effort to redesign the non-majors Human Biology course with an emphasis on active learning. Outside of work, she enjoys gardening and hiking.

**Workshop: A609**  
**Digital Detour: Exploring the urinary system through escape room adventure**  
Utilizing a digital escape room offers an enjoyable educational experience—a distinctive and fun way for students to reinforce their understanding of difficult concepts. I will present the steps for creating a virtual escape room—I will focus my escape room on the Urinary System. There is ample space for creativity throughout the process, from room design, to writing the narrative, and designing the clues within the room. Students work through various exercises to get the code to “escape.” You can take this inspiration to build your own virtual escape room for teaching A&P. Come see what you think!

Gregory Diersen is a Professor of Science and Education at Martin Luther College, in southern Minnesota. He has taught for several decades in both the high school and the undergraduate levels. His roles at the college level include guiding pre-service teachers in pedagogy and teaching multiple content courses. Human Anatomy & Physiology is one of the courses that has been part of the high school elective and undergraduate offerings for most of the years. Teaching at a small institution focusing on pre-service teachers makes unique demands on resources for lab activities but is an enjoyable challenge. Additional courses taught include Botany and Ecology, which make traveling anywhere an educational experience.

**Poster: 208**  
**Kidney Inquiry**  
After studying many other systems throughout the year, I have found benefits and positive responses in students beginning the urinary system study by dissecting a kidney. They provide reasonable names and descriptions for the structures and hypothesize the functions of those structures. While much of the material in the course is given to them to memorize and learn, this is an opportunity for them to discover and describe the structures and functions of a system.

continued on next page
Jeff Kingsbury is an Associate Dean and Teaching Professor in the College of Integrative Sciences and Arts at Arizona State University. Jeff earned his bachelor’s degree in biology, and his medical degree from the State University of New York, and then completed an NIH sponsored extramural fellowship at the State University of New York. Dr. Kingsbury has served in leadership roles at ASU, at the state level in Arizona on the Biology Curriculum Task Force, and as a past member of the Teaching Section of the American Physiological Society. He has been active in APS, FASEB, and HAPS during his career. Dr. Kingsbury teaches Anatomy and Physiology II, and Advanced Human Anatomy for primarily pre-health professions students at ASU. He has numerous publications related to education in Anatomy and Physiology and has co-authored the Anatomy and Physiology I and II lab manuals used at ASU, as well as the digital atlas, Regional Human Anatomy. He has previously served as a member of the HAPS Physiology Learning Objectives Advisory Board, and as a past physiology consultant for NASA.

Workshop: A501

The Impact of Effective Study Strategies in Anatomy and Physiology Courses

Anatomy and Physiology courses frequently serve as a gateway for students seeking careers in healthcare and science-related fields. As such, they provide an entry point for innovations intended to enhance students’ learning. Innovations and interventions have been found to positively impact students’ study strategies, with resultant positive grade impacts. These innovations, however, often have associated time and costs, which may limit more widespread use. Our study looked at the extent to which students evidence increased use of effective study strategies after engaging in a brief (i.e., 15-min), online module requiring no financial cost for students or time commitment from instructors, and whether changes in students’ use of effective study strategies are associated with changes in exam performance. The present study employed a brief, online module designed to support undergraduate students’ (n = 98) use of effective study strategies in an introductory human anatomy and physiology course. Through a pretest-posttest design, students described the strategies they used to study and completed four cognitive and metacognitive subscales before and after engaging in a brief, online module designed to teach them about effective study strategies. Results were somewhat mixed, although students evidenced a statistically significant increase in the number of strategies used and changes in strategy use were associated with changes in exam score. Notably, this relationship was not moderated by GPA, suggesting that the strength of the relationship between changes in strategy use and changes in exam scores were not different depending on students’ levels of prior academic performance. Taken together, the innovation was associated with increases in students’ exam scores, irrespective of GPA.

Dr. Jill Kirby is an Associate Professor in the Biology department at Lipscomb University where she teaches Anatomy and Physiology, Neuroanatomy, and an Intro to Gross Anatomy course for undergraduates. She has found her passion as a professor in the last seven years after spending the first 11 years of her career working as a physical therapist. Students and colleagues recognized her as Outstanding Teacher of the year in 2022. Her goal as an educator is to make the subject of the human body accessible to all students to help shape their future healthcare careers. Jill believes that the best part of her job is mentoring and being inspired by her students. When she’s not doing that, she loves to travel and share the beauty of the world with her family.

Poster: 310

Anatomy Unveiled

Undergraduate students often struggle to comprehend difficult anatomy concepts. There is a disconnect between what students see in textbooks and their ability to translate that to gross anatomy dissection at the undergraduate level. We will show how an aspiring medical illustrator student was able to visualize the brachial plexus in an accessible way for her peers in order to elevate understanding and retention of the complex anatomical structures in the axilla. We will share the process that was used to enhance student performance on laboratory assessments through art.

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Jennifer Rogers, Professor of Instruction, serves as the Director of Undergraduate Studies for Human Physiology in the Health and Human Physiology Department at the University of Iowa. Areas of expertise include exercise physiology and sex disparities in human function. As an educator, she has taught small, medium, and large sized classes at a variety of institutions ranging across the community college, 4-year college, and university- higher education spectrum, including varied teaching modalities such as laboratory, online, flipped, and one-course-at-a-time. Dr. Rogers aims to provide appropriate learning experiences for STEM majors, aspiring healthcare providers (DO/MD, physician assistant, physical therapy, dentistry, and others), and new-to-college students who are still trying to figure everything out.

Workshop: B303
Four Ways to Build an Instructional Team to Foster Belonging and Engagement
Active learning techniques are commonly incorporated into class sessions to enhance student engagement and subsequently knowledge acquisition beyond traditional lecture-based approaches. Furthermore, cultivating a sense of belonging has been shown to improve retention in undergraduate STEM coursework. The purpose of this workshop is to summarize four practices structured around “instructional team” messaging, which was piloted to enhance engagement and community among human physiology majors: (1) team teaching models, (2) creative use of graduate teaching assistants to support learning and metacognition, (3) embedding undergraduate learning assistants into lab courses, and (4) development of undergraduate independent study opportunities.

Andrew Stewart is a third-year medical student at Nova Southeastern University Dr. Kiran C. Patel College of Allopathic Medicine (NSU MD). He has 7 years of experience developing active learning projects for a wide range of learners. His research goals aim to improve the diversity of medical school didactic and facilitate student learning in non-traditional and creative ways. He is currently interested in pursuing a career in Psychiatry and Family Medicine with a focus on LGBTQ+ and adolescent health.

Workshop: A604
The Histo-Kitchen
Histology is one subject area that consistently presents as a challenge for medical and undergraduate students. Pedagogical studies that use physical objects and hands on learning have been shown to motivate and encourage students to self-learn such complex topics. This application of using physical objects and hands on learning, however, is not the easiest to translate to the cellular level. The Histo-Kitchen was designed to help students manage the vast amount of information and acquire knowledge in a meaningful and creative way. Don’t let anyone say that you shouldn’t play with food!
The Human Anatomy & Physiology Society is happy to announce the following winner of the Sam Drogo Technology in the Classroom Award. This award is sponsored by ADInstruments.

Juanita Jellyman is an Associate Professor in the Biological Sciences Department at California State Polytechnic University at Pomona (Cal Poly Pomona), an Hispanic Serving Institution in Southern California. Dr. Jellyman received her BSc (Honors) in Physiology from the University of Otago, New Zealand, and her PhD in Fetal Physiology from the University of Cambridge in England. She currently teaches human physiology, systems physiology, physiology of human reproduction, developmental origins of adult health and disease, and endocrinology. Dr. Jellyman's research interests are in maternal and fetal physiology with an emphasis on the endocrine mechanisms that regulate fetal growth and development in utero. The long-term goal of her research is to identify how the intrauterine environment programs fetal physiology and increases the risk of chronic diseases, such as obesity and type 2 diabetes, in the offspring. At Cal Poly Pomona she serves as the Associate Chair for Student Success for the Biological Sciences Department, and as the Chair of the Institutional Animal Care and Use Committee.

Workshop: A202
Innovative Use of Technology to Support Learning Outcomes in Human Physiology
This workshop will describe innovative uses of technology to engage undergraduate students through active learning, practice, and immediate feedback. The workshop will focus on ways in which technology can be used to teach and assess learning outcomes in an undergraduate human physiology course.

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 & Physiology Society is happy to announce the following winner of the Gail Jenkins Teaching and Mentoring Award.

This award is sponsored by Wiley.

**WILEY**

**Donna Hoefner** is an Associate Professor of Anatomy & Physiology at Piedmont Virginia Community College. She earned her Ph.D. in Pharmacology from the University of Kentucky and completed a post-doc at the Mayo Clinic before settling into teaching. Donna advises several clubs including the Scrubs Club for allied health majors, the Red Cross Club, and the Volunteer Club. She volunteers as a Red Cross Ambassador, enjoys mentoring and collaborating with other faculty. Donna serves on the HAPS Teaching Tips Committee.

**Workshop: A410**

**ADA: Analogies, Drawings, Activities**

This workshop shares everyday analogies, colored drawings, and class or group activities. Analogies help us learn new material based on things or experiences we already know. We will discuss everyday analogies for complex terms or processes. For visual and tactile learners and/or those who need to see the big picture and the complex details, add colorful drawings of body structures, building on their comprehension of the terms and processes. Lastly, engage the class or groups with simple interactive activities to foster community that have learners team up to put it all together.

**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 HAPSter colleagues, 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.

**Amanda Haage** is an assistant professor on the educator scholar track in the department of biomedical sciences at the University of North Dakota’s School of Medicine and Health Sciences. As an educator scholar she is committed to innovative, evidence-based teaching as well as inclusive practices stemming from a deep belief that science is for everyone. In 2020, she launched UND’s new anatomy and physiology course sequence, unique in its certification as “diversity of human experience” courses within UND’s essential studies program.

**Workshop: A210**
**Designing A&P for Impact**
HAPS learning outcomes provide a solid foundation for content, but not instructional methods, which can be overwhelming when tasked with course redesign. This session offers a focused case study of a three-year complete revamp of an A&P sequence, incorporating flexible delivery modalities. Explore the journey of integrating teaching philosophy, external constraints, and a commitment to student learning into a course aligned with metacognition, critical thinking, and cultural competency goals. An in-depth examination of student data, including HAPS exam measures and an intercultural inventory tool, highlights the success of the chosen methods in this comprehensive A&P redesign.

**Nicholas Pollock** is originally from upstate New York, earned my bachelor’s degree from SUNY ESF, master’s degree from Cal Poly San Luis Obispo, and Ph.D. from Rutgers University. Now at the University of Texas at Arlington, he is an associate professor of instruction and lab coordinator for Human Physiology, Human Anatomy, and Anatomy & Physiology, in which he develops/co-develops lecture/lab curricula, teach lecture/lab components, and supervises all labs. He has recently won College of Science and University Award for Excellence in Teaching. Outside of academia, his interests include hiking, herping, traveling, cooking, craft beer, live music, hockey, baseball, softball, and bowling. He also has a cuddly pit bull, 2 crazy cats, a spunky bearded dragon, a beautiful Brazilian rainbow boa, and a chunky leopard gecko.

**Poster: 209**
**Student Performance in Anatomy & Physiology Labs Before and After the COVID-19 Pandemic**
The COVID-19 pandemic forced significant changes in how academic curricula were organized and delivered. Institutions were forced into all online instruction, which eliminated hands-on experiences, altered student learning, and greatly hindered the development of student-student and student-instructor relationships. Students transitioning from high school to college perhaps experienced the greatest setbacks in their education due to COVID-19. Anatomy & Physiology (A&P) courses are often taken by students during their freshman year of college, often encouraging hands-on learning, diverse study techniques, and interpersonal interactions. This study compares student performance in undergraduate A&P labs before and after the COVID-19 pandemic.

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Melanie Neumeier started teaching in the BScN program at the Saskatchewan Institute of Applied Science and Technology in 2009, and since moving to the Faculty of Nursing at MacEwan University in 2013 she has focused her SoTL work on knowledge retention, classroom technology, and gamification to improve student engagement and learning. She joined HAPS last year and attended her first HAPS conference in Albuquerque where she presented a workshop on gamification. She is excited to be back with her fellow Hapsters this year in St. Louis to hear about the new innovations they have come up with and to share the results of her latest gamification project.

Workshop: A109
Maximize your gaming success with semester long competition
Gamification is an established way to promote student engagement in the classroom, but beneficial effects may be limited to the time of the single gaming event. To overcome this limitation, I created a semester-long game to determine if increased student engagement could be maintained over a full academic term. Two health assessment classes were compared in terms of engagement and academic performance. Both classes were taught by the same instructor, played the same individual games, and used the same exams and materials. Students playing the semester-long game had significantly higher test scores, better attendance, and sustained classroom engagement.

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Visit adi.to/ltsensors
The Human Anatomy and Physiology Society is happy to announce the following winners of the Marieb, Hoehn, and Haynes Award for Diversity, Equity, and Inclusion.

This award is sponsored by Pearson.

Sherrie Gallipeau is a Professor of Human Anatomy and Physiology at San Joaquin Delta College. Because of the numerous obstacles she had to overcome to attain a college degree, Sherrie’s passion is to provide equitable education and mentorship to students, especially to those who are underrepresented in the sciences. Over the past two years she has developed a highly structured hybrid anatomy laboratory course to address the post-pandemic rise in hybrid course offerings and concurrent drop-in success rates of students enrolled in STEM hybrid lab courses. Sherrie is currently participating in the NSF-funded CAPER program (community college anatomy and physiology education research) where community college instructors are taught how to conduct educational research on evidence-based instructional practices that improve student success in STEM and reduce achievement gaps between minority and majority students.

Workshop: B108
How I increased underrepresented minority student success in a community college hybrid anatomy laboratory course using cooperative learning and increased course structure.

Despite increasing access to higher education, underrepresented minority (URM) students underperform in STEM hybrid courses. Consequently, the rise in hybrid education may negatively impact existing achievement gaps between URM and non-URM students. With increasing hybrid course offerings in a post-pandemic world, studies examining pedagogy that increase URM student success are needed. This workshop will show you the weekly preparatory and practice assignments, in-person cooperative active learning activities, and low-risk assessments used to significantly increase lab exam scores of all students and URM students.
Jessica Cisneros Lerma is a first-generation Latina student at the University of North Georgia (UNG). Currently, she is the Lead Coach of the Boot Camp program in A&P designed to engage students in a peer-led collaborative learning environment and to encourage deep, meaningful learning. Thus, she strives to help students become lifelong learners by facilitating the development of an active learning approach, growth mindset, and metacognitive skills. Furthermore, she is also involved in a scientific research project analyzing how e-cigarette vapor exposure affects murine brain tissue. Being part of these two experiences has been a transformative event in her learning journey allowing her to find a sense of belonging and passion for research/teaching. As a minority student herself, my goal is to inspire students to follow their passion and break barriers in order to create a more inclusive and diverse environment for future generations.

Workshop: A305
A Sanctuary for All: Finding Community and Building Metacognitive Skills in A&P Boot Camp
As students from underrepresented communities, we have always searched for a sense of belonging in the classroom. We found this community in our university's A&P Boot Camp Program, a peer-led collaborative learning environment designed to engage students in deep, meaningful learning. As current leaders in the program, we strive to provide a positive influence on our peers by promoting active engagement, allowing students to build interpersonal relationships while developing a growth mindset and metacognitive skills. Join us as we discuss the transformative role that the A&P Boot Camp Program has played in our educational paths.
Tutoring is included in this app to meet the needs of all community college students!!

**Anatomy Karma Skeletal System**

free download from AppStore with in-app purchases

Scan the code below to see a demo video of quiz, mini-practical, and in-app tutoring features.

Scan the code below for the inventory of bones and surface markings
# HAPS 38th Annual CONFERENCE
## May 25 – 29, 2024
### Schedule of Events

#### Saturday, May 25
*Marriott St. Louis Grand*

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:00 AM – 5:00 PM</td>
<td>Exhibitor Set up: Majestic Ballroom</td>
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<tr>
<td>8:00 AM – 12:30 PM</td>
<td>Board of Directors &amp; Steering Committee Joint Meeting: 5 &amp; 6 (Board of Directors &amp; Steering Committee Only)</td>
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<tr>
<td>12:30 PM – 1:30 PM</td>
<td>Board of Directors and Steering Committee Luncheon: Landmark 7 (Board of Directors and Steering Committee Chairs Only)</td>
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<tr>
<td>1:30 PM – 3:30 PM</td>
<td>Board of Directors Meeting: Landmark 6 (Board of Directors Only)</td>
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<tr>
<td>1:00 PM – 3:30 PM</td>
<td>Steering Committee Meeting: Landmark 5 (Steering Committee Chairs Only)</td>
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<tr>
<td>1:00 PM – 7:30 PM</td>
<td>Registration: Majestic Foyer</td>
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| 5:00 PM – 6:00 PM | Pre-Show Trivia Jam: Landmark 1 – 4
Join the HAPS Regional Directors and members of the Welcoming & Belonging Committee in some HAPS-themed trivia fun before the Opening Reception. Immediately after trivia the fun continues with the HAPS T-shirt Swap where everyone’s a winner! Show off your college pride by sharing a t-shirt that you can swap for another college t-shirt to grow your ever impressive t-shirt collection! |
| 6:00 PM – 8:00 PM | Welcome Reception: Landmark 1 - 4                                   |

#### Sunday, May 26
*Marriott St. Louis Grand*

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7:00 AM – 5:00 PM</td>
<td>Registration: Majestic Foyer (closed from 12:00 PM – 1:00 PM)</td>
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</table>
| 7:30 AM – 8:30 AM | First Timer’s Breakfast: Crystal Ballroom  
Sponsored by ADInstruments, HHMI |
<p>| 7:30 AM – 8:30 AM | Second Timer’s Breakfast: Statler                                      |
| 7:30 AM – 8:30 AM | Continental Breakfast (for all other attendees): Majestic Ballroom    |
| 7:30 AM – 6:15 PM | Silent Auction Open: Majestic Ballroom      |</p>
<table>
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<th>Time</th>
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<tbody>
<tr>
<td>7:30 AM – 6:15 PM</td>
<td>Exhibit: Majestic Ballroom (Exhibits are closed from 12:00 PM - 1:00 PM)</td>
</tr>
<tr>
<td>8:30 AM – 9:00 AM</td>
<td>Welcome and Opening Remarks: Landmark 1 - 4</td>
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<tr>
<td>9:00 AM – 10:00 AM</td>
<td>Update Seminar I: Landmark 1 - 4</td>
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<td>Sponsored by HAPS</td>
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<td>Andrew (Andy) Russo</td>
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<td>“Migraine: Clues From a Neuropeptide”</td>
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<td>10:00 AM – 11:00 AM</td>
<td>Refreshment Break &amp; Exhibits: Majestic Ballroom</td>
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<td>Sponsored by Anatomic Excellence</td>
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<tr>
<td>10:00 AM – 11:00 AM</td>
<td>Poster Session 1: Majestic Ballroom</td>
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<td>(Posters for session 1 should be set-up by 9:00 AM and taken down by 12:00 PM)</td>
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<tr>
<td>11:00 AM – 12:00 PM</td>
<td>Update Seminar II: Landmark 1 - 4</td>
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<td>Jason Williams</td>
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<td>“Using the Honeybee as a Model Organism to Study Fundamental Questions in Aging and Alcohol Use Disorder”</td>
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<td>12:00 PM – 1:15 PM</td>
<td>Lunch on your own</td>
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<td>Registration &amp; Exhibits closed from 12:00 PM - 1:00 PM</td>
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<tr>
<td>1:15 PM – 2:15 PM</td>
<td>Update Seminar III: Landmark 1 - 4</td>
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<td>Sponsored by American Physiological Society</td>
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<td>Andy Lechner</td>
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<td>“Breathing Life and Meaning into the Teaching of Respiratory Physiology”</td>
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<tr>
<td>2:15 PM – 3:15 PM</td>
<td>Refreshment Break &amp; Exhibits: Majestic Ballroom</td>
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<tr>
<td>2:45 PM – 3:15 PM</td>
<td>HAPS Fundraising – Chair Yoga: Majestic Ballroom</td>
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<td>Attendees can participate for a small donation</td>
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<tr>
<td>3:15 PM – 4:15 PM</td>
<td>Update Seminar IV: Landmark 1 - 4</td>
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<td>Sponsored by American Association of Clinical Anatomists</td>
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<td>Kathleen Bubb</td>
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<td></td>
<td>“Evidence-Based Anatomy: The Future of Clinical Anatomy and Anatomy Education”</td>
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<tr>
<td>4:15 PM – 5:15 PM</td>
<td>Update Seminar V: Landmark 1 - 4</td>
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<td>Sponsored by HAPS</td>
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<td></td>
<td>Sarah England and Erin Reinl</td>
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<td>“Ion Channels: Teaching About Excitability in Non-Traditional Tissues”</td>
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<tr>
<td>5:15 PM – 6:15 PM</td>
<td>Drinks with Exhibitors: Majestic Ballroom</td>
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<tr>
<td>6:15 PM</td>
<td>Silent Auction Closes: Majestic Ballroom</td>
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<td>Free Night!</td>
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### Monday, May 27

**Marriott St. Louis Grand**

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<th>Time</th>
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</table>
| 7:00 AM – 8:30 AM | HAPS Fundraising Run/Walk: Foyer of the Marriott St. Louis Grand  
Pre-registration or onsite registration required. Not included in Conference registration. |
| 7:00 AM – 8:30 AM | HAPS Fundraising Yoga: Crystal Foyer  
Pre-registration or onsite registration required. Not included in Conference registration. |
| 7:30 AM – 8:30 AM | Continental Breakfast: Majestic Ballroom |
| 7:30 AM – 8:30 AM | HAPS Cafecito: Majestic Ballroom  
To help attract and retain our BIPOC and ALANA members, the HAPS DEI committee invites you for an in-person Cafecito at our 38th Annual Conference in St. Louis Missouri. Join us for coffee, icebreakers, mindfulness meditation exercises, and connection. Cafecito gatherings are intended to provide a safer affinity space for networking and reflection. |
| 7:30 AM – 5:00 PM | Exhibits: Majestic Ballroom  
(Exhibits are closed from 12:00 PM – 1:00 PM) |
| 8:00 AM – 3:00 PM | Silent Auction Item Collection & Payment: Majestic Foyer and Ballroom |
| 8:00 AM – 5:00 PM | Registration: Majestic Foyer  
(Closed from 12:00 PM – 1:00 PM) |
| 8:30 AM – 9:45 AM | HAPS Annual General Membership Meeting: Landmark 1 - 4 |
| 9:45 AM – 10:45 AM | Refreshment Break & Exhibits: Majestic Ballroom |
| 9:45 AM – 10:45 AM | Poster Session 3: Majestic Ballroom  
(Posters for session 3 should be set-up by 9:00 AM and taken down by 12:00 PM) |
| 10:45 AM – 11:45 AM | Update Seminar VI: Landmark 1 - 4  
Sponsored by HAPS  
Corey Ragsdale  
“Bioarcheological Approaches to Understanding Human Health in the Past” |
| 11:45 AM – 1:15 PM | Lunch on your own  
Registration & Exhibits close for lunch from 12:00 PM-1:00 PM |
| 1:15 PM – 2:15 PM | Update Seminar VII: Landmark 1 – 4  
Sponsored by HAPS  
Megan T. Baldridge  
“Local and Systemic Effects of the Intestinal Microbiota on Infection and Immunity” |
| 2:15 PM – 3:15 PM | Refreshment Break & Exhibits: Majestic Ballroom |
| 2:15 PM – 3:15 PM | Poster Session 4: Majestic Ballroom  
(Posters for session 4 should be set-up by 1:00 PM and taken down by 4:00 PM) |
| 3:15 PM – 4:15 PM | Update Seminar VIII: Landmark 1 - 4  
Sponsored by HAPS  
Amynah Pradhan  
“Role of Opioid Receptors in Migraine.” |
| 4:15 PM – 5:00 PM | Door prizes: Majestic Ballroom |
| 6:00 PM – 8:00 PM | HAPS Social: Crystal Ballroom |

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**Tuesday, May 28**  
*Southern Illinois University Edwardsville*

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<tr>
<th>Time</th>
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| 7:00 AM – 9:00 AM | **Transportation to from Marriott St. Louis Grand to SIUE**  
6 Hairpin Drive, Southern Illinois University, Edwardsville, IL 62026  
(Please check transportation schedule on page 90 for exact times) |
| 7:30 AM – 8:30 AM | Welcome Breakfast (provided)                                                               |
| 8:00 AM – 5:00 PM | **Registration: Founder’s Hall Corridor 1200**  
(Closed from 12:00 PM – 1:00 PM)                                                                |
| 9:00 AM – 11:15 AM| **Workshops**  
Session A1: 9:00 – 10:00 AM  
Session A2: 10:15 – 11:15 AM                                                                 |
| 11:15 AM – 12:15 PM| Lunch (lunch is provided)  
Committee Meetings – 11:45 AM – 12:15 PM                                                      |
| 12:30 PM – 5:15 PM| **Workshops**  
Session A3: 12:30 – 1:30 PM  
Session A4: 1:45 – 2:45 PM  
Session A5: 3:00 – 4:00 PM  
Session A6: 4:15 – 5:15 PM                                                                 |
| 5:15 PM           | **Bus transportation back to the St. Louis Grand Hotel**  
800 Washington Ave, St. Louis, MO 63101  
(Please check transportation schedule on page 90 for exact times) |

**Wednesday, May 29**  
*Southern Illinois University Edwardsville*

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<tr>
<th>Time</th>
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| 7:00 AM – 9:00 AM | **Transportation from Marriott St. Louis Grand to SIUE**  
6 Hairpin Drive, Southern Illinois University, Edwardsville, IL 62026  
(Please check transportation schedule on page 90 for exact times) |
| 7:30 AM – 8:30 AM | Breakfast (provided)                                                                       |
| 8:00 AM – 4:00 PM | **Registration: Founder’s Hall Corridor 1200**  
(Closed from 12:00 PM – 1:00 PM)                                                                |
| 9:00 AM – 12:00 PM| **Workshops**  
Session B1: 9:00 – 10:00 AM  
Session B2: 10:15 – 11:15 AM                                                                 |
| 11:15 AM – 12:15 PM| Lunch (lunch is provided)                                                                  |
| 12:30 PM – 4:00 PM| **Workshops**  
Session B4: 12:30 – 1:30 PM  
Session B5: 1:45 – 2:45 PM  
Session B6: 3:00 – 4:00 PM                                                                 |
| 4:00 PM           | **Bus transportation back to the St. Louis Grand Hotel**  
800 Washington Ave, St. Louis, MO 63101  
(Please check transportation schedule on page 90 for exact times) |
Meeting Space Layouts

MARRIOTT BALLROOM PLAZA MEETING SPACE

SECOND FLOOR

MARRIOTT BALLROOM

MARRIOTT INTERNATIONAL CONFIDENTIAL & PROPRIETARY INFORMATION

GROUND LEVEL

WASHINGTON AVENUE
ENTRANCE

REGISTRATION OFFICE

LANDMARK FOYER

LANDMARK BALLROOM

LINDSAY

HOTEL MEETING SPACE

21ST FLOOR

CRYSTAL FOYER

CRYSTAL BALLROOM

LACLEDE BOARDROOM

20TH FLOOR

MARRIOTT ST LOUIS GRAND

MARRIOTT INTERNATIONAL CONFIDENTIAL & PROPRIETARY INFORMATION
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Migraine: Clues from a Neuropeptide

Abstract: Migraine is a debilitating neurological disorder that affects over a billion people worldwide. A hallmark of migraine is head pain accompanied by altered sensory perception. To understand the mechanisms underlying these events, we have focused on the neuropeptide calcitonin gene-related peptide (CGRP), which can induce migraine in people and is the target of 8 drugs now approved by the FDA for treating and preventing migraine. We are using transgenic, optogenetic, and chemogenetic tools and measuring migraine-like symptoms in mice to identify neural circuits involving central and peripheral CGRP actions. In parallel studies, we are using a preclinical model of post-traumatic headache to look at possible therapeutic roles of improved glymphatic flow in the brain during sleep and cannabis products following traumatic brain injury. Our overall goals are to develop effective diagnostic and therapeutic strategies for migraine and post-traumatic headache.

BIO: Dr. Andy Russo is a Professor of Molecular Physiology and Biophysics at the University of Iowa. He received his PhD in Biochemistry from UC Berkeley and did postdoctoral training at UCSD on the neuropeptide CGRP. The focus of Dr Russo’s research is the molecular basis of migraine with the goal to develop therapeutic strategies for migraine and post-traumatic headache. He has taught graduate, medical, and dental students for over 30 years and helped develop new graduate and medical school curriculums. He has received a number of teaching awards and honors. He is currently the course director of a first-year medical student physiology and genetics course and is a co-author of Seeley’s Anatomy and Physiology textbook.
**Update Seminar II**

**Sunday, May 26 from 11:00 AM – 12:00 PM**

*Jason (Jake) Williams*

*Sponsored by HAPS*

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**Using the Honey Bee as a Model Organism to Study Fundamental Questions in Aging and Alcohol Use Disorder**

**Abstract:** Use of vertebrate models in physiological studies have yielded tremendous insight. Yet, performing controlled studies on vertebrates can be problematic due to ethical considerations, length of life span, cost, replicate number, etc. By contrast, controlled studies with insects, such as honey bees, *Apis mellifera*, lack these problems while still sharing physiological underpinnings with humans. Furthermore, honey bees have unique characteristics, such producing the highest measured mass-specific metabolic rate during flight and naturally encountering ethanol in nectar which make them uniquely suited to ask fundamental questions associated with oxidative stress induced senescence and alcohol tolerance. Lastly, division of labor within a colony allows for controlled studies of animals while still living in a natural setting.

**BIO:** Jason (Jake) Williams received a BS in biology from Luther College where he studied the use of ground beetles as bioindicators of tallgrass prairie management techniques. He then earned a MS and PhD in Zoology from Miami University with Dr. Richard Lee while examining the physiological underpinnings of freeze and cold tolerance in insects. Dr. Williams was a Ruth L. Kirschstein NIH Postdoctoral Fellow and Adjunct Assistant Professor at University of Nevada Las Vegas where he investigated the negative consequences of flight in hypermetabolic insects. Jake is currently an associate professor and chair of the department of Biological Sciences at Southern Illinois University Edwardsville. His current research interests primarily focus on the negative consequences of climate change on overwintering insects and oxidative stress induced senescence.
Update Seminar III

Sunday, May 26 from 1:15 PM – 2:15 PM

Andy Lechner
Sponsored by American Physiological Society

Breathing Life and Meaning into the Teaching of Respiratory Physiology

Abstract: There are obvious challenges in teaching learners of any age and education level about the delicate beauty of lung structures and their roles in promoting systemic oxygen delivery and a disease-free life. First, almost no one in the audience has seen healthy lungs in action, at either the macroscopic or microscopic level. Second, only a few may have the backgrounds in physics and math to appreciate how those disciplines can explain and robustly quantify the essential pulmonary functions of ventilation, diffusion, acid-base regulation, and host defense. But everyone knows how to breathe and knows what it feels like if they cannot, so you have a captive audience. This presentation will provide a general content outline based on core principles about the lung’s shared role with the heart and blood in sustaining oxygen delivery, using an outline whose complexity can be scaled for any audience from K-12 through critical care specialists. Our focal points will include: 1) Showing the appearance of lung tissues “down there”; 2) Diagramming the major steps of, and bottlenecks to, whole-body oxygen transport; 3) Dividing the respiratory domain into its key physiological elements of ventilation and diffusion; 4) Identifying some of the most common immediate or long-term consequences when ventilation or diffusion fail; 5) Defining life choices that promote healthy lungs; and 6) Summarizing current approaches to repairing or supporting pulmonary tissues that have been injured. The presentation will include occasional sidebars on suggested respiratory small-group activities that can likewise be scaled to the educational level of your learners.

BIO: Andy Lechner joined the faculty at Saint Louis University School of Medicine in 1981 following Ph.D. training in high altitude physiology at the University of California, Riverside, and NIH/NSF postdoctoral research in lung development and systemic oxygen transport physiology during cold and hypoxic stress at the University of Colorado School of Medicine in Denver. His most recent pulmonary research has focused on the immuno-pathophysiology of septic shock, notably acute lung injury caused by infections like pneumonic plague and COVID that bring patients to intensive care units. In 1997 he organized SLU’s first system-based Respiratory Module for 2nd year medical students, is lead author of nearly a hundred peer-reviewed manuscripts in these fields and is the senior author of the 2012 medical text, Respiratory: An Integrated Approach to Disease. He served six years each on the Step 1 Physiology Committee for the National Board of Medical Examiners, and on the Education Committee of the American Physiological Society. He currently directs first- and second-year preclinical courses, co-directs the 4th year Wilderness Medicine Elective, gives review lectures on pulmonary medicine to resident and fellows, and is a senior medical admissions officer. His hobbies include hiking, biking, North American archaeology, and foraging for edible and medicinal plants and fungi, all of which he enjoys with his clinical laboratorian spouse, Victoria Salvato-Lechner, and their two physician-scientist children.
Evidence-Based Anatomy: The Future Of Clinical Anatomy And Anatomy Education

Abstract: Evidence-based anatomy (EBA) will have positive implications for the future of anatomy as a fundamental basic science. Systemic reviews and meta-analyses reflect accurate population statistics and associations. The Anatomical Quality Assessment (AQUA) tool further improves EBA research quality, reducing biases and providing a clear guideline for researchers. From a career development perspective, EBA provides opportunities for transdisciplinary research and promotes collaboration between clinicians and anatomists. The next logical phase is incorporating EBA into undergraduate and graduate medical education. This approach outlined to our students will further aid in integrating anatomy into clinical practice.

BIO: Kathleen Bubb is a physician-anatomist who has been a medical educator for the past sixteen years, training medical, nursing, physician assistant, and science students at both undergraduate and postgraduate levels. She completed her medical training at the Universidad de Ciencias Medicas de Santiago de Cuba in Cuba. She obtained a postgraduate qualification from St George's University School of Graduate Studies in Grenada. She has an extensive educational leadership background. Her previous role as a senior faculty at St George's University School of Medicine involved leadership in academia, including histology associate course director, premedical anatomy course director, gross anatomy laboratory director, and academic advising coordinator. She is currently an assistant professor of Anatomy in the Radiology department at Weill Cornell Medicine, teaching anatomy, embryology, and neuroanatomy to medical and physician assistant students. She is a unit leader in the foundational curriculum and course director (recently appointed) for the Essential Principles of Medicine Course (EPOM). Kathleen Bubb strongly believes that anatomy is essential for safe clinical practice. This passion for medical education motivates and equips future healthcare professionals, as evidenced by the several awards and recognitions she has received throughout her career. In addition to her service to the various medical societies and committees in Grenada, St. George's University, and the Weill Cornell Medicine community, she has been an active member of the American Association of Clinical Anatomists for many years and has contributed in many meaningful ways. For example, she has chaired the Bylaws Committee for six years and led an extensive document review to reflect the association's mission to increase diversity and support equity in the Anatomical Sciences. Kathleen has also been a judge and moderator for presentations at the annual meetings and has served as Councilor-at-Large for the past three years. Kathleen is considered a nurturer, the “Mommy,” not only to her seven-year-old daughter but to the many colleagues and students she has mentored and supported throughout their careers.
Update Seminar V
Sunday, May 26 from 4:15 PM – 5:15 PM

Sarah England and Erin Reinl
Sponsored by HAPS

Ion Channels – Teaching about Excitability in Non-traditional Tissues

Abstract: Ion channels play an essential role in cell excitability. Typically, ion channel function is taught in the context of neurophysiology and cardiovascular biology. However, channel function is important in most biological systems. This lecture will focus on ion channel behavior in a non-traditional tissue, the uterus. We will explain how ion channels regulate uterine function, and how alterations in their activity results pathophysiologic conditions. The goal of this talk is to highlight new ways to teach old concepts and highlight new findings in the field.

BIO: Dr. England is the Alan A. and Edith L. Wolff Professor of Medicine and Vice Chair of Research in the Department of Obstetrics and Gynecology at Washington University in St. Louis. She also directs the Center for Reproductive Health Sciences and is a Professor of Cell Biology and Physiology. Dr. England’s research focuses on the molecular mechanisms underlying uterine function during pregnancy. Her research has been funded by the National Institutes of Health, the American Heart Association, the March of Dimes, and other funding agencies. She has authored over 100 research and review articles and has reviewed for over 50 journals in basic science, translational, and clinical fields. Dr. England serves on review committees for multiple funding agencies including the NIH, American Heart Association, and the Howard Hughes Medical Institute. She was a former Robert Wood Johnson Health Policy Fellow and worked in the office of Senator Hillary Rodham Clinton for one year on policies related to maternal child health issues, women's health, and the healthcare workforce. Her memberships include: National Academy of Medicine, Society for Reproductive Investigation, Society for the Study of Reproduction, Perinatal Research Society, American Physiological Society, and Society for General Physiologists.

Dr. Reinl is an instructor in the Department of OB/GYN at Washington University in St. Louis. In 2016, she graduated from Washington University with a PhD in Molecular Cellular Biology under the mentorship of Dr. Sarah England. Her doctoral research, funded by an NIH F31 fellowship, focused on ion channels involved in uterine contractility as it relates to pregnancy, labor, and preterm birth. As an NIH F32-funded postdoctoral fellow at the University of Maryland in Baltimore, under the mentorship of Dr. Margaret McCarthy, Dr. Reinl studied maternal-fetal crosstalk and the development of sex differences in neonates. Throughout her career, she has published 11 peer-reviewed scientific manuscripts, including 6 as first author.
Bioarchaeological Approaches to Understanding Human Health in the Past

Abstract: Bioarchaeology is a field within Anthropology that is interested in the intersect of biology and culture, examining human remains to gain insight about individual lives and society more broadly. Human skeletal and dental remains embody our life experiences, trauma, and health, allowing bioarchaeologists the unique opportunity to look at the interplay of environmental and biological relationships. What do human bones and teeth tell us about the lives of people in the past? How can this information be applied to contemporary human populations? Using examples from the archaeological context, this talk will address these questions by examining evidence of health/nutrition, migration/mobility, climate change, and violence. Information derived from the human skeletal and dental system is applicable not only to the past, but also in the present, including the medicolegal context.

BIO: Dr. Ragsdale is an Associate Professor in Anthropology that focuses on studying human health, migration, and mobility. His work is rooted in the specialized fields of bioarchaeology and dental anthropology, examining human skeletal and dental remains to understand the lives of people of the past, with inferences on contemporary people. He is the author of over 26 scientific publications, and his work has been showcased by various forms of media internationally. Dr. Ragsdale’s research is primarily focused on Europe, and he is involved with projects in Mexico and West Africa. He is a director of an ongoing excavation in Poland (16th to 18th century), as well as the Forensic Anthropology and Bioarchaeology Laboratory (FABL) at SIUE. In addition to his academic research Dr. Ragsdale also consults with law enforcement agencies with cases regarding human skeletal and/or dental remains in the medicolegal context, and teaches and mentors students in the classroom, field, and laboratory setting.
Update Seminar VII

Monday, May 27 from 1:15 PM – 2:15 PM

Megan T. Baldridge
Sponsored by HAPS

Associate Professor
Washington University School of Medicine
St. Louis, MO

Local and Systemic Effects of the Intestinal Microbiota on Infection and Immunity

Abstract: The intestinal microbiota is a compilation of bacterial, viral, and fungal microbes that has a significant impact on the health and physiology of mammalian hosts. Characterization of the microbiota in human disease states, as well as manipulation of the microbiota using gnotobiotic and antibiotic-treated animal models, have revealed that altered microbial community composition has a causal role in the etiology of multiple diseases. While local effects in the intestine are well-recognized, systemic effects in distal organs are increasingly appreciated. With a focus on new discoveries in the past decade, the effects of the microbiota on infection and immunity will be described.

BIO: Dr. Megan Baldridge is an Associate Professor in the Division of Infectious Diseases in the Department of Medicine as well as in the Edison Family Center for Genome Sciences & Systems Biology. She majored in Biochemistry at Rice University in Houston, TX, then joined the MD/PhD program at Baylor College of Medicine. For her PhD work she studied regulation of hematopoietic stem cells by infection in Dr. Margaret Goodell’s lab. After completing MD/PhD training, she joined Dr. Skip Virgin’s lab at Washington University to begin studying intestinal viruses and the microbiota. In 2016, she started her own lab at Washington University, and currently oversees a research program studying how the gut microbiota regulates virus infections in the intestine as well as immune responses. She currently also serves as Co-director for the Microbiology graduate program and as Scientific Director of the Washington University Gnotobiotic Core.
Update Seminar VIII

**Monday, May 27 from 3:15 PM – 4:15 PM**

**Amynah Pradhan**

*Sponsored by HAPS*

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**Role of Opioid Receptors in Migraine**

**Abstract:** Dr. Pradhan is the Director for the Center of Clinical Pharmacology at Washington University School of Medicine and the University of Health Sciences and Pharmacy in St. Louis. Her lab investigates novel therapies for migraine, and she identified the delta opioid receptor as a promising target for this disorder. Ongoing studies in her lab are focused on the differential role of mu and delta opioid receptors in headache. Additionally, the lab focuses on identifying the molecular mechanisms that contribute to migraine chronicity, as well as overlapping mechanisms between migraine and neuropsychiatric conditions.

**BIO:** Dr. Megan Baldridge is an Associate Professor in the Division of Infectious Diseases in the Department of Medicine as well as in the Edison Family Center for Genome Sciences & Systems Biology. She majored in Biochemistry at Rice University in Houston, TX, then joined the MD/PhD program at Baylor College of Medicine. For her PhD work she studied regulation of hematopoietic stem cells by infection in Dr. Margaret Goodell’s lab. After completing MD/PhD training, she joined Dr. Skip Virgin’s lab at Washington University to begin studying intestinal viruses and the microbiota. In 2016, she started her own lab at Washington University, and currently oversees a research program studying how the gut microbiota regulates virus infections in the intestine as well as immune responses. She currently also serves as Co-director for the Microbiology graduate program and as Scientific Director of the Washington University Gnotobiotic Core.
HHMI BioInteractive Workshops:

Addressing Entering Competencies within Physiology Concepts and Equity in Medicine with HHMI BioInteractive’s Sickle Cell Disease Resources
Tuesday, May 28, 9:00 AM - 10:00 AM
Building A106, Room FH 2409

HHMI BioInteractive’s Online Community for Life Science Educators
Wednesday, May 29, 10:15 AM - 11:15 AM
Building B207, Room FH 3302

Join our Online Community to access discussion groups, our Educator Resource Library, and a suite of instructional tools.
www.biointeractive.org

Human Physiology, 3rd Edition
By Bryan Derrickson

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- Enhanced illustrations
- Updated assessment
- Careful attention to diversity, equity, and inclusion
- Real-world applications and activities designed to keep students engaged and provide them with important critical thinking and problem-solving skills

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Session 1: Sunday, May 26 from 10:00 – 11:00 am

Poster 101
Unlocking Team Potential: The Power of Understanding Group Dynamics
Aymen Arain, Dr. Kiran C Patel College of Allopathic Medicine at Nova Southeastern University, aa3882@mynsu.nova.edu
Fostering a positive group dynamic and an interactive learning space is crucial for both academic achievement and future professional success. As educators, we often facilitate teamwork among students, yet the challenge of differing personalities can create obstacles in the learning atmosphere. Each individual brings their own life experiences and ways of interacting with others. To navigate diverse personalities, we start each semester in neuroanatomy with an engaging activity that involves a personal preference profile test. Our study examines the variety of personality types drawn to health professions programs, including Optometry, Dental, and the Master of Biomedical Sciences students.

Poster 102
Prevalence and Major Patterns of the Berrettini Anastomosis
Albert Sarpong, Tilman J Fertitta Family College of Medicine, aksarpon@cougarnet.uh.edu
Co-Authors: Mathew Mendoza, Tilman J Fertitta Family College of Medicine, mmendo31@cougarnet.uh.edu, Ayala Madeline, Tilman J Fertitta Family College of Medicine, mgayala@cougarnet.uh.edu, Dallas Bennett, Tilman J Fertitta Family College of Medicine, dfbennet@cougarnet.uh.edu, Chakravarthy Sadacharan, Tilman J Fertitta Family College of Medicine, cmsadach@central.uh.edu, Samantha Tippen, Baylor College of Medicine, cmsadach@central.uh.edu, Xiaoming Ming, Baylor College of Medicine, cmsadach@central.uh.edu
The present study investigated the Berrettini anastomosis (BA)– an anatomical connection between the median and ulnar nerves within the hand. Using specific dissection techniques, researchers examined 56 hands to document the BA's patterns. A 53% prevalence was found, with two major communication patterns. Type 1 originates from the third common digital nerve and connects to the second common digital nerve. Type 2 is a simple oblique connection between the two nerves. These findings have clinical implications, particularly for conditions such as carpal tunnel syndrome.

Poster 103
A Study on the Academic Performance of ESL Students at Indiana University in A&P vs Computer Science Courses
Asmita Aryal, Indiana University-Bloomington, aryala@iu.edu
Co-Author: Valerie Dean O'Loughlin, Indiana University School of Medicine - Bloomington, vdean@indiana.edu
International students with English as their second language (ESL) experience greater difficulties in higher education due to the language barrier (Mhlongo and Masango 2020, Olson 2012). Langtree et al., (2018) have shown that ESL students in A&P classes earned lower grades than native English-speaking students. In this study, we examine Indiana University Bloomington learning analytics data to investigate how ESL students perform in our 200-level anatomy and physiology courses. We will also compare these results with other similar-level science courses (Computer science); where a higher number of ESL students are enrolled.

continued on next page
Harnessing the Power of the Histology Challenge
Abbey Breckling, University of Illinois at Chicago, abreckling@hapsconnect.org
Co-Authors: Soma Mukhopadhyay, Augusta University, smukhopadhyay@augusta.edu, Kathleen Ahles, Tarrant County College, kathleen.ahles@tccd.edu, Sharada Gollapudi, San Jacinto College South, sharada.gollapudi@sjcd.edu, Rachel Hopp, University of Louisville, rachel.hopp@louisville.edu, Tiffany McFalls-Smith, Elizabethtown Community & Technical College, tmcfalls0001@kctcs.edu, Deborah Merritt, University of Hawaii at Manoa, dmerritt@hawaii.edu, Yuli Pernia, San Jacinto College North, Yuli.Pernia@sjcd.edu, Hiranya S. Roychowdhury, NMSU-DACC, hroychow@nmsu.edu

Since 2022, the HAPS Curriculum and Instruction Histology Subcommittee has been hard at work indexing over 2329 images to support anatomy and physiology instruction. Micrographs are tagged by tissue, organ, organ system, magnification, and pathology. In this poster, we will present ways instructors can utilize this treasure trove of pathologist-curated images to enhance active learning in the classroom. These images, a HAPS member-exclusive resource, can be leveraged to maximize learning outcomes through (1) case studies, (2) exploratory learning activities, and (3) normal versus pathological comparison walk-throughs all while reducing student reliance on external resources.

Developing Active Learning Strategies in Large Physiology Course for Health Professions Students
Anastasia Mashukova, NSU MD, amashukova@nova.edu
Co-Authors: Marye Lee, NSU MD, ml2521@my.nsuidu.nova.edu, Alvin Nguyen, NSU MD, an1089@my.nsuidu.nova.edu

Many educators find it difficult to implement active learning in large courses. Previously, we reported an improvement in exam scores upon incorporating virtual active learning sessions which utilized Zoom’s “breakout rooms.” Here, we examined student feedback using specifically designed survey and standard course evaluations. Survey results demonstrated an average Likert score exceeding 4.0 for five out of seven questions. Course evaluations indicated increases to ≥4.0 for five out of six metrics in 2022, compared to one out of six in 2019. Overall, we show that virtual active learning can help successfully enhance student satisfaction and outcomes in large courses.

3D printed Materials for Teaching in A&P for Vision Impaired Students
Amanda Haage, University of North Dakota, amanda.haage@und.edu
Co-Authors: Nicholas Bittner, University of North Dakota, nicholas.bittner@und.edu, Isaac Heizelman, University of North Dakota, isaac.heizelman@und.edu, Tre Williams, University of North Dakota, tre.williams@und.edu, Joseph Miller, University of North Dakota, joseph.miller@und.edu, Ryan Striker, University of North Dakota, ryan.striker@und.edu

“Higher education institutions, mandated by the Americans with Disabilities Act, must accommodate students with disabilities. These accommodations are reactive and framed within ‘reasonableness’. To foster universal participation, a proactive, universal design approach is essential. We’re testing 3D printed materials from open-access A&P texts for teaching microscopic-heavy foundational content to students with impaired vision. The aim is to offer pre-tested, cost-effective, open-access resources for educators to swiftly implement in their accommodations processes, facilitating quick and efficient support for students.”

Different Cards for Different Classes: Student Perceptions of Flashcard Usage During Pre-clinical Courses
Polly R. Husmann Indiana University phusmann@iu.edu
Medical students use a variety of resources to study for courses in their pre-clinical years. Numerous types of flashcard software are often used. In order to evaluate how student perceptions of their use of flashcard software changed over time, focus groups were conducted. Questions focused on flashcard software use, including how cards were used, how often, and what content was included. A qualitative thematic analysis was conducted and themes and subthemes were identified. The results of this analysis will help inform the creation of a institution-approved flashcard study resource that is tailored directly to course expectations and student needs.
Poster 108
Ethical Foundations: Constructing an Osteology Atlas from Consenting Donors for Responsible Anatomy Education
Caroline Rowe, University of Minnesota-Twin Cities, rowe0101@umn.edu
Due to the pedagogical demand for the cessation of unethically sourced human bone being used in educational institutions, available osteological resources are limited to 3D and/or 2D models, images and drawings. Ethical problems remain when models, images and drawings are created using unethically sourced human bone or when consent of osteological sources is unknown. In response, we are preparing the first online osteological atlas that will clearly state sources as ethically acquired bone, from consensual donors. Using a variety of digital imaging technologies, this project will create high resolution 3D models, presenting the highest quality representations of osteological material.

Poster 109
Development and evaluation of a crowdsourced histology question bank
Jonathan Bendinger, Indiana University School of Medicine, jbending@iu.edu
A histology question bank was developed as an optional resource by first-year students from all nine regional campuses of Indiana University School of Medicine. The four-year project was assessed by examining the number of student participants, quality of the submitted questions, usage of the question bank quizzes, student surveys, and statistical relationships between use of question bank quizzes and performance on course lab exams. Overall, the results suggest that student crowdsourcing was an effective way to create the question bank, that students valued the question bank quizzes, and that use of the quizzes was associated with better course performance.

Poster 110
Are we Caring for our Undergraduate Students Appropriately when they Interact with Donors in the Anatomy Lab?
Anna Shafer, Indiana University - Bloomington, annakshafer@gmail.com
Co-Author: Stacey Dunham, Indiana University School of Medicine - Bloomington, dunhams@indiana.edu
The use of human donors in anatomy education is a common experience for many future healthcare professionals. For undergraduates taking anatomy, this may be their first introduction to donors. This study aimed to identify and describe students’ emotions and reactions to the donors in the laboratory classroom setting and identify coping mechanisms that students used within this learning environment. Students completed an anonymous survey that asked questions about their experiences in the lab. While the initial exposure to human donors can be an unsettling experience for students, anatomy educators can accommodate their students’ emotional needs by using appropriate instruction methods.

Poster 111
Cadaveric Dissection Demonstration of Compartment Syndrome of the Leg with Northwest Missouri Area Health Education Center (AHEC) High School Learners
Barbara Dyer, University of Missouri - Kansas City School of Medicine, bpd4n4@umsystem.edu
Co-Author: Meghan Rodriguez, University of Missouri - Kansas City School of Medicine Saint Joseph Rural Health Campus, meghan.rodriguez@umkc.edu
High-school-aged students have limited exposure to cadaveric anatomical coursework. This activity targeted high-school-aged Northwest Missouri Area Health Education Center members. Literature suggests high-school-aged anatomy students with cadaveric experiences have increased knowledge and confidence. Our unique program required no prerequisite anatomy. Students completed a 10-question pretest. Students collaboratively completed a worksheet using plastic and human-derived anatomy models. A cadaveric dissection demonstration followed. Students then completed a 20-question posttest. Assessments included Likert-scale-style questions and multiple-choice/fill-in-the-blank questions. Paired, 2-tail t-test was used. The five pre- and post-assessments demonstrated significant improvement (p=0.0002). Comfort in the cadaver lab and with anatomy increased (p=0.0086 and p=0.0074).
Poster 112

Prevalence of Morton's Toe and Assessing the Associated Risk Factors
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Morton's toe results in an uneven distribution of pressure across the feet. Knowledge about Morton's toe and its associated risk factors are clinically important. Although studies have reported the prevalence of Morton's toe, no studies appear in literature discussing its impact on the associated risk factors. Hence, we have undertaken this study to analyze the prevalence of Morton's toe in the Gulf region to assess its impact on the foot. A cross-sectional descriptive epidemiological study was carried out between November 2021 and February 2022 on the feet of 100 individuals (male=50; female=50) with age ranging from 18 – 100 years. Study included the Bahraini & non-Bahraini residents. Any individuals with severe foot injuries and deformities resulting from surgeries were excluded. A total of 56 Morton's toe (male 18 and female 38) were noted in the individuals aged between 18-75 years. The overall prevalence of Morton's toe was 28% and majority of the participants with Morton's toe were females (67.9%). Of 56 Morton's toe cases, majority were seen in the age group of 31-42 years, particularly in females. Our findings clearly showed a significant association between Morton's toe and usage of high feels, particularly in females (p<0.001). However, the association between Morton's toe and other risk factors such as hammer toe, bunion deformity, plantar fasciitis and overpronation of the foot were found to be statistically insignificant (p>0.05). Our study provides baseline data for the first time on the prevalence of Morton's toe and associated risk factors.

Ethics statement: This project was approved by Institutional Ethics Committee, College of Medicine and Medical Sciences, Arabian Gulf University (No: E24-PI-11-21). Informed consent was obtained from all the individuals who participated in this study.

Poster 113

Cheat Sheets – A best-kept secret tool for student success?
Carol Gibbons Kroeker, University of Calgary, kcagibbo@ucalgary.ca

Student-made reference sheets, or “cheat sheets” are often considered a negative tool with unfair assessment of knowledge. We examined student outcomes, comparing traditional “closed book” tests, “open-book” on-line exams, and the use of exam “cheat sheets” in a physiology course. We also surveyed students’ perceptions of their use. Students reported a drastic reduction in test anxiety when using “cheat sheets” and stated that developing them was a strong study tool that helped with retention and consolidation of material. Students reported the temptation to cheat was greatly reduced. Grades increased slightly when using cheat sheets, but students reported greater long-term retention.

Poster 114

Enhancing the Moral Compass of Future Healthcare Professionals
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The need for ethical competencies in our pre-health majors has never been more critical. The intersection of ethical thinking and real-world dilemmas are often disconnected. By creating an understanding of theoretical and practical ethical awareness, future healthcare professionals, researchers, policymakers, and global citizens will be empowered to navigate ethical challenges with integrity and emotional intelligence. As we prepare students, integrating bioethics into our educational curriculum, we foster ethical reflection, empathy and compassion. Through educating and surveying students, we aim to enhance patient-centered care, communication and equipping them with tools to navigate ethical dilemmas in clinical practices and interprofessional teams.
Poster 115

Does timing matter?: Correlations between lab days/times and DFW rates
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Each semester, hundreds of undergraduate students take Basic Human Anatomy (ANAT-A215), a five-credit course with three, 50-minute lectures and two, 105-minute labs each week. Students enroll in 1 of 11 lab sections that meet Monday/Wednesday or Tuesday/Thursday between 8am and 9:15pm. Data was collected from spring of 2012 to fall of 2021 to determine if there's a correlation between the day and time students attend lab and their success in the course, defined as receiving an A, B, or C as the final grade. Findings from this research provides insight to what groups of students could benefit from more support.

Poster 116

Clinically Oriented Dissection Portfolios in Undergraduate Medical Education
Emily Bradshaw, University of Central Florida, emily.bradshaw@ucf.edu
The use of autopsy reports can increase anatomical knowledge, observational skills, and clinicopathologic correlation. We piloted a dissection portfolio which can help students develop autopsy report skills. Anatomy lab teams recorded their weekly dissection findings in portfolios that included pathology lists, measurements, CT images, and clinical procedures. Surveys indicate that M1 students liked doing clinical measurements, organ weights, and correlating findings with CT imaging. Overall, the portfolio appears to help students focus on examining the donor systematically and integrating imaging and clinical procedures. Incorporating a dissection portfolio may help other student populations like undergraduates connect dissection with clinical topics.

Poster 117

Enhancing Active Learning of Anatomy and Physiology with the Use of Clickers
Daniela Popescu, Kent State University, Geauga campus, dpopescu@kent.edu
One of the most challenging aspects of teaching anatomy and physiology is using teaching tools that enhance active learning and keep students actively engaged during the lecture courses. This study explored the use of a student response system that was easy to use, cost-efficient, and re-usable for multiple anatomy and physiology courses. More specifically, the impact of clickers on student performance in anatomy and physiology courses was investigated by comparing exam scores before and after the introduction of clickers. This study showed that the use of clickers during the lecture courses increased student engagement and improved the performance of students on the lecture exams covering the respiratory, digestive, urinary, reproductive, lymphatic, and immune systems. The overall performance of students in the anatomy and physiology lecture courses had also a tendency to increase. Furthermore, student feedback regarding clicker use was highly positive.

Poster 118

Life after death: applying anatomy and cadaveric dissection to understand the impact of physical trauma on occupational performance
Josie Hunter, Elizabethtown College, hunterj@etown.edu
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The ability to envision how pathology and trauma are manifested in anatomical changes can help occupational therapists develop an in-depth understanding of their patients’ lived experience. However, observations of postmortem anatomy are not traditionally utilized to discuss changes in quality of life. In this study, we examined anatomy of a donor with significant internal and external physical trauma, hypothesized its possible impact on well-being, and applied our findings to develop occupational therapy interventions. Integrating cadaveric dissection and examination with occupational therapy treatments increases awareness of the indelible connection between structure and function, and its ultimate impact on quality of life.

Poster 119

Attendance as a motivator for coming to class.
Chris Donnelly, Loyola University Chicago, cdonnelly4@luc.edu
Does the simple act of taking attendance each class increase overall attendance? Using a QR code to track attendance, students scan and check in during class. Without any incentive to attend class, it was found that students in sections that took attendance had greater overall attendance. The act of taking attendance increases student attendance in a freshman anatomy course.

continued on next page
Poster 120  
Charcot’s Neuroarthropathy After Simultaneous Pancreas-Kidney Transplant – a case report  
Dr. Michael Wilson, Forsyth Tech Community College, miwilson@forsythtech.edu

Charcot osteoarthropathy is a destructive bone and joint disorder of the foot, seen in patients with long-term uncontrolled diabetes. The combination of diabetic neuropathy and painless trauma causes tarsal dislocation and collapse. This report presents a review of the clinical identification, diagnosis and treatment of this unusual diabetic complication. A case report is presented. Also, the rationale for the inclusion of clinical applications in the teaching of anatomy and physiology is presented.

Poster 121  
Cadaveric Anatomical Characterization of the Aortic Root in a Midwestern (U.S.) Population  
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Coronary circulation varies by geographic region. Characterization of the aortic root in 21 Midwestern (U.S.) cadavers was performed through triplicate measurements of circumference, diameter, and height of/between key structures. Results show an average left coronary ostial (LCO) height of 12.28 ± 2.22 mm and right coronary ostial (RCO) height of 14.25 ± 2.57 mm from the sinus base. 83.33% of coronary ostia laid below the sinotubular ridge. The RCO shifted more towards the aortic Commissure I, whereas the LCO was more centrally placed. The study provides regional aortic root data from the American Midwest, adding to the literature.

Poster 122  
Sex-based Variations in ACL structure: An In-situ Analysis  
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This study explores sex-related differences in the anterior cruciate ligament (ACL) and knee compartment structures. Females experience higher ACL injury rates; thus our research aims to quantify structural variations in situ as a potential explanation. 32 cadavers had ACL length, ACL width, intercondylar notch, and tibial eminence widths measured at 120-degrees knee flexion. Results show a significant difference in ACL length in males compared to females. No additional significant differences were found. We conclude that increased ACL volume in males is a primary factor contributing to the sex-based ACL injury discrepancy.

Poster 123  
Assessment of Normal Range of Interorbital Distance among the Igbo People of Abakaliki, Ebonyi State, Nigeria  
Edwin Ewunonu, David Umahi Federal University of Health Sciences, Uburu, Ebonyi State, Nigeria, and Ebonyi State University, Abakaliki, Nigeria, ediojims02@yahoo.com

This study accessed normal range of interorbital distance (IOD) of Igbo people of Abakaliki, Nigeria. Weighing balance, stadiometer, sliding caliper, laboratory stool and stationeries were used and the parameters include height, weight and interorbital distance. Data was collected from 187 males and 213 females, whose age range falls between 16 – 35 years. Result showed mean ± standard deviation for age 23.69±4.42, height 170.39±8.60, weight 70.06±12.99 and IOD 2.74±0.37 (males 2.96 and females 2.55) with positive correlation between IOD and age (r = 0.739, P = 0.0001), and between IOD and height (r = 0.428, P = 0.001).

Poster 124  
The Heart of Learning – A Student Perspective  
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A dynamic, interactive learning environment facilitates student engagement and promotes student success. As a result of our experience as undergraduate students and our involvement in A&P Boot Camp, a peer-led collaborative learning program at our university, we embrace the importance of strengthening our growth mindset and improving our metacognitive skills as we become life-long learners. In this presentation, we will (1) outline our perspective on the keys to creating a successful learning environment, (2) describe our A&P Boot Camp program, and (3) summarize key findings of SoTL research that support a constructivist approach to education.
Session 2: Sunday, May 26 from 2:15 – 3:15 pm

**Poster 201**
**Improving Student Outcomes in A&P I at St. Louis Community College: Putting Tutors in Lab Sections**
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Anatomy & Physiology I at St. Louis Community College (STLCC) has been identified as a class that has a high D/F/W rate. To increase student retention and success, STLCC’s Academic Success & Tutoring Center employed Supplemental Instruction (SI). While this program had some success, the many students who did not attend SI sessions did not reap the benefits. Thus, the use of Embedded Tutoring (ET) was implemented. Embedded Tutoring places a tutor in the lab section of A&P I classes to build relationships and help students during lab.

Here we highlight the results of using ET in lab sections and compare those results to our previous use of SI and traditional tutoring.

**Poster 202**
**Abnormal Presentation of a Malignant Occipital Lobe Neoplasm in a Human Anatomical Donor**
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Dissection of a human anatomical donor showed an abnormal presentation of an occipital lobe neoplasm. Occipital lobe neoplasms are masses of tissue that grow on the posterior lobe of the brain due to uncontrolled cell division. The donor presented with neurological tissue that had formed on the superficial side of the calvaria. Medical imaging was conducted to allow for further evaluation of the growth of the neoplasm prior to further dissection. The anatomical and clinical significance was assessed in comparison to the normal presentation.

**Poster 203**
**Osteobiography-Based Skeletal Anatomy Lab Exercises for A&P**
John Robertson, Westminster College - PA, robertjc@westminster.edu

These lab exercises reinforce learning of bone structure by engaging students in inquiry-based, quantitative analysis. Students use in-lab skeletal materials to generate data for comparison with primary literature sources that apply osteometry to explore the biology and anthropology of subject individuals and populations. The activities emphasize bone structure in functional contexts and introduce students to osteobiography – an anatomical approach to understanding the lives of individuals and social groups. There are cross-cultural elements to the activities, including ethical and cultural considerations of use of human remains. Examples exercises are presented, along with discussion of benefits and challenges of this approach.

**Poster 204**
**The Effects of E-cigarette Exposure on Lung Histology and the Immunolocalization of Angiotensin Converting Enzyme 2 (ACE-2) in the Common House Mouse, Mus musculus**
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Vaping has become a dangerous epidemic in our society, yet little is known about its impact on health due to its novelty. We investigated the histological effects of e-cigarette exposure in the common house mouse, Mus musculus, using three different e-cigarette flavors, all with the same nicotine content. We compared the histological morphology and the expression of an inflammatory chemical, angiotensin converting enzyme 2 (ACE-2), in adult male animals. Through this research, we hope to educate others about the potential consequences of vaping as we examine the physiological impact of exposure to e-cigarettes at the histological level.

continued on next page
Poster 205

**Student Performance in Human A&P I and II: A Comparison of Pre- and Post-Pandemic Scores**

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If course procedures and routines have returned to normal since the COVID-19 pandemic, why haven’t student scores returned to pre-pandemic levels? Exam, lab practical, and formative assessment scores were compared for students in A&P I and II over the 3 years (2017-2019) preceding the pandemic and the 3 years (2022-2024) after instruction returned to a fully in-person format. While the number and type of assessments and content for each assessment remained constant, exam scores are 4-5% lower post-pandemic and lab practical scores are 8-10% lower post-pandemic. Potential causes within students, instructors, and institutions are identified and evaluated for mitigation.

Poster 206

**Critical Thinking Assessment in an Undergraduate A&P Course**

Louis Kutcher, Univ. of Cincinnati, Blue Ash College, louis.kutcher@uc.edu

Since 2014 we have tracked the development of critical thinking in undergraduate A&P-I students. Students were assessed at several points during the semester using a two question quiz. Each quiz began with a description of physiologic regulation by the endocrine system, followed by a reading comprehension question and a critical thinking question. Most students answered the reading comprehension question correctly, both early and late in the term. Performance on the critical thinking question significantly increased from the first to the final assessment. Collecting this data each year has allowed us to evaluate assessment construction and compare on-line versus in-person quizzes.

Poster 207

**Inter-professional medical education**

Ali Al-Azzawi, Bedfordshire Hospitals Trust NHS, ali.alazzawi96@gmail.com

The importance of interprofessional education (IPE) lies in building collaborative team working, vital in healthcare to improve patient care. An emphasis on IPE is not often found in healthcare curricula, with 85% of our intervention’s attendees having never attended an IPE session before. On the 8th of December 2023 we held an IPE session which invited medicine, pharmacy, nursing and physiotherapy students. Participants were split into mixed groups, completing guided clinical scenarios and a simulation scenario. These scenarios were accompanied by question sets designed to encourage discussion and draw on the skills of each profession. A pre-session questionnaire gauged comfort with interprofessional working, using a ratings scale of 1 (strongly disagree) to 5 (strongly agree). Queried on whether they felt comfortable working in a Multi disciplinary team (MDT), the average student’s rating was 3.75 pre-intervention and 4.4 post-intervention, a 16.5% increase. Participants were questioned on whether they understood the job roles of the MDT members with a post-questionnaire average between 4 and 5, from between 3 and 4 pre-questionnaire. Participants valued the opportunity to “interact with students and staff of other professions” and were keen to take part in future MDT sessions. This intervention highlighted the positive impact of IPE, exposing them to the roles and responsibilities of their colleagues, to improve team working in the workplace. Increasing awareness of the effectiveness of these sessions could have a direct impact on the quality of interprofessional working in our future healthcare professionals and improve patient outcomes.

Poster 208

**Kidney Inquiry**

Gregory Diersen, Martin Luther College, diersegt@mlc-wels.edu

HAPS Conference Travel Award Winner

After studying many other systems throughout the year, I have found benefits and positive responses in students beginning the urinary system study by dissecting a kidney. They provide reasonable names and descriptions for the structures and hypothesize the functions of those structures. While much of the material in the course is given to them to memorize and learn, this is an opportunity for them to discover and describe the structures and functions of a system.
Poster 209
Student Performance in Anatomy & Physiology Labs Before and After the COVID-19 Pandemic
Nicholas Pollock, University of Texas at Arlington, nicholas.pollock@uta.edu
John Martin Second Timer Award Winner
The COVID-19 pandemic forced significant changes in how academic curricula were organized and delivered. Institutions were forced into all online instruction, which eliminated hands-on experiences, altered student learning, and greatly hindered the development of student-student and student-instructor relationships. Students transitioning from high school to college perhaps experienced the greatest setbacks in their education due to COVID-19. Anatomy & Physiology (A&P) courses are often taken by students during their freshman year of college, often encouraging hands-on learning, diverse study techniques, and interpersonal interactions. This study compares student performance in undergraduate A&P labs before and after the COVID-19 pandemic.

Poster 210
The RE-CAPER project: Engaging Community College Anatomy and Physiology Instructors in Education Research Since 2017
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The Community College Anatomy and Physiology Education Research (CAPER) project is concluding its third year. Cohort 1 participants are publishing their results from classroom research projects, cohort 2 participants are presenting their projects, and cohort 3 participants have completed 2 professional development courses and are preparing to conduct a classroom-based research project in the next academic year. This study includes an examination of the instructors’ perspectives on education through a series of interviews in addition to data from participating students on learning and anxiety aiming to delve further into the impacts of diverse teaching interventions. This poster will highlight the overall CAPER project and provide updates on the first three cohorts of CAPER.

Poster 211
How Does Course Format Relate to Cognitive Load? Comparisons from a Flipped and Traditional Undergraduate Physiology Course
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Cognitive load (CL) is a measure of how much information someone’s working memory is storing. The purpose of this research is to analyze CL differences between a comparable flipped and non-flipped physiology course. A modified version of the Multidimensional Cognitive Load Scale for Physical and Online Lectures (MCLS-POL) was administered 3 times throughout the semester, generating 1000+ responses between the two 200+ student class sections (Andersen, 2021). CL differences were analyzed between the two sections to see how the flipped and non-flipped class differ. CL was also linked to demographic, academic history, and course outcomes data for further analysis.

Poster 212
Evaluating Longitudinal Trends in Student Learning in Human Anatomy: Pre-Pandemic, Pandemic, and Now
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We evaluated pre-pandemic (Fall 2017-Fall 2019), pandemic (Spring 2020-Spring 2021), and post-pandemic (Fall 2021-Fall 2023) student performance in Human Anatomy coursework. Parameters of interest included demographic/academic characteristics, lecture and lab exam performance, performance by course delivery format (in-person versus online), LMS-based course content access, and subsequent performance in a human physiology course. Unlike higher-achieving students, we found that post-pandemic students with average or below average incoming GPAs underperformed on the final exam compared to pre-pandemic students with similar GPAs. Pandemic GPA “inflation” may asymmetrically affect lower-achieving students. To succeed, these students might need even more educational support than typically expected.
Poster 213

Whodunnit?
Haneen Salhieh, Chamberlain University, Hsalhieh@chamberlain.edu

Get ready to dissect a different kind of mystery in the anatomy and physiology classroom. This presentation explores the innovative integration of a “whodunnit” scenario to enhance student engagement, foster critical thinking, and encourage the application of previously learned knowledge. The scenario revolves around a mysterious medical case, challenging students to apply their anatomical and physiological knowledge to either diagnose the condition or determine if the cause of death was natural or foul play. Through interactive clues, hands-on investigations, and collaborative problem-solving, students engage with the course material, reinforcing their understanding of complex concepts in a stimulating and enjoyable manner.

Poster 214

The Right Steps on a Broken Road: How Diverse Students Find Success in Education
Jessica Cisneros Lerma, University of North Georgia, jcisn0417@ung.edu
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America is ranked at average or slightly below educational benchmarks according to global data from Programme for International Student Assessment (PISA) and Trends in International and Mathematical Science Study (TIMSS) tests in 2017. With this in consideration and the current decreasing trend of university enrollment, we will be examining the psychosocial influences of under-performing learners and how these factors affect education over the lifetime of diverse students. This will analyze the pros and cons of the education system from student perspectives, the cultural barriers that may impede learning, and beliefs that promote or hinder life-long learners.

Poster 215

Using artificial intelligence to grade practical laboratory examinations: Sacrificing students’ learning experiences for saving time?
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The use of artificial intelligence (AI) by students has recently been made a key topic among educators because of the potential to transform students’ learning experiences. However, the use of AI-based software by instructors has not received the same level of consideration despite its recent accessibility and prevalence. This contribution discusses the benefits, challenges, and limitations of commercial AI-based software for grading summative, short answer practical examinations in an undergraduate gross anatomy course. While the integration of AI-based software in grading practical examinations reduces time and perceived instructor biases, it might erode personal relationships between students and instructors, especially with regard to individual feedback. Future research should assess best practices for incorporating AI technology into course grading considering the challenges and trade-offs to students and instructors.

Poster 216

Using hot spot questions to enhance learning in the anatomy lab
Jennifer Hancock, Mary Baldwin University, jhancock@marybaldwin.edu

One challenge that students face in anatomy is identifying structures on cadavers. Pre-laboratory assignments were developed using hot spot questions which ask students to identify structures on images by clicking on the structure. Each question is developed by uploading an image and outlining the structure on the image. Then, the questions are automatically graded. In addition to the pre-laboratory assignments, video recordings of the instructor identifying all of the structures on the same images were created with the pre-laboratory assignments. Lab exam grades will be compared between this year and previous years to assess the impact on lab exam performance.
Turning ideas into teaching tools through biomedical engineering senior design projects
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Neuroanatomy students need to understand neuronal circuits, including those that control the pupil of the eye. They also must learn to predict lesion sites based on the well-established swinging flashlight test and pupillary responses. These goals are difficult for some students. To enhance student learning, a vision of a teaching tool was created and formally presented to the CSU biomedical engineering department as a potential senior design project. This led to a collaboration that resulted in a functioning physical and electrical model that can be used to complement course content. Here we present an overview of the project and collaboration.

Enhancing Understanding and Alignment: Chakra Yoga’s Impact on Anatomy and Physiology Knowledge
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Chakra yoga, a popular practice in local community, combines mindset with physiological effects. One can align it with the nerve plexuses. However, it can be confusing for beginners. To address this, we integrated anatomical and physiological information in classes of Chakras Wheels. Students gained a realistic understanding of their bodies, adjusting postures based on chakras. Not being confined in a classroom setting, learning thus became more enjoyable and relaxed. Statistics showed an average of 25% increase in Anatomy and Physiology knowledge among learners. Integrating human science curriculum with Chakras proved to be an effective and valuable learning experience.

A&P Laboratory Accommodations: An Invaluable Resource Coming to You!
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The HAPS Curriculum and Instruction Accommodations Subcommittee has curated a handbook for HAPS members which provides suggestions for meeting student accommodations in anatomy and physiology laboratories. This poster shares our 3-year long progress on the handbook as we near the final edition! Our goals are twofold: to inform members of this invaluable resource and to create discussions on how instructors can use and share the handbook at members’ institutions.

The Investigation of the Cavernous Nerve
Julio Villarman, Midwestern University, julio.villarman@midwestern.edu

Objectives: To investigate the presence or absence of post-ganglionic cell bodies within erectile tissue. The presence of intramural cell bodies will indicate parasympathetic features. The absence of intramural cell bodies will indicate sympathetic features. Methods: Rabbit monoclonal anti-Neun Alexa488 Immunofluorescence staining on tissue sections from dissections to target neuronal nuclei in the positive controls and erectile tissue sample.

Key Terms: cavernous nerve, erectile tissues, inferior hypogastric plexus, parasympathetic, sympathetic.
Poster 221

**Unusual Muscular Bands Associated With Platysma**

Mark Cook, University of Minnesota, cookx072@umn.edu

The platysma muscle, a muscle of facial expression, is known to exhibit variations in muscle fiber patterns. However, most descriptions in the literature describe midline variations including wide midline gaps, narrow midline gaps and muscle fascicles that cross the midline along their descent. This case study describes atypical muscle bands that originate from the zygomatic bone bilaterally and course posteriorly over the great auricular nerve, sternocleidomastoid and the lesser occipital nerve to the posterior neck and insert on the fascia of splenius capitis. Muscular bands, discovered during parotid surgery, extending posteriorly from the parotid gland have been called notoplatysma.

Poster 222

**Improving Physiology Course Outcomes in the Master of Biological Science Program through Virtual Large Group Discussions.**

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Co-Author: Dawn Owens, NSU MD, dowens@nova.edu

Teaching physiology in the Master of Biological Science (MBS) program at our institution typically consisted of didactic lectures. With an increasing number of health professions programs adopting active learning curricula, relying on didactic lectures may present an issue for future healthcare professionals. We found that the incorporation of collaborative learning sessions emphasizing the clinical application of fundamental physiology concepts has improved students’ perception of the course. Furthermore, there was a statistically significant increase in exam scores (p < 0.05, n=60). Our findings support the reorganization of the MBS program curriculum to incorporate more active learning modalities.

Poster 223

**Variation in the distances of duodenum landmarks: A ten-year multi-campus study**

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Surgical exploration of the duodenum requires a solid understanding of the distances of the major duodenal papilla of Vater to both the pylorus and minor duodenal papilla. In a ten-year study of 108 cadavers, distances between these landmarks were quantified. The expected distance from the pylorus to the major duodenal papilla was in agreement with our multi-year observations. However, the distance from the major to the minor duodenal papilla was significantly shorter than expected (p<0.01). This study provides insight into the accurate distances of the duodenal structures which are essential to understand during clinical procedures including endoscopic retrograde cholangiopancreatography (ERCP).

Poster 224

**HAPS Exam Performance as a Predictive Index for First-Semester Success in a Physician Assistant (PA) Program**

Cindy Wingert, Lipscomb University, cindy.wingert@lipscomb.edu

Co-Author: Matt Steidl, Lipscomb University, matt.steidl@lipscomb.edu

Sponsored by HAPS

Mitigating student attrition is an ongoing challenge for graduate health education programs. The varying levels of readiness among students for advanced science coursework pose a significant obstacle, particularly for those who are less prepared. Efforts to link metrics like overall GPA, science GPA, and additional admissions criteria have shown weak if any, correlation. In search of a tool to quickly identify the struggling medical learner, our faculty piloted the use of the Human Anatomy and Physiology Society’s Comprehensive A&P exam as a predictive index of student preparation and success in first-semester PA program courses.
Session 3: Sunday, Monday, May 27 from 9:45 -10:45 am

Poster 301
Using Exam Wrappers as a Metacognition Tool to Promote a Shift in Student Test-taking Preparations
Larry Young, Florida Southern College, lyoung@hapsconnect.org
Co-Author: Suzanne Hood, Bishop's University, shood@ubishops.ca
Exam wrappers offer students an opportunity for self-reflection that allows the student to see assessments as opportunities for learning and growth. Students reflect on their performance on an assessment compared to the time spent and activities used to prepare for the assessment. Exam wrappers and metacognitive surveys have been deployed in various ways with mixed results. Research demonstrates that outside influences impacts their effectiveness. The focus of this research will be to determine how, if at all, the use of exam wrappers combined with flipped classroom pedagogy, lead to shifts in student test-taking preparation.

Poster 302
Assessing Anatomical Knowledge Retention and Learning Styles among Omani Nursing Students: A Cross-Sectional Study
Mickael Joseph, Sultan Qaboos University, mickaelj@squ.edu.om
Co-Author: Jansirani Natarajan, University of Edinburgh, jnataraj@ed.ac.uk
This study evaluates anatomical knowledge retention in nursing students at Sultan Qaboos University, Oman, across four cohorts (2018-2021) and explores the impact of learning styles on retention. Utilizing a 42-item test on the human body’s systems and the VARK questionnaire, the study found a significant decline in retention over time, with students from 2021 scoring higher than those from 2018. Most students preferred multimodal learning, but kinesthetic learners showed slightly better retention, though not statistically significant. The findings suggest the need for curriculum adjustments to improve anatomy retention and application in clinical practice.

Poster 303
Abdominal Aortic Aneurysm Discovery
Meghan Jackson, University of Health Science and Pharmacy, meghan.jackson@uhsp.edu
Co-Author: Melissa Thompson, Louisiana State University, melissathompson@lsu.edu
Timeline of a student led discovery of an abdominal aortic aneurysm in undergraduate human cadaver dissection course. Continued student-led inquiry related to the vascular system and clinical procedures and outcomes for pathologies associated with the cardiovascular system and disorders of the connective tissue.

Poster 304
Ontogeny and covariation in the human occipital bone
Miranda Karban, Illinois College, miranda.karban@ic.edu
Previous studies suggest that occipital bone convexity is developmentally associated with cranial or basicranial breadth, basicranial flexion, midfacial prognathism, or cranial dolichocephaly. This study assesses these patterns of cranial covariation in a longitudinal human sample. Landmark and semi-landmark measurements were collected from 156 growth study radiographs, representing 26 subjects from 3.0 to 20.4 years of age. Two-block partial least squares analysis and permutation procedure were used to assess patterns of covariation. In both sexes, significant covariation was found between occipital bone convexity and low, elongated frontal and parietal bones, with this pattern existing from the earliest available age point.

Poster 305
Genetic Predictor of Childhood Asthma; Association of rs7216389 Polymorphism in Orosomucoid like 3 Gene (ORMDL3) with Childhood Asthma
Qudsia Umaira Khan Khan, CMH Lahore Medical College and IOD, drqudsia@yahoo.com
The sample size of cross-sectional and longitudinal studies is calculated by the formula Z² x p (1-p)/e²
For problems of unknown prevalence, the p-value is taken as 0.50 (50%). This same formula was employed to calculate the sample size of the study, which was n = 386. The data on 386 individuals was obtained from a tertiary care hospital in Lahore. These patients had attended outpatients for respiratory symptoms. The patients who were diagnosed with asthma were separated into asthma groups. There were 50 (12.95%) patients (aged 3 to 18 years) in the asthma group, and they were compared with a group of 50 non-asthmatic patients having similar demographic characteristics. The genome analysis did not reveal any significant association of rs7216389 in the ORMDL3 gene with childhood asthma. The negative association does not nullify the importance of this study. The association of certain factors with diseases can differ in different geographical regions and have different demographic characteristics.
**Poster 306**

*Quantification of lesion growth rate in hyperostosis frontalis interna (HFI)*

Russell Hogg, Florida Gulf Coast University, rhogg@fgcu.edu

Hyperostosis frontalis interna (HFI) is a human disease characterized by thickening of the frontal bone's inner surface, with late-stage impingement of the frontal lobes of the brain. This study uses histologic assessment of HFI lesions from donated cadavers to provide the first assessment of bone tissue growth rate in HFI. We measured lamellar breadth in HFI frontal bone sections to provide a chronology of lesion growth rate. Our data support a growth rate of 3-4 years per millimeter of bone thickness. This suggests that HFI progression is typically a slow, gradual process occurring over years to decades.

**Poster 307**

*Blooms Taxonomy in the Classroom*

Trey Shupp, Indiana University, tshupp@iu.edu

Co-Author: JT Cornelius, Indiana University School of Medicine - Bloomington, jtcornel@iu.edu

Anatomy and physiology coursework ranges from introductory to advanced levels. These levels share a common goal of knowledge creation and synthesis. With the aid of Classroom Assessment Techniques (CATs), students' comprehension of A&P knowledge can be assessed at various points on Bloom's Taxonomy pyramid. However, CATs tend to be course specific with no comparison or scale between introductory and advanced coursework. This study focuses on the use of one CAT scaled between introductory, intermediate, and advanced A&P coursework. This approach ensures broader applicability, benefiting all levels of anatomy and physiology instruction.

**Poster 308**

*Cadaver Clinical Correlations of Anatomy - Upper and Lower Extremities*

Jessica Halla, University of Missouri Kansas City - School of Medicine, jhdhd@umsystem.edu

A thorough grasp of anatomy is crucial for physician education, enabling a comprehensive understanding of the human body and its interconnected functions. Cadaver dissection plays a pivotal role in medical training, offering unparalleled learning opportunities for students. Undergraduate and medical students were taught using a clinical correlate lesson plan with cadavers and assessed before and after. Results showed improved scores at both levels, indicating an increased understanding of the lesson's concepts. The development of this teaching aid aims to incorporate essential clinical components derived from anatomy. This enhances future physicians' ability to apply anatomical knowledge in clinical practice.

**Poster 309**

*Aiming for the bullseye: A fresh perspective on Bloom’s Taxonomy for creating learning objectives, activities, and assessments*

Jonathan J Wisco, Boston University Chobanian & Avedisian School of Medicine, jjwisco@bu.edu

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Many students enter A&P courses with varying foundational knowledge making it difficult to teach exciting, application-based concepts, leaving instructors feeling obligated to focus on the remembering and understanding levels of Bloom’s taxonomy. However, challenging students with sophisticated cognitive tasks at higher Bloom’s levels may serve as an impetus to help students learn concepts simultaneously at lower Bloom’s levels. We present an alternative conceptual framework for learning in the cognitive domain - the Bullseye - which depicts how learning objectives at higher cognitive domains meet objectives at lower domains.

**Poster 310**

*Anatomy Unveiled: Elevating Undergraduate Anatomy Education through Student-Led Medical Illustration*

Jill Kirby, Lipscomb University, jmkirby1@lipscomb.edu

Co-Authors: Cindy Wingert, Lipscomb University, cindy.wingert@lipscomb.edu, Lauren Blank, Lipscomb University, lcblank@mail.lipscomb.edu

Undergraduate students often struggle to comprehend difficult anatomy concepts. There is a disconnect between what students see in textbooks and their ability to translate that to gross anatomy dissection at the undergraduate level. We will show how an aspiring medical illustrator student was able to visualize the brachial plexus in an accessible way for her peers in order to elevate understanding and retention of the complex anatomical structures in the axilla. We will share the process that was used to enhance student performance on laboratory assessments through art.
**Poster 311**

**The Good, Bad, & Ugly: Addressing Grade Surprise in the Anatomical Sciences**

JT Cornelius, Indiana University School of Medicine - Bloomington, jtcornel@iu.edu

Co-Author: Dunham, Indiana University School of Medicine - Bloomington, dunhams@indiana.edu

The phenomenon of ‘grade surprise,’ where students are unexpectedly shocked by their early semester assessment grades, is associated with cognitive and emotional factors, particularly confidence. Recognizing its impact on student well-being, IU Bloomington ANAT-A215 instructors conducted surveys throughout the semester to gauge student perceptions of grade surprise. The surveys included positive, negative, and overall wellness reactions in relation to assessment scores. Based on the survey results, students are prompted to take part in an academic intervention. We hypothesized that the use of interventions along with course resources would decrease the level of grade surprise in the anatomy classroom.

**Poster 312**

**Learning Assistants Support Student Success and Promote Inclusivity in an Undergraduate Biology Course**

Kimberly Jeckel, Colorado State University, kimberly.jeckel@colostate.edu

In large, undergraduate, science courses such as biology, active learning, student participation, and peer support are necessary components of a successful teaching and learning approach. Therefore, undergraduate learning assistants were utilized to support in-class activities, provide additional resources, promote student success, and enhance inclusivity within a biology course. Students reported that the learning assistants were essential in creating a collaborative learning environment, providing personalized assistance, promoting an inclusive atmosphere, and enhancing student-centered learning. Thus, the biology learning assistants positively influenced student success, encouraged student engagement, and promoted a sense of community, resulting in a cohesive, connected, and involved student experience.

**Poster 313**

**Evaluating the effectiveness of cooperative quizzes in enhancing the learning experiences of students**

Mary Vagula, Gannon University, vagula001@gannon.edu

Co-Authors: Dana Smith, St. Johns River State College, danasmith@sjrstate.edu, Suzanne Hood, Bishop’s University, shood@ubishops.ca, Chasity Omalley, Wright State University chasity.omalley@wright.edu, Ronald Gerrets, Milwaukee School of Engineering, gerrits@msoe.edu, Murray Jensen, University of Minnesota, mjsjensen@umn.edu

Anatomy and Physiology, and Physiology are the core courses required for advancement within allied health curriculum. The core concepts of these courses are difficult to understand and master by the students. Many research reports indicate that students retain the subject material longer when they are involved actively in the learning process. Among many active learning tools, cooperative (collaborative) learning has gained attention due to its advantages in helping students with anxiety, improving self-confidence, promoting reflective thinking and retention. In this presentation students’ performance in individual and cooperative quizzes are compared and discussed in the light of retention and test anxiety.

**Poster 314**

**Investigating the Efficacy of Manipulatives in Enhancing Comprehension of the Electron Transport Chain and Chemiosmosis in Asynchronous Anatomy & Physiology Online Courses**

Nathaniel King, Polk State College, nking@polk.edu

In the rapidly evolving landscape of online education, asynchronous courses have become increasingly prevalent, necessitating innovative active learning approaches to enhance student comprehension of complex biochemical processes. This research investigates the potential impact of manipulatives on understanding the electron transport chain (ETC) and chemiosmosis, pivotal concepts in biochemistry, within asynchronous online learning environments. Preliminary results suggest that incorporating manipulatives positively influences students’ understanding of the ETC and chemiosmosis in the asynchronous anatomy and physiology 2 courses. Additionally, qualitative feedback from participants highlights the perceived benefits of interactive learning tools in fostering a deeper conceptual grasp of these biochemical processes.

**Poster 315**

**Can Content Reinforcement of Anaerobic and Aerobic Energy Systems in Second-Year Kinesiology Students Improve Knowledge Retention?**

Paul Chahal, MacEwan University, chahalp@macewan.ca

Physiological knowledge retention in Kinesiology students has not yet been investigated. To improve long-term knowledge in Kinesiology, amongst many interventional strategies (Narnaware, Y., 2021; Narnaware and Neumeier, 2023), the impact of content reinforcement as one of the interventional strategies was evaluated in the present study. The results demonstrate that even though knowledge of anaerobic and aerobic energy systems was week-specific, it was lowest in the first two weeks. However, it did improve over the next four weeks, indicating that content reinforcement strategies can be used as an interventional tool to improve long-term knowledge retention in Kinesiology students.

*continued on next page*
Poster 316

**A Free, Open Educational Resource Medical Terminology Textbook**

Jim Hutchins, Weber State University, jimhutchins@weber.edu  
Co-Authors: Justin Burr, Weber State University, justinburr1@weber.edu, Travis Price, Weber State University, tprice@weber.edu, Jordan West, Weber State University, jordanwest@weber.edu, Misty Allen, Weber State University, mallen4@weber.edu  
We have created a free, adaptable, open educational resource textbook of Medical Terminology which is available to anyone who wishes to use it.

Poster 317

**State of the Classroom: Impact of Adverse Childhood Experiences at a 4-Year University**

Juanita Jellyman, California State Polytechnic University, Pomona, jkjellyman@cpp.edu

The current study determined the incidence of adverse childhood experiences and the well-being (social connectedness, loneliness, stress, anxiety, depression) of 513 freshman and transfer students at a four-year University. The results highlight the importance of understanding the prevalence and impact of violence, victimization, and other forms of trauma on student learning. Potential actions to take in an A&P classroom to create a learning environment in which students feel safe to take risks and make mistakes will be discussed.

Poster 318

**Impact of Integrated Virtual Anatomical Laboratory Sessions in Nursing Curriculum**

Kiara Ukrainetz, MacEwan, ukrainetzk3@mymacewan.ca  
Co-Authors: Raj Narnaware, MacEwan University, naranwarey@macewan.ca, Melanie Neumeier, MacEwan University, neumeiern@macewan.ca, Sarah Cushieri, University of Malta, cushieri@um.edu.mt  
With the decreased use of Cadavers in anatomy classes across Canadian nursing programs due to strict ethical approvals, lack of donors' programs, lab space and reduced dissection hours, universities must find alternative methods to deliver effective and realistic learning (Narnaware & Neumeier, 2021). In our preliminary qualitative study, 15 virtualized laboratory sessions were available to students throughout the semester, with the freedom of completing the sessions on one's own schedule. Virtual labs are proven to be effective at increasing anatomical retention amongst nursing students and should be a component of anatomy classes across Canada.

Poster 319

**An Undergraduate Human Anatomy & Physiology Lab Overhaul: Was it worth it?**

Mikaela Drake, Butler University, mldrake1@butler.edu  
Co-Author: Michele Moore, Butler University, mnmoore1@butler.edu  
Our students were the catalysts for change in our lab curriculum. Through annual student feedback, we recognized the necessity to offer more clinically relevant, hands-on, and realistic content at the undergraduate level. Over the past 5 years, we have vastly changed the landscape of our lab curriculum to meet these evolving student needs. The purpose of this study is to compare student perceptions of the effectiveness of different learning modalities (textbook images, plastic models, an online interactive lab manual, virtual cadaver dissection technology, and a fresh tissue cadaver lab experience) offered in an undergraduate Anatomy & Physiology course.

Poster 320

**Neuroscience in A&P Classes: An Interdisciplinary Approach**

Maria Puigbonet, Georgian College, Maria.Puigbonet@GeorgianCollege.ca  
Human Anatomy & Physiology is a foundational discipline in academic programs worldwide. The nervous system is found to be relevant in understanding human and technological evolution. Consequently, neuroscience has emerged as an interdisciplinary hub for areas of study such as AI, behavior, cognition, marketing, and more. Despite its growth, transitioning students have no awareness of neuroscience. To bridge this divide, I implemented an interdisciplinary initiative at our college, the Neuroscience Fair. The event encourages collaborative learning and critical thinking; and, also serves as an outreach platform to expose high school students invited to attend. This conference-style event ignited passion among students, fostered literature research skills, promoted impactful presentations, and increased awareness.
Poster 321
Answer-Changing Behavior of Students in an E-proctored Anatomy and Physiology (A&P) Exam
Justin Burr, Weber State University, justinburr1@weber.edu
This study aims to investigate the answer-changing behavior of students in an e-proctored Anatomy and Physiology (A&P) exam. The research focuses on understanding the frequency and reasons behind students altering their responses during the exam. The study seeks to identify patterns in answer changes, exploring potential correlations with exam difficulty, time constraints, and individual student characteristics. Findings from this research may contribute valuable insights into the dynamics of online exam-taking behavior, informing educational strategies and e-proctoring methodologies to enhance the integrity and fairness of virtual assessments.

Poster 322
Incidence of Cruciate Ligament Injuries in Saudi Professional Soccer League in the Past 20 Years
Khaleel Alyahya, King Saud University, alkhaleel@ksu.edu.sa
This study aims to report the incidences and causes of cruciate ligament (CL) injuries in the Saudi professional soccer league in the past 20 years. Additionally, this study is also aimed to measure the association of the most common causes of injuries with age and the rate of injury recurrence in the Saudi professional soccer league. This descriptive epidemiology study combines published information online, TV news, and newspapers, about players and teams in Saudi Professional Soccer League from the year 2000 to 2020. Data were analyzed with graphs and tables of CL injury incidence by club type, frequency of matches, the position of players, age, and causes of injury. In addition, we also assess the recurrence of injury among the players. Our results revealed that CL injury is common among players in the Saudi professional soccer league. Contact with other players or opponents is the leading cause of this injury (61.9%). In terms of players’ position and CL injury, the center midfielder is more susceptible (34.9%) than players in other positions. Age-wise, young players between 20-25yr (42.9%) and 25–30 years (39.7%) of Soccer age sustain more injuries than older players (14.3%). The incidence of injury among Saudi players during this time was higher than that recorded for the non-Saudi professional player. In our study, we found that CL injury is established among players in the Saudi professional soccer league most of which was due to contact with another player. Our findings can serve as a valuable reference to understand how the frequency of participation in the match, and pressure from media and fans could affect players’ performance and contribute to the cause of injury.

Poster 323
Induced Thyroid Dysfunction Effect on Alveolar Bone Height and Gut Microbial Composition
Lucia Thompson, Southern Illinois University Edwardsville, lutchom@siue.edu
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Evidence indicates that a bidirectional relationship exists between thyroid dysfunction and gut dysbiosis. An imbalance of microorganisms prevents effective metabolic and maintenance processes in the gut and influences peptide signaling from enteroendocrine cells (EECs). Disruptions to these functions are associated with thyroid disorders, such as hyper- and hypothyroidism. Thyroid dysfunction and dysbiosis of the gut microbiome are also associated with periodontal disease, which can be characterized by alveolar bone loss.

Poster 324
Hook Them with Histology!
Cathy Whiting, University of North Georgia, cathy.whiting@ung.edu
Co-Author: Estacia Lawhorn, University of North Georgia, ellawh9613@ung.edu
While histology is often a challenging topic for undergraduate A&P students, you can make it both interesting and relevant for them. We will outline three key components to our approach to teaching histology. First, we will describe an interactive lab activity designed to introduce the four tissue types and stimulate higher-order thinking. Second, we will discuss effective strategies for integrating histology across the curriculum. Finally, we will illustrate several examples of how to connect the study of microscopic anatomy to real-life applications.

continued on next page
Session 4: Monday, May 27 from 2:15 - 3:15 pm

Poster 401
How Much Physiology Do Fourth-Year Nursing Students Really Remember?
Sharlini Purani, MacEwan University, puranis@mymacewan.ca
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Concerns about nursing students’ physiological knowledge loss prompted a study assessing knowledge decline over their four-year Bachelor of Science in Nursing program at MacEwan University. This study aims to assess knowledge loss in fourth-year nursing students. Fourth-year students were tested on ten organ systems using Kahoot quizzes, and scores were compared to first-year students. The study revealed a general reduction in knowledge loss; however, variations exist among systems. Knowledge loss reported was significantly lower than previously reported in medical and allied health students (Pourshanazari et al., 2013). Differences between the fourth and third years were insignificant (Narnaware Y., 2021).

Poster 402
The Heart of the Matter
Shreya Kurella, MCPHS University, shreyakurella@gmail.com
This case study was developed to be used as an in-depth learning tool to help undergraduate students better understand the electrical and mechanical events of the heart. The study explores Wolff-Parkinson-White (WPW) Syndrome in April, a pregnant woman, in order to understand cardiac function in relation to arrhythmias, physiology, and potential diagnostic and treatment methods. In addition to gaining an understanding of the cardiovascular system, both pharmacological and surgical methods are explored to remedy April’s heart function.

Poster 403
Undergraduate Student Conceptions and Sources of Knowledge of Reproduction and Pregnancy
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In light of the US Supreme Court’s overturning of Roe v. Wade, the study investigates undergraduate students’ understanding of reproductive physiology and the sources of that knowledge, using the JAMA Benchmarks as a framework. We surveyed students on their knowledge and sources of this information, analyzing 72 responses through multiple coding rounds. Findings revealed significant misconceptions about pregnancy and embryonic development, with a majority of information derived from non-expert sources. Only one question aligned with current Anatomy and Physiology learning outcomes, highlighting the need for educational adjustments to better inform future voters and leaders on reproductive health and rights. This research underscores the importance of revising educational content to address reproductive misconceptions and enhance informed decision-making among undergraduates.

Poster 404
Circle of Willis Variations and Features in an American Midwestern Cadaver Population
Swathi Sridhar, Kansas City University, swathi.sridhar@kansascity.edu
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The Circle of Willis (CoW) shows significant variation throughout populations. CoW arteries were analyzed with a dissection microscope on 25 Midwestern (U.S.) cadavers with diameter and length compared to gender and body mass index (BMI). 92% of CoWs showed variation with eight variants not seen in a recent comprehensive classification system produced by systemic review. Male average artery diameter and length were both greater in five arteries (p<0.05); female average diameter was greater in two arteries (p<0.05); and average diameter in obese/overweight BMI was greater in two arteries (p<0.05). The study adds to the anatomical literature in a Midwestern cohort.
Poster 405
I Can't See Things Clear
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This case study was created to help undergraduate students learn about the anatomy and physiology of the eye and its relationship to the visual cortex. This study follows a 70-year-old female diagnosed with optic neuritis. Students will use their prior knowledge of the anatomy and physiology of the nervous system and the special sense of vision to provide a better understanding of optic neuritis. By combining previous knowledge and newly acquired knowledge, students will identify the cause of the ensuing blurry vision experienced by the patient and describe the sensory pathway of vision.

Poster 406
Learning from the Dead: Using Cadaver Dissection to Identify pathological Structures and Determine the Cause of Death.
Kebret Kebede, Nevada State University, kebret.kebede@nevadastate.edu
Anatomy education is a fundamental component of medical and healthcare curricula, providing students with a foundational understanding of the human body. Traditional cadaver dissection remains a cornerstone of anatomical learning. However, incorporating the identification of pathological tissues during the dissection session offers a unique and clinically relevant dimension to undergraduate anatomy education. Cadaver dissection has been a cornerstone in medical education, providing invaluable insights into human anatomy. This study explores an innovative approach to enhance the educational value of cadaver dissection by integrating the identification of pathological structures to determine the cause of death. Over the span of 4 years 120 Upper division Medical Gross Anatomy students have dissected 24 cadavers, and at the conclusion of the dissection session they were given the assignment of reporting and explaining the pathological findings present in their cadavers and base those findings in determining the cause of death of their cadavers.

Poster 407
Student Buy-In for Small Group Guided Inquiry Activities in a Pedagogically Transparent Community College Classroom
Rebecca Westphal, Cape Cod Community College, rwestphal@capecod.edu
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Students achieve greater learning gains in active learning compared to lecture-based classrooms. We explored the degree to which students reported "buy-in" to active learning in a pedagogically transparent classroom. Implementation of pedagogical transparency involved explicitly, and repeatedly, sharing with students why guided-inquiry activities were planned instead of lecturing. We hypothesized that pedagogical transparency and repeated exposure to guided-inquiry activities would lead to increasing student buy-in. Using surveys we discovered that student buy-in was already high at the outset and persisted through the end of the semester. Student comments provided additional insight into the aspects of active learning they appreciated.

Poster 408
Laying the Foundation for Successful Future Healthcare Students: The Importance of Basic Science Education
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As basic science faculty teaching pre-health majors, we recognize the struggles students face when dealing with challenging topics in anatomy and physiology. However, we often do not assess the importance of these foundational sciences in our students' journey to their career as future healthcare professionals. To address this, we will survey our current graduate students taking Physiology, Histology and Neuroanatomy courses in order to identify additional supplemental resources based on their needs and interests. This will allow us to implement changes in our courses and possibly curriculum to optimize student learning and better prepare them for their future careers.

continued on next page
Implementation of concept mapping to improve student self-efficacy and concept understanding in lower division undergraduate Anatomy and Physiology classes.
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Co-Authors: Chasity O’Malley, Wright State University Boonshoft School of Medicine, chasity.omalley@wright.edu, Ron Gerrits, Milwaukee School of Engineering, gerrits@msoe.edu, Suzanne Hood, Bishops University, shood@ubishops.ca, Vicky Rands, Salt Lake Community College, Vicky.Rands@slcc.edu, Murray Jensen, University of Minnesota, msjensen@umn.edu
During Fall 2023 semester, students in a lower-level Anatomy and Physiology classroom transitioned from a traditional lecture format to implementation of active learning. Concept mapping was used to scaffold old content and new content with the aim of helping students comprehend Anatomy and Physiology and succeed in the course. While improved performance was the primary aim, the study also assessed changes in students’ self-confidence and self-efficacy. This study evaluated student artifacts, scores and surveys. Findings will be discussed in the poster.

Increased Course Structure in a Hybrid Human Anatomy Laboratory Class Utilizing Cooperative Learning Increases Success of Underrepresented Minority Students
Sherrie Gallipeau, San Joaquin Delta College, sherrie.gallipeau@deltacollege.edu
Despite increasing access to higher education, underrepresented minority (URM) students underperform in STEM hybrid courses. Consequently, the rise in hybrid education may negatively impact existing achievement gaps between URM and non-URM students. With increasing hybrid course offerings in a post-pandemic world, studies examining pedagogy that increase URM student success are needed. This study shows that increasing course structure by using weekly preparatory and practice assignments, in-person cooperative active learning activities, and low-risk assessments increased lab exam scores of all students as well as URM students. These results support previous studies indicating that active-learning pedagogy positively impacts URM student STEM success.

The Impact of Cooperative Quizzes on Test Anxiety and Course Completion Rates in a Community College Level-1 A&P Course.
Will Jonen, Delaware County Community College, wjonen@dccc.edu
Co-Authors: Ron Gerrits, Milwaukee School of Engineering, gerrits@msoe.edu, Suzanne Hood, Bishops University, shood@ubishops.ca, Murray Jensen, University of Minnesota, msjensen@umn.edu, Chasity O’Malley, Wright State University, chasity.omalley@wright.edu, Vicky Rands, Salt Lake Community College, Vicky.Rands@slcc.edu
This study investigates the efficacy of cooperative quizzes in reducing test anxiety and improving course success rates among community college students. Test anxiety was measured using a mini-SPIN survey provided by the RECAPER project. 20 students completed pre-semester and post-semester surveys. Statistical analyses revealed no significant difference (Student’s t-test, p>0.05) in test anxiety levels or success rates between the two groups. These findings suggest that cooperative quizzes may not offer significant advantages in reducing test anxiety or improving course outcomes compared to traditional quiz formats. Nevertheless, students’ responses indicated that cooperative quizzes had a positive impact on their learning.

Empowering Voices, Elevating Equity: A Review of Student-Generated Videos
Melanie Schroer, Stockton University, melanie.schroer@stockton.edu
The persistent inequities entrenched in education may be either inadvertently perpetuated or purposefully mitigated through the efforts of dedicated educators. The design of assessments emerges as a crucial tool through which educators are empowered to promote a more equitable learning experience for their students, and therefore act to dismantle the barriers they face. This study reviews the literature on one assessment design: student-generated videos (SGVs). The poster summarizes how the process of creating their own educational content impacts students’ affective and cognitive learning, and facilitates progress toward more equitable and inclusive learning environments.

continued on next page
Poster 413

Benefits of undergraduate TA in regional campus ‘satellite class’
Nicole Krauss, University of Connecticut, nicole.krauss@uconn.edu
Co-Author: Emelis Santos, University of Connecticut, emelis.santos@uconn.edu
This study explores the effectiveness of integrating Undergraduate Teaching Assistants into regional campus ‘satellite classes’ to provide support for students. “Satellite” classes involve live or recorded lectures broadcasted from the main campus to regional campuses. In this case, Anatomy and Physiology was taught at the University of Connecticut’s main campus, Storrs, and students at the regional Waterbury campus joined lecture remotely. However, one of the consequences of offering a hybrid manner is that the Waterbury students experience isolation. To address this, the role of the undergraduate TA is crucial, as they share strategies for success in navigating this hybrid course.

Poster 414

Disease Breakout Rooms in Anatomy and Physiology Instruction
Nazish Siddiqi, Chamberlain University, nsiddiqi@chamberlain.edu
Two major challenges instructors face while delivering anatomy and physiology content online are, lack of student interaction and relating classroom learning to clinical courses. To overcome these challenges, small breakout room activities were designed. These ‘Disease Breakout Rooms’ serve various purposes. They improve classroom interaction, connect dots between sciences and clinical side, make learning meaningful by comparing ‘normal with abnormal’, and give students an opportunity of ‘public speaking’ early in their nursing program. This tool was utilized in virtual synchronous classrooms when we moved to online instruction in 2020. Since returning to campus, this activity is being conducted in our newly designed hybrid classrooms.

Poster 415

Leveraging Extended Reality: Augmented Reality (AR), Virtual Reality (VR) Technology to Enhance Students’ Engagement
Opeyemi Odewale, QCC, oodewale@qcc.mass.edu
Extending reality, such as augmented reality (AR) and virtual reality (VR) in education provides students with a practical scenario beyond the traditional classroom and textbooks. Leveraging extending reality technology in education promotes engagement and enhances learning experiences.

Poster 416

Why Can’t I Breathe Normally
Michael Wenzel, MCPHS University, mwenz1@stu.mcphs.edu
Co-Authors: Matthew Gochan, MCPHS University, Matthew.Gochan@mcphs.edu, Nalini V. Broadbelt, MCPHS University, Nalini.Broadbelt@mcphs.edu
This case study was developed to understand why Michael’s respiratory system was not functioning as it should. Analysis of Michael’s medical history and diagnostic tests were used to understand the pathophysiology and prescribed treatments. In addition to gaining an in-depth understanding of the respiratory system, the cardiovascular system was examined to explain physical appearance and symptoms of the neonate’s APGAR score. Anatomy and physiology students working on this case will build upon prior knowledge as they integrate these two systems in their analysis.

Poster 417

Staying Hydrated - A Comparative Analysis of Humectants in Human Tissue
Rachel Prince, Brigham Young University, rachprince45@gmail.com
Co-Author: Joseph Monsen, Brigham Young University, jmonsen00@gmail.com
Humectants are a class of compounds that attract and retain water within tissue. When mixed with water, humectants prevent desiccation of cadaveric specimens. We utilized wet-dry analysis to compare the effects of four humectants on water retention in human cadaveric tissue including brain, cardiac muscle, liver, lung, skeletal muscle, and skin. Using a concentration gradient for each humectant we identified the optimal concentrations of each compound for water retention, then we compared retention at these concentrations of each humectant under standardized conditions. We show that all types of cadaveric tissues submerged in concentrations of 13-15% glycerol retained the most water.
Atypical variations found within the deep gluteal region

Skylar Arwood, Northern Illinois University, arwood032@gmail.com

Co-Author: Kara Coffman-Rea, Northern Illinois University

Variations related to the sciatic nerve and its surrounding structures are well-documented, relevant for certain medical procedures, and identified as contributors to pathological conditions. This case report describes an anatomic abnormality involving the bilateral presence of a double piriformis, absence of a sciatic nerve (tibial and common fibular nerves never within a shared sheath), and atypical course of the inferior gluteal vessels, perforating the right tibial nerve. Documentation of atypical anatomy can help improve treatment and diagnosis.

A study on Anorectal Malformations (ARM): Case Presentations and Implications

Shilpa Karkera, Trinity Medical Sciences University, skarkera@tmsu.edu.vc

Anorectal malformations encompass a spectrum of congenital anomalies affecting the distal anus and rectum in both sexes. In this study we included 3 cases of ARM, a 1-month-old female patient with translocation Down syndrome presented with recto-vestibular fistula and absence of anal opening; A 3-month-old patient with suspected cloaca and left kidney hydronephrosis; and a 6-month-old patient with suspected cloaca and associated anomalies. All cases underwent specific surgical interventions tailored to their unique presentations. A definitive repair was performed for the female recto-vestibular fistula. The primary objective was to investigate the different types of ARMs and utilizing karyotyping to detect any anomalies.

Quantifying sweat gland activity via electrodermal activity.

Andras Dobai, Carleton University, AndrasDobai@cunet.carleton.ca

Co-Authors: Casey Higginson, Carleton University, CaseyHigginson@cmail.carleton.ca, Rozlyn Dakin, Carleton University, RoslynDakin@cunet.carleton.ca, Iain McKinnell, Carleton University, IainMcKinnell@cunet.carleton.ca

Methodological approaches for monitoring the activation of eccrine sweat glands, include iodine-infused cotton paper/linen paper that monitor the density of glands, and gravimetric methods measuring average rate of sweating over a given area. Limitations of these methods include high intra-individual variability, and a lack of real-time sensitivity. Other methods like infrared optical monitoring are more accurate, but not cost effective for classroom use. Here we report the use of electrodermal activity as a sensitive, convenient and cost-effective method for quantifying sweat gland activity. Our model is statistically validated, and the methodology simple to apply in research and classroom settings.

Community College Student Attitudes of Evidence-Based Instructional Practices

Brian Shmaefsky, Lone Star College - Kingwood, brian.r.shmaefsky@lonestar.edu

The research presented in this poster session is part of the NSF Funded (IUSE 2111119) HAPS Community College Anatomy and Physiology Educational Research Program (CAPER). In this study, community college students were surveyed about their apprehension levels and satisfaction levels with evidence-based instructional practices (EBIP). The study focused on cell biology, molecular biology, and toxicology content covered in health professions and human sciences classes. The results underline that certain EBIPs cause student anxiety and disconnect in certain populations of students. In these student populations, the EBIPs are counterproductive to learning. Suggestions are made to help faculty select optimal instructional strategies.

A&P I Content Retention Trends: Ongoing Effects of the Pandemic Covid Slide

Youlonda FitzGerald, Texas Woman's University, yfitzgerald@twu.edu

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

This longitudinal perspective continues to assess whether university matriculation or method of instruction lead to differences in retention of core A&P I content in the post-pandemic era, and changing patterns as the educational landscape returns to pre-pandemic norms. Previous data indicated that significant differences were between the year, university, and mode; year and university; and university (p=.039, p=.004, and p=.001 respectively). New variables of an online synchronous component requirement and peer tutoring are investigated for effects on learning trends, to help inform whether this pedogeological change can further improve retention rates in our students.
Poster 423
The Effects of Study Sessions and Gamification on Nursing Student Anatomy and Physiology Course Outcomes
Leslie Worrell, Chamberlain University, lworrell@chamberlain.edu
A firm understanding of anatomy and physiology is crucial for students that wish to become registered nurses. Though many nursing students enjoy the biomedical sciences, they tend to perform poorly and show poor retention long term. To help combat this issue, a series of optional study sessions using a combination of guided discussions and Virtual Quizzes over didactic topics were developed. Students that chose to attend these study sessions were shown to have greater scores on comprehensive examinations at the end of the Anatomy & Physiology Course Series. With the rapid development of new and innovative technologies that can be easily introduced into the classroom, instructors must continue to develop and implement new methods of support for students to support their learning and understanding of topics. By using resources such as Virtual Quizzes, students are more likely to succeed on assessments and in turn, be less likely to attrit from a nursing program.

Poster 424
A model of active learning in Anatomy and Physiology in the first year curriculum
Zachary Murphy, St. John Fisher University, zmurphy@sjf.edu
Co-Authors: Kaitlin Bonner, St. John Fisher University, kbonner@sjf.edu, Sarah Casper, St. John Fisher University, scasper@sjf.edu
Teaching anatomy and physiology during the first year presents a host of challenges including difficulty of content, a student population not prepared for college courses out of secondary education, while meeting a need to meet industry standards. Here we present a model for engaging students via active learning, direct instruction of study techniques, and backwards design for pre-nursing and allied health professions students. We will present our model and preliminary results and analysis. In addition, our approach uses an open education resources approach. Teaching anatomy and physiology during the first year presents a host of challenges including difficulty of content, a student population not prepared for college courses out of secondary education, while meeting a need to meet industry standards. Here we present a model for engaging students via active learning, direct instruction of study techniques, and backwards design for pre-nursing and allied health professions students. We will present our model and preliminary results and analysis. In addition, our approach uses an open education resources approach.
April 1, 2024

On behalf of Southern Illinois University Edwardsville, it is my pleasure to extend a warm welcome to St. Louis and to our Edwardsville campus. SIUE is proud to host programming for the Human Anatomy and Physiology Society’s annual meeting. We are delighted to have you join our vibrant community!

I encourage you to embrace the spirit of curiosity and exploration that defines our institution. At SIUE, we firmly believe in the transformative power of higher education. In particular, through our excellent programs in nursing, applied health, pharmacy, and dental medicine, SIUE is committed to providing high-quality, accessible, and affordable academic and clinical training to the next generation of healthcare professionals and leaders.

As such, we are especially excited to host science educators who share our commitment to student-centered, responsive pedagogical practices. Thank you for taking the time to connect with colleagues and explore best practices that will shape current and future learners.

I invite you to immerse yourself in all that our university has to offer. Explore our beautiful 2,660-acre campus and engage with our community. There is much to enjoy, including the Gardens at SIUE, a 36-acre public botanical garden located east of the core area of the university. Additionally, the Madison County Transit Trail System runs through our campus, an optimal way to enjoy our scenic, wooded, rolling hills.

Once again, welcome to Southern Illinois University Edwardsville. We are thrilled to have you here and we wish you a productive, rewarding conference!

Sincerely,

James T. Minor, Ph.D.
Chancellor
Don’t forget to attend the HAPS Committee Meetings!
Become more involved with HAPS by joining a committee.

Tuesday, May 28:
Southern Illinois University - Edwardsville, 11:45 AM – 12:15 PM

- Awards & Scholarship – Founders Hall (FH) 0306
- Anatomical Donor Stewardship – Founders Hall (FH) 1408
- Communications – Founders Hall (FH) 2211
- Conference – Founders Hall (FH) 2300
- Curriculum & Instruction – Founders Hall (FH) 2409
- Diversity, Equity, and Inclusion – Founders Hall (FH) 3302
- Fundraising – Founders Hall (FH) 3408
- HAPS Educator Journal - Founders Hall (FH) 3115

USE ONLINE MEDICAL NEWS TO BRING EXCITEMENT TO COMMUNITY COLLEGE LIFE SCIENCE CLASSES!

Teachable Medical News on the web as teachmedicalnews.com

- Teachable moments list for teachers!
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- Searchable by organ system or disease!
- The use of online news make better connections with students!
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- Connects complex material to everyday events!
- Free resource from Eleasys, LLC. No cookies!
# Bus Time Schedule

The hotel is roughly a half hour from the University. Please keep that in mind when planning your travel to and from the various locations.

### TUESDAY, MAY 28

<table>
<thead>
<tr>
<th>Time</th>
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<tr>
<td>7:00 - 9:00 AM</td>
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<td>6:45 AM</td>
<td>Bus 1V leaves Marriott for SIUE</td>
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**9:00 AM - 5:00 PM**  
Every half hour each location will have a bus there to transport an attendee either to and from the Marriott and/or SIUE.

**5:00 PM - 7:15 PM**  
(if bus is at capacity, it will leave earlier than scheduled time)

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### WEDNESDAY, MAY 29TH

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**3:50 PM - 6:00**  
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**Workshops at a Glance 5/28 – A**

Workshop = Letter and three-digit number; Building = FH (Founders Hall), SW (Science West), or AH (Alumni Hall); Room = four-digit number.

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<thead>
<tr>
<th>Workshop</th>
<th>Title</th>
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<tbody>
<tr>
<td>A101 (FH 0310)</td>
<td>Interprofessional Education in Anatomy and Physiology: Incorporating Diverse Health Science Perspectives into Courses That Are Taught Within Multiple Health Science Disciplines</td>
<td>Edgar Meyer</td>
</tr>
<tr>
<td>A201 (FH 0207)</td>
<td>Climbing Blooms Pyramid: Modifying Activities for All Levels of A&amp;P</td>
<td>JT Cornelius</td>
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<tr>
<td>A301 (FH 0207)</td>
<td>Exploring Appetite: regulation, dysregulation, willpower, and drugs</td>
<td>David Temme</td>
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<tr>
<td>A401 (FH 0207)</td>
<td>Learning Action Potentials with legos</td>
<td>Andrew Corless</td>
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<tr>
<td>A501 (FH 0207)</td>
<td>The Impact of Effective Study Strategies in Anatomy and Physiology Courses</td>
<td>Jeffrey Kingsbury</td>
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<tr>
<td>A601 (FH 0306)</td>
<td>Implementing Inclusive Teaching Practices in Anatomy and Physiology Labs</td>
<td>Jennifer Stokes</td>
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<tr>
<td>A102 (FH 0207)</td>
<td>How Can We Help Our Students Succeed? Identifying the Reasons Students Fail A&amp;P and Interventions to Improve Student Success</td>
<td>Mark Tran</td>
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<td>A202 (FH 2409)</td>
<td>Technology in the Classroom Award Winner</td>
<td>Sam Drogo</td>
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<td>A302 (FH 3408)</td>
<td>Exploring Appetite: regulation, dysregulation, willpower, and drugs</td>
<td>Danielle Edwards</td>
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<tr>
<td>A402 (SW 0325)*</td>
<td>Love It or Fix It: Top Tricks and Tools for Your Anatomy Lab</td>
<td>Abbey Breckling</td>
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<tr>
<td>A502 (SW 0325)*</td>
<td>Using our (Sheep) Brains to Teach Anatomy: The ADS Support Team</td>
<td>Jeremy Grachan</td>
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<tr>
<td>A602 (SW 0325)*</td>
<td>Surface Anatomy of the Human Brain: How to Get it Right When Most of us are Getting it Wrong</td>
<td>Christine Eckel</td>
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<tr>
<td>A103 (AH 2401)</td>
<td>Hitting the bullseye: Case examples for how to create learning objectives, activities, and assessments that encompass more than one level of Bloom’s Taxonomy</td>
<td>Anya Goldina</td>
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<td>A203 (AH 2401)</td>
<td>Sponsored by Anatomage &amp; Anatomy in Clay A Hands-On, Active Learning Approach to Teaching Anatomy Using Multiple Resources</td>
<td>Lynne Ross</td>
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<tr>
<td>A303 (FH 0306)</td>
<td>Implementation of Diversity and Inclusive Pedagogies in Human Anatomy and Physiology: A Systems Approach</td>
<td>Burhan Gharibeh</td>
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<tr>
<td>A403 (FH 3115)</td>
<td>Sponsored by Cengage Belonging in the A&amp;P classroom</td>
<td>Liz Co</td>
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<tr>
<td>A503 (FH 3115)</td>
<td>Sponsored by Cengage Big/Small, Short/Long, Deep/Shallow</td>
<td>Liz Co</td>
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<tr>
<td>A603 (FH 3302)</td>
<td>HAPS Conference Travel Award Winner A Journal Club Project to promote teamwork and read the primary literature</td>
<td>Patrick Cafferty</td>
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<tr>
<td>A104 (FH 3302)</td>
<td>The Art of Fostering Synergy in Team Dynamics</td>
<td>Aymen Arain</td>
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<tr>
<td>A304 (FH 2300)</td>
<td>From Basic Sciences Teacher to Medical Student: Enhancing Undergraduate Anatomy and Physiology Education to Bridge Gaps in Graduate-Level Preparedness</td>
<td>Katlynn Kenon</td>
</tr>
<tr>
<td>A404 (FH 2300)</td>
<td>Anatomy Unveiled: Exploring The Wonders Within the Human Body Through Dissection</td>
<td>Adalyne Singh</td>
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<tr>
<td>A504 (FH 2300)</td>
<td>Empowering Diversity: Nurturing Underrepresented Minorities and their Pathway to a Career in Healthcare</td>
<td>Katlynn Kenon</td>
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<tr>
<td>A604 (FH 2300)</td>
<td>HAPS Conference Travel Award Winner The Histo-Kitchen</td>
<td>Andrew Stewart</td>
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<tr>
<td>A105 (FH 2211)</td>
<td>The Heart of Learning</td>
<td>Cathy Whiting</td>
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<tr>
<td>A205 (FH 2211)</td>
<td>RAAScinating Connections: Blood Pressure Regulation and Beyond</td>
<td>Josie Ayers</td>
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<td>A305 (FH 2211)</td>
<td>Marieb, Hoehn, Haymes, and Abbott Award Winner for Diversity, Equity, and Inclusion A Sanctuary for All: Finding Community and Building Metacognitive Skills in A&amp;P Boot Camp</td>
<td>Jessica Cisneros Lerma</td>
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<td>A405 (FH 3302)</td>
<td>Sponsored by McGraw Hill 6 Ways Students Learn</td>
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<td>B or Better in A&amp;P: Tools That Help Students Reach Their Long-term Goals</td>
<td>Steve Sullivan</td>
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<tr>
<td>A605 (FH 1408)</td>
<td>Reasons Why Students May Withdraw from Online Courses</td>
<td>Nahel Awadallah</td>
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## WORKSHOPS AT A GLANCE 5/28 – A

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<td>Addressing Entering Competencies within Physiology Concepts and Equity in Medicine with HHMI BioInteractive’s Sickle Cell Disease Resources Holly Basta</td>
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<td>Curious about long-COVID? Janet Casagrand</td>
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<td>Building a laboratory TA Program from Scratch Nanette Tomicek</td>
<td>Sponsored by HAPS Meet the Board! Learn about HAPS Leadership Opportunities Tracy Ediger</td>
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A107 (FH 1408) Sponsored by ADInstruments Increasing student performance and engagement with interactive digital laboratory manuals and study guides in an introductory anatomy & physiology course James Windelborn

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<td>Enhancing Student Engagement in Online and Seated Courses Nahel Awadallah</td>
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<td>How to build the lower limb musculature for the three main nerves of the lumbosacral plexus (femoral, obturator, and sciatic), along with their associated blood supply Cary Cortese</td>
<td>Designing Manageable Two-Stage Exams in Anatomy and Physiology Courses Ryan Tubbs</td>
<td>Is Your Anatomy Laboratory Ethically Sound? A panel discussion on ethical topics in the anatomy laboratory Kelsey Stevens</td>
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A108 (FH 0306) Sponsored by Visible Body Visible Body Tips and Tricks- Get Hands On with new Immersive Assignments! Mary Ness

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<td>Virtual Flashcard Creation Primer Brandon Flom</td>
<td>Sponsored by Pearson &amp; HAPS Travel Award Winner Effective practices to support student success in anatomy and physiology courses Caitlin Burns</td>
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A109 (FH 2407) John Martin Second Timer Award Winner Maximize your gaming success with semester long competition Melanie Neumeier

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<td>Sponsored by HAPS Calling All Authors! A Special Edition of the HAPS Educator is Planned on Gamification to Promote Active Engagement in Learning A&amp;P Jackie Carnegie</td>
<td>Use Online Group and Individual Assignments to Help Students in Large Enrollment Courses Develop their Soft Skills for the Workplace Joanne Savory</td>
<td>Using Artificial Intelligence (AI) as a Personal Assistant to Write a Manuscript for the Special Edition of the HAPS Educator Brenda Del Moral</td>
<td>HAPS Conference Travel Award Winner Digital Detour: Exploring the urinary system through escape room adventure Carla Carr</td>
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A110 (FH 3408) Draw to Learn in the A&P Laboratory Michael Wood

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<tr>
<td>John Martin Second Timer Award Winner Designing A&amp;P for Impact Amanda Haage</td>
<td>Empowering Anatomy and Physiology Lab Faculty Through Clinical Skills Integration: A Focus on Cranial Nerve Testing Carley Parkinson</td>
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<td>Custom Lab Manual - Print, Digital or Hybrid Dreis Van Landuyt</td>
<td>Different Approaches on how to Incorporate Case Studies in the Instruction of Anatomy and Physiology at the undergraduate level Chinemy Anako</td>
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**Workshops at a Glance 5/29 – B**

| Workshop = Letter and three-digit number; Building = FH (Founders Hall), SW (Science West), or AH (Alumni Hall); Room = four-digit number |
|---|---|---|---|---|
| **B101 (FH 3115)**  
Knowing where You’re Going: Backward Design in A&P  
JT Cornelius | **B201 (FH 0312)**  
Do You Like Attending HAPS Annual and Regional Meetings? Learn How to Get Involved with the HAPS Conference Committee  
Edgar Meyer | **B301 (FH 0207)**  
Enabling Critical Thinking in Human Anatomy  
Bob Tallistch | **B401 (FH 0207)**  
Developing Authenticity and Vulnerability in the Classroom  
Bob Tallistch | **B501 (FH 0306)**  
Transitioning from Individuality to Inclusivity: Fostering a Culture of Student Belonging, Retention, and Success Through Strategies Across Disciplines and Teaching Modalities  
Ruby Kaur |
| **B102 (FH 0207)**  
Teachers and Tutors: A Dynamic Duo for Student Success  
Elizabeth Granier | **B202 (FH 0306)**  
Whodunnit?  
Haneen Salhiieh | **B302 (FH 0306)**  
Study By the Case Study: Various Applications of Case Studies to Promote Science Teaching and Learning  
Hisham Elbatarny | **B402 (FH 0306)**  
Flipping the Script: Unleashing the Magic of Flipped Classrooms  
Jim Davis | **B502 (FH 1408)**  
Sponsored by Carolina Distance Learning  
Decoding Blood Types: An Interactive Blood Typing Lab Experience  
Sabrina Walthall |
| **B103 (AH 2401)**  
Words Matter! ‘Say This, Not That to Your A&P Student  
Carol Britson | **B203 (FH 1408)**  
A Journey into Virtual Reality to Enhance Student Learning of Anatomy & Physiology  
Holly Young | **B303 (FH 1408)**  
HAPS Conference Travel Award Winner  
Four Ways to Build an Instructional Team to Foster Belonging and Engagement  
Jennifer Rogers | **B403 (FH 1408)**  
Make Your Physiology Labs POPs (on a budget)  
Jo Feldman Stosich | **B503 (FH 2211)**  
Props and Role Playing in Building Conceptual Models  
Sam O’Dell |
| **B104 (FH 2211)**  
Enhancing undergraduate anatomy and neuroanatomy labs with interactive HTML5 Package (H5P) content  
Burhan Gharaibeh | **B204 (FH 2211)**  
Enhancing Course Materials With Movement: How To Make Professional, Custom Animations Without Expensive Subscription Software  
Joshua Schmerge | **B304 (FH 2211)**  
Practical Implementation of Formative Assessment in Anatomy and Physiology Courses  
Justin Burr | **B404 (FH 2211)**  
Into the Unknown: Finding Meaningful Free A & P Workshops  
Kathleen Ahles | **B504 (FH 2409)**  
A Palm-Size 3D Golgi May Grab Your Attention! – On designing a variety of learning activities with tactile and creativity elements  
Santa Makstenieks |

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### Workshop at a Glance: 5/29 - B

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<td>Creating Change Agents Through Inclusive STEM</td>
<td>Kathy Burleson</td>
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<tr>
<td>B205 (FH 2409)</td>
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<td>FH 2409</td>
<td>Pros and Cons of Specifications Grading in Intro Anatomy</td>
<td>Kelly Miles</td>
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<td>View It. Do It. Write It. Teaching Anatomy and Physiology Through a Gender-Neutral Lens</td>
<td>Lacy Cleveland, Leslie Worrell</td>
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<td>Shannon Helbling</td>
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<td>Louis Kutcher</td>
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<td>B206 (FH 3115)</td>
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<td>Michelle Murphy</td>
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<tr>
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<td>Helping students avoid “gumption traps”</td>
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<td>TJ Holmberg</td>
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<td>FH 3302</td>
<td>A New Opportunity to Support Student Agency - Using Tokens in A&amp;P</td>
<td>Staci Johnson</td>
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**Note:**
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- **B206 (FH 3115):** Promoting student physiology core concept mental model development through systems thinking and modeling
- **B306 (FH 3115):** Helping students avoid “gumption traps”
- **B406 (FH 3115):** The P-value Primer: A Review of Basic Statistical Methods for Educational Research
- **B506 (FH 3115):** Building an Undergraduate Teaching Assistant Training Program: Helping Prepare Peer Teachers
- **B107 (FH 3302):** Solubility as a unifying concept for teaching human physiology
- **B207 (FH 3302):** Sponsored by HHMI BioInteractive
- **B307 (FH 3302):** A New Opportunity to Support Student Agency - Using Tokens in A&P
- **B407 (FH 3302):** Sponsored by ADInstruments
- **B507 (FH 3302):** Time to embrace simulation in ungraduated physiology laboratories?
- **B108 (FH 2409):** Marieb, Hoehn, Haynes, and Abbott Award Winner for Diversity, Equity, and Inclusion
- **B208 (FH 2409):** How I increased underrepresented minority student success in a community college hybrid anatomy laboratory course using cooperative learning and increased course structure
Workshop Abstracts

Session 1: May 28 @ 9:00 AM

A101- Interprofessional Education in Anatomy and Physiology: Incorporating Diverse Health Science Perspectives into Courses That Are Taught Within Multiple Health Science Disciplines
Edgar Meyer, University of Mississippi Medical Center, emeyer@umc.edu
Anatomy and physiology (A&P) are courses taught within different health science curricula. Students within A&P can engage in interprofessional education, learning from, with, and about one another via various desired health science careers. Students can learn ways in which different health science disciplines teach A&P to students within their respective programs. This workshop will include an overview of how A&P emphasis areas within these health science disciplines are incorporated into an essential anatomy course within a postbaccalaureate program at an academic health science center. Attendees will discuss how they share similar or different emphasis areas with students in their programs.

A102- How Can We Help Our Students Succeed? Identifying the Reasons Students Fail A&P and Interventions to Improve Student Success
Mark Tran, University of Cincinnati Blue Ash College, tranmk@uc.edu
This workshop will be structured as an open conversation and exchange of ideas around the central topic of student success rates in Anatomy & Physiology courses. We will first discuss reasons behind high failure rates in the course, and then discuss tangible solutions to the problem. The goal of this workshop is for participants to leave with a better idea of (1) the challenges faced by colleagues and students at different institutions, (2) common themes regarding student success, and (3) proven strategies that have increased student success.

A103- Hitting the bullseye: Case examples for how to create learning objectives, activities, and assessments that encompass more than one level of Bloom's Taxonomy
Anya Goldina, Elizabethtown College, goldinaa@etown.edu, Jonathan J. Wisco, Boston University Aram V. Chobanian & Edward Avedian School of Medicine, jjwisco@bu.edu
Many students enter A&P courses with varying foundational knowledge making it difficult to teach exciting, application-based concepts, leaving instructors feeling obligated to focus on the remembering and understanding levels of Bloom's taxonomy. However, challenging students with sophisticated cognitive tasks at higher Bloom's levels may serve as an impetus to help students learn concepts simultaneously at lower Bloom's levels. In this workshop, we apply concepts of an alternative conceptual framework for learning in the cognitive domain - the Bullseye - to help instructors modify their learning objectives to address combinations of remembering, understanding, applying, analyzing, evaluating and creating.

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A104- The Art of Fostering Synergy in Team Dynamics
Aymen Arain, Dr. Kiran C Patel College of Allopathic Medicine at Nova Southeastern University, aa3882@mynsu.nova.edu, Adalyne Singh, Dr. Kiran C. Patel College of Allopathic Medicine (NSUMD), as1616@nova.edu, Katlynn Kenon, Dr. Kiran C. Patel College of Allopathic Medicine (NSUMD), kk1381@mynsu.nova.edu, Ricardo Rodriguez-Millan, Dr. Kiran C. Patel College of Allopathic Medicine (NSUMD), rrodriguezmillan@nova.edu, Cheryl Purvis, Dr. Kiran C. Patel College of Allopathic Medicine (NSUMD), cpurvis@nova.edu
Our workshop is designed to enhance participants’ understanding of positive psychology and self-awareness, pinpointing their inherent strengths. Participants will begin by completing a personal preference profile test, followed by exploration of various personality types and their influence on teamwork and communication skills. The workshop will also delve into strategies for cultivating healthy group dynamics, essential for fostering effective teamwork. By utilizing their unique newfound knowledge, team members can harness the power of diversity. The goal of our session is to create awareness, understanding and appreciation, embracing different cultures and perspectives to maximize productivity and success within the academic landscape.

A105- The Heart of Learning
Cathy Whiting, University of North Georgia, cathy.whiting@ung.edu, Josie Ayers, University of North Georgia, jgayer4588@ung.edu, Andrea Galindo-Madera, University of North Georgia, agali8874@ung.edu, Estacia Lawhorn, University of North Georgia, ellawh9613@ung.edu, Michelle Madera, University of North Georgia, mmade9128@ung.edu
Creating an engaging active learning environment facilitates student success. Teaching strategies that encourage growth mindsets, develop metacognitive skills, and build trust foster a student’s willingness to engage in active learning. As a result, students experience meaningful learning that provides them with a solid foundation on which to build their knowledge base as they continue their journeys as life-long learners. Join us in this workshop as we demonstrate techniques that we utilize to facilitate student engagement and promote deeper understanding of course content.

A106- Addressing Entering Competencies within Physiology Concepts and Equity in Medicine with HHMI BioInteractive’s Sickle Cell Disease Resources
Holly Basta, Rocky Mountain College, holly.basta@rocky.edu, Rebecca Westphal, Cape Cod Community College, rwestphal@capecod.edu
Cutting-edge therapies for sickle cell disease make it an exciting and medically-relevant topic that ties together many physiology outcomes. This workshop models adapting HHMI BioInteractive’s resources as an interrupted case study. Participants will engage in hands-on activities, applying the central dogma to the genetics of sickle cell disease. Different treatments, including gene editing, are identified that address both causes and symptoms of the disease. Also included is a template on how sickle cell disease can be used for discussing racial disparities in medicine.
A107- Increasing student performance and engagement with interactive digital laboratory manuals and study guides in an introductory anatomy & physiology course
James Windelborn, Regis College and ADInstruments, james.windelborn@regiscollege.edu
Sponsored by ADInstruments
First-year anatomy and physiology undergraduates can struggle to utilize lab time optimally and can be overwhelmed by laboratory practical exams. Customized exercises were created on the Lt software platform to guide students through laboratory activities. Additionally, interactive study guides were created to better prepare students for lab practicals. Large increases in lab practical averages were measured with this system compared to the previous year and students exhibited increased engagement during lab sessions. In this workshop, a process for utilizing Lt and open educational resources to create interactive lab exercises and study guides will be demonstrated and practiced.

A108- Visible Body Tips and Tricks- Get Hands On with new Immersive Assignments!
Mary Ness, Visible Body, mary.ness@visiblebody.com
Sponsored by Visible Body
Join this interactive and hands on session to get tips and tricks on using Visible Body’s 3D interactive anatomy and physiology software. Current and interested users of Visible Body's 3D anatomy and physiology are invited to join this session led by trainer Mary Ness. We'll dive into the new Immersive Assignments platform and discuss tips and tricks to customize and share content, including flashcards on web and mobile and easy sharing in and outside of class via QR codes. Bring your computer and/or mobile devices so you can get hands on!

A109- Maximize your gaming success with semester long competition
Melanie Neumeier, MacEwan University, neumeierm@macewan.ca
John Martin Second Timer Award Winner
Gamification is an established way to promote student engagement in the classroom, but beneficial effects may be limited to the time of the single gaming event. To overcome this limitation, I created a semester-long game to determine if increased student engagement could be maintained over a full academic term. Two health assessment classes were compared in terms of engagement and academic performance. Both classes were taught by the same instructor, played the same individual games, and used the same exams and materials. Students playing the semester-long game had significantly higher test scores, better attendance, and sustained classroom engagement.

A110- Draw to Learn in the A&P Laboratory
Michael Wood, Del Mar College, mwood@delmar.edu
Research on learning supports that students are more engaged and gain ownership of course material when they draw. Professor Michael G. Wood has incorporated drawing into his laboratory teaching with positive outcomes. In this workshop, he will share strategies for sketching in the A&P lab to foster in his students a deeper understanding of anatomical structures and physiological processes. Anyone can draw - no artistic abilities required. Join us and change the way your students learn!

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A201- Climbing Blooms Pyramid: Modifying Activities for All Levels of A&P
JT Cornelius, Indiana University School of Medicine - Bloomington, jtcornel@iu.edu,
Valerie O’Loughlin, Indiana University School of Medicine - Bloomington, vdean@iu.edu
Many colleges offer several anatomy and physiology courses, such as introductory A&P, histology, embryology, and upper-level coursework. As instructors, we utilize various classroom assessment techniques (CATs) to gauge student comprehension. These assessments interact with varying levels of Bloom's taxonomy pyramid. However, these activities are typically tailored towards one specific class. In this workshop, participants will learn how to create and scale a classroom assessment technique (CAT) based on the needs of their student populations rather than a specific course. This will include the creation of one central CAT that can scale Bloom’s pyramid to benefit all levels of A&P instruction.

A202- Innovative Use of Technology to Support Learning Outcomes in Human Physiology
Juanita Jellyman, California State Polytechnic University, Pomona, jkjellyman@cpp.edu
This workshop will describe innovative uses of technology to engage undergraduate students through active learning, practice, and immediate feedback. The workshop will focus on ways in which technology can be used to teach and assess learning outcomes in an undergraduate human physiology course.

A203- A Hands-On, Active Learning Approach to Teaching Anatomy Using Multiple Resources
Lynne Ross, Pueblo Community College, Lynne.Ross@PuebloCC.edu, Andrew Miller
Pueblo Community College, Andrew.Miller@PuebloCC.edu
Sponsored by Anatomage and Anatomy in Clay
Pueblo Community College has centralized their anatomy education resources into a single facility, the Human Anatomy Learning Center (HALC). The HALC utilizes Anatomy In Clay (TM), cadavers, Anatomage Tables and traditional anatomy models. The HALC provides customized, engaging, hands-on learning activities for students in numerous health professions career and technical education programs and biology courses. During classes in the HALC, students progress through a series of stations working in small, collaborative groups to complete curriculum relevant lesson objectives. A “Think sheet” guides the learner to the intended outcomes which allows instructors to assist students as needed. This shift to active learning pedagogy has resulted in increases in critical thinking skills as evidenced by assessment of student learning data. Eight years of student satisfaction surveys consistently rate the overall experience of learning in the Human Anatomy Learning Center between 4.8 and 5.0 on a 5 point scale.

Valerie O’Loughlin, Indiana University - Bloomington, vdean@indiana.edu, Janet Casagrand, University of Colorado - Boulder, janet.casagrand@colorado.edu, Dee Silverthorn, University of Texas at Austin, silverthorn@utexas.edu
Hear about the HAPS A&P Panel of Experts’ progress regarding developing additional versions of our HAPS A&P exams, which will have more higher order choice questions. We will provide information about the HAPS Comprehensive A&P and stand-alone anatomy exams. These exams can help you compare your class performance with others across North America, assess learning gains, and/or examine equity and diversity issues in learning. Learn more about these validated exams with their 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.
The renin-angiotensin-aldosterone system (RAAS) is a vital component of blood pressure regulation with clear connections to cardiovascular, endocrine, and nervous physiology. However, recent research suggests that this system exerts a wider range of effects than previously known, targeting multiple organs. In this workshop, we will review the RAAS pathway, incorporating current research, as we demonstrate an integrative approach to teaching this hormone cascade. Workshop participants will engage in an activity based on real-life clinical applications. By exploring RAAS beyond its traditional scope, instructors can challenge students to make extensive physiological connections, thus fostering deeper comprehension and promoting better learning outcomes.

A206- Guided Inquiry Learning: Ensuring Collaboration in Large Classrooms with Digital Technology
Murray Jensen, University of Minnesota, msjensen@umn.edu, Aravind Pochiraju, Lrnr, aravind@lrnfast.com
The benefits of active learning teaching strategies, such as guided inquiry learning, live polling, and cooperative group learning, are well-documented. However, instructor resistance to using these strategies is both prevalent and understandable. Issues such as managing student groups, printing materials, and grading difficulties related to group work can be burdensome. Moreover, these challenges become more complex with increasing class sizes. To address these concerns, we have collaborated with the Lrnr team to develop online tools aimed at managing these issues effectively and promoting equitable group work experiences for students. Our solution includes the integration of several guided inquiry activities, such as “Levels of Organization” and “Inside and Outside the Body,” into a new online tool named Guided Inquiry Learning Group Activities (GILGA). Additionally, we have created an online cooperative quiz tool that can be customized to meet instructors’ specific needs. Both the guided inquiry and cooperative quiz tools will be demonstrated in this workshop. Participants are encouraged to bring their laptops or tablets. Join us for an engaging and interactive session.

A207- Enhancing Student Engagement in Online and Seated Courses
Nahel Awadallah, Nash Community College, nwawadallah755@nashcc.edu
The presentation will explore productive strategies to engage anatomy and physiology students in online and traditional classroom settings to achieve optimal educational outcomes.

A208- Analogies of Cardiac Output
Tom Lehman, Great Falls College, tom.lehman@gfcmsu.edu
Come learn some different ways to help your students visualize ways to understand the factors that affect cardiac output. We will experiment with some demos and some hands-on examples, learning the pros and cons of each.
A209- An Innovative, Evidence-Based Transformation of Anatomy & Physiology Lab for Equity & Inclusion
Amanda Bireline, Mercy University, abireline@mercy.edu, Ferdnand Esser, Mercy University, fesser@mercy.edu
A&P national failure rates impact the student, institutional retention, and program dropout rates. Through collaborative efforts of health profession faculty, on-going work has been done to slow down and reverse these statistics. This presentation will discuss the renovation of our A&P laboratory and explain how it has promoted change. This will include multi-sensory and contextual inquiry-based learning techniques that provide a learning-centered classroom. Specifically, we will discuss changes to the physical lab space and curriculum that focuses on the infusion of captivating & engaging technology, instructor facilitation, and use of team-based and peer-assisted learning to provide a student-learning-centered environment.

A210- Designing A&P for Impact
Amanda Haage, University of North Dakota, amanda.haage@und.edu
John Martin Second Timer Award Winner
HAPS learning outcomes provide a solid foundation for content, but not instructional methods, which can be overwhelming when tasked with course redesign. This session offers a focused case study of a three-year complete revamp of an A&P sequence, incorporating flexible delivery modalities. Explore the journey of integrating teaching philosophy, external constraints, and a commitment to student learning into a course aligned with metacognition, critical thinking, and cultural competency goals. An in-depth examination of student data, including HAPS exam measures and an intercultural inventory tool, highlights the success of the chosen methods in this comprehensive A&P redesign.

Session 3: May 28 @ 12:30 – 1:30 PM

A301- Exploring Appetite: regulation, dysregulation, will-power, and drugs
David Temme, University of Utah, temme@biology.utah.edu
Hunger and satiation are conscious sensations that steer our focus either towards or away from seeking/eating food. This is appetite regulation. Appetite dysregulation revolves around the “foods” one consumes influencing appetite regulation in some disruptive/unhealthy way. Will-power is often viewed as the strength of one’s ability to override conscious sensation-based control of one’s behavior. Here, I first explore the biological role/nature of conscious sensations in general. Next, I examine the roles played by appetite regulation/dysregulation and will-power in controlling one’s feeding decisions—along with associated “health” implications. And last, I discuss emerging pharmaceutical interventions into appetite regulation.

A302- Let’s talk about the color gray: De-mystifying radiology in anatomy education
Danielle Edwards, University of Alabama at Birmingham, dned222@uab.edu
Radiology is an essential topic in gross and sectional anatomy education, but many anatomy educators struggle to include imaging in their courses due to a lack of training or confidence in reading the images. This workshop intends to build the skills of anatomy educators by 1) introducing them to key concepts in plain film (x-Ray), CT, and MR imaging, 2) use these key concepts to work through images of normal and abnormal anatomy of the knee, and 3) participate in a clinical case of the knee using the different modalities.
**A303- Implementation of Diversity and Inclusive Pedagogies in Human Anatomy and Physiology: A Systems Approach**

Burhan Gharaibeh, University of Pittsburgh, burhan@pitt.edu, Anya Goldina, Elizabethtown College, goldinaa@etown.edu, Juanita K. Jellyman, California State Polytechnic University, jjjellyman@cpp.edu, Melanie Schroer, Stockton University, melanie.schroer@stockton.edu, Cristy D. Tower-Gilchrist, Emory University, cristy.tower-gilchrist@emory.edu

Anatomy and physiology educators strive to create an inclusive curriculum and prepare students to recognize the social, historical, and cultural contexts that serve as the bases for the many challenges in their communities. HAPS has dedicated much attention to increasing our understanding of topics related to diversity, equity, and inclusion, and empowering us to teach, engage, and connect with our students. In this workshop, we will provide you with specific ways to incorporate examples of diversity into your existing curriculum, highlighting how diversity in anatomy and physiology relates to history, existing policies in the fields of education, medicine, and science.

**A304- From Basic Sciences Teacher to Medical Student: Enhancing Undergraduate Anatomy and Physiology Education to Bridge Gaps in Graduate-Level Preparedness**

Katlynn Kenon, Dr. Kiran C. Patel College of Allopathic Medicine (NSU MD), kk1381@mynsu.nova.edu, kk1381@mynsu.nova.edu, Ricardo Rodriguez-Millan, Dr. Kiran C. Patel College of Allopathic Medicine (NSU MD), rodriguezmillan@nova.edu, Aymen Arain, Dr. Kiran C. Patel College of Allopathic Medicine (NSU MD), aa3882@mynsu.nova.edu, Adalyne Singh, Dr. Kiran C. Patel College of Allopathic Medicine (NSU MD), as1616@nova.edu, Cheryl Purvis, Dr. Kiran C. Patel College of Allopathic Medicine (NSU MD), cpurvis@nova.edu

Anatomy and Physiology (A&P) are vital subjects that are taken by students in graduate and professional health programs. Although A&P is generally offered at the undergraduate level, there is a decrease in students taking these courses. A&P at the graduate level is fast-paced and goes into extreme detail, with students often becoming overwhelmed by the vast amount of material. Knowing basic A&P better prepares students for learning future pathologies, histology, and clinical reasoning. This workshop will showcase how undergraduate A&P professors can target their curriculum to better prepare students for graduate-level courses.

**A305- A Sanctuary for All: Finding Community and Building Metacognitive Skills in A&P Boot Camp**

Jessica Cisneros Lerma, University of North Georgia, jcsn0417@ung.edu, Andrea Galindo-Madera, University of North Georgia, agali8874@ung.edu, Adrian Kim, University of North Georgia, aykim@ung.edu, Michelle Madera, University of North Georgia, mmade9128@ung.edu, Daleana Reyes-Alejo, University of North Georgia, dreye4228@ung.edu, Cathy Whiting, University of North Georgia, cathy.whiting@ung.edu

Marieb, Hoehn, Haynes, and Abbott Award Winner for Diversity, Equity, and Inclusion

As students from underrepresented communities, we have always searched for a sense of belonging in the classroom. We found this community in our university’s A&P Boot Camp Program, a peer-led collaborative learning environment designed to engage students in deep, meaningful learning. As current leaders in the program, we strive to provide a positive influence on our peers by promoting active engagement, allowing students to build interpersonal relationships while developing a growth mindset and metacognitive skills. Join us as we discuss the transformative role that the A&P Boot Camp Program has played in our educational paths.

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A306- Curious about long-COVID?
Janet Casagrand, University of Colorado Boulder, janet.casagrand@colorado.edu, Wendy Riggs, College of the Redwoods, WendyK-Riggs@Redwoods.edu, Judi Nath, Pennsylvania State University, Judi@Judinath.com
The World Health Organization defines long-COVID as symptoms arising within 3 months of infection with SARS-CoV2 and lasting >2 months. A 2023 CDC survey estimated >5% of American adults are currently experiencing long-COVID with millions affected. Over 200 symptoms have been described resulting from the impact of SARS-CoV2 infection on the cardiovascular, gastrointestinal, nervous, muscular, renal, and respiratory systems with symptoms ranging from mild to severe. Who is most likely to develop long-COVID? What causes it, and how long does it last? This workshop will focus on several case studies (based on personal experiences), along with current theories and research.

A307- The Use of ePortfolios to Mentor Pre-Nursing Students
Caroline Hanson, Georgia Gwinnett College, chanson@ggc.edu
Anatomy & Physiology are gateway courses for nursing programs so these classes are an opportunity to mentor pre-nursing students as well as provide necessary content. Given that our institution's average acceptance GPA is approximately 3.7 and TEAS = over 80%, many students have to consider alternate careers. We developed an ePortfolio template in which students complete pages of self-introduction, mission statement, work ethic characteristics, leadership, critical thinking skills and an alternative careers assignment. These pages are completed in API, APII, and Microbiology classes required for all pre-nursing students. Students complete a voluntary electronic survey providing opinions about the project.

A308- The Compassion and Equity Approach to Teaching, Learning, and Assessment
Lori Fetter, Clark State College, fetterl@clarkstate.edu
We reside in a world where students are often viewed as test scores and not recognized as human beings. Inspired by the climate of post-pandemic teaching, this presentation presents practical strategies and tools to help educators foster a culture of care and compassion for their students. Finally, the impact of practices on grading and its implication on student learning, mental health and future educational and career opportunities are discussed.

A309- Calling All Authors! A Special Edition of the HAPS Educator is Planned on Gamification to Promote Active Engagement in Learning A&P.
Jacqueline Carnegie, University of Ottawa, jcarnegi@uottawa.ca, Carol Britson, University of Mississippi, cbritson@olemiss.edu, Brenda del Moral, Edgewood College, BdelMoral@edgewood.edu, Tracy Ediger, Georgia State University, tediger@gsu.edu, Elizabeth Granier, St. Louis Community College, egranier@stlcc.edu, Joanne Savory, University of Ottawa Joanne.Savory@uottawa.ca, Zoe Soon, University of British Columbia, ZoeAnne.Soon@ubc.ca
Sponsored by HAPS
Have you tried games (crossword puzzles, jigsaw puzzles, escape rooms, etc.) to promote active engagement by your A&P students? Have you found ways in which artificial intelligence can help you provide an interactive learning environment with timely feedback? Let’s talk! We are planning a special edition of the HAPS Educator featuring gamification (in-person or online) and other strategies to promote active engagement and our inaugural meeting for potential authors will be at this workshop. Please come with your ideas (they don’t need to be fully planned out) and let’s discuss! We hope to have this special edition published by mid-2025.
A310- Empowering Anatomy and Physiology Lab Faculty Through Clinical Skills Integration: A Focus on Cranial Nerve Testing
Carley Parkison, State College of Florida, carleyparkison@gmail.com
This workshop focuses on integrating clinical skills, notably cranial nerve testing, into anatomy and physiology lab sessions. Participants will acquire practical techniques and pedagogical strategies to enhance student understanding of anatomical concepts. Through hands-on practice and collaborative discussions, faculty members will learn to seamlessly integrate clinical skills into lab curriculum, fostering student engagement and critical thinking. The workshop aims to elevate anatomical instruction quality, preparing students for healthcare careers by bridging basic science with clinical practice. Ultimately, it seeks to empower faculty to create dynamic learning experiences that promote clinical application of anatomical knowledge in lab settings.

Session 4: May 28 @ 1:45 – 2:45 PM

A401- Learning Action Potentials with legos
Andrew Corless, Vincennes University, acorless@vinu.edu
In this workshop you will learn how to teach about membrane potentials, graded potentials, and action potentials using legos. This active learning activity is very engaging and will help students retain their knowledge. This is a low cost activity that my students have given great reviews to. Come learn how to teach these difficult concepts in a more active, engaging way.

A402- Title: Love It or Fix It: Top Tricks and Tools for Your Anatomy Lab
Abbey Breckling, University of Illinois at Chicago, abreckling@hapsconnect.org, Jeremy Grachan, Rutgers New Jersey Medical School, jg1916@njms.rutgers.edu, Bobbie Leeper, Seton Hill University, bleeper@setonhill.edu, Rhiannon Robinson, Boston University Chobanian & Avedisian School of Medicine, rerbnsn@bu.edu, Jonathan Wisco, Boston University Chobanian & Avedisian School of Medicine, jwjisco@bu.edu, Kelsey Stevens, Briar Cliff University, kelsey.stevens@briarcliff.edu
The Anatomical Donor Stewardship, Lab Resource subcommittee, will be showcasing best practices to employ in your own human donor anatomy labs! These tips and tools will highlight simple adaptations that allow teaching to be the main priority, while maintaining student safety and instructor time. Panel experts will lead round table discussions including topics on storage options, chemicals used for donor preservation, airflow, and highlight tools and techniques for effective human donor dissections. You don't want to miss out!

A403- Belonging in the A&P classroom
Liz Co, Boston University, eco@bu.edu
Sponsored by Cengage
There are many factors that go into how students see themselves as learners, scientists and future health care practitioners. A sense of belonging is one of the most impactful factors that helps students persist through school and pursue health care or science-related careers. In this workshop we'll explore themes of belonging and academic success, and talk about tactics to foster students' confidence and sense of belonging in any classroom.

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Anatomical education is undergoing exciting reforms to ensure students are equipped to become competent healthcare professionals. Our “Summer Cadaveric Dissection Fellowship” allows participants to dissect human body donors as their “first patient” experience. While visualizing and integrating their prior anatomical knowledge, students serve as teaching assistants for anatomy courses in our health professions programs. Through creating prosections, individuals engage in a multifaceted learning environment fostering teamwork, interdisciplinary teaching, cooperative learning and respect for human life. Our “Summer Cadaveric Dissection Fellowship” is a priceless opportunity to instill desired anatomical competencies in faculty, students and clinicians of tomorrow.
A408- Broadening grade choice through projects using creative arts and technology  
Beth Eischen, Hamilton College, beischen@hamilton.edu  
Anatomy and Physiology education can often be limiting in the variety of effective assessments, both low stakes and high stakes that we offer students. While assessing students through high stakes practicals and exams can be effective, I have found that it limits grade choice as well as equity in grading. Offering students a high stakes assessment as a project using creative arts and technology that they design, implement and present in a variety of mediums, offers an engaged experience and allows them to demonstrate their mastery of anatomy. I will walk attendees through how I use VR, podcasting/webcasting and 3D printing to allow my students new ways to explore the A & P curriculum and provide grade choice in the process.

A409- Use Online Group and Individual Assignments to Help Students in Large Enrollment Courses Develop their Soft Skills for the Workplace  
Joanne Savory, University of Ottawa, Joanne.Savory@uottawa.ca, Jacqueline Carnegie, University of Ottawa, jcarnegie@uottawa.ca  
Providing opportunities for students in large enrollment (100-400) classes to engage with one another to develop soft skills such as communication (oral and written), cooperation, conflict resolution, critical thinking, and product evaluation is a challenge. While it is important for students in applied healthcare disciplines to learn anatomy and physiology, being able to work as a team and communicate clearly are skills that will serve them well once in the workplace. In this workshop we explore approaches to online group and individual assignment creation that engage students, foster creativity and teamwork, and encourage them to apply concepts learned in class.

A410- ADA: Analogies, Drawings, Activities  
Donna Hoefner, Piedmont Virginia Community College, dhoefner@pvcc.edu  
This workshop shares everyday analogies, colored drawings, and class or group activities. Analogies help us learn new material based on things or experiences we already know. We will discuss everyday analogies for complex terms or processes. For visual and tactile learners and/or those who need to see the big picture and the complex details, add colorful drawings of body structures, building on their comprehension of the terms and processes. Lastly, engage the class or groups with simple interactive activities to foster community that have learners team up to put it all together.
A501 - The Impact of Effective Study Strategies in Anatomy and Physiology Courses
Jeffrey Kingsbury, Arizona State University, jkingsbury@asu.edu
Anatomy and Physiology courses frequently serve as a gateway for students seeking careers in healthcare and science-related fields. As such, they provide an entry point for innovations intended to enhance students’ learning. Innovations and interventions have been found to positively impact students’ study strategies, with resultant positive grade impacts. These innovations, however, often have associated time and costs, which may limit more widespread use. Our study looked at the extent to which students evidence increased use of effective study strategies after engaging in a brief (i.e., 15-min), online module requiring no financial cost for students or time commitment from instructors, and whether changes in students’ use of effective study strategies are associated with changes in exam performance. The present study employed a brief, online module designed to support undergraduate students’ (n = 98) use of effective study strategies in an introductory human anatomy and physiology course. Through a pretest-posttest design, students described the strategies they used to study and completed four cognitive and metacognitive subscales before and after engaging in a brief, online module designed to teach them about effective study strategies. Results were somewhat mixed, although students evidenced a statistically significant increase in the number of strategies used and changes in strategy use were associated with changes in exam score. Notably, this relationship was not moderated by GPA, suggesting that the strength of the relationship between changes in strategy use and changes in exam scores were not different depending on students’ levels of prior academic performance. Taken together, the innovation was associated with increases in students’ exam scores, irrespective of GPA.

A502 - Using our (Sheep) Brains to Teach Anatomy: The ADS Support Team
Jeremy Grachan, Rutgers New Jersey Medical School, jeremy.grachan@rutgers.edu, Abbey Breckling, University of Illinois at Chicago, abreck2@uic.edu, Danielle Edwards, University of Alabama at Birmingham Heersink School of Medicine, dned222@uab.edu, Bobbie Leeper, Seton Hill University, bleeper@setonhill.edu, Rhiannon Robinson, Boston University Chobanian Avedisian School of Medicine, rerbsnn@bu.edu, Jonathan Wisco, Boston University Chobanian Avedisian School of Medicine, jjwisco@bu.edu, Kelsey Stevens, Briar Cliff University, kelsey.stevens@briarcliff.edu
The HAPS Anatomical Donor Stewardship (ADS) Committee’s Support Team will facilitate a workshop designed to thoughtfully pair coaches with attendees across academic levels and programs. Participants will work through dissecting sheep brains and discuss ways to incorporate these demonstrations into their classroom and/or outreach, respectively. The session will compare high-yield human brain structures in surface and cross-sectional views of models and medical images to the sheep brain dissections. The ADS Committee’s Support Team provides dissection coaching of anatomical donors and animal specimens. We will highlight how this unique member benefit resource fosters coaching relationships within HAPS.

A503 - Big/Small, Short/Long, Deep/Shallow
Liz Co, Boston University, eco@bu.edu, Hilary Engebretson, Whatcom Community College, HEngebre@whatcom.edu
Sponsored by Cengage
Have you ever run across a great teaching idea and thought “That sounds great, but it won’t work in my classroom”? In this workshop, two Anatomy and Physiology instructors share their approaches for tailoring activities for different spaces, time constraints, and teaching levels. One instructor will share their experience adapting activities for small rooms (24 students) at the 200 level while the other will discuss adapting activities for large rooms (250 students) at the 200 through 500 level.
A504- Empowering Diversity: Nurturing Underrepresented Minorities and their Pathway to a Career in Healthcare
Katlynn Kenon, Dr. Kiran C. Patel College of Allopathic Medicine (NSU MD), kk1381@mynsu.nova.edu, Ricardo Rodriguez-Millan, Dr. Kiran C. Patel College of Allopathic Medicine (NSUMD), rrrodriguezmillan@nova.edu, Aymen Arain, Dr. Kiran C. Patel College of Allopathic Medicine (NSUMD), aa3882@mynsu.nova.edu, Adalyne Singh, Dr. Kiran C. Patel College of Allopathic Medicine (NSUMD), as1616@nova.edu, Cheryl Purvis, Dr. Kiran C. Patel College of Allopathic Medicine (NSUMD), cpurvis@nova.edu

In recent studies, Black, Hispanic, and Native Americans are underrepresented in professions such as physicians, dentists, pharmacists, and physician assistants. With the increase in healthcare inequities amongst underrepresented minorities, it is imperative to increase the number of minorities pursuing careers in healthcare. Exposure to the healthcare field can begin as early as high school and continue throughout undergraduate education. Anatomy & Physiology professors present a key bridge point to not only exposing students to the field of science but also preparing them for future courses in graduate education. This workshop will explore pathways to healthcare for underrepresented minorities.

A505- B or Better in A&P: Tools That Help Students Reach Their Long-term Goals
Steve Sullivan, Bucks County Community College, stephen.sullivan@bucks.edu
Sponsored by McGraw Hill

Delve into innovative strategies for leveraging an array of digital tools to craft dynamic activities aimed at fostering the success of your students in both the A&P classroom and their future endeavors. Explore customizable 3D models, A&P Tutor Videos, and interactive physiology simulations, designed to help your students understand complex topics such as skeletal muscle contraction, action potential, the cardiac cycle, and more. Whether conducting in-person, virtual, or blended classes, these digital tools will equip your students for their professional journey. Participate in quizzes that can seamlessly integrate into your teaching methodology with chances to win gift card prizes!

A506- Building a laboratory TA Program from Scratch
Nanette Tomicek, Thomas Jefferson University, nanette.tomicek@jefferson.edu

Undergraduate A&P courses are foundational to clinical and basic science education programs. To equitably and consistently serve student populations in multi-section lab courses qualified teaching assistants (TA) and instructors are needed. Undergraduate TAs are an excellent institutional knowledge resource, and with investment in training they can do much more than be “a second set of hands”. Furthermore, graduate assistants (GAs) make excellent instructors given their content expertise, but national trends suggest most GA programs lack sufficient training in pedagogy and fail to support GAs with critical first-time teaching skills. Come learn how to improve your lab course from the ground up with TA/GA training strategies.

A507- Designing Manageable Two-Stage Exams in Anatomy and Physiology Courses
Ryan Tubbs, Michigan State University, tubbsrya@msu.edu, Nicole Geske, Michigan State University, geskenic@msu.edu

Two-stage examinations are increasingly utilized in gross anatomy and physiology courses. Studies have shown positive outcomes with regard to student performance, a deeper understanding of content, improved group dynamics, and student satisfaction. In this workshop, we will guide participants through identifying barriers and benefits to implementing two-stage exams in their courses. Participants will be equipped with insights into the benefits of adopting two-stage exams in their courses and a strategy for their implementation.
A508- Virtual Flashcard Creation Primer
Brandon Flom, Indiana University School of Medicine, bflom@iu.edu
When attempting to learn anatomy and physiology, students begin to seek the aid of external study tools. There are many applications that utilize the spaced repetition of flashcards to deliver content to its users. Not only are these tools pervasive, but they are extremely customizable, allowing students to create their own curated decks for specific courses. This can then lead to potential discrepancies between what students are studying, and what the instructors would like them to be studying. This workshop is aimed at instructors to show them how virtual flashcards work, and how to create decks of their own.

A509- Using Artificial Intelligence (AI) as a Personal Assistant to Write a Manuscript for the Special Edition of the HAPS Educator
Brenda Del Moral, Edgewood College, bdelmoral@edgewood.edu, Carol Britson, University of Mississippi, cbritson@olemiss.edu, Jacqueline Carnegie, University of Ottawa, jcarne@uottawa.ca, Tracy Ediger, Georgia State University, tediger@gsu.edu, Elizabeth Granier, St. Louis Community College, egranier@stlcc.edu, Joanne Savory, University of Ottawa, jsavory@uottawa.ca, Zoë Soon, University of British Columbia - Okanagan, zoenee.soon@ubc.ca
Have you used an engaged learning tool that you want to share with educators, but could use help in organizing, creating, formatting, or describing your teaching innovation and how to implement it in another classroom? AI can help by serving as an idea-generator, editor, writing assistant and more! Come see how HAPS Educator editors have used AI to prepare a manuscript on classroom A&P games for the special edition of the HAPS Educator planned for mid-2025. This workshop is intended for the AI-naive and AI-experienced to share ideas and discuss the acceptable versus unacceptable use of AI to support authorship.

A510- Custom Lab Manual - Print, Digital or Hybrid
Dreis Van Landuyt, Van-Griner, dreis@van-griner.com, Brenda Schwieterman, Van-Griner, brenda@van-griner.com, Russ McLellan, Van-Griner, russ@van-griner.com
Sponsored by Van-Griner
Looking for an independent publisher that is customer obsessive and has the resources (images, labs, animations and more) to deliver an affordable lab manual just how you want it? Join us as we show you how simple and efficient the process is and why it could be your best, most flexible option in a changing lab environment.
Session 6: May 28 @ 4:15 – 5:15 PM

A601 - Implementing Inclusive Teaching Practices in Anatomy and Physiology Labs
Jennifer Stokes, Southwestern University, stokesj@southwestern.edu, Heather Ambruster, Southern Union State Community College, harmbruster@suscc.edu, Abbey Breckling, University of Illinois at Chicago, aberkla@uic.edu, Pat Clark, Indiana University Indianapolis, patclark@iu.edu, Cheryl Hill, University of Missouri, hillche@umsl.edu, Rachel Hopp, University of Louisville, rachel.hopp@louisville.edu, Juanita Jellyman, California State Polytechnic University, Pomona, jellyman@cpp.edu, J.P. Swigart, Carle Illinois College of Medicine, swigart@illinois.edu, Diane Tice, SUNY Morrisville, ticedg@morrisville.edu

The goal of this workshop is to discuss potential barriers to student learning in A&P labs and to allow workshop attendees the opportunity to troubleshoot challenges students may face. Attendees will be presented with common A&P lab scenarios and work in groups to brainstorm potential challenges and solutions. Workshop facilitators will lead group discussions on inclusive laboratory teaching methods which promote equity and enhance the learning experience. Attendees will come away with tangible ideas, teaching strategies, and accommodation suggestions focused on increasing diversity, equity, and inclusivity in A&P labs.

A602 - Surface Anatomy of the Human Brain: How to Get it Right When Most of us are Getting it Wrong.
Christine Eckel, Indiana University School of Medicine, ceckel@iu.edu

Accurately locating the central sulcus, pre- and post-central gyri, Broca and Wernicke areas, and major lobes of the brain is important for most A&P courses and textbooks. However, navigating the complicated sulci and gyri of a real brain can be daunting. A critical look at textbook and online images portraying the surface anatomy of the brain revealed more errors than accuracy. In this workshop we will take a hands-on approach to learning how to accurately identify surface features of the human brain using real brains and select images. Specific activities for use in the classroom will be provided for participants.

A603 - A Journal Club Project to promote teamwork and read the primary literature
Patrick Cafferty, Emory University, pcaffer@emory.edu

Many undergraduate students receive little guidance on how to critically read, interpret data within, or present information from primary literature before they begin senior independent research experiences or enter professional or graduate school. To provide guidance on reading and formally presenting scientific information, I incorporated a multi-part Journal Club Project into my class. In this project, students worked in teams throughout the semester to present research papers to the rest of the class, and incorporated peer and instructor feedback into their work. During this workshop, I will share instructions, rubrics, and how I assessed the impact of the project.

A604 - The Histo-Kitchen
Andrew Stewart, Dr. Kiran C Patel College of Allopathic Medicine, as4902@my.edu, Chasity O'Malley, Boonshoft School of Medicine, Wright State University, chasity.omalley@wright.edu

Histology is one subject area that consistently presents as a challenge for medical and undergraduate students. Pedagogical studies that use physical objects and hands on learning have been shown to motivate and encourage students to self-learn such complex topics. This application of using physical objects and hands on learning, however, is not the easiest to translate to the cellular level. The Histo-Kitchen was designed to help students manage the vast amount of information and acquire knowledge in a meaningful and creative way. Don't let anyone say that you shouldn't play with food!
A605- Reasons Why Students May Withdraw from Online Courses
Nahel Awadallah, Nash Community College, nwawadallah755@nashcc.edu

The presentation examines the leading causes of students dropping out of online courses. Various factors contribute to the attrition rate of online students, including issues related to students themselves, faculty, and the institution. By identifying the reasons for student withdrawal, it is possible to improve the online learning experience, making it more effective and efficient and ultimately leading to fewer students dropping out.

A606- Meet the Board! Learn about HAPS Leadership Opportunities
Tracy Ediger, Georgia State University, tediger@gsu.edu
Sponsored by HAPS

Ever wondered if you’d like to be on the HAPS Board of Directors? Do you think you have the time, skills, or interest to be a Board member? Come chat with current Board Members, learn about the HAPS organizational and governance structures, and discuss how you could get involved.

A607- Is Your Anatomy Laboratory Ethically Sound? A panel discussion on ethical topics in the anatomy laboratory
Kelsey Stevens, Briar Cliff University, kelsey.stevens@briarcliff.edu, Lacy Cleveland, Colorado Christian University, l.cleveland@ccu.edu, Jeremy Grachan, Rutgers New Jersey Medical School, jjg1916@njms.rutgers.edu, Bobbie Leeper, Seton Hill University, bleeper@setonhill.edu, Rhiannon Robinson, Boston University Chobanian & Avedisian School of Medicine, rrobinson@bu.edu, Jonathan J. Wisco, Boston University Chobanian & Avedisian School of Medicine, jjwisco@bu.edu, Danielle Edwards, University of Alabama at Birmingham Heersink School of Medicine, dned222@uab.edu, Nicole Geske, Michigan State University, geskenic@msu.edu, Melissa Thompson, School of Kinesiology, LSU, melissathompson@lsu.edu

Ethical use and care of anatomical donors, as well as appropriate laboratory management, have been a “hot” topic for educators and the public alike. To promote best practices, experts from the Anatomical Donor Stewardship Committee (ADS) will lead conversations from a diverse range of viewpoints and institutional programs. Discussion topics include historical collections of human bone or soft tissue, laboratory access, willed body donors programs, imaging practices, and ethical behavior in the anatomy laboratory. This interactive discussion is perfect for those who use human anatomical specimens and bones, including gross anatomy faculty and lab managers.

A608- Effective practices to support student success in anatomy and physiology courses
Caitlin Burns, County College of Morris, cburns@hapsconnect.org
Sponsored by Pearson and HAPS Conference Travel Award Winner

This workshop will introduce several strategies that have been successfully implemented in Anatomy and Physiology I and II at County College of Morris that aim to enhance the student learning experience and increase student success. Strategies include academic advisement, standardization of curriculum in lecture and laboratory, and extensive student support options outside of the classroom. Some of these student support options include an orientation session, tutoring center opportunities, utilization of publisher and virtual resources, and a student performance improvement plan.

A609- Digital Detour: Exploring the urinary system through escape room adventure
Carla Carr, University of Mississippi, cbarr@olemiss.edu
HAPS Conference Travel Award Winner

Utilizing a digital escape room offers an enjoyable educational experience—a distinctive and fun way for students to reinforce their understanding of difficult concepts. I will present the steps for creating a virtual escape room—I will focus my escape room on the Urinary System. There is ample space for creativity throughout the process, from room design, to writing the narrative, and designing the clues within the room. Students work through various exercises to get the code to “escape.” You can take this inspiration to build your own virtual escape room for teaching A&P. Come see what you think!
A610 - Different Approaches on how to Incorporate Case Studies in the Instruction of Anatomy and Physiology at the undergraduate level.
Chinenye Anako, Nova Southeastern University, ccanako@gmail.com, Sheela Vemu, Waubonsee Community College, svemu@waubonsee.edu

Attend this session for a diverse approach on how to incorporate case studies in the teaching of anatomy and physiology. At the end of this session, you will have the resources that you need to successfully incorporate case studies in your courses. Case-studies provide an opportunity for a real-life application of course content. It improves problem solving and critical thinking skills while promoting knowledge retention. It can be used to promote group learning and in-depth discussion of content. It increases student interest by providing real-world applications that help reassure the students of the relevance of the course content.

Session 1: May 29 @ 9:00 – 10:00 AM

B101 - Knowing where You’re Going: Backward Design in A&P
JT Cornelius, Indiana University School of Medicine - Bloomington, jtcornel@iu.edu

A&P curriculum is typically presented in systemic or regional approaches that follows a textbook as a guide. Each unit concludes with a summative assessment that utilizes multiple choice or short answer questions to gauge student comprehension and content mastery. This workshop will challenge the traditional approach to A&P curriculum/assessment using the methods of Backwards Design. Participants will be tasked with creating a base curriculum that starts with the end in mind. Learning activities, objectives, and assessments will be crafted following a backward design plan. This will include the use of authentic assessment, performance tasks, and considerations for specific student populations.

B102 - Teachers and Tutors: A Dynamic Duo for Student Success
Elizabeth Granier, St. Louis Community College, egranier@stlcc.edu, Meg Curran, STLCC, mcurren15@stlcc.edu, Rae Iseman, STLCC, riseman@stlcc.edu, Sally Kloppe, STLCC, sklopp@stlcc.edu, Elizabeth Granier, STLCC, egranier@stlcc.edu

Anatomy and Physiology I at St. Louis Community College (STLCC) has been identified by the College as a class that has a high D/F/W rate. To attempt to increase student retention, student learning, and successful course completion, the Academic Success & Tutoring Center (AST) at STLCC has partnered with the Biology department toward this shared goal. AST utilizes both Embedded Tutoring (ET) and traditional walk-in tutoring in a dedicated Health Sciences tutoring room. The combination of having Embedded Tutors attending all A&P I lab sections and having tutors available in the tutoring room provides quantifiable as well as intangible benefits to students. ETs are able to reach all students who attend the lab sections, while tutors in the tutoring room are able to provide more in-depth and personalized assistance to students who come in to study outside of class. Teachers enjoy having another person qualified to help students during labs and are comfortable directing students to the tutoring center for extra help outside of class and office hours. Additionally, having consistent tutoring hours during the semester and retaining tutors from semester to semester helps build collaborative relationships between faculty, tutors, and students, creates community, engenders trust, and increases institutional memory. Here we report our initial data and impressions of using Embedded Tutoring along with traditional tutoring to facilitate student success in A&P I classes.

continued on next page
B103- Words Matter! ‘Say This, Not That’ to Your A&P Student.  
Carol Britson, University of Mississippi, cbritson@olemiss.edu
Do you always seem to come up with the perfect response well after the conversation where it was needed? Do you have confidence in your content knowledge as an educator but struggle to connect with and support your students? In this workshop situational examples will be used to identify the words and phrases that will encourage and uplift your students while avoiding the ‘technically correct’ but disparaging responses. The long-term benefits of positive conversations are not limited to exam scores and pass rates. Ultimately, there will be more individuals that love learning and love A&P as much as you do.

B104- Enhancing undergraduate anatomy and neuroanatomy labs with interactive HTML5 Package (H5P) content  
Burhan Gharaibeh, University of Pittsburgh, Burhan@pitt.edu, Erika Fanselow, Department of Neuroscience, University of Pittsburgh, fanselow@pitt.edu, Natasha Baker, School of Dental Medicine, University of Pittsburgh, nab74@pitt.edu
Interactive online anatomy materials can significantly enhance traditional teaching methods. However, suitable interactive resources are limited. Therefore, we began developing anatomy teaching resources utilizing HTML5 Package (H5P) technology within Canvas platform. We found that H5P allows creating versatile and compelling interactives. However, H5P can be technically complex. We present preliminary findings that the interactive content improved student performance and engagement based on opinion surveys. Further, we evaluated the feasibility of content sharing and adaptability across anatomy courses of varying difficulty levels and content depths. Finally, we tested the feasibility of using H5P for collaborative instruction within the educational community.

B105- Creating Change Agents Through Inclusive STEM  
Kathy Burleson, Hamline University, kburleson01@hamline.edu
What does equitable science look like, and why do we need it? How do we help students identify and address challenges to inclusion in STEM, foster a sense of belonging, and develop agency? In this workshop, we'll discuss two approaches to inclusive pedagogy: embedding a general education diversity designation into Human Anatomy & Physiology I and the creation of an Inclusive STEM course required for biology and math majors. Participants will learn about the successes and challenges, hear student feedback, have access to syllabi and other resources, and brainstorm ways to incorporate inclusive content into their own curricula.

B106- Harnessing the Superpower of AI  
Louis Kutcher, Univ. of Cincinnati, Blue Ash College, louis.kutcher@uc.edu
Generative artificial intelligence (AI) sparks vigorous debates: will it be humanity’s downfall or a potential savior? Are we living an educational nightmare, where students have unfiltered access to the collective knowledge of mankind, without its collective wisdom; or a future where AI automates basic academic tasks, allowing a focus on higher-level learning? Reality probably encompasses a bit of both. This session will give an overview of AI, point out some of its hazards, and describe class assignments that lean into AI’s benefits while teaching about its dangers. Participants will brainstorm classroom assignments fostering critical evaluation and ethical use of AI.

B107- Solubility as a unifying concept for teaching human physiology  
Tracy Ediger, Georgia State University, tediger@gsu.edu
Solubility is a foundational chemistry concept that underpins the function of multiple organ systems taught across both semesters of the typical two-semester pre-nursing human anatomy & physiology course. In this workshop, we will first discuss how to lay the groundwork for a strong understanding of water-soluble and lipid-soluble molecules. Then we will take a tour of the organ systems, touching upon physiological arenas where solubility comes into play, from circulation and filtration to membrane transport and hormone mechanisms of action.
B108 - How I increased underrepresented minority student success in a community college hybrid anatomy laboratory course using cooperative learning and increased course structure
Sherrie Gallipeau, San Joaquin Delta College, sherrie.gallipeau@deltacollege.edu

Despite increasing access to higher education, underrepresented minority (URM) students underperform in STEM hybrid courses. Consequently, the rise in hybrid education may negatively impact existing achievement gaps between URM and non-URM students. With increasing hybrid course offerings in a post-pandemic world, studies examining pedagogy that increase URM student success are needed. This workshop will show you the weekly preparatory and practice assignments, in-person cooperative active learning activities, and low-risk assessments used to significantly increase lab exam scores of all students and URM students.

Session 2: May 29 @ 10:15 – 11:15 AM

B201- Do You Like Attending HAPS Annual and Regional Meetings? Learn How to Get Involved with the HAPS Conference Committee
Edgar Meyer, University of Mississippi Medical Center, emeyer@umc.edu

B202- Whodunnit?
Haneen Salhieh, Chamberlain University, Hsalhieh@chamberlain.edu

B203- A Journey into Virtual Reality to Enhance Student Learning of Anatomy & Physiology
Holly Young, SUNY Alfred State College, younghm@alfredstate.edu, Kathryn Link, SUNY Alfred State College, linkka@alfredstate.edu

Have you experienced the world of virtual reality (VR) and how it can be used to enhance student learning? Whether your answer is yes or no, please join us as we discuss what we did to incorporate VR into our Anatomy & Physiology classes. Part of the journey includes how a virtual anatomy lab was set up and used as part of a class. Another part of the process that will be shared includes the logistical aspects of the process, including purchasing VR headsets and working with Information Technology to use a VR platform.

continued on next page
B204- Enhancing Course Materials With Movement: How To Make Professional, Custom Animations Without Expensive Subscription Software
Joshua Schmerge, University of Mississippi, jdschmer@olemiss.edu
Many concepts in physiology rely on students understanding dynamic activity from cluttered, static images presented in course materials. This workshop will teach how to convert images into animated slideshows to better capture students’ attention and enhance learning, using the presentation tools you already have at your disposal – no subscriptions or expensive software needed! The workshop will show step-by-step how to edit images and produce a sequence of animations to create clean, professional animated slides. Participants will learn how to implement these animations in a variety of modalities, such as clickable sequences for synchronous classes, videos, and embedded animations in assignments.

B205- Pros and Cons of Specifications Grading in Intro Anatomy
Kelly Miles, University of New Brunswick, k.miles@unb.ca
In this workshop, I review my experiences using this form of student assessment in a large enrollment first year introductory human anatomy class. Comparisons will be made between students under specification grading, online COVID-era learning, and traditionally evaluated course structures. Lessons learned using specification grading as a measure of student success will be shared and discussed.

B206- Promoting student physiology core concept mental model development through systems thinking and modeling
Michelle Murphy, Lake Region State University, michelle.murphy@lrsc.edu
Systems modeling is a cognitive tool that promotes visualization of physiology core concepts. In this workshop we will place systems modeling into the context of systems thinking and explore implications for physiology education based on the literature and the presenter’s research with undergraduate and graduate physiology students. We will then work together to practice the systems modeling process as it applies to development of student core concepts mental models. This is an active participation workshop.

B207- HHMI BioInteractive’s Online Community for Life Science Educators
Tara Holmberg, HHMI BioInteractive, holmbergt@hhmi.org
Sponsored by HHMI BioInteractive
Join us to get an insider view of BioInteractive’s new Online Community, where educators gather to share resources, teaching strategies, and professional development opportunities. Included will be a sneak peek at our new Educator Resource Library, a portal for community members to submit teaching resources they have created that connect with BioInteractive materials. Bring your own device to sign up and become a member of the Online Community and explore specific opportunities for your Anatomy and Physiology courses.

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Session 3: May 29 @ 12:30 – 1:30 PM

B301- Enabling Critical Thinking in Human Anatomy
Bob Tallitsch, Augustana College, RobertTallitsch@augustana.edu
Human Anatomy, be it taught as a stand-alone course or as a component of an A&P course, is often thought of as a memorization course — both by instructors and students. This workshop will show instructors possible ways to help students develop critical thinking through test questions, Problem-Based Learning, and in-course activities.

B302- Study By the Case Study: Various Applications of Case Studies to Promote Science Teaching and Learning
Hisham Elbatarny, St. Lawrence College & Queen's University, helbatarny@sl.on.ca
Case studies are instrumental pedagogical tools in enhancing teaching and learning in various science disciplines. They can be used in many courses such as A&P, biochemistry, and pharmacology. They incorporate real-world scenarios into theory and empower students to connect knowledge with practice. I generate case studies to support the science courses I teach and develop different scenarios to suit the learning objectives of these courses. In this workshop, I will define case studies, present various styles and their use and suitability in different courses, and finally discuss their impact in promoting comprehensive learning experiences in science education.

B303- Four Ways to Build an Instructional Team to Foster Belonging and Engagement
Jennifer Rogers, University of Iowa, jen-rogers@uiowa.edu
HAPS Conference Travel Award Winner
Active learning techniques are commonly incorporated into class sessions to enhance student engagement and subsequently knowledge acquisition beyond traditional lecture-based approaches. Furthermore, cultivating a sense of belonging has been shown to improve retention in undergraduate STEM coursework. The purpose of this workshop is to summarize four practices structured around “instructional team” messaging, which was piloted to enhance engagement and community among human physiology majors: (1) team teaching models, (2) creative use of graduate teaching assistants to support learning and metacognition, (3) embedding undergraduate learning assistants into lab courses, and (4) development of undergraduate independent study opportunities.

B304- Practical Implementation of Formative Assessment in Anatomy and Physiology Courses
Justin Burr, Weber State University, justinburr1@weber.edu, Jim Hutchins, Weber State University, jinhutchins@weber.edu, Travis Price, Weber State University, tprice@weber.edu, Jordan West, Weber State University, jordanwest@weber.edu
The workshop is designed to explore innovative strategies for the practical implementation of formative assessments in anatomy and physiology courses. We will delve into the practical application of the “10 F’s of Formative Assessment” to enhance student engagement and understanding. Participants will discover effective techniques to foster a dynamic learning environment, promote continuous feedback, and tailor assessments to individual student needs. This workshop aims to empower educators with actionable insights, promoting a student-centered approach to anatomy and physiology education.

B305- View It. Do It. Write It.
Lacy Cleveland, Colorado Christian University, lcleveland@ccu.edu
In this workshop, the presenter will showcase a three-fold approach to teaching complex physiology processes. The View It. Do It. Write It. method empowers students with multiple ways to interact with the material. In the View It phase, the instructor provides direct instruction utilizing a figure. Moving to the Do It phase, students actively engage with hands-on activities or role-playing, modeling complex concepts. In the Write It phase, students synthesize understanding by creating a figure caption. The presenter will model this approach with multiple topics. Participants can then create their own Do It activity, enhancing understanding and promoting active learning.
B306- Helping students avoid “gumption traps”
Matthew Abbott, Des Moines Area Community College, mabbott1@dmacc.edu
In Zen and the Art of Motorcycle Maintenance, Robert M. Pirsig discusses the critical need for gumption (“psychic gasoline”) when tackling a complex task. He also describes various “gumption traps” (setbacks and hang-ups) that we often stumble into, which can sap our enthusiasm and motivation. The goal of this workshop is to consider how to help our students deal with gumption traps, such as self-doubt, that can impede student success. We will discuss ways we can foster gumption by creating a classroom environment that is positive and engaging, in which student confidence increases as they navigate the A&P learning path.

B307- A New Opportunity to Support Student Agency - Using Tokens in A&P
Staci Johnson, Southern Wesleyan University, sjohnson@swu.edu
This workshop explores the benefits of enhancing student agency within academic courses, specifically through the implementation of a Token System. I will share insights and practical applications from my experience integrating this system into my anatomy & physiology class, demonstrating its effectiveness in promoting student engagement and autonomy. Participants will not only gain an understanding of the Token System’s mechanics but will also engage in hands-on activities to design their own tailored systems. This interactive session offers a unique opportunity for educators to collaborate, refine their approaches, and receive constructive feedback from peers, aiming to foster a more dynamic and student-centered learning environment.

Session 4: May 29 @ 1:45 – 2:45 PM

B401- Developing Authenticity and Vulnerability in the Classroom
Bob Tallitsch, Augustana College, RobertTallitsch@augustana.edu
Bob was named the “Unofficial Teacher of the Year” award by graduating seniors at Augustana 20 times in his last 22 years at Augustana. In this workshop Bob will explain why a teacher needs to exhibit a level of authenticity and vulnerability in the classroom in order to be an outstanding teacher. Bob points out why your students need to get to know you as a person, and you need to get to know your students — both in and out of the classroom — as people. If you do this miracles can and will happen — both in the lives of your students and in your life as well.

B402- Flipping the Script: Unleashing the Magic of Flipped Classrooms
Jim Davis, Indiana University, jidavi@iu.edu, Freddie Bauer, Indiana University School of Medicine, frbauer@iu.edu, JT Cornelius, Indiana University School of Medicine, Jtcornel@iu.edu
Join us as we embark on an exhilarating journey into the world of flipped classrooms! In this workshop you will dive into the secrets we learned while flipping a 200-level physiology class. Uncover the magic found in flipped classrooms, while exploring successful strategies and learning from our missteps. You will depart with a powerful toolkit, which will help you launch your own flipped adventure. Brace yourself for an immersive experience as we flip the script on traditional workshops – get ready to revolutionize your teaching approach!

B403- Make Your Physiology Labs POPs (on a budget)
Jo Feldman Stosich, Salt Lake Community College, josto82@gmail.com
Learn how to incorporate Project Based Learning into your physiology labs! This workshop will give an overview of how we created the Physiology of Physiology Students (POPS) Project in which students plan, design, and execute small research project on their own physiology. (received poster award at the HAPS Annual Conference 2022). It will also include updates to what we are doing now, how we started with very low budget, and access to materials to get you started. There is updated information from the Western Regional workshop, including IRB approval.
B404- Into the Unknown: Finding Meaningful Free A & P Workshops
Kathleen Ahles, Tarrant County College, kathleen.ahles@tccd.edu, Chinenye Anako, Nightingale College, canako@nightingale.edu, Heather Armbruster, Southern State Community College, harmbruster@suscc.edu

The post-pandemic return to in-person learning has decreased the reliance of faculty on some online resources. However, there are many free educational tools that could still augment the student learning experience - both in and out of the classroom. In this workshop, we will explore a variety of free tools that assist faculty with content curation, content delivery, and content expansion. By the end of this session, faculty will be familiar with many helpful online resources to assist students in their traditional, virtual, or blended learning environments.

B405- Teaching Anatomy and Physiology Through a Gender-Neutral Lens
Leslie Worrell, Chamberlain University, lworrell@chamberlain.edu

Education in the sciences has historically been derived from the idea of a distinct dichotomy that occurs between the sexes. This methodology has taken the approach that there are fundamental differences between individuals considered male or female without exception despite the literature revealing that there is a spectrum of morphologies derived from the levels of specific hormones during development. By taking a gender-neutral approach to education of the anatomical sciences, we can teach these variations and aid our students to be culturally competent and move beyond the heteronormative ideology that human anatomy has a hard line between “male” and “female.”

B406- The P-value Primer: A Review of Basic Statistical Methods for Educational Research
Polly Husmann, Indiana University, phusmann@indiana.edu

Are you terrified of t-tests? Do ANOVAs make you anxious? Are you crazy for Kruskal-Wallis? In this session, participants will gain a basic understanding of descriptive versus inferential statistics and some common test assumptions that must be met for analyses to be valid. This workshop will also provide a basic review of different comparative tests based on sample number, covariates, power, and effect size with an emphasis on applicability to educational research. Participants will learn the basic ideas about when to use each test as well as how to run the analysis and how to interpret the outputs.

B407- Use of Biosignal Data in Upper-Level Undergraduate Physiology Laboratory
Shari Litch Gray, Regis College, shari.gray@regiscollege.edu

Sponsored by ADInstruments
Application of content knowledge in independent study/research is critical to prepare undergraduates for graduate study and the workforce. The physiology lab offered by Regis College offers students hands-on experience collecting their own biosignal data in pre-made lab assignments and weeks were dedicated to student groups researching, proposing and performing independent projects to collect, evaluate and draw conclusions from study data. Student written lab reports were presented in class. This workshop will focus on the structure, challenges and importance of independent student research and allow participants to observe and work with the Lt Sensor hardware and software for physiology data collection.

B501- Transitioning from Individuality to Inclusivity: Fostering a Culture of Student Belonging, Retention, and Success Through Strategies Across Disciplines and Teaching Modalities
Dr. Ruby Kaur, Aurora University, rkaur@aurora.edu

This interactive session will present evidence-based practices across disciplines and support system modalities. The Presenter and Participants will share experiences and co-create actionable recommendations for inclusive teaching in the Sciences, especially the Anatomy and Physiology Courses.
Session 5: May 29 @ 3:00 – 4:00 PM

**B502- Decoding Blood Types: An Interactive Blood Typing Lab Experience**
Sabrina Walthall, Mercer University, WALTHALL_SL@mercer.edu, Justice Zauber, Carolina Distance Learning, Justice.Zauber@carolina.com
Sponsored by Carolina Distance Learning
The objective of this hands-on lab workshop is to immerse participants in the fascinating world of blood typing, unraveling the mysteries of blood compatibility and transfusion science. Through engaging in practical activities, participants will gain a deeper understanding of blood types, antigens, and the importance of accurate blood typing in medical contexts.

**B503- Props and Role Playing in Building Conceptual Models**
Sam O’Dell, Walters State Community College, samuel.o’ dell@ws.edu
Students struggle to build conceptual models for topics like chemistry and physiological processes. This workshop will present literature regarding role playing/conceptual model building and suggested guidelines for building role playing activities and simple models. Participants will be given examples of exercises, written copies of guidelines for constructing activities, and will be invited to design their own original activities in groups using basic materials. A list of potential topics will be provided. A portion of the workshop will be reserved for sharing with other groups. This workshop will be more participation than the demonstration it has been in the past.

**B504- A Palm-Size 3D Golgi May Grab Your Attention! – On designing a variety of learning activities with tactile and creativity elements.**
Santa Makstenieks, Concordia University Wisconsin, santa.makstenieks@cuw.edu
In this age of digitalization of everything, is there still space for hands-on and creative learning methods? Yes, and they are backed by research. We are told that handwriting movements lead to brain patterns that promote encoding new information and are superior to typing notes. Hence, labeling anatomy diagrams by hand is a keeper! But there is so much more we can do when designing effective and fun ways of learning new things. I will offer a variety of activities, and will enthusiastically listen to what you have tried in your classes. Let’s unleash our own and our students’ creativity!

**B505- Building an Undergraduate Teaching Assistant Training Program: Helping Prepare Peer Teachers**
Sarah Beam, The Ohio State University, sarahbeam16@gmail.com
Undergraduate teaching assistants (UTAs) are often utilized to help teach anatomy courses. However, many of these students receive no further training in anatomy or teaching practices beyond their personal experiences in the course. This can cause a disparity in the quality level across teaching assistants which is unfair to students. This workshop will cover the process of the creation, implementation, and evaluation of a new UTA Training Program based on feedback from anatomy educators across the country.

continued on next page
B506- Juice without the Squeeze: Conducting Impactful Youth Outreach Without Embalmed Donor Specimens
Shannon Helbling, Washington State University, shannon.helbling@wsu.edu, Candi Heimgartner, University of Idaho, cheim@uidaho.edu
Anatomy outreach is gaining recognition as an impactful way of reaching youth, particularly in underrepresented populations, and can be a powerful tool for inspiring career interests in science and health care fields. While some programs have easy access to embalmed donor specimens for conducting youth anatomy outreach, this is not always available or feasible in external spaces. This workshop will focus on how you can still conduct meaningful, fun, and impactful outreach activities for engaging youth participants. It will include sample activities such as bone forensics and medical imaging workshops that can be done by diverse audiences in variable locations.

B507- Time to embrace simulation in ungraded physiology laboratories?
Thad Wilson, University of Kentucky, Thad.Wilson@uky.edu
Simulation is incorporated into many facets of healthcare and medical/health professions education, being considered integral to training. However, adoption of simulation into science laboratories has been slow. Why is that? This workshop will address the positives and negatives of wholesale adoption of a simulation approach in undergraduate physiology laboratories based on six semesters of experience. We have enabled students to test hypotheses, measure variables not possible in standard labs or healthcare settings, compare simulations with disease phenotypes to those without, and implement medical treatments, all in an environment that is safe and accessible for both the student and study subject. Simulation is incorporated into many facets of healthcare and medical/health professions education, being considered integral to training. However, adoption of simulation into science laboratories has been slow. Why is that? This workshop will address the positives and negatives of wholesale adoption of a simulation approach in undergraduate physiology laboratories based on six semesters of experience. We have enabled students to test hypotheses, measure variables not possible in standard labs or healthcare settings, compare simulations with disease phenotypes to those without, and implement medical treatments, all in an environment that is safe and accessible for both the student and study subject.
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Katherine Geric, Medical Student

“Only wish I had known about this earlier!”
Rina Yadav, Heme-Oncology Fellow

“So simple to understand. Such great visual representations!”
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