Pre-Lab Exercise 16-3

anatomy of the Heart

Label and color the three views of the heart in Figure 16.2 with the terms from Exercise 16-1 (p. 393). Use your text and Exercise 16-1 in this unit for reference.

Figure 16.2 The heart: (A) anterior view; (B) posterior view; (C) frontal section

- Mitral valve
- Papillary muscle
- Interventricular septum
- Left atrium
- Aortic valve
- Aortic arch
- Pulmonary valve
- Chordae tendinae
- Right atrium
- Myocardium
- Tricuspid valve
- Right ventricle
- Interatrial septum
- Endocardium
- Visceral pericardium
- Left ventricle
- Trabeculae carneae
- Inferior vena cava
- Right pulmonary veins
- Branches of right pulmonary artery
- Opening of coronary sinus
- Superior vena cava
- Left pulmonary artery
- Pulmonary trunk
- Pectinate muscles
- Aortic arch
- Ligamentum arteriosum
- Branches of left pulmonary artery
- Left pulmonary veins
- Pulmonary trunk
- Anterior interventricular artery (in posterior interventricular sulcus)
- Left atrium
- Anterior interventricular vein
- Left ventricle
- Apex of heart
- Superior vena cava
- Branches of right pulmonary artery
- Right pulmonary veins
- Right atrium
- Inferior vena cava
- Right coronary artery (in coronary sulcus)
- Coronary sinus
- Posterior interventricular artery (in posterior interventricular sulcus)
- Middle cardiac vein
- Right ventricle
- Apex of heart
- Superior vena cava
- Branches of right pulmonary artery
- Right pulmonary veins
- Right atrium
- Inferior vena cava
- Thoracic aorta
- Right coronary artery and vein
- Right ventricle
- Ascending aorta
- Circumflex artery
- Auricle of right atrium
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Welcome to HAPS 2015!

This year the HAPS Annual Conference feels like it is taking place in my own backyard! I grew up in Austin and currently live there, and I am so very excited to share Central Texas with the members of HAPS. This is going to be a wonderful conference with exciting activities for the seasoned HAPS attendee as well as for the first timer.

The real strength of HAPS is its members, and nothing highlights that fact more than bringing a big group of HAPS members together! There is a wealth of knowledge, camaraderie, and just plain fun to be had this week, and if that is not enough there is always the famous Riverwalk just outside your door. We have an impressive array of six Update Seminars, two poster sessions, and a two new activities planned for Sunday and Monday. On Tuesday and Wednesday we have almost 90 workshop presentations at the University of Texas at San Antonio Downtown Campus. And some of you are earning graduate credit or professional development credit by taking part in the in-person phase of your HAPS Institute courses.

I will be available throughout the conference, and I hope to welcome you in person. In addition to being the HAPS Executive Director I am also a fellow physiology instructor, so we will surely have something to share with each other.

Our two new activities are ideas from HAPS members. On Sunday, we will have the first session of SYNAPSE!, which is a series of 5-minute talks using an auto advancing slide presentation. We hope to fit seven of these in a 1-hour time slot and then all retire to an evening with exhibitors and a cash bar. On Monday afternoon we will try our first session of Speed Networking. There will be topic areas and participants will move among them meeting new people for 5 minutes at a time. We are excited to see how these activities work for HAPSters.

Many of the new things that we try at the Annual Conference and at Regional Meetings come from members, and I would love to hear your thoughts on our new activities and other topics: do you have ideas of how to make HAPS even better, how to expand our wonderful group, or how you can be more involved? Let me know!

On behalf of all of the staff, I want to welcome you to HAPS 2015 in San Antonio and share our sincere hope that you have a great experience while you are here.

Sincerely,

Peter English, Ph.D.
Executive Director
WELCOME!

As the Mayor of the City of San Antonio and on behalf of our citizens, it is my pleasure to welcome you to the 29th Annual Conference of the Human Anatomy and Physiology Society. San Antonio is proud to offer our warmest greetings and extend a Texas-sized welcome to such a distinguished group of anatomy and physiology educators.

Now the nation’s 7th largest city, San Antonio is proud to be a mixture of diverse cultures, history, events, cuisine and southern hospitality. Thank you for choosing San Antonio for the opportunity to facilitate your group’s goals of updating knowledge, improving technical skills, investigating new technologies and networking with a growing international peer contingent.

While you are here to connect with colleagues, please take time to enjoy our unique treasures including the Alamo and River Walk and to appreciate the small-town ease and charm of navigating the various sights and sounds that draw over 31 million visitors annually to our city.

It is our hope that your visit encourages you to return often. Best wishes for a successful and memorable conference.

Sincerely,

Ivy R. Taylor
MAYOR
NYCC’s Master of Science in Human Anatomy and Physiology Instruction (MSHAPI) program is uniquely designed for those with science education, biology and professional healthcare degrees. The course of study builds on existing anatomy and physiology knowledge base, transforming the student into an exceptional A&P instructor for the undergraduate level of higher education.

This masters degree program is offered online, providing all the advantages of the online educational environment important to advanced learners including an asynchronous format to accommodate working professionals. It has components that:

- Assure competency over the entire spectrum of undergraduate anatomy and physiology instruction
- Provide a sound foundation in instructional theory and practices
- Allow for a measure of specialization through selection of elective courses

Contact the Admissions Office at 800-234-6922 or visit us at nycc.edu.

“The MSHAPI approach is unique – it starts with a student already educated in A&P course content and builds on that foundation, creating a highly trained instructional specialist for the undergraduate A&P lecture room and laboratory.”

Michael Mestan, D.C.
NYCC Executive Vice President of Academic Affairs
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. A variety of HAPS committees will hold meetings over the lunch hour on the first day of workshops (Tuesday, May 26). A complete list of committees will be available at registration. 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.

HAPS Board of Directors 2014 – 2015

President: Tom Lehman
Past President: Valerie O’Loughlin
President Elect: Betsy Ott
Secretary: Carol Veil
Treasurer: Karen McMahon
Central Regional Director: Murray Jensen
Eastern Regional Director: Leslie Day
Southern Regional Director: Jason LaPres
Western Regional Director: Jon Jackson

Executive Director: Peter English
Business Manager: Shanan Atkinson
Membership Coordinator: Brittney Roberts

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

**Current President**
Tom Lehman, 2014-2015

**President Elect**
Betsy Ott, 2015-2016

**Past Presidents**
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**
2015 – San Antonio, TX
(Anita Moss & Jason LaPres)

**Coming Attractions**
2016 – Atlanta, GA (Kyla Ross & Adam Decker)
2017 - Salt Lake City, UT (Mark Nielsen)

**Previous HAPS Conferences**
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
2014 - 2015

President
Tom Lehman

Past President
Valerie O'Loughlin

President-Elect
Betsy Ott

Secretary
Carol Veil

Treasurer
Karen McMahon

Central Regional Director
Murray Jensen

Eastern Regional Director
Leslie Day

Southern Regional Director
Jason LaPres

Western Regional Director
Jon Jackson
HAPS Committees

2014 - 2015 Committee Chairs

HAPS has a number of committees that deal with a wide variety of topics within the Society. Below are the chairs and a brief description of each committee. Look for the committee chairs throughout the conference and learn more about what HAPS has to offer (First-Timers will be seeking them out as part of the Scavenger Hunt).

**Animal Use Committee**
*Robert Tallitsch*

We are charged with developing, reviewing, and recommending policies and position statements on the use of animals in college-level A&P instruction.

**Cadaver Use Committee**
*Melissa Carroll*

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

**Communication Committee**
*Wendy Riggs*

We encourage communication and outreach within the Society as well as outward to non-members and potential members through various social media outlets.

**Annual Conference Committee**
*Ellen Lathrop-Davis*

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**
*Hiranya Roychowdury & Terry Thompson*

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.

**Executive Committee**
*Tom Lehman*

We are comprised of the top administrators of HAPS, setting policies and governance of the Society.

continued on next page
HAPS Committees
2014 - 2015 Committee Chairs

Foundation Oversight Committee
Don Kelly & Bob Crocker
We establish and manage endowed funds for the Society, oversee the activities and operations of the HAPS Foundation, and administer the HAPS Grants and Scholarship Program.

HAPS-EDucator Committee
Sarah Cooper & Jennelle Malcos
We create the quarterly online publication, the HAPS-EDucator. Committee members solicit articles about teaching or other relevant topics, edit, proofread, and determine what new content might be of benefit to our members.

HAPS 2015 Annual Conference Committee
Anita Moss & Jason LaPres
The HAPS 2015 Conference Committee is responsible for organizing the 2015 annual meeting.

Membership Committee
Elizabeth Pennefather-O’Brien & Kyla Ross
We work to increase HAPS general membership by maintaining ties with current members, creating awareness of HAPS’ value, and introducing HAPS to potential members.

continued on next page
**HAPS Committees**

**2014 - 2015 Committee Chairs**

---

**Nominating Committee**  
*Betsy Ott*

We assemble a list of qualified candidates for election to the HAPS Board of Directors.

---

**Presidents-Emeriti Advisory Board**  
*Dee Silverthorn*

We are comprised of past presidents of HAPS, providing advice and a historical perspective to the Board of Directors upon request.

---

**Steering Committee**  
*Ron Gerrits*

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.

---

**Safety Committee**  
*Yuli Kainer & Neal Schmidt*

We promote safety in the A&P laboratory with the HAPS Safety Guidelines and through the publication of Spotlight on Safety articles and Safety Case Studies. Currently we are analyzing the results from a survey of the HAPS membership on the incidence of accidents memberships in the Human A&P laboratory.

---

**Testing Committee**  
*Curtis DeFriez & Eric Sun*

We develop, maintain, and manage the HAPS comprehensive exam. We are working on developing an online exam and aligning the exam to the student learning outcomes established by the C&I Committee.

---

*Many of the committees will have meetings during the annual conference, as well as presenting 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!*
Exhibitors and Sponsors

HAPS would like to recognize and thank all of our conference exhibitors, sponsors, and advertisers. Their generous support makes the HAPS 29th Annual Conference possible.

**OUR SPONSORS**
- ADInstruments
- American Association of Anatomists (AAA)
- American Association of Clinical Anatomists (AACA)
- American Physiology Society (APS)
- Imagineeringart
- McGraw-Hill Higher Education
- Morton Publishing Company
- Pearson
- Wiley

**OUR EXHIBITORS**
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- ADInstruments
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- American Physiology Society (APS)
- Anatomy in Clay Learning System
- Anatomy in Flashcard Learning Systems
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- BrainSpin
- Carolina Biological Supply
- Elsevier
- eScience Labs, LLC
- Hands-On Learning
- Hayden-McNeil Publishing
- HC Simulation
- Holt Anatomical
- Imagineeringart
- iWorx Systems
- Mala Scientific
- McGraw-Hill Higher Education
- MedTutor
- Morton Publishing Company
- New York Chiropractic College
- OpenStax College
- Pearson
- Primal Pictures
- Thieme Publishers
- Today’s Class – Melior Inc.
- Visible Body
- Visual Representation Solutions, LLC
- Wiley
- Wolter’s Kluwer Health
- zSpace, Inc.
HAPS President’s Initiative

WILEY & McGraw Hill Education

The Human Anatomy & Physiology Society wishes to thank Wiley and McGraw Hill for their generous donations to the HAPS President’s Initiative.

HAPS President’s Initiative 2013-2015: Expanding A&P Educational Research in HAPS. This initiative is designed to:

1) inform HAPS membership about methodical ways of assessing teaching and learning effectiveness,
2) introduce members to the scholarship of teaching and learning,
3) showcase exemplary educational research efforts of our members, and
4) ultimately have HAPS serve as an example for producing rigorous A&P educational research projects.
Welcome to the Ninth Season of HAPS Institute!

HAPS Institute offers participants 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. Final course projects may be written for publication and submitted to HAPS-Educator or other journals.

HAPS offers both graduate credit and Professional Development options for participants who successfully complete HAPS-I courses. Graduate credit is earned through Alverno College in Milwaukee, Wisconsin.

HAPS is always adding courses for the fall, spring, and summer. Check out the courses coming up for the 2015 - 2016 year at http://www.hapsweb.org/?page=HAPSI_current

Conference Course for 2015

Introduction to Educational Research Methods
Valerie Dean O'Loughlin, Ph.D.
Indiana University, Bloomington, IN

This course is for college level instructors who want to become more familiar with basic educational research methods. Participants will learn about metacognition, how people learn, the basics of quantitative versus qualitative educational research methods, how to search the educational literature database, the scholarship of teaching, and develop a foundation for implementing classroom research and assessment. Participants will learn the material through directed readings, online weekly synchronous discussion forums, and face-to-face instruction at the HAPS 2015 meetings (or additional online reading/assignment component, should the participant not be able to attend the HAPS 2015 conference). In addition, participants will apply the information they have learned in the independent development of an educational research question they want to examine in their own classroom.

Summer 2015 Travel Course

Anatomia Italiana: The Cultural History of Anatomy Along the Italian Peninsula
(3 credits) June 1 - August 31, 2015
Dr. Kevin Petti
San Diego Miramar College, San Diego, CA

This course is designed to provide college-level instructors with the opportunity to expand their understanding of the rich cultural heritage of anatomy education along the Italian Peninsula, and its connection with Renaissance art. This course is an international experience preceded by a series of readings in peer-reviewed journals and scholarly books intended to put the travel experience into context, and followed by the development of a teaching module. Readings will be discussed in online forums, experienced deeper through the international experience, and applied by way of incorporating the teaching module into an existing anatomy course.

After a four-week online component, students will participate in a 12-day visit to Italy. They will visit anatomy museums in Rome, Florence, Bologna and Padua that are important to the history of anatomy education. These museums include historic anatomy theaters and centuries old anatomical wax models. Traditional cultural sites that contain Renaissance masterpieces, such as the Vatican museums, will also be toured. These masterpieces will be considered within the context of how they were influenced by the dissections conducted by the masters. This interdisciplinary experience allows for students to connect art and anatomy in a unique manner. The result is a deeper and richer understanding of the historic and cultural underpinnings of anatomy education.

Students who have participated in the travel experience prior to participation in the HAPS-I course are eligible to enroll in this course by completing the remaining online component and submission of an interdisciplinary teaching module. Additional information can be found at AnatomiaItaliana.com.

Cadaver Workshop in Residence
(Professional Development Only) August 2 - August 15, 2015
Dr. Kevin Petti and Dr. Francesco Maria Galassi
In residence at San Diego Miramar College

Join us for a two-week cadaver workshop based at San Diego Miramar College. Limited to 12 participants, this professional development course will cover eight major dissection modules under expert guidance. The course will begin with two undissected cadavers plus a third prosected cadaver. Each weekday will be spent in the lab, and the weekend will be held open for free exploration of San Diego.

Dissection modules include: removal of skin and subcutaneous fat to expose superficial musculature, blood vessels and nerves of the body; thoracic cavity dissection including removal of heart and lungs; abdominopelvic cavity dissection with a focus on organ blood supply, and spatial relationship between organs; removal of brain and spinal cord.

continued on next page
Spring 2016 Online Course
Teaching Central Nervous System Concepts Using Diagnostic Radiology and Case Studies
(2 credits) Dates to be announced later
Carmen Eilertson
Alverno College, Milwaukee, WI

Students enrolled in college level Anatomy and Physiology Courses are required to learn brain and spinal cord anatomy and function. This course will help you develop cases incorporating radiology of the CNS into your teaching portfolio. Students find this method of teaching to be meaningful because they learn how to read radiograms and correlate their analysis with patient symptoms. It is a perfect way to integrate anatomy with physiology and teach valuable diagnostic skills at the same time. Most of your students will enter the health care field and will benefit from learning clinical problem solving skills early in their academic development. The cases developed as part this course can be used as in class activities, enhancements to your current lecture PowerPoints, or as clicker quizzes or exam questions.

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

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

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

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

There’s also plenty of information about HAPS Institute on the HAPS website – look for the tab called “Graduate Credit Courses.”
Join Us for the

“RIVERWALK FUN RUN”

2K & 5K

to support the HAPS Foundation!

Monday, May 25, at 7 AM
Start and finish in front of the Hyatt Regency
$15 registration fee
Prizes for best times and best spirit!

For further information and to register, stop by the HAPS Foundation table in the Exhibitor Hall

Rules:
1. Register at the HAPS Foundation table for the 2K or 5K.
2. Show up on the Riverwalk outside the Hyatt Regency Monday morning before 7:00 a.m.
3. The routes will take you along the Riverwalk.
4. Lap times will be recorded.
5. Finishers will be entered into a drawing for a grand prize. The prize will be distributed at the HAPS business meeting at 9 am (must be present to win).
6. Fun and exercise will be had by all!

Through its Foundation, HAPS awarded 14 grants and scholarships totaling $9,895 to deserving HAPS members this year. These awards are funded primarily by member donations to the HAPS Foundation. Please visit the Foundation table in the exhibit hall to learn more about the eight categories of grants and scholarships we fund. You may qualify for one!

Please help us continue to support our colleagues by making a donation or pledge. No amount is too small (or too large)! You can donate today at the Foundation table or on the HAPS Foundation webpage at any time http://www.hapsweb.org/?page=HAPSFoundation
Terry Thompson –
HAPS-Thieme Award for Excellence in Teaching

Terry Thompson is a Professor of Biological Sciences at Wor-Wic Community College in Salisbury, MD. She has been teaching A&P there since 2001, but also taught A&P previously as both an adjunct and graduate teaching assistant. She received her second Master’s degree in Human Anatomy & Physiology Instruction from New York Chiropractic College in 2014, a M.S. in Ethology from University of Maryland College Park in 1982, and a B.A. in Biology from West Chester University, PA in 1979. She attended her first HAPS conference in 2003, became active with the Curriculum & Instruction committee in 2005, and has served as co-chair since 2013. Before 2001, Terry had varied experiences as a naturalist/educator in schools, museums, parks and field stations and a field researcher/conservationist with National Zoological Park Conservation Research Center, Virginia Institute of Marine Science, and The Nature Conservancy. During that time she received the Mid-Atlantic Marine Education Association Outstanding Educator Award (1987), U.S. EPA Region III Center for Environmental Learning Award (1988), and Virginia Governor’s Environmental Education Excellence Award (1991). What she enjoys most about teaching is being able to share a personal love of science and enthusiasm for life-long learning, and to involve students in hands-on experiences and critical thinking. She also appreciates the importance of the A&P courses in providing a solid foundation for those who do answer a calling to the health science professions. Until the day she retires, she anticipates seeking different professional development opportunities because if she isn’t being challenged, how can she expect learning to become contagious for her students? When Terry isn’t teaching, she and her husband of 31 years enjoy gardening, hiking, kayaking and baking in their traditional wood-fired brick oven. She also enjoys tying flies, decorating pysanky and reading when she gets a break.

Shannon Gill –
Primal Pictures and HAPS Scholarship Program

Shannon has a very diverse academic background, including numerous experiences in anatomy and physiology. She holds a degree in business management from San Jose State University, and recently graduated with a bachelor’s degree in molecular biology and biotechnology from the University of Idaho. She has been accepted into Indiana University’s Anatomy Education Ph.D. program this coming fall, leading toward her future career goal of becoming an anatomy instructor at a post graduate institution or medical school. At the University of Idaho, Shannon was involved in many aspects of undergraduate anatomy. She excelled in the human anatomy course during an accelerated summer session, went on to serve as an anatomy teaching assistant, and subsequently served as the laboratory coordinator for both the anatomy and physiology courses over the past two years. In addition, Shannon served as a WWAMI medical education program teaching assistant in the first year medical student anatomy laboratory at Washington State University.

While taking a full course load toward her degree, Shannon also conducted research under the INBRE program at the UI modeling molecular interactions in Alzheimer’s disease. Over the past year, she has also initiated a research project investigating human cadaver dissection methods relevant to an undergraduate anatomy teaching laboratory and developed methods to increase prosected cadaver longevity while in use in a teaching environment.
# HAPS 29th Annual Conference
## May 23 – May 28, 2015
### Schedule of Events

**Saturday, 23 May**  
_Hyatt Regency San Antonio Riverwalk_

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 AM – 5:00 PM</td>
<td>Exhibitor Set up: Regency Center &amp; East</td>
</tr>
<tr>
<td>9:00 AM – 12:00 PM</td>
<td>Board of Directors Meeting: Pecan</td>
</tr>
<tr>
<td>9:00 AM – 12:00 PM</td>
<td>Steering Committee Meeting: Mesquite</td>
</tr>
<tr>
<td>12:00 PM – 1:30 PM</td>
<td>Board of Directors and Steering Committee Luncheon: Live Oak</td>
</tr>
<tr>
<td>1:00 PM – 6:00 PM</td>
<td>Registration: Los Rios Foyer</td>
</tr>
<tr>
<td>1:30 PM – 4:00 PM</td>
<td>Board of Directors and Steering Committee Meeting: Live Oak</td>
</tr>
<tr>
<td>4:00 PM – 5:30 PM</td>
<td>HAPSconnect Training: President’s Suite</td>
</tr>
<tr>
<td>7:45 PM – 9:30 PM</td>
<td>Registration: Garden Terrace</td>
</tr>
<tr>
<td>8:00 PM – 10:00 PM</td>
<td>Welcome Reception (for all participants): Garden Terrace</td>
</tr>
</tbody>
</table>

(Schedule continued on next page)
### Sunday, 24 May

*Hyatt Regency San Antonio Riverwalk*

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 AM – 5:00 PM</td>
<td>Registration: Los Rios Foyer (closed from 12:00 PM – 1:00 PM)</td>
</tr>
</tbody>
</table>
| 7:30 AM – 8:30 AM | First-timers’ Breakfast: Garden Terrace  
*Sponsored by ADInstruments and McGraw Hill Higher Education* |
| 7:30 AM – 8:30 AM | Continental Breakfast (for all other attendees): Regency Center & East |
| 7:30 AM – 6:00 PM | Exhibits: Regency Center & East  
(Exhibits are closed from 12:00 PM - 1:00 PM) |
| 8:30 AM – 8:45 AM | Welcome and Opening Remarks: Regency West                             |
| 8:45 AM – 9:45 AM | Update Seminar I: Regency West  
Peggy Van Meter, The Pennsylvania State University  
*Sponsored by HAPS President’s Initiative*  
“Visualizations and the College Anatomy and Physiology Student: How Instructional Practice Can Support Learning.” |
| 9:45 AM – 10:45 AM | Refreshment Break & Exhibits: Regency Center & East  
Posters: Regency Center & East  
(posters available until 5:00 PM) |
| 10:45 AM – 11:45 AM | Update Seminar II: Regency West  
Peter Ward, Ph.D., West Virginia School of Osteopathic Medicine  
*Sponsored by American Association of Clinical Anatomists*  
“Qualitative Research Methods and Anatomy Education – Getting to the Meaning Within Data” |
| 11:45 AM – 1:30 PM | Lunch on your own  
Registration & Exhibits closed 12:00 PM - 1:00 PM |
| 1:30 PM – 2:30 PM | Update Seminar III: Regency West  
Dr. Dee Silverthorn, Ph.D., University of Texas - Austin  
*Sponsored by HAPS President’s Initiative*  
“The Challenges of Educational Research, or Navigating Your Way through Grant Proposals, Reviewers, and IRBs on Your Way to a Published Project.” |
| 2:30 PM – 4:00 PM | Refreshment Break & Exhibits: Regency Center & East |
| 2:45 PM – 3:45 PM | Synapse HAPS!: Regency West |
| 4:00 PM – 5:00 PM | Update Seminar IV: Regency West  
Mark Terrell, Ed.D.  
*Sponsored by American Association of Anatomists*  
| 5:00 PM – 6:00 PM | Drink with Exhibitors: Regency Center and East  
cash bar available |

*Free Night!*

(Schedule continued on next page)
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>6:30 AM – 7:00 AM</td>
<td>Registration for the HAPS Foundation Walk-Run</td>
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<tr>
<td>7:00 AM – 8:30 AM</td>
<td>HAPS Foundation Walk-Run: leaving from the Hyatt hotel</td>
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<tr>
<td>7:30 AM – 8:30 AM</td>
<td>Continental Breakfast: Regency Center &amp; East</td>
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<tr>
<td>8:00 AM – 5:00 PM</td>
<td>Registration: Los Rios Foyer (Closed from 12:00 PM – 1:00 PM)</td>
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<tr>
<td>7:30 AM – 5:00 PM</td>
<td>Exhibits: Regency Center &amp; East (Exhibits are closed from 12:00 PM – 1:00 PM)</td>
</tr>
<tr>
<td>8:30 AM – 9:45 AM</td>
<td>HAPS Annual General Membership Meeting: Regency West</td>
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<td>Everyone is encouraged to attend this important meeting.</td>
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<tr>
<td>9:45 AM – 10:45 AM</td>
<td>Refreshment Break &amp; Exhibits: Regency Center &amp; East</td>
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<tr>
<td></td>
<td>Poster Session 2 (posters available until 5:00 PM)</td>
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<tr>
<td>10:45 AM – 11:45 AM</td>
<td>Update Seminar V: Regency West</td>
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<td>Patricia Molina, MD, Ph.D., Louisiana State University Health &amp; Sciences Center</td>
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<td>Sponsored by American Physiology Society</td>
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<td>“Preclinical and Translational Studies Dissecting Chronic Alcohol Modulation of HIV Disease.”</td>
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<tr>
<td>11:45 AM – 1:30 PM</td>
<td>Lunch on your own</td>
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<td>Registration &amp; Exhibits close for lunch from 12:00 PM-1:00 PM</td>
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<tr>
<td>1:30 PM – 2:30 PM</td>
<td>Update Seminar VI: Regency West</td>
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<td>Jose Bowen, Ph.D., FRSA, Goucher College</td>
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<td>Sponsored by Wiley and HAPS President’s Initiative</td>
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<td>“Teaching Naked: How Moving Technology out of your College Classroom will Improve Student Learning.”</td>
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<tr>
<td>2:30 PM – 4:00 PM</td>
<td>Refreshment Break &amp; Exhibits: Regency Center &amp; East</td>
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<tr>
<td>2:45 PM – 3:45 PM</td>
<td>Speed Networking: Rio Grande Ballroom</td>
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<tr>
<td>4:00 PM – 5:00 PM</td>
<td>Exhibits and door prizes: Regency Center &amp; East</td>
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<tr>
<td>6:00 PM – 9:00 PM</td>
<td>HAPS Social (for all participants): Garden Terrace</td>
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(Schedule continued on next page)
### Tuesday, 26 May

*At The University of Texas at San Antonio – Downtown Campus*

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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| 7:00 AM – 8:15 AM | Transportation to The University of Texas at San Antonio – Downtown Campus  
Shuttle will pick up in front of the Hyatt Regency, on Losoya Street |
| 8:15 AM – 8:45 AM | Welcome Breakfast                                                     |
| 9:00 AM – 11:45 AM | Workshops                                                            
Session 1: 9:00 – 10:30 AM (90 minutes)  
Session 2: 10:45 AM – 11:45 PM (60 minutes) |
| 11:45 AM – 1:45 PM | Lunch (box lunches are provided)  
*Sponsored by Pearson*                    |
| 1:45 PM – 4:30 PM | Workshops                                                            
Session 3: 1:45 – 2:45 PM (60 minutes)  
Session 4: 3:00 – 4:00 PM (60 minutes)  |
| 4:30 PM         | Bus transportation back to the hotel                                |

### Wednesday, 27 May

*At The University of Texas at San Antonio- Downtown Campus*

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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| 7:00 AM – 9:00 AM | Transportation to The University of Texas at San Antonio – Downtown Campus  
Shuttle will pick up in front of the Hyatt Regency, on Losoya Street |
| 8:00 AM – 8:30 AM | Breakfast                                                             |
| 8:30 AM – 12:00 PM | Workshops                                                            
Session 5: 8:30 – 9:30 AM (60 minutes)  
Session 6: 9:45 AM – 10:45 AM (60 minutes)  
Session 7: 11:00 AM – 12:00 PM (60 minutes) |
| 12:00 PM – 1:00 PM | Lunch (box lunches are provided)                                      |
| 1:00 PM – 2:30 PM | Workshops                                                            
Session 8: 1:00 PM – 2:30 PM (90 minutes)  |
| 2:30 PM         | Bus transportation back to the hotel                                  |
Don’t forget to attend the HAPS Committee lunch meetings!

**Monday**: meetings will be from 1:00 PM - 1:30 PM at the Hyatt Hotel in the rooms indicated next to each committee - Cadaver Use Committee - Mesquite Boardroom
- HAPS-EDucator - Live Oak Boardroom

**Tuesday**: meetings will be from 12:45 PM - 1:30 PM in the UTSA Downtown Campus room indicated next to each committee.
- Animal Use Committee - BV 3.306 - Communication - BV 3.318
- Conference - BV 3.324
- Curriculum & Instruction - BV 3.326
- Foundation Oversight - BV 3.328
- Membership - BV 3.330
- Safety - FS 2.520
- Testing - FS 3.512
Update Seminar 1: Regency West

Sunday, May 24th from 8:45 AM – 9:45 AM

Dr. Peggy Van Meter

Sponsored by the HAPS President’s Initiative

Associate Professor of Education
The Pennsylvania State University
University Park, Pennsylvania
Pnv1@psu.edu

Visualizations and the College Anatomy and Physiology Student: How Instructional Practice Can Support Learning

Abstract: College students must be able to learn from provided instructional material if they are to be successful in human anatomy and physiology courses. Whether that material is presented in textbooks, lecture slides, online learning environments or lab manuals, there is one characteristic that remains a constant: the presence of nonverbal visualizations such as diagrams. These visualizations serve a critical role in biology learning by communicating not only key structures but also the structural relations necessary for understanding biological processes. Although most domain-area experts believe the meaning of these representations is transparent, the reality is that many college students do not adequately comprehend visualizations and fail to draw connections between what these visualizations depict and content conveyed through other means. The cost of these limitations is high because students who can effectively use visualizations acquire higher quality content knowledge than their peers who struggle. In this talk, Dr. Van Meter will review findings from her research on human anatomy and physiology students working to understand and use visualizations. By interpreting this research through a framework of students’ cognitive learning processes, this talk will focus on not only understanding where students struggle but also how students can be supported to more effectively use these visualizations.

Bio: Dr. Van Meter is an Associate Professor of Education in the Educational Physiology program at Penn State. She conducts research across a range of STEM disciplines on college students’ learning from nonverbal representations such as diagrams and equations. In this research, Dr. Van Meter uses cognitive theories of learning to understand how students use these representations and to guide the design of instructional interventions. Dr. Van Meter has been a co-PI in several funded projects examining these issues and has published findings in both Educational Physiology and discipline-area journals. She currently serves on the editorial boards of the journals Contemporary Educational Psychology, Instruction and Learning, and the Journal of Experimental Educations.
Qualitative Research Methods and Anatomy Education – Getting to the Meaning within Data

Abstract: Many teachers learn to conduct quantitative research to improve course outcomes, examine different classroom interventions, and produce generalizable data to improve education. However, quantitative methods are not always ideal for answering every question encountered when examining ways to improve student learning. For example, it may be difficult or impossible to rigidly control the wide array of variables that are encountered in the classroom or laboratory. Educational researchers cannot always recruit subjects randomly but instead must carry out investigations with a pre-selected group of learners, who may not be reflective of the general population of learners. One way to address these issues is to utilize qualitative research methods. These methods are innovative in several ways. Qualitative methods excel at extracting data from a variable-rich environment within a deliberately-selected subject population. They identify categorical variables present within a learning environment as they develop (i.e. variables do not need to be defined in advance) during the study. Qualitative methods can compare educational designs to richly describe how student experiences and outcomes differ in one treatment group compared to another. They also identify and describe outlier groups or individuals within the larger subject population and what makes them distinct. This talk will focus on how qualitative methods operate, how qualitative studies can be designed, and how qualitative and quantitative data can complement each other to provide a nuanced view of educational phenomena. The speaker will provide examples of qualitative studies in anatomy education, including his own mixed-methods work in anatomy education at the medical and veterinary school level.

Bio: I was born in Denver, CO but grew up primarily in Casper, WY, graduating from high school in 1992. I attended Carnegie Mellon University in Pittsburgh, PA and in 1996, I graduated with a B.S. in Biology (genetics, biochemistry, molecular biology) with a minor in Chemistry. After two years working in several high-profile retail and temping positions, I was accepted to graduate school at Purdue University. At Purdue I first encountered gross anatomy, histology, embryology, and neuroanatomy, and was hooked. I matriculated through these courses in the Purdue College of Veterinary Medicine as well as the branch campus of the Indiana University School of Medicine. I began working as a teaching assistant in these courses as I completed my Master’s degree in a muscle research laboratory, graduating in 2002. I then started a PhD program in Anatomy Education, taking course on educational theory and educational
research methods while continuing to teach in the medical and veterinary programs. I completed my thesis work, a quantitative and qualitative investigation of how year veterinary students change their approaches to learning, and graduated in 2005.

I then traveled to Lewisburg, WV to join the faculty of the West Virginia School of Osteopathic Medicine. Since that time I have taught gross anatomy, embryology, neuroscience, histology, radiography, and the history of medicine. In terms of research, I have continued investigating how medical students learn effectively, with particular emphasis on anatomy. I also carry out some anatomical projects, looking to find structures that have not been adequately described. I enjoy exploring new and interesting teaching methods such as TBL, flipped classrooms, and using video as a supplementary resource in medical education. These videos are available to view at Clinical Anatomy Explained! on YouTube. In conjunction with Bone Clones, a company that specializes in osteological reproductions, I have been producing a series of tactile models that mimic the appearance and feel of different joints when intact and when ruptured. These will hopefully be available commercially in the very near future!

I enjoy spending my off-time teaching jujutsu (martial arts), watching cheesy movies, and spending as much time as possible with my twin sons, Dashiell and Archer, and my wife Sarah, a Veterinarian and US Army Reserve Major. Thank you all for your attention and I greatly appreciate the opportunity to speak with the members of HAPS!
The Challenges of Educational Research, or Navigating Your Way through Grant Proposals, Reviewers, and IRBs on Your Way to a Published Project

Abstract: So you think you’d like to try doing some educational research? Why not? We’re trained scientists. We understand controlled experiments and how to collect and analyze data. Not so fast! Educational research and biological bench or field research share some properties but they are also very different in many ways. In this talk we will walk through the process of doing educational research from the viewpoint of a scientist with no formal training in education. We will cover the entire lifespan of a project, from first ideas to publication, with memorable examples of what not to do and suggestions for how to be successful with your very first project. Many of the lessons learned come from the NSF-funded project known as ITIP (Integrative Themes in Physiology) that was a collaboration between HAPS and the American Physiological Society.

Bio: Dee U. Silverthorn studied Biology as an undergraduate at Newcomb College of Tulane University, where she did research on cockroaches. For graduate school she switched to studying crabs and received a Ph.D. in marine science from the Belle W. Baruch Institute for Marine and Coastal Sciences at the University of South Carolina. Her research interest is epithelial transport, and most recently work in her laboratory focused on transport properties of the chick allantoic membrane. Her teaching career started in the Physiology Department at the Medical University of South Carolina but since 1986 she has been at University of Texas – Austin, where she teaches physiology in both lecture and laboratory settings, and instructs graduate students on developing teaching skills in the life sciences. In June 2015 she will move from the College of Natural Sciences to the new UT – Austin Dell Medical School, where she will be the physiologist for the first-year medical students.

Dee joined HAPS in 1992 and has only missed one national conference in all those years. She has played various roles in HAPS, including acting as liaison to the American Physiology Society, serving as a member of the Curriculum & Instruction Committee and the Testing task force, helping with several annual conferences (Fort Worth, Austin, Las Vegas, and San Antonio), and serving as President in 2012-2013. In her spare time she writes a human physiology textbook and tries to garden, cook, and do multimedia fiber art.
Update Seminar 4: Regency West
Sunday, May 24th from 4:00 PM – 5:00 PM

Mark Terrell, Ed. D
Sponsored by American Association of Anatomists

How About Them APPLES? Anatomists & Physiologists Learning Educational Scholarship

Abstract: Why should we conduct education research? As HAPSters, we share a genuine interest in maximizing student learning in A&P and some faculty may have to partially satisfy some research-based P&T requirements. However, I argue that the long-range rationale for educational research in A&P is to improve patient care because A&P faculty share the common goal of teaching the foundational science that interprofessionally underpins all the health professions. This interactive seminar will discuss the who, what, why, and how educational research in A&P, with a specific emphasis on strategies for success in developing, implementing, and assessing educational research. Strategies for publishing your educational scholarship and for documenting your educational activity for faculty annual performance reviews will culminate the seminar.

Bio: Mark A. Terrell, Ed.D. is the Assistant Dean of Medical Education at the Lake Erie College of Osteopathic Medicine. In this role, Dr. Terrell serves as the Institutional Director for Faculty Development and for Inter-professional Education, serves as the Program Director for LECOM’s Master of Science in Medical Education Program, oversees Faculty performance evaluation, and participates in medical school curriculum reform. He has given over 50 faculty development training workshops in clinical practice settings and has organized and facilitated many faculty learning communities and other programs for improving basic science instruction in the medical school. Dr. Terrell has given many international workshops, has over a dozen publications, and multiple grants with funding exceeding $85,000, all centered on scholarships in medical education.

Dr. Terrell has taught over 10,000 students across a wide-range of higher education settings including medical school, large urban research-1 institutions, moderate-sized state colleges, and community colleges. As a graduate teaching assistant at Ball State, Dr. Terrell taught introductory biology and geology labs, and courses in medical microbiology and anatomy. In 2000, Dr. Terrell joined the faculty at the University of Southern Indiana in Evansville, IN to teach courses in anatomy, physiology, general biology, and statistics. In 2001, Dr. Terrell joined the faculty at Indiana University – Purdue University at Indianapolis to direct and teach the department’s largest course – undergraduate human anatomy, which enrolled over 1,000 students annually. Due to the educational scholarship surrounding the design, implementation, and analysis of various pedagogical innovations for the betterment of student learning in this course, Dr. Terrell received the Indiana University Board of Trustees’ Teaching Award in 2005 – Indiana University’s highest accolade for excellence in teaching. Later in 2005, Dr. Terrell was recruited by the College of Medicine at The Ohio State University to direct and teach their large-enrolling undergraduate anatomy courses. In 2008, Dr. Terrell was recruited by LECOM and currently serves in an interdisciplinary faculty position. Dr. Terrell’s current teaching assignments include teaching in the Master’s in Medical Education program, Medical Gross Anatomy, and Biostatistics.
Preclinical and Translational Studies Dissecting Chronic Alcohol Modulation of HIV Disease

Abstract: Chronic alcohol consumption is the most common and costly form of substance abuse in the United States. Alcohol use disorders (AUD) and HIV frequently coexist in the same individual. Results from studies conducted by scientists at the Louisiana State University Health Sciences Center (LSUHSC) Comprehensive Alcohol Research Center (CARC) have provided evidence that chronic alcohol elevates viral set point, increases lung viral levels during bacterial infection, promotes intestinal CD4+ and CD8+ T lymphocyte population changes that favor disease transmission, negatively affects bone metabolism, nitrogen balance, and skeletal muscle wasting, ultimately leading to accelerated disease progression to end-stage disease in Simian Immunodeficiency Virus (SIV) infected non-human primates (NHP). These bio-medical consequences of chronic alcohol on SIV disease progression have significant implications for clinical HIV disease progression and add to the existing body of knowledge about the multiple negative effects of AUD in HIV+ patients, including decreased adherence to and effectiveness of ART, and enhanced susceptibility to infection and viral replication. Increased survival resulting from antiretroviral therapy (ART), has elevated the risk for comorbid conditions, arising from both chronic alcohol consumption and HIV infection, including myopathy, insulin resistance, prediabetes, and lipodystrophy. Our interdisciplinary team of investigators has used an integrative organ systems approach to examine the interaction of chronic alcohol consumption on disease progression. Using this approach, we have shown that the CBA-consuming non-ART SIV-infected (CBA/SIV) male NHP has decreased and dysfunctional skeletal muscle (SKM) mass. This decrease in SKM is a critical determinant of time to end-stage disease. Acceleration of SAIDS wasting is associated with accentuated SKM inflammation, profound depletion of anti-oxidant capacity, increased proteasome activity, and decreased myoblast differentiation potential. Ongoing studies have identified that CBA/SIV macaques on ART present with lipodystrophy that is reflected in an increased % abdominal adipose tissue deposition, decreased circulating levels of adiponectin, increased adipose tissue inflammatory cytokine and resistin expression, which we hypothesize contributes to decreased insulin sensitivity. This presentation will focus on our studies investigating the mechanisms responsible for metabolic dysregulation, with focus on SKM mass and body composition and will illustrate the interaction among basic scientists and clinicians in development of a
translational approach to investigating the impact of alcohol on multiple aspects of disease. We anticipate that the results from our studies will identify possible targets for therapeutic interventions to ameliorate HIV/ART associated metabolic derangements. Funding support: AA07577, AA09803, and AA11290.

Bio: Patricia Molina completed her MD training at the Universidad Francisco Marroquin in Guatemala, Central America. Thereafter, she pursued a PhD in Physiology at LSUHSC under the mentorship of Dr. John J. Spitzer, presenting her dissertation on “Ethanol-endotoxin interaction with carbohydrate metabolism”. Her postdoctoral experience at Vanderbilt University was supported by a NIGMS Minority Supplement Grant under the mentorship of Dr. Naji N. Abumrad. She progressed through the academic ranks initially as an Assistant Professor of Surgery and Physiology at the State University of New York, Stony Brook and subsequently as Director of Surgical Research at North Shore University Hospital. During that period, she held a Guest Scientist appointment at Brookhaven National Laboratory prior to joining the Department of Physiology at LSUHSC as an Associate Professor. Since becoming a faculty member at LSUHSC, Dr. Molina has obtained tenure and promotion to the rank of Professor, and has been named the Richard Ashman, PhD Professor in Physiology. In September 2008, she was appointed Department Head for Physiology. Dr. Molina’s research has been funded continuously since completing her PhD degree. She has mentored several undergraduate, graduate and post-doctoral trainees. Dr. Molina is a member of the faculty of the School of Graduate Studies, the Graduate Education Committee in Physiology, The Graduate Advisory Council, and is a mentor for the LSUHSC Interdisciplinary Graduate Program. Dr. Molina is an active member of several committees within LSUHSC and is also actively involved in the Scientific Community outside the institution. Currently, she is the Chair for the National Hispanic Science Network on Drug Abuse and President Elect of the American Physiological Society. Research in her laboratory focuses on the impact of alcohol and drug abuse on the cardiovascular, metabolic and immune consequences of acute traumatic injury and hemorrhagic shock. In addition, work in her laboratory also investigates the interaction of chronic alcohol and cannabinoid use on the behavioral, metabolic, and immune consequences of HIV/AIDS. Currently, work in her laboratory is funded by NIAAA, NIDA, and CDMRP.

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Update Seminar 6: Regency West
Monday, May 25th from 1:30 PM – 2:30 PM

Josè Antonio Bowen, Ph.D., FRSA
Sponsored by Wiley & HAPS President’s Initiative

President
Goucher College
Baltimore, Maryland
Jose.bowen@goucher.edu

Teaching Naked: How Moving Technology out of your College Classroom will Improve Student Learning

Abstract: Technology is changing higher education, but the greatest value of a physical university will remain its face-to-face (naked) interaction between faculty and students. The most important benefits to using technology occur outside of the classroom. New technology can increase student preparation and engagement between classes and create more time for the in-class dialogue that makes the campus experience worth the extra money it will always cost to deliver. Students already use online content, but need better ways to interact with material before every class. By using online quizzes and games, rethinking our assignments and course design, we can create more class time for the activities and interactions that most spark the critical thinking and change of mental models we seek.

Bio: José Antonio Bowen is President of Goucher College. Bowen has won teaching awards at Stanford, Georgetown, Miami and Southern Methodist University where he was Dean of the Meadows School of the Arts for 8 years. He was the Founding Director of the Centre for the History and Analysis of Recorded Music (C.H.A.R.M.) at the University of Southampton, England. He has written over 100 scholarly articles, edited the Cambridge Companion to Conducting (2003), received a National Endowment for the Humanities (NEH) Fellowship, and contributed to Discover Jazz (Pearson, 2011). He is an editor of the 6-CD set, Jazz: The Smithsonian Anthology (2011). He has appeared in Europe, Africa, Asia, the Middle East and the United States with Stan Getz, Dizzy Gillespie, Bobby McFerrin, Dave Brubeck, Liberace, and many others. He has written a symphony (nominated for the Pulitzer Prize in Music), a film score, and music for Hubert Laws, Jerry Garcia and many others. He has served on the Editorial Boards for Jazz Research Journal, the Journal of the Society for American Music (Cambridge University Press), the Journal of Music History Pedagogy, and Per Musi: Revista Acadêmica de Música. He is also a Founding Board Member of the National Recording Preservation Board for the Library of Congress and a Fellow of the Royal Society of Arts (FRSA) in England. Bowen has been featured in The Wall Street Journal, Newsweek, USA Today, US News and World Report, and on NPR for his book Teaching Naked: How Moving Technology out of your College Classroom will Improve Student Learning (Jossey-Bass, 2012, and winner of the Ness Award for Best Book on Higher Education from the American Association of Colleges and Universities). Stanford honored him as a Distinguished Alumni Scholar in 2010. For more in his teaching, see his blog at teachingnaked.com or follow him on Twitter @josebowen.
Much more than a learning platform

LabTutor
Bringing science to life

The LabTutor learning system allows students to record and measure real biological signals with research-grade equipment, helping educators to provide true-to-life experience within the learning environment.

Find out more at Tables 36-38
Poster Presentation Abstracts

Poster Session 1 – Regency Center & East, Sunday, May 24 (Set up by 8:30 AM; present 9:45 AM – 10:45 AM; breakdown by 5 PM)

Poster 101
Lisa Appeddu, SWOSU College of Pharmacy, Lisa.Appeddu@swosu.edu
Co-Presenters: Melinda Burgess, SWOSU College of Professional and Graduate Studies, melinda.burgess@swosu.edu, Ashley Murray, University of Toledo, ashley.murray3@rockets.utoledo.edu, Laura Burleigh, SWOSU College of Pharmacy, burleighl@student.swosu.edu, Gwen Burgess, SWOSU College of Arts & Sciences, gwennewg@gmail.com
Using Salivary Components as Physiological Indicators of Stress Induced by Physical Poses
The objective was to investigate the relationship between stress and salivary hormones before and after subjects were asked to conduct poses high or low in sexualization and power. Factors to be reported include: (1) changes in salivary alpha-amylase (a proposed indirect indicator of adrenergic activity), estrogen, and progesterone levels; (2) relationship of these three salivary components to cortisol and testosterone (which have mixed results in being altered by physical poses); and (3) their relationship with stress as self-reported by subjects. Results will be applied to future research designs which evaluate salivary hormones in test subjects exposed to different stimuli.

Poster 102
Gregory L. Brower, Texas Tech University Health Sciences Center, Greg.Brower@ttuhsc.edu
Co-Presenters: Vaughan H. Lee, Texas Tech University Health Sciences Center, Vaughan.Lee@ttuhsc.edu, James Dembowski, Texas Tech University Health Sciences Center, james.dembowski@ttuhsc.edu, Betsy Jones, Texas Tech University Health Sciences Center, betsy.jones@ttuhsc.edu
Clinical Application of Head and Neck Anatomy: An Interprofessional Experience for Medical and Allied Health Students
A key mission of our institution is fostering interprofessional teamwork via education across healthcare disciplines. Implementation is often challenging, however, we developed an activity pairing students in the Speech-Language and Hearing Sciences to work with small groups of medical students in the Clinically Oriented Anatomy course. This poster will describe the successful experience, which allowed learners to analyze the clinical and ethical challenges in a case involving vocal cord surgery; discuss diagnosis, treatment and long-term follow up for patients with cleft lip/palate birth defects; and identify interprofessional roles and responsibilities in dealing with patients and families affected by speech disorders.

Poster 103
Ann Caplea, Walsh University, acaplea@walsh.edu
Flipping Instructor and Student Resources in the Interactive Classroom
Although many instructors appreciate the value of the interactive classroom, many think that finding time to redesign their classroom will be difficult. A great way to start the process is to “flip” the textbook-provided Instructor Resources with Student Resources. Powerpoint lectures can be prerecorded, annotated and provided to students as ‘homework’. In the classroom, animations and activity sheets, physiology labs and anatomy resources can be used by students. Students can work individually or as groups in the classroom. Using textbook resources is a great way to get started designing an active-learning classroom with meaningful teacher-to-student and student-to-student interactions.

Poster 104
Keely Cassidy, Indiana University, kmcassid@indiana.edu
Embryology in the Medical Curriculum: The Perceptions and Opinions of Current Anatomy Faculty
The anatomical sciences have seen a decrease in hours within U.S. science education in recent years, most notably in the subject of embryology. With more changes to come, it is prudent to ask educators to reveal patterns in content placement, pedagogical methods, and personal experiences. To address these issues an online mixed methods survey was distributed to current anatomy and embryology faculty. In this time of reform and integration, educators’ perceptions and opinions of the current status of embryology in science education must be gathered in order to assess its efficacy and to formulate inquiry-guided recommendations for the future.
Poster 106
Julie Dais, Okanagan College, jdais@okanagan.bc.ca
Co-Presenter: Erin Radomske, Okanagan College, eradomske@okanagan.bc.ca
Sponsored by HAPS
Student Lab Data Project on the HAPS Website - Laboratory Data Collection and Sharing Amongst Post-Secondary Institutions
In order to increase first-year anatomy and physiology students’ interpretation and analysis of data, we need to stimulate their interest. One method involves students comparing their own physiological measurements (i.e. EKG, blood pressure, lung volumes) obtained in the laboratory to data shared by students from other institutions around the world. The data would form a broader pool including more males, elite-level athletes, and older subjects, as well as permit analysis of the effects of less common variables such as asthma and smoking on lung volumes. Learn how your institution can add to this ever-growing pool of human physiology data.

Poster 107
Michel Desilets, University of Ottawa, mdesilet@uottawa.ca
Co-Presenter: Mona Allan, University of Ottawa, mona.allan@rogers.com
Virtual Labs in Nurse Education of Pathophysiology
Nursing students have historically struggled with pathophysiology courses. New technologies can assist students in their learning process, specifically simulation programs used as virtual labs to complement traditional didactic lectures. We implemented interactive virtual labs (using “web-Human”) in the nursing curriculum and showed a significant increase in understanding of cardiovascular pathophysiology, with pre-lab sessions (2009-2011) means at 50 ± 21% (± SD, n = 367) and post-lab (2012-2014) means at 67 ± 17% (± SD, n = 360). While 52% of the 223 surveyed students were satisfied with the labs, 70% felt that they enhanced their understanding of pathophysiology.

Poster 108
Lisa M. Flick, Monroe Community College, lflick@monroecc.edu
Effect of Test Item Order on Student Confidence and Exam Performance in Human Anatomy
Test item order has a demonstrated effect on performance in non-science disciplines. Here, students were randomized into three groups according to their cumulative GPA. Each group of students was given one exam of each order type (random, easy-to-hard, reverse chronological) and the average test scores were compared. Surveys were administered to students to gauge their level of confidence with the exam material and their predicted result. Mean test scores for the three exam types were not significantly different. Students were more likely to correctly predict their score on the random-order exam and were overly confident about the difficulty-ordered exam.

Poster 109
Kareemah Gamieldien, Cape Peninsula University of Technology, GamieldienK@cput.ac.za
Co- Presenters: Navindra Naidoo, Cape Peninsula University of Technology, NaidooN@cput.ac.za, Lloyd Christopher Cape Peninsula University of Technology, LloydC@cput.ac.za
Responding to Subject Mal-alignment/Incoherence Toward National Standardization and Regulation of Anatomy and Physiology in Emergency Care Education at Higher Education Institutions in South Africa
The Bachelor of Emergency Medical Care is a four-year professional degree offered by Higher Education Institutions (HEIs) in South Africa. Such graduates are eligible to register with the Health Professions Council of South Africa (HPCSA) as Emergency Care Practitioners (ECP). The HPCSA mandated programme to nationally align Anatomy and Physiology (A&P) education in Emergency Care, to regulate the minimum standards of related theoretical/practical outcomes is required for the coherent development of a competent ECP graduate. This paper addresses the problematisation of subject mal-alignment/incoherence as a basis for national standardization and regulation of A&P in emergency care education in South Africa.

Poster 110
Ron Gerrits, Milwaukee School of Engineering, gerrits@msoe.edu
Sponsored by HAPS
The HAPS Committees: What Do They Do & How Do I Get Involved?
HAPS has a number of committees that serve to benefit the organization and its members. Many of the committees offer opportunities for members to become involved in projects that benefit A&P instructors at all levels. This poster reviews some of the committees, their main goals and current projects. It also provides information on how you can get involved. Even more information can be found in the conference program and online at http://www.hapsweb.org/?page=AboutHAPScommittee. The HAPS Committees are a great place to learn more about the Society, develop your own skills as a professional, and help others grow as instructors. Join us now.

continued on next page
Poster 111
Tejendra Gill, University of Houston, tgil@uh.edu
**Impact of Class Attendance on Student Performance**

Traditional face-to-face instruction is still the most effective way of delivering scientific information to the undergraduates, and one important factor that influences the student performance is the class attendance. Students who attended lectures on a regular basis outperformed those who did not. Interestingly, the class size, as well as the academic level of the course, did not affect the outcome - going to the class helped students earn higher grades! The information presented is based on the lecture courses taught by the author over several semesters.

Poster 112
Ursula Grabs, UQTR Canada, grabs@uqtr.ca
Co-Presenter: Detlev Grabs, UQTR Canada, grabs@uqtr.ca
**Clinical Research in Anatomy - What about Histology**

We are using Thiel’s embalming method for the clinical research studies. This technique preserves the original color and the flexibility of the joints and is thereby well suited for clinical applications. Recently we started to include also the histopathological evaluation for various regions. We found that the Thiel’s fixation, using an elevated quantity of a salt mixture was not suitable for a classical histopathology procedure. We show here an adapted histopathology protocol that requires additional steps before post-fixation to make samples from Thiel cadavers, which are used in clinical studies, accessible to a classical histopathology evaluation.

Poster 113
Danielle C. Hanson, Indiana University, dchanson@indiana.edu
Co-Presenters: V. D. O’Loughlin, Indiana University, vdean@indiana.edu, M. W. Braun, Indiana University, braunm@indiana.edu, M. Bauman, Indiana University, mebauman@indiana.edu
**Analysis of Student Attitudes Toward the Implementation of Computerized Testing at IU School of Medicine**

Indiana University School of Medicine assessment was standardized with the introduction of computerized testing. Medical students (n=100) were surveyed about concerns and preconceptions concerning the system prior to their first ExamSoft test, and again following several experiences with computerized exams. Using grounded theory methods, student responses were coded and analyzed. In surveys before and after experience with computerized testing, major coded concepts included technical issues, inability to mark directly on exams, and increased comfort with computerized exams. Results support previous analysis of multiple choice surveys, but show more nuanced changes in attitudes indicating decreased anxiety after experience with computerized exams.

Poster 114
Yuli C. Kainer, San Jacinto College North, yuli.kainer@sjcd.edu
Co-Presenter: Neal Schmidt, Pittsburgh State University, nschmidt@pittstate.edu
**Sponsored by HAPS**
**Instructor’s Liability for Student Injuries in the Lab: Are We Covered? Survey Findings and Conclusions**

The HAPS Safety Committee will report on the findings of an on-line survey which will be deployed through the HAPS website during the spring 2015 to collect information about liability policies in the Human Anatomy and Physiology Lab. The information to be presented will include the different liability policies used by the Anatomy and Physiology instructors. The information will be based on responses from HAPS members.

Poster 115
Barbara Kraszpulska, Wright State University, barbara.kraszpulska@wright.edu
**Sponsored by HAPS**
**Factors Influencing the Inclination of Whole Body and Organ Donation Among Medical Students**

Although the majority (95%) of 370 surveyed medical students highly valued the importance of cadaver dissection for medical knowledge, only 42% of them would consider donating their own body for educational purposes. In contrast, as many as 79% of medical students would donate their organs for medical needs. Among five analyzed factors: age, gender, parent’s occupation, religion and ethnicity only two influenced students’ decisions about organ donation – ethnicity and religion (results were confirmed by the chi-squared test and ANOVA). None of the studied factors made a difference in students’ decisions about whole body donation. The study was approved by WSU IRB (exemption # 4539).
Poster 116
Cleveland O. Lane, Jr., Prairie View A&M University, colane@pvamu.edu
Integration of 3-D Dissection Table into Undergraduate Gross Anatomy Course
The learning landscape of undergraduate education has become more dynamic requiring instruction to be creative, engaging and inquiry-based. Studying the human anatomy has often been limited to 2-D images and models. The integration of 3-D Dissection table provides the students the opportunity to be active in their learning and instructor to use interactive methods in assessing the student’s conceptual understanding. In a pilot study, 20 undergraduate students used a 3-D Dissection table to understand anatomical structures.

Poster 117
He Liu, Gannon University, liu017@gannon.edu
Co-Presenter: Mary Vagula, Gannon University, vagula001@gannon.edu
Pedagogical Effectiveness of a Lab Activity of Measuring Salivary Cortisol Levels in Physiology Lab Course
In this study, an undergraduate physiology laboratory activity was developed for students in health profession and biology majors, to enhance students’ understanding of the functions of cortisol hormone, circadian rhythms associated with the release of this hormone, ELISA technique, and quantitative data analysis methods including linear regression and t-test using Microsoft Excel. A commercially available ELISA kit was used by students to measure their cortisol levels in the saliva samples obtained in early morning and late evening. We present here the design, detailed methodology and modifications related to undergraduate students in this teaching lab, and assessment of student learning outcomes.

Poster 118
Darryl McAndrew, University of Wollongong, mcandrew@uow.edu.au
Transitioning the Anatomy Manual to Mobile Technology Platforms
Mobile technology devices in anatomy labs currently deliver content laden applications, e-texts, generic dissection manuals and is recognised to enhance the learner’s engagement and increase productivity. The lab manual, a resource essential to anatomical educators, has been slow to adopt technological enhancement. Students remain tied to hardcopy versions containing basic instruction for lab visits. An interactive e-manual that could be used on a mobile device was developed to included images and videos filmed in the lab and formative assessment tasks that provided targeted and timely feedback. Student review considered the e-manual beneficial to their learning within a medical anatomy curriculum.

Poster 119
Thomas R. Mikkelsen, VIA University College, trm@via.dk
Student Actions, Experiences and Perceptions in a Flipped Classroom Anatomy and Physiology Course
In flipped classroom teaching, students prepare for class by engaging with teacher-produced learning material, typically videos. This frees up time in class which can instead be used for various student centered, active learning activities. I explored nursing student’s experiences with and perceptions of a course on kidney and urinary system anatomy and physiology designed after the flipped classroom concept, with special focus on the videos used. Results from a questionnaire survey indicate that students were very satisfied, and students reported that the videos used played an important and significant role during their learning.

Poster 120
A. M. Prasad, Manipal University, wakaru75@gmail.com
Multiple Variations of the Nerves of Gluteal Region and their Clinical Implications – A Case Report
Knowledge of variations of nerves of gluteal region is important for clinicians administering intramuscular injections, for orthopedic surgeons dealing with the hip surgeries and possibly for physiotherapists managing the painful conditions and paralysis of this region. In the current case, the sciatic nerve was absent. The common peroneal nerve gave a muscular branch to the gluteus maximus. The inferior gluteal nerve and posterior cutaneous nerve of the thigh arose from a common trunk. The common trunk was formed by three nerve roots. Upper and middle roots arose from sacral plexus and entered gluteal region through greater sciatic foramen above and below piriformis respectively. The lower root arose from the pudendal nerve and joined the common trunk. These variations were seen in the right gluteal region of an adult male cadaver aged approximately 70 years during the routine dissection. Innervation of gluteus maximus by common peroneal nerve and presence of a common trunk of inferior gluteal nerve and posterior cutaneous nerve of the thigh make this case unique. The variant nerves may be subjected to iatrogenic injuries during surgical approach to the hip.

continued on next page
Poster 121
Peter Reuter, Florida Gulf Coast University, preuter@fgcu.edu
I’m Sure I got an A Students’ Misperception of their A&P Knowledge as a Contributing Factor to Low Exam Scores
Analysis of students’ estimated test scores and actual test scores on lecture exam 1 in A&P I showed that a majority of students overestimated their score on this exam as well as on the final exam. However, students who developed a better understanding of what they knew did better on the final exam and were able to give a more accurate estimate of their score on the final exam. The data from this study was used to educate students in following courses about the importance of self-assessment and conscious competence.

Poster 122
Peter Reuter, Florida Gulf Coast University, preuter@fgcu.edu
How Creating Your Own A&P Course Companion and Lab Workbook Benefits You as well as Your Students
Using a standard textbook and a lab manual led to frustration for both students and faculty. The students had to skip parts in both books we didn’t use and we had to use activities that didn’t fit what we wanted to do in lab. Creating our own condensed A&P Course Companion and Lab Workbook changed that more than expected. Not only did we receive more positive feedback from students, our passing rates in A&P I went up by almost 14% and the percentage of students that withdrew during the term went down by almost 50%.

Poster 123
Peter Reuter, Florida Gulf Coast University, preuter@fgcu.edu
Co-Presenters: Nils-Otto Jaasko, Florida Gulf Coast University, najaasko6730@eagle.fgcu.edu, Christopher Gonzalez Florida Gulf Coast University, cagonzalez0414@eagle.fgcu.edu
Correlation of 2D:4D Ratio, Vital Lung Capacity, and Self-Reported Athletic Ability in Women
Differences in the ratio between the index (2D) and ring finger (4D) between men and women have been known for a long time. However, we do not know if lung volumes/capacities (esp. vital capacity) differ in men and women depending on their 2D:4D ratio. If yes, this could explain some differences in cardiovascular fitness and why some men/women are better suited for endurance sports. We report on the outcomes of a study that looked at more than 200 women, their 2D:4D ratio and their vital capacity as well as their self-reported athletic ability.

Poster 124
Peter Reuter, Florida Gulf Coast University, preuter@fgcu.edu
Co-Presenter: Ginger Correnti, Florida Gulf Coast University, gmcampbe@eagle.fgcu.edu
Is there a Correlation Between In-Utero Exposure to Sex Hormones, Age of First Menstruation, Sexual Orientation and Prevalence on PCOS?
Studies have shown that in-utero exposure to sex hormones has a marked influence on the physical and mental development of men and women. One of the more common ways to assess this exposure is by measuring the 2D:4D ratio. Recent studies point to a possible link between sex hormone levels at the end of the first trimester and sexual orientation as well as prevalence of Polycystic Ovary Syndrome (PCOS). We report on the results of a survey involving more than 200 female college students and a possible correlation of 2D:4D ratio to age of first menstruation, sexual orientation and prevalence on PCOS.

Poster 125
Ni Song, Lamar State College-Orange, nsong@lsco.edu
Promoting and Assessing Teamwork in Online Anatomy & Physiology Lectures
Teamwork is one of the newly adopted mandatory learning outcomes in Lamar State College-Orange. In support of this new initiative, we designed and used a Team Assignment in the online Anatomy & Physiology lectures to promote and assess teamwork. The assignment involved the usage of online group discussion forum. It produced artifacts allowing direct and accurate assessment, and enabled the instructor to closely monitor team progress and provide timely guidance. Most importantly, the team assignment helped build a tight-knit learning community in online classes, promoted student engagement and enhanced student learning in Anatomy & Physiology.
Poster 126
Kathy Starr, Western Carolina University, kstarr@email.wcu.edu
Using a Background Knowledge Probe to Assess Student Preparedness for a Physical Therapy Program Human Anatomy Course
Anatomy and physiology are prerequisites courses for the Western Carolina University physical therapy anatomy course. The course instructor developed a Background Knowledge Probe to assess student preparedness. The probe, consisting of 62 questions, was administered to students the first week of classes and again at the end of the course. Those who did poorly on the first (pretest) also tended to do poorly on the second (posttest) probe with a positive correlation between the pretest score and the final grade in the course. A Background Knowledge Probe may be a good predictor for student performance in a course.

Poster 128
Malynde Weaver, University of North Georgia, Malynde.Weaver@ung.edu
Development of a Facebook Lab Companion to Improve Student Engagement in Anatomy and Physiology
In classes like Anatomy and Physiology, there is a great need for additional time in the laboratory to access materials. Due to the number of students enrolled in these classes, outside laboratory time is at a premium. As well, students are becoming increasingly engaged with social media. To find a solution to the space problem and to engage students where they are, I created a Lab Companion via Facebook. “Weaver’s World of Anatomy and Physiology” contains pictures of the laboratory models tagged and video clips. This poster shares ideas and successes I have had using Facebook as a laboratory companion.

Poster 129
Danielle Willborn-Johnson, Saint Louis College of Pharmacy, danielle.willborn-johnson@stlcop.edu
Co-Presenter: Lucia Tranel, Saint Louis College of Pharmacy, ltranel@stlcop.edu
Can This Student be Saved: Why Is Everything You Do Still Not Enough?
Why do some students enrolled in Human Anatomy meet with success, while others have difficulty? As a former student in Anatomy and a current Teaching Assistant, this question became of interest. The class structure and rigor have not changed. Can the reason for students’ ineffectiveness be due to poor study habits? An anonymous survey was created addressing variables related to study behaviors. The survey was administered to a Control Group (those passing Anatomy with C or better) and to an Experimental Group (those repeating the course due to a grade lower than C). The data show that the reasons for students’ unsuccessful completion of Human Anatomy are more complicated than first suspected.

Poster 130
Ann Wright, Canisius College, wrighta@canisius.edu
Co-Presenter: Jenny McFarland, Edmonds Community College, jmcfarla@email.edcc.edu, Mary Pat Wenderoth, University of Washington, mpw@u.washington.edu, Joel Michael, Rush Medical College, jmichael40@gmail.com, Harold Modell, Physiology Education Research Consortium, modell@physiologyeducation.org, William Cliff, Niagara University, bcliff@niagara.edu
Knowing Common Misconceptions About Homeostasis Helps Students’ Learning
Homeostasis is a core concept in physiology that students must understand. When students enter a physiology course, they may have commonly misconceptions about homeostasis. If we are aware of students’ misconceptions, we can focus our teaching on helping the students correct their ideas. The responses of thirty-one faculty members at a 2012 Human Anatomy and Physiology Annual Conference provided qualitative evidence of clusters of students’ misconceptions. We will summarize some of the major trends. We will present data about the connections between the challenges that make understanding homeostasis difficult and misconceptions. Poster was presented at EB, March 2015. Supported by NSF DUE1043443.

Poster 131
Grzegorz Zurek, University School of Physical Education in Wroclaw, grzegorz.zurek@awf.wroc.pl
How to Improve the Efficiency of our Brain Work
The aim of the work is to present the most important factors influencing the efficiency of the brain work. Those factors are included into the SOMECO programme. The paper inform about current knowledge and results different researches in Europe and the United States.
Poster 201
Sarah Balizan, Dona Ana Community College/New Mexico State University, sbalizan@dacc.nmsu.edu
Co-Presenter: Ana Serna, New Mexico State University

Service Based Learning Project (Anatomy Academy) and Outreach in a Community College Setting
Utilizing the Anatomy Academy setup and Curriculum provided by Dr. Jonathan J. Wisco of Brigham Young University - this outreach program was able to engage 2 year university students and assist them in applying their learned Anatomy and Physiology course knowledge as they worked with 5th grade science students and continued on to apply for Health programs or advanced medical degrees.

Poster 202
A. A. Buraimoh, Ahmadu Bello University, adebayo.buraimoh@gmail.com
Co-Presenters: S.A. Ojo, Ahmadu Bello University, profsajo@gmail.com, H.O. Shu’ainu, Ahmadu Bello University, I. G. Bako, Ahmadu Bello University

The Study of the Effects of Aqueous Leaves Extract of Vernonia Amygdalina on Normotensive Cats
Hypertension is one of the growing threats of the health of adults in Sub Saharan Africa, which if not properly controlled, could lead to life wasting conditions like stroke and other cardiovascular complications. Vernonia amygdalina, a member of the Asteraceae family, is a small shrub that grows in the tropical Africa. This study was aimed at evaluating the possible effects that aqueous leaves extract of Vernonia amygdalina could have on normotensive cats and the effects of aqueous extract were compared with normal basal rhythm and acetylcholine. Two cats were used for this study and they were administered with the extract at doses of 1mg/ml, 10mg/ml and 100mg/ml through a cannula inserted into the femoral artery. 0.05 ml of Acetylcholine, a standard drug that has a relaxing effect on the heart and 0.1ml of Atropine, a receptor blocker was also administered. The extract produced a generally significant decrease in cat blood pressure at various doses but exhibited more effective response at 1mg/ml which was similar to what was observed after the administration of Acetylcholine. The blood pressure reducing effects of both drug and extract were inhibited by Atropine. Based on our observations, we therefore concluded that Vernonia amygdalina had hypotensive effects on normotensive cats and could be a useful tool in the management of hypertension.

Poster 203
Melissa A. Carroll, DeSales University, melissa.carroll@desales.edu

Spatial Intelligence and Cadaveric Dissection
The learning gains from cadaveric dissection are poorly understood, however understanding student cognitive spatial abilities may contribute to developing a more effective pedagogical approach to teaching with cadavers. The purpose of this research was to determine if the spatial ability of a student predicted the academic achievement in human gross anatomy. Student scores on a cognitive spatial abilities tests were compared to the student’s academic performance within the cadaver lab. Two graduate programs were investigated (Physician Assistant and Doctor of Physical Therapy) and as a comparison undergraduate students in Human Structure and Function were also assessed.

Poster 204
Marnie Chapman, University of Alaska Southeast - Sitka Campus, mdchapman@uas.alaska.edu

Disease Team Discussions: Making Connections that Matter in Large, Online A&P Courses
This discussion board assignment connects students with each other and with overarching learning goals. Students self-sort into Disease Teams. Teams synthesize text information with real world issues. For example, over the course of a semester, the alcoholism team would discuss homeostatic loops disrupted by alcoholism, chemicals associated with alcoholism, cellular processes disrupted by alcoholism, and finally alcoholism’s effects on different body systems. Students see the interconnectedness of systems, and apply information literacy and an evidence based approach. This poster provides sample discussions, learning outcomes, and tips for efficient discussion board management, assignment creation, feedback, and grading.
**Poster 205**  
**Jackson Davenport, University of Illinois at Chicago, jdaven5@uic.edu**  
**Female Runners With ITBS Have Distal Hyperalgesia In The Affected Leg**  
Runners with overuse knee injuries have shown altered leg strength and tactile sensation. The authors hypothesized the affected legs of runners with Iliotibial Band Syndrome (ITBS) would demonstrate altered pain pressure thresholds (PPT), strength (hip frontal plane), and vibratory perception thresholds (VPT) compared to the unaffected legs of controls. Fifteen adult female runners (ITBS=9, Control=6) participated. ITBS affected legs had lower PPT at the 1st dorsal (foot) compared to controls (P=0.01). Results showed no group differences in strength or VPT. Distal hyperalgesia suggests central sensitization, which may contribute to the chronicity and severity of ITBS in female runners.

**Poster 206**  
**Stacey Dunham, Indiana University, dunhams@indiana.edu**  
**Prosected Donors in a Small Lab: Can it be Done?**  
In a small gross anatomy lab with nine donor tables and hardly any extra space, how do you incorporate prosected donors into the laboratory curriculum? For years we assumed it was not possible, but this year with some creative thinking and an extra hour or two from our teaching instructors, we successfully implemented prosections in our lab. Using a rotating schedule, one of the nine donors is prosected prior to the lab. Student engagement is maintained through small video assignments and an obligation to instruct fellow students. We found these changes have benefited both students and instructors.

**Poster 207**  
**Edwin Ewunonu, Ebonyi State University, ediojims02@yahoo.com**  
**Co-Presenter: C.I.P. Anibeze, Enugu State University Of Science and Technology, cipanibeze@yahoo.com**  
**Nasal Morphometric Pattern of the Abakaliki Ethnic Group of South Eastern Nigeria**  
The study documents the nasal morphometric values of Igbo people of South-Eastern Nigeria resident in Abakaliki Area of Ebonyi State. The subjects comprise 669 males and 331 females between 12 and 45 years of age. The nasal length and nasal breadth were measured and Nasal indices calculated. The result shows the mean Nasal Length and Nasal breadth values as 5.54 cm and 3.87 cm respectively and Nasal Index, 70.37 (mesorrhine). There was sexual dimorphism with male values statistically higher than female values. This could be useful in plastic and reconstructive surgery of the nose.

**Poster 208**  
**Kimberly A. Fournier, University of Rhode Island, kimfournier@uri.edu**  
**Co-Presenter: Aura Fajardo Grandidge, University of Rhode Island, afgrandidge@uri.edu**  
**Comparing Instructional and Testing Techniques for a Large Introductory Human Anatomy Course**  
Instructors for the large introductory Human Anatomy course at the University of Rhode Island are working towards enhancing student learning and success in a historically high-risk gateway class. Two pedagogical approaches aimed at improving student performance are currently being implemented; a) flipped delivery aimed at improving self-regulatory behaviors and b) two-stage group exams aimed at providing immediate feedback, decreasing exam anxiety, and increasing overall content retention. Results observed using the two pedagogical approaches will be presented. Implications for practice include improved student performance and preparedness through the use of instructional techniques geared towards providing more guidance during the learning process.

**Poster 209**  
**Mukul C Ganguli, South Texas College, mganguli@southtexascollege.edu**  
**The Role of Class Attendance on Student Performance in Anatomy & Physiology II (A & P) Course**  
This investigation was conducted on an A & P II course. In this course the students meet twice per week for 2 hours and 50 minutes per session. Student attendance is a big concern for the long class hours. As an incentive to attend class, I allocated 50 points (5%) of the total grade to class attendance. Attendance of 205 students over a period of four semesters were recorded. A significant correlation was found between attendance and the final course grade with \( r = 0.43 \) (p<.01). At 8 weeks, the attendance scores for students with grades A through D were 48.4, 45.5, 43.5, and 41.7 respectively. There was no significant difference between students with grades C and D. At 16 weeks, the attendance scores for students with grades A through D were 45.8, 40.1, 36.5 and 30.5 respectively and the difference is significant (p<.01). The results are very similar to a previous study in A & P I. It confirms that class attendance has a significant effect on students’ performance. Also, that there is a considerable drop in attendance as the semester progresses for all students.
Poster 211
Ethel J. Gordon, Salem State University, egordon@salemstate.edu
Co-Presenter: David E. Mercer, Salem State University, dmercer@salemstate.edu

Student Motivation to Volunteer for Extra Credit Presentations in Human Anatomy and Physiology
Students often ask for extra credit projects at the end of a semester for many reasons. In this study, we offer students in Human Anatomy Physiology the opportunity to study a topic relevant to the course and to present their findings to the class. We seek to understand the students’ motivation for either volunteering or declining to present a research topic related to Anatomy & Physiology. The goals of this study include fostering an active learning environment; encouraging student inquiry and research; encouraging reading and writing in the discipline; and increasing the content of interactive class components.

Poster 212
Monica R. Hall-Porter, Lasell College, mhall-porter@lasell.edu
Co-Presenter: Stephen Sarikas, Lasell College, ssarikas@lasell.edu

Implementation of an Online Learning Module in a Traditional Anatomy & Physiology Lecture Course
Knowledge of basic chemistry and cell biology is essential to an anatomy & physiology course. These areas of study require a significant amount of instructional time in a semester long course. Students who take anatomy & physiology at Lasell College are athletic training and exercise science majors whose curricular needs are better served by devoting more time to the study of the muscular and nervous systems. In an effort to support understanding and mastery of basic chemistry and cell biology concepts, without devoting in-class lecture time to these topics, an online learning module was constructed and piloted during the Spring 2015 semester.

Poster 213
Kebret Kebede, Nevada State College, kebret.kebede@nsc.edu
Co-Presenters: Laura Naumann, Nevada State College, Jenny Reategui, Nevada State College

Undergraduate Students’ Responses to Cadaver Laboratory, Coping Strategies and Learning Preferences
This study evaluated undergraduate students’ responses to cadaver laboratory, their coping strategies and their learning preferences in the study of Anatomy. Students attending Anatomy and Physiology classes completed a pre-laboratory survey (N=112) and a post-laboratory survey (N=96) right after the experience. The results indicated the majority of students reported experiencing positive attitudes such as gratitude towards the donor, respect and interest. Coping strategies identified included using menthol, naming the cadaver and limiting interaction. The study also found that 80% of students value the cadaver dissection laboratory as a learning tool for Anatomy over other modalities including synthetic cadavers and anatomical models.

Poster 214
Brian L. Kuyatt, Clearwater Christian College, briankuyatt@clearwater.edu

Pearson Education Practice Anatomy Laboratory 2.0 Software Use in FTF and Online Anatomy Lab Classes: Student Perceived Learning Benefits and Software Developer Benefits for Future Software Versions
This study evaluated the effectiveness of Pearson Education’s Practice Anatomy Laboratory 2.0 software in face-to-face and online anatomy laboratory classes. Cognitive, affective, and psychomotor perceived learning was measured for students using this software. The results indicate that student-perceived learning was significantly greater in the online class environment, specifically in the area of psychomotor learning. The study findings, including an attitudinal survey, have implications for future educational practice in the use and design of advanced digital software for learning in both traditional and online education courses as instructors and commercial software developers seek improvement of student skills in learning human anatomy.

Poster 215
Brianna Julien, La Trobe University, b.julien@latrobe.edu.au
Co-Presenter: Louise Lexis, La Trobe University, l.lexis@latrobe.edu.au

Introduction of a Smartphone APP to Increase Student Engagement in an Advanced Human Physiology Capstone Program
The way students are interacting with course material is changing: most students do not make full use of paper-based subject outlines, assessment guidelines, and timetables which is frustrating for academics and students. Smartphone usage is commonplace in the students’ lives. We aimed to harness this technology and student interest by creating and introducing a mobile app that would support students through completion of an advanced human physiology capstone program. We describe how the app was created and provide preliminary data on student engagement with the app.
Poster 216
Louise Lexis, La Trobe University, l.lexis@latrobe.edu.au
Co-Presenter: Brianna Julien, La Trobe University, b.julien@latrobe.edu.au
From Paper to Screen: Translating our How to Do Science Guide to the Audio-Visual World
We implemented a student-centred capstone curriculum in advanced human physiology that prepares students for postgraduate study and the workplace, and promotes development of research, team work, and communication skills. The program utilizes resource-based teaching and learning (RBTL) in which resources (e.g., student guides, videos) support independent study and allows learning from students’ own investigation of information resources. We recently created supplementary audio-visual resources for our How to Do Science guide. We show some examples of the videos, along with the How to Do Science guide, and provide preliminary data on the usefulness of the videos for student learning.

Poster 217
Mackenzie Loyet, Indiana University Bloomington, mloyet@indiana.edu
Co-Presenters: Barbie Klein, Indiana University Bloomington, barbklei@indiana.edu, Valerie O’Loughlin, Indiana University Bloomington, vdean@indiana.edu
The Effectiveness of Using Yoga Asanas to Teach Musculoskeletal Anatomy to Undergraduate Students
We developed a Yoga/Anatomy workshop that guided students through a series of yoga poses in order to 1) teach the names and locations of muscles and 2) show how anatomic systems work together to produce an action. Students completed a pre and post quiz and an open-answer questionnaire. 43 students were recruited and while there was no significant difference between pre and post quiz scores, many students responded favorably to the workshop, stating that it was helpful in reviewing function of muscles. In the future, we plan to expand on this study and develop workshops for first year medical students.

Poster 218
Robert McCarthy, Benedictine University, rmccarthy@ben.edu
Using Peer Teaching to Engage Undergraduate Anatomy Students
Pedagogical research indicates that peer teaching facilitates deeper student learning. High-performing Biology and Health Sciences undergraduate students at Benedictine University serve as teaching assistants (TAs) in anatomy open labs. I investigated the relationship between the amount of time students spent learning with peers and exam grades in an upper-level human anatomy course. Preliminary data suggest that time spent in open lab correlates with lab practical but not lecture exam grades. I am currently examining factors including class format, instructor, and TA using a multi-way ANOVA design in order to isolate the effect of peer teaching on undergraduate performance.

Poster 219
Jenny McFarland, Edmonds Community College, jmcfarla@email.edcc.edu
Co-Presenters: Ann Wright, Canisius College, wrighta@canisius.edu, Mary Pat Wenderoth, University of Washington, mpw@u.washington.edu, Joel Michael, Rush Medical College, jmichael40@gmail.com
Development of a Homeostasis Concept Inventory for Undergraduate Physiology
This poster describes the development of the homeostasis concept inventory (HCI) to measure undergraduate students’ conceptual understanding of homeostasis. The HCI consists of 20 multiple-choice questions that have been validated using student interviews, faculty surveys and testing in many physiology and A&P courses. The HCI aligns with the homeostasis conceptual framework and detects some common student misconceptions. The HCI can be used in undergraduate-level physiology and A&P courses to assess students’ performance, reveal misconceptions and evaluate the effectiveness of teaching and learning activities. This poster was presented at EB, March 2015. Supported by NSF DUE-1043443.

Poster 220
John Pellegrini, St. Catherine University, jipellegrini@stkate.edu
Co-Presenters: Samantha DeAngelo, St. Catherine University, sadeangelo@stkate.edu, Stacy Symons, St. Catherine University
The Possible Relationship Between DHEA and Depression
Dehydroepiandrosterone (DHEA) is a steroid hormone produced by the adrenals. Some investigators report that a deficiency in DHEA correlates with depression, while other studies contradict this. Since most work has focused on elderly subjects, we sought to investigate a potential correlation of DHEA and mood in college students. Fifteen female undergraduate participants completed the Beck Depression Inventory (BDI) and provided saliva samples that were analyzed for DHEA by ELISA. Analysis yielded no significant correlation between depression scores and DHEA concentration. Although inadequate DHEA may contribute to some forms of depression, we did not observe a relationship in this study.

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Poster 221
Mia Ray, Trinity Washington University, Raym@trinitydc.edu
Poetry Assignments Increase Student Performance in Anatomy and Physiology
This study assessed whether students performed better on test questions after creating a poem about the cell or a component therein. When compared to controls students showed a 7% increase in test performance after being assigned a poetry task. In addition the test performance of students who did not complete the assignment were comparable to the control group whereas those who completed the task showed a 22% increase in test performance on cell related questions. Poetry in this case vivified student learning and creativity, as well as increased the comprehension and retention of information related to anatomy and physiology.

Poster 222
Krista Rompolski, Drexel University, klrompolski@gmail.com
Roux-En-What? The Anatomy and Physiology of Bariatric Surgery
As obesity and its associated co-morbidities continue to rise in prevalence worldwide, more and more patients are pursuing bariatric surgery as an option to induce substantial weight loss and control metabolic syndrome. It is important for future health care practitioners to understand the changes that occur in the anatomy and physiology of the digestive and endocrine systems with these surgeries. This presentation will describe the anatomical and physiological changes that occur with the weight loss surgeries that are both restrictive and malabsorptive. Studying these procedures are excellent case studies for students, comparing normal digestion to altered.

Poster 223
Kiran Sankar, Lonestar College - University Park, kjsankar01@gmail.com
Co-Presenter: Jason LaPres, Lonestar College - University Park, Jason.H.LaPres@lonestar.edu
Thermoregulation
For many years, the accepted standard for the average healthy body temperature in humans has been 98.6 degrees. The objective of this study is to confirm or challenge this theory in order to benefit public knowledge. Data was collected anonymously from 165 participants via a forehead thermometer. This resulted in the new average healthy body temperature to be 98.05 which is approximately 0.55 degrees below “normal.” The importance of this study shows that there has been an inexplicable decline in the average body temperature which is also the basis for determining if one is ill or not.

Poster 224
Bahram Sardarabadi, Parker University, bsardarabadi@parker.edu
Co-Presenters: Everett Johnson, Parker University, ejohnson@parker.edu, Kelsey Martin
Parker University, KMMartin@parker.edu
Dorsal Scapular Artery: Variation of Rare Origin
This study is the result of identification of a variation of the normal anatomy of the dorsal scapular artery (DSA), which was discovered during routine dissection of the neck at a chiropractic institution. Upon inspection of the first part of the subclavian artery on the left side, it was noted that there were four branches emerging from the thyrocervical trunk, one of which was the dorsal scapular artery. The DSA takes a course deep to the superior trunk of the brachial plexus. Origination of the DSA directly from the thyrocervical trunk is reported in approximately 0.6% of the population.

Poster 225
Katharine Semsar, University of Colorado, Boulder, katharine.semsar@colorado.edu
Co-Presenter: Françoise Bentley, francoise.bentley@gmail.com
The Anatomy Learning Inventory (ALI): A “Big Idea” Learning Assessment for Anatomy Courses
Here we present the validation of a new instrument for measure learning of anatomy knowledge, the Anatomy Learning Inventory (ALI). The ALI is designed to assess a subset of big ideas and common misconceptions relevant to the field of anatomy. Although the tool is designed specifically for an undergraduate Human Anatomy course, the assessment would be relevant to many undergraduate Comparative Vertebrate Anatomy and Anatomy and Physiology courses as well.
Poster 226
Dee Silverthorn, University of Texas at Austin, silverthorn@utexas.edu
Co-Presenters: Michael Chirillo, University of Texas Austin, windhoek.lover@gmail.com, Kevin M. Christmas, University of Texas at Austin, kevin.christmas@gmail.com
Exploring Oxygen Transport by Hemoglobin: A computer simulation for students
One of the more difficult aspects of teaching respiratory physiology is getting students to understand the cause-effect relationship between dissolved oxygen in plasma (PO2), percent saturation of hemoglobin, and what happens when inspired oxygen and the amount of available hemoglobin change. We adapted previously developed equations for calculating oxygen saturation across a range of partial pressures of oxygen into an interactive spreadsheet and have written a self-directed activity that allows students to discover how changing altitude and anemia affect oxygen transport in the blood.

Poster 227
Zoe Soon, University of British Columbia Okanagan, zoeanne.soon@ubc.ca
Co-Presenters: Nathan Betsill, University of British Columbia Okanagan, nate.betsill@hotmail.com, Stephanie McKeown, University of British Columbia Okanagan, stephanie.mckeown@ubc.ca, Heather Hurren, University of British Columbia Okanagan, heather.hurren@ubc.ca
Lights! Camera! Action! Gauging Student Reaction to Hands-on-Histology Activities & Projection System
Learning cellular biology and histology through microscope use can be a frustrating, boring, and meaningless task for 1st-year undergraduate students. This study investigates the effectiveness of introducing an interactive microscope camera station. At this new station, TAs and students can project microscope images onto a white board (or pull-down screen). TAs can instruct the students using dry erase markers to highlight specific items or go through the day’s lab activity. Students can also take digital pictures to email themselves or submit to our course’s new on-line histology gallery. In addition, to make this station more hands-on and exciting, mini “treasure hunt” worksheets have been added. For each individual, self-perceived knowledge gains measured by survey are correlated with each student’s background science knowledge, preferred learning style, enjoyment level of each activity, and long-term retention of the material.

Poster 228
Janet Steele, University of Nebraska at Kearney, steelei@unk.edu
Co-Presenter: Karla Gunter, Rend Lake College, duncank@rlc.edu
Comparison of Online Student Performance with Face-to-Face Student Performance in a Non-Majors’ Biology Course
This study examined the performance of students in a non-majors’ biology course offered both face-to-face and online by a rural community college. The same instructor taught both formats of the course. Online students received the same visual presentation of lecture material as face-to-face students, but instead of accompanying audio the online students received only written text. Results showed that online students (n=69) scored significantly higher (mean +/- SD) on the pre-test (36+/-.8 versus 31+/-.9 percent), but students in the face-to-face classes (n=122) showed significantly greater improvement in performance and scored significantly higher on the post-test (68+/-.14 versus 61+/-.16 percent).

Poster 229
Mary Vagula, Gannon University, vagula001@gannon.edu
Co-Presenter: He Liu, Gannon University, liu017@gannon.edu
Teaching Cardiopulmonary Physiology with Clinical Correlation Using Human Patient Simulators to Upper Level Undergraduate Students
Use of patient simulators is becoming common in medicine and health care education. In this study an attempt has been made to evaluate the effectiveness of patient simulators in enhancing students’ understanding of normal cardiopulmonary physiology and the parameters used in the diagnosis of diseased states associated with these systems. About 90 students participated in this study and four conditions were simulated, namely, second degree AV block, atrial fibrillation, COPD, and pericarditis. The complete design and the methodology of this new lab and the assessment of student learning objectives will be presented in this poster.
Poster 230
Cathy Whiting, University of North Georgia - Gainesville, Cathy.Whiting@ung.edu
Co-Presenters: Brittany Bailey, University of North Georgia - Gainesville, BLBAI7902@ung.edu, Margaret Still, University of North Georgia – Gainesville, MRSTI1223@ung.edu
A Review of Peer-Assisted Learning Research and Its Implications for Anatomy and Physiology Education: The Development of An Effective Teaching Assistant Program
Current research supports peer-assisted learning as an effective instructional strategy. Furthermore, data indicate that undergraduate teaching assistant programs benefit not only students, but also teaching assistants and course instructors. Students participating in effective teaching assistant programs earn higher grades and enjoy their learning experience more than students not involved in such programs. In this review of peer-assisted learning research, important conclusions are summarized and implications for anatomy and physiology education are explored as a model for a teaching assistant program is outlined and explained.

Poster 231
Patricia Wisenden, Minnesota State University Moorhead, wisendenp@mnstate.edu
Co-Presenter: Darac Peters, Minnesota State University Moorhead, petersda@mnstate.edu
The healthcare industry will likely see more than 10 million professional positions by 2016. Consequently, the human health sciences are the most popular and heavily enrolled STEM curricula in higher education. Cadaver dissection has long been recognized as the best way to learn human anatomy. The educational value of cadaver dissection comes from hands-on “learning-by-doing” that confers a deeper and longer-lasting knowledge of human tissues than study of sterile models, study based upon computer simulations or study by analogy through dissection of other mammals such as cats or fetal pigs. Historically, cadaver dissection has played a central role in medical education by medical students at medical schools. Recent trends in medical training however have led some medical schools to reduce or eliminate their courses in gross anatomy to make room for new curricula relating to advances in cellular and molecular biology, and genetics. Because of high demand for careers in these areas, the great learning value of the cadaver dissection experience and the pressures to reduce cadaver dissection at medical schools, cadaver dissection is increasingly being incorporated into the curriculum of pre-med and undergraduate pre-health tracts in conventional biology degrees. Currently, about 10% of undergraduate pre-med programs incorporate cadaver dissection. Given projected growth in human health job opportunities and competition among educational institutions to enroll these students, the market demand for cadaver-based courses at the undergraduate level should also increase, creating a sustained market for a laboratory dissection guide for undergraduates. Since 2001 we have incorporated cadaver dissection into our course in Human Anatomy with great success. We have tried various dissection guides but none seem to strike a good balance between dense high-level tomes developed for students at medical school and simplistic high-schoolish manuals based on dissection of cats and fetal pigs. Consequently, we created and refined our own lab manual over a number of years and tested and adjusted it with the feedback of generations of undergraduate students ranging from sophomores to seniors. The result is a rigorous, comprehensive but accessible text that is perfect for an undergraduate course in human anatomy based on cadaver dissection. The manual includes alternative lesson plans for adapting cadaver dissection for courses with varying numbers of students and budgets.
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Memorandum

Dear HAPS Conference Attendees,

On behalf of the Department of Biology at The University of Texas at San Antonio, I am pleased to welcome you to our downtown campus for the two days of workshops for the 29th Annual Conference of the Human Anatomy Physiology Society.

I commend the dedication of HAPS to promote excellence in the teaching of human anatomy and physiology and to encourage collaboration among those who teach this discipline. I know that this conference will benefit the instruction of students in the health and science fields in the future.

Once again, welcome to UTSA. I am confident that you will have a productive and exciting annual conference.

Sincerely,

Edwin J. Barea-Rodriguez, Ph.D.
Chair, Department of Biology
Director, MBRS RISE/MARC Students Training, LSAMP Bridge to Doctorate Program and PEM Sloan Programs
Partnership for Undergraduate Life Sciences Education (PULSE) Fellow
University of Texas at San Antonio
One UTSA Circle, TX 78249
The University of Texas at San Antonio Downtown Campus

- Bus pick up/drop off
- Frio St. Building
- Buena Vista Building
- Durango Building
- Miller Plaza
- Parking Garage
- I-35 / I-10
## Star Shuttle & Charter - HAPS Shuttle Schedule

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<th>Tuesday, May 26, 2015</th>
<th>Wednesday, May 27, 2015</th>
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</thead>
<tbody>
<tr>
<td><strong>7:00 AM – 9:00 AM</strong></td>
<td><strong>7:00 AM – 8:30 AM</strong></td>
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<tr>
<td>There will be 3 buses running between the Hyatt Regency hotel and the UTSA Downtown Campus</td>
<td>There will be 3 buses running between the Hyatt Regency hotel and the UTSA Downtown Campus</td>
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<tr>
<td>Bus pick up is right outside the Hyatt Regency on Losoya Street</td>
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<tr>
<td><strong>9:00 AM – 4:00 PM</strong></td>
<td><strong>8:30 AM – 2:30 PM</strong></td>
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<tr>
<td>There will be 1 bus running between the Hyatt Regency hotel and the UTSA Downtown Campus</td>
<td>There will be 1 bus running between the Hyatt Regency hotel and the UTSA Downtown Campus</td>
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<tr>
<td><strong>4:00 PM – 5:30 PM</strong></td>
<td><strong>2:30 PM – 3:30 PM</strong></td>
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<tr>
<td>There will be 3 buses running between the UTSA Downtown Campus and the Hyatt Regency hotel</td>
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**Planning to drive to The University of Texas at San Antonio – Downtown Campus?**

*Please be aware that there is a $2/hour fee to park on campus.*

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---


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WORKSHOPS-AT-A-GLANCE TUESDAY (MAY 26, 2015)

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<td>101 (Room BV 3.306)</td>
<td>America vs. India: A comprehensive comparison of issues and challenges faced in migrating to a digital teaching and learning environment</td>
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<tr>
<td>201 (Room BV 3.306)</td>
<td>Incorporating a modified “Interteaching” methodology into Anatomy &amp; Physiology lecture settings</td>
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<td>301 (Room BV 3.306)</td>
<td>Bloom’s taxonomy - a way to determine cognitive level of course materials when used correctly</td>
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<tr>
<td>401 (Room BV 3.306)</td>
<td>Sponsored by Hands-On Learning Beyond the Hype: Three Types of “Must-Have” Data</td>
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<td>102 (Room BV 3.318)</td>
<td>Teaching, learning &amp; assessing using a conceptual framework for homeostasis</td>
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<tr>
<td>202 (Room BV 3.324)</td>
<td>I want to flip my class! Now what?</td>
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<tr>
<td>302 (Room BV 3.318)</td>
<td>Conscience in crisis: the Nazi academics</td>
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<tr>
<td>402 (Room BV 3.318)</td>
<td>Sponsored by McGraw Hill Higher Education Integrating Anatomy &amp; Physiology Revealed into your Classes</td>
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<td>103 (Room BV 3.324)</td>
<td>Andreas Vesalius: The Father of Modern Anatomy and Physiology</td>
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<td>203 (Room BV 3.326)</td>
<td>Flipping histology: An interactive lymphatic adventure</td>
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<td>303 (Room BV 3.324)</td>
<td>Identifying the Core Concepts of Human Anatomy</td>
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<td>403 (Room BV 3.324)</td>
<td>Now You’re the Doctor – A Diagnostic Game</td>
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<td>104 (Room BV 3.326)</td>
<td>Sponsored by Pearson Use Learning Catalytics™ to Experience Peer Instruction and the Flipped Classroom from the Students’ Point of View</td>
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<td>204 (Room BV 3.328)</td>
<td>Unburdening content-heavy A&amp;P courses</td>
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<td>304 (Room BV 3.326)</td>
<td>Updates to Advising for Medical School: Myths and Facts</td>
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<td>404 (Room BV 3.326)</td>
<td>How to make a large classroom feel small</td>
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<td>105 (Room BV 3.328)</td>
<td>Ovarian follicle selection: an update on hormones and ovarian function</td>
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<td>205 (Room BV 3.330)</td>
<td>Rational Course Design</td>
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<td>305 (Room BV 3.328)</td>
<td>Using Role-Playing Simulations To Teach Endocrine and Respiratory Physiology</td>
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<td>405 (Room BV 3.328)</td>
<td>Estrogen and Estrogen Receptors in the Aging Female Heart: What Happened to Hormone Replacement Therapy?</td>
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<td>106 (Room BV 3.330)</td>
<td>Physiology-Maps: Assessing student learning across an entire physiology program</td>
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<td>206 (Room DB 2.228)</td>
<td>Sponsored by Pearson MasteringA&amp;P and MyReadinessTest: A First-Timer’s Guide</td>
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<td>406 (Room BV 3.330)</td>
<td>Whole body Anatomy &amp; Physiology Final Projects: Using student presentations to prepare for the comprehensive exam</td>
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<td>107 (Room DB 2.222)</td>
<td>Improving Student Success towards a Health Science Career with Technology-Enriched Redesigned STEM Courses</td>
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<td>207 (Room DB 2.304)</td>
<td>An integrative Approach to Course Assessment and Feedback</td>
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<td>307 (Room DB 2.304)</td>
<td>Teaching the Five Senses through the Art of Beer</td>
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<td>407 (Room DB 2.304)</td>
<td>Teaching with analogies to make meaningful associations for students</td>
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<td>108 (Room DB 2.228)</td>
<td>Sponsored by APS &amp; HAPS Using the Life Sciences Teaching Resource Community (LifeSciTRC) to support Vision and Change and Next Generation Science Standards evidenced-based teaching</td>
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<td>208 (Room DB 2.306)</td>
<td>Connecting students to cellular respiration</td>
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<td>308 (Room DB 2.306)</td>
<td>Sponsored by Anatomy in Clay Learning System “Neuro 101”</td>
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<td>408 (Room DB 2.306)</td>
<td>The Musculated Skeleton</td>
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<td>109 (Room DB 2.304)</td>
<td>Low-cost 3D printing for A&amp;P labs: make what you need when you need it</td>
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<td>209 (Room DB 3.316)</td>
<td>Sponsored by ADInstruments Setting the new standard for immersive, interactive learning with Lt this workshop is a repeat of session 609</td>
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<td>309 (Room DB 3.316)</td>
<td>Using student focus groups to improve subject design and faculty performance</td>
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<td>409 (Room DB 3.316)</td>
<td>Sponsored by HAPS Decoding genetics: fun hands-on material to teach introductory concepts of genetics</td>
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<td>110 (Room DB 2.306)</td>
<td>Building critical-thinking skills through innovative active learning strategies centered around a teaching-assistant-based learning model</td>
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<td>210 (Room FS 1.512)</td>
<td>An active learning approach utilizing case study presentations to demonstrate physiological principles in A &amp; P</td>
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<td>310 (Room FS 1.512)</td>
<td>In-Class Activities and Strategies for the Flipped Classroom</td>
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<td>410 (Room FS 1.512)</td>
<td>It’s Time to Start Using the HAPS Comprehensive A&amp;P Exam - We Will Show You How and Why</td>
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<td>111 (Room DB 3.316)</td>
<td>Sponsored by ADInstruments Using electromyography to demonstrate skeletal muscle physiology</td>
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<td>211 (Room FS 2.520)</td>
<td>Collaborative Learning/Testing of Human Muscles</td>
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<td>311 (Room FS 2.520)</td>
<td>Sponsored by McGraw Hill Higher Education Increasing student motivation using assignments and grading schemes that foster “Hope and Grit”</td>
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<td>411 (Room FS 2.520)</td>
<td>Mysteries at the Microscope: Histopathology Case Studies as a Tool for Teaching Undergraduate Histology</td>
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<td>112 (Room FS 1.512)</td>
<td>Less Blah, Blah, More Aha - Best HAPSter Demos</td>
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<td>113 (Room FS 2.520)</td>
<td>How we teach: the myths and facts of learning styles, critical thinking, and active learning</td>
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## WORKSHOPS-AT-A-GLANCE  WEDNESDAY (MAY 27, 2015)

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<th>Session 7 60 Minutes 11:00 AM – 12:00 PM</th>
<th>Session 8 90 minutes 1:00 PM – 2:30 PM</th>
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<td><strong>501 (Room BV 3.306)</strong>&lt;br&gt;What type of learner are you? Learning styles of undergraduate gross anatomy students.</td>
<td><strong>601 (Room BV 3.306)</strong>&lt;br&gt;A Non-Major Problem: How to Keep Non-Majors Interested in Your Biology Electives and General Education Courses&lt;br&gt;&lt;br&gt;701 (Room BV 3.306)**&lt;br&gt;Avoiding CATastrophe: Distance Labs promote learning and an assessment culture</td>
<td><strong>701 (Room BV 3.306)</strong>&lt;br&gt;A Non-Major Problem: How to Keep Non-Majors Interested in Your Biology Electives and General Education Courses&lt;br&gt;&lt;br&gt;701 (Room BV 3.306)**&lt;br&gt;Avoiding CATastrophe: Distance Labs promote learning and an assessment culture</td>
<td><strong>801 (Room BV 3.306)</strong>&lt;br&gt;Sponsored by Carolina Biological Supply&lt;br&gt;Adaptations for Lab-Based Online Anatomy and Physiology Courses</td>
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<tr>
<td><strong>502 (Room BV 3.318)</strong>&lt;br&gt;Using embedded common finals to promote learning and an assessment culture</td>
<td><strong>602 (Room BV 3.318)</strong>&lt;br&gt;Sponsored by McGraw Hill Higher Education&lt;br&gt;Ending the Depth versus Breadth Debate: How to Utilize Innovative Techniques to Develop Curricula Based on the Recommendations from Vision and Change</td>
<td><strong>702 (Room BV 3.318)</strong>&lt;br&gt;Sponsored by McGraw Hill Higher Education&lt;br&gt;Ending the Depth versus Breadth Debate: How to Utilize Innovative Techniques to Develop Curricula Based on the Recommendations from Vision and Change</td>
<td><strong>802 (Room BV 3.318)</strong>&lt;br&gt;Sponsored by McGraw Hill Higher Education&lt;br&gt;Adaptive Learning in A&amp;P: From Reading Assignments to Lab Prep, Tailor their Learning and Hold them Accountable</td>
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<td><strong>503 (Room BV 3.324)</strong>&lt;br&gt;Hypothesis Driven Learning: Student Led Short-Term Research Studies in Physiology using Human Subjects</td>
<td><strong>603 (Room BV 3.324)</strong>&lt;br&gt;Comparative Study of Online, Hybrid, and Traditional Anatomy and Physiology Courses</td>
<td><strong>703 (Room BV 3.324)</strong>&lt;br&gt;Zombie A&amp;P</td>
<td><strong>803 (Room BV 3.326)</strong>&lt;br&gt;Sponsored by HAPS-Institute&lt;br&gt;Connecting Art and Science: The Cultural History of Art and Anatomy in Italy</td>
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<td><strong>504 (Room BV 3.326)</strong>&lt;br&gt;Sponsored by Hands-On Learning Avoiding CAstrophe: Distance Labs that Rock</td>
<td><strong>604 (Room BV 3.326)</strong>&lt;br&gt;Sponsored by the HAPS-Thieme Award for Excellence in Teaching&lt;br&gt;Re-packaging for our Teaching Journey</td>
<td><strong>704 (Room BV 3.326)</strong>&lt;br&gt;Integrating virtual dissection into a hybrid, graduate anatomy course which also utilizes cadaveric study</td>
<td><strong>804 (Room BV 3.328)</strong>&lt;br&gt;Validating and norming assessment rubrics</td>
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<td><strong>505 (Room BV 3.328)</strong>&lt;br&gt;The Importance and Benefits of Low-stakes Online Practice Exams for Student Success in A&amp;P classes</td>
<td><strong>605 (Room BV 3.328)</strong>&lt;br&gt;Moving Students from “What?” to “Why?”</td>
<td><strong>705 (Room BV 3.328)</strong>&lt;br&gt;Student engagement; join the conversation!</td>
<td><strong>805 (Room BV 3.330)</strong>&lt;br&gt;The State of Online Anatomy &amp; Physiology Lecture/Lab Course Delivery: Are We Ready for Prime Time?</td>
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<td><strong>506 (Room BV 3.330)</strong>&lt;br&gt;Engaging the community in science: an often overlooked scientific skill</td>
<td><strong>606 (Room BV 3.330)</strong>&lt;br&gt;Pre-semester bridge programs: how can they be used to improve student retention in A&amp;P?</td>
<td><strong>706 (Room BV 3.330)</strong>&lt;br&gt;Role Playing through Medical Terminology</td>
<td><strong>806 (Room DB 2.228)</strong>&lt;br&gt;Screencasts &amp; Lecture Capture – Tips and Best Practices</td>
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<td><strong>507 (Room DB 2.304)</strong>&lt;br&gt;Understanding the Mediastinum and Thoracic Surface Anatomy</td>
<td><strong>607 (Room DB 2.304)</strong>&lt;br&gt;Sponsored by Pearson&lt;br&gt;Increase Student Success Using MasteringA&amp;P’s Adaptive Learning Tools</td>
<td><strong>707 (Room DB 2.304)</strong>&lt;br&gt;Diagnosing how students organize their knowledge</td>
<td><strong>807 (Room DB 2.304)</strong>&lt;br&gt;Students Helping Students Engage and Succeed in Anatomy and Physiology: A Pilot Study of a Peer-Assisted Learning Program</td>
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<td><strong>508 (Room DB 2.306)</strong>&lt;br&gt;“Express it and guess it”: a word game to review anatomy and physiology terms</td>
<td><strong>608 (Room DB 2.306)</strong>&lt;br&gt;The nerve of it all: the brachial plexus in 3-D</td>
<td><strong>708 (Room DB 2.306)</strong>&lt;br&gt;Sponsored by Anatomy in Clay&lt;br&gt;Learning Systems&lt;br&gt;“Kneesy Does It”</td>
<td><strong>808 (Room DB 2.306)</strong>&lt;br&gt;From “What’s a humerus?” to “No two deltoid tuberosities are created equal” or Teaching Anatomy Labs Effectively at All Four Levels.</td>
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<td><strong>509 (Room FS 1.512)</strong>&lt;br&gt;Do Something! A Toolkit of Strategies to Promote Active Learning</td>
<td><strong>609 (Room DB 3.316)</strong>&lt;br&gt;Sponsored by ADInstruments&lt;br&gt;Setting the new standard for immersive, interactive learning with Lt this workshop is a repeat of session 209</td>
<td><strong>709 (Room FS 1.512)</strong>&lt;br&gt;Teaching a study skills course to anatomy undergraduates: activities and lessons learned</td>
<td><strong>809 (Room DB 3.316)</strong>&lt;br&gt;Tubes and Twists: A Hands-on Activity to Teach Development of the Digestive System</td>
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<tr>
<td><strong>510 (Room FS 2.520)</strong>&lt;br&gt;Pre-lecture Reviews with Anatomy Tunes</td>
<td><strong>610 (Room FS 2.520)</strong>&lt;br&gt;View It, Then Capture It: A Histology Atlas for Better Understanding and Learning</td>
<td><strong>710 (Room FS 2.520)</strong>&lt;br&gt;You can’t teach them if you can’t keep them: Improving retention in A&amp;P I</td>
<td><strong>810 (Room FS 1.512)</strong>&lt;br&gt;Sponsored by HAPS Presidential Initiative&lt;br&gt;“How-to” Guide for Developing a Publishable Scholarship of Teaching Project</td>
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<td><strong>511 (Room FS 3.512)</strong>&lt;br&gt;Sponsored by Anatomy in Clay&lt;br&gt;Teaching Online Anatomy/Physiology: Digital Techniques that Appeal to the Senses and Emotions</td>
<td><strong>611 (Room FS 3.512)</strong>&lt;br&gt;Fostering collaboration: Two (or more) heads are better than one</td>
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Tuesday, Session 1

101 (Room BV 3.306) – America vs. India: A Comprehensive Comparison of Issues and Challenges Faced in Migrating to a Digital Teaching and Learning Environment – 90 Minutes
William L. Hoover, Bunker Hill Community College, wlhoover@bhcc.mass.edu, Dennis Burke, Bunker Hill Community College, dburke@bhcc.mass.edu, Kaushik (Kash) Dutta, University of New England, kdutta@une.edu
As higher education becomes increasingly global, it is imperative we share our digital successes and failures with our international counterparts. Topics to be addressed in this presentation are: finding time to acclimate to technology, digital course creation, accreditation standards, WiFi access, faculty and student onboarding, user training and support, and publisher content limitations. Participants will actively engage in a roundtable discussion and Q & A session with both American professors and Indian professors (via a live Skype session).

102 (Room BV 3.318) – Teaching, Learning & Assessing Using a Conceptual Framework for Homeostasis – 90 Minutes
Jenny McFarland, Edmonds Community College, jmcfarla@email.edcc.edu, Ann Wright, Canisius College, wrighta@canisius.edu
Homeostasis is a core concept in physiology and an example of the “systems” Vision & Change core concept. Workshop participants will apply a validated conceptual framework for homeostasis to their teaching, student-centered learning activities and assessments. We will discuss the framework in the context of giving students deliberate practice with this concept and components of the framework throughout a course. Participants will use the framework to design formative assessments, and learn how to apply the feedback to a plan that provides recurring deliberate student practice. For multiple-choice feedback, we will address the importance of item (distractor) selection in formative assessment. Supported by NSF DUE-1043443.

103 (Room BV 3.324) – Andreas Vesalius: The Father of Modern Anatomy and Physiology – 90 Minutes
Mark Nielsen, University of Utah, marknielsen@bioscience.utah.edu
Five hundred years ago this past December 31st, in the wee hours of the morning, a young boy was born in Brussels. In a short span of 30 years he would not only revolutionize the science of anatomy, but completely change the tenor and practice of the biological and medical sciences. And while he will always be remembered for his incredible book, De Humani Corporis Fabrica, it is his courage, genius, and vision that are the real story behind this Renaissance man.

104 (Room BV 3.326) – Use Learning Catalytics™ to Experience Peer Instruction and the Flipped Classroom from the Students’ Point of View – 90 Minutes
Marien Cendon, Miami Dade College, mcendon@mdc.edu
*Sponsored by Pearson* What is it like for a student to be in an interactive classroom? Please join Marien Cendon of Miami Dade College as she flips the traditional HAPS workshop. Come experience a flipped classroom where you will participate in a session that uses cloud-based constant formative assessment with critical thinking questions and sketching on A&P illustrations. We’ll explore a different kind of A&P interactive class with peer instruction based on your responses. Bring your smartphone, tablet, or computer to this hands-on workshop that uses cutting edge flipped classroom techniques and technology.

105 (Room BV 3.328) – Ovarian Follicle Selection: An Update on Hormones and Ovarian Function – 90 Minutes
Chad Wayne, University of Houston, cwayne@uh.edu
The process of dominant follicle selection which leads to the selection of a single ovum for ovulation is the result of a complex interaction between the endocrine and reproductive systems. If the primary function of the ovary is to produce a viable gamete, then it would follow that dominant follicle selection would be an important physiological process to understand. This update will go beyond the standard textbooks to explore how a single follicle is recruited from a cohort of follicles to become the dominant follicle. In addition, the hormones of the menstrual cycle and the regulatory mechanisms responsible will be examined.

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106 (Room BV 3.330) – Physiology-MAPS: Assessing Student Learning Across an Entire Physiology Program – 90 Minutes
Katharine Semsar, University of Colorado, Boulder, katharine.semsar@colorado.edu
If you are looking for an instrument to measure student learning across an entire physiology program, the upcoming Physiology-MAPS might be just the instrument you are looking for. We welcome you to come review assessment questions currently in development, provide feedback from the point of view of your own program, volunteer for Physiology-MAPS piloting, and join in a discussion of how and when key physiological concepts are taught over the course of an entire curriculum.

107 (Room DB 2.222) – Improving Student Success towards a Health Science Career with Technology-Enriched Redesigned STEM Courses – 90 Minutes
Meg Flemming, Austin Community College, mflemmin@austincc.edu, Rick Fofi, Austin Community College, rfofi@austincc.edu
The STEM pre-requisite courses for health science programs have long been a barrier to student success. In response, the Biology Innovation Lab at Austin Community College used a Department of Labor grant to redesign BIOL 1308, Biology Fundamentals, BIOL 2101/2304 Human Anatomy and BIOL 2404, Introduction to Anatomy & Physiology. The modularized course material creates a “flipped” approach with extensive in-class active learning opportunities. We will present examples of the modules, the hands-on activities and the data showing improved student success. Your tax dollars at work! The modules will be free of charge to any school wanting to adopt them!

108 (Room DB 2.228) – Using the Life Sciences Teaching Resource Community (LifeSciTRC) to Support Vision and Change and Next Generation Science Standards Evidenced-based Teaching – 90 Minutes
Julie Dais, Okanagan College, jdais@okanagan.bc.ca, Miranda Byse, The American Physiology Society, mbyse@the-aps.org
*Sponsored by American Physiology Society and HAPS*
Vision and Change is a framework of core concepts and competencies for undergraduate life science education developed by AAAS and NSF. Learn how one teacher is introducing Vision and Change to her classes and labs through activities and collections found in the Life Science Teaching Resource Community (LifeSciTRC). Then, receive a hands-on walkthrough of how to find resources for your own courses in the LifeSciTRC. HAPS is a founding partner of the LifeSciTRC, which is a free online educator community and digital library of over 7,000 free peer-reviewed resources.

109 (Room DB 2.304) – Low-cost 3D Printing for A&P Labs: Make What You Need When You Need It – 90 Minutes
John Pattillo, Middle Georgia State College, john.pattillo@mga.edu
Models are essential tools for learning in A&P. However, we may not always have the models we need, or we may wish to create novel models to better suit our students or teaching styles. 3-D printing is a rapidly developing technology that may solve these problems. Using a low-cost printer and free software, it is possible to create a variety of models from publically available anatomical data. These data may also be combined in creative ways to make new and unique models. Come learn about the challenges of 3D printing, and how this exciting technology can enhance your A&P labs.

110 (Room DB 2.306) – Building Critical-Thinking Skills through Innovative Active Learning Strategies Centered Around a Teaching-Assistant-Based Learning Model – 90 Minutes
Cathy Whiting, University of North Georgia - Gainesville, Cathy.Whiting@ung.edu, Mark Green, University of North Georgia - Gainesville, magree7145@ung.edu, Dylan Shearer, University of North Georgia - Gainesville, djsheaa8786@ung.edu, Paul Siegrist, University of North Georgia - Gainesville, pmsieg1596@ung.edu, Shannon Sutton, University of North Georgia - Gainesville, asutt0742@ung.edu, Brittany Bailey, University of North Georgia - Gainesville, bbbail7902@ung.edu, Jancy Burge, University of North Georgia - Gainesville, joburge4207@ung.edu, Ryan Martucci, University of North Georgia - Gainesville, rtmart9457@ung.edu, Caitlin Trout, University of North Georgia - Gainesville, cltrou4888@ung.edu
Come join us for an interactive demonstration of active learning techniques that will transform your labs. Imagine students preparing for lab by completing their pre-lab assignments. Imagine them staying actively engaged and focused for the entire lab period instead of rushing through activities as quickly as possible so that they can leave early. We will present innovative strategies centered around a teaching assistant-based learning model to help you create a rigorous, dynamic learning environment in which your students can excel as they build critical-thinking and problem-solving skills.

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111 (Room DB 3.316) – Using Electromyography to Demonstrate Skeletal Muscle Physiology – 90 Minutes
Aaron Fried, MVCC, afried@mvcc.edu, Don Kelly, MVCC, dkelley@mvcc.edu, Wes Colgan, ADInstruments Inc, w.colgan@adinstruments.com
*Sponsored by ADInstruments Inc*
This is a demonstration of a customized laboratory exercise used at MVCC that replaces the traditional frog gastrocnemius muscle laboratory activity. Using an ADInstruments data acquisition system, the activity of the triceps, biceps and flexor digitorum superficialis muscles will selectively be recorded during several maneuvers. In small groups, participants will actively predict and test hypotheses about muscle electrophysiology, concentric and eccentric actions of muscles, and analyze EMG data to answer questions about the agonist/antagonist relationship between the biceps and triceps as well as grip force fatigue in the forearm. Demonstration includes description of LabAuthor to customize lab activities.

112 (Room FS 1.512) – Less Blah, Blah; More Aha - Best HAPSter Demos – 90 Minutes
John Koch, John Tyler Community College, jkoch@jtcc.edu, Terry Thompson, Wor-Wic Community College, tthompson@worwic.edu, Carol Veil, Anne Arundel Community College, cbveil@aacc.edu, Javni Mody, Anne Arundel Community College, jmody@aacc.edu, Robin McFarland, Cabrillo College, rromcfarl@cabrillo.edu, Karen McMahon, University of Tulsa, karen-mcmahon@utulsa.edu
Eight HAPSters are collaborating to show and explain their best, student-tested, in-class demonstrations that help students gain a particular insight or inspiration. A wide range of anatomical and physiological principles and processes will be included, focusing on those that often evade students through misconceptions or confusion. Each presenter will provide workshop attendees with a handout describing the materials needed and the instructions for how to construct their own demonstration materials. A brief question/answer/comment period will follow each demonstration. Attendees are sure to leave with at least one, and likely several, dynamite demonstrations to enlighten and energize their students.

113 (Room FS 2.520) – How We Teach: The Myths and Facts of Learning Styles, Critical Thinking, and Active Learning – 90 Minutes
Peggy Van Meter, Penn State University, pnv1@psu.edu, John R. Waters, Penn State University, johnwaters@psu.edu
Anatomy and physiology educators often speak of how we integrate critical thinking and active learning into our courses, and we are encouraged to design lessons and adopt products that address students’ learning styles. But what do these terms really mean? Are they marketing buzzwords or are they concepts supported by well designed studies? In this workshop, we will discuss how educational psychology research can help instructors separate myth from fact, and design meaningful curricula for our students.

Tuesday, Session 2

201 (Room BV 3.306) – Incorporating a Modified “Interteaching” Methodology into Anatomy & Physiology Lecture Settings – 60 Minutes
David Mercer, Salem State University, dmercer@salemstate.edu
Interteaching is a technique developed by behavioral analysts to promote deeper student learning by encouraging student teaching. Several studies demonstrate improved student test scores when compared to traditional lecture methods in diverse fields of study. This workshop will describe interteaching in its original format, its use in an Anatomy and Physiology course, the improvement in test scores compared to lecture-only classes, and the limitations when used in its original form. In addition, the workshop will introduce modifications made to the interteaching technique to make it more engaging and acceptable for students in learning the complex concepts of human physiology.

202 (Room BV 3.324) – I Want to Flip my Class! Now what? – 60 Minutes
Leslie Day, Northeastern University, l.day@neu.edu
Flipping a classroom is a great way to get students engaged in active learning. I have been flipping my 100+ class for the past 4 years and will share my ups and downs. This workshop will explore the tools you can use to help you flip a classroom, including prerecorded lectures (Camtasia, Tegrity, etc.), different classroom performance devices (clicker), online activities, and in-class interactive activities.

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203 (Room BV 3.326) – Flipping Histology: An Interactive Lymphatic Adventure – 60 Minutes
Barbie Klein, Indiana University Bloomington, barbklei@indiana.edu
The flipped classroom is a style of instruction where students review material prior to class and traditional lecture time is devoted to application and collaboration. Last year I developed a flipped class for the lymphatic system in a medical-level histology course. Students prepared by reviewing assigned material then lecture began with a short pre-test followed by groups working on three computer-based clinical cases. In this workshop we will go through how to construct an interactive hyperlinked document from learning objectives, reflect on student perceptions, and discuss ideas for future flipped classes.

204 (Room BV 3.328) – Unburdening Content-Heavy A&P Courses – 60 Minutes
Kartika Tjandra, Mount Royal University, ktjandra@mtroyal.ca
Content-heavy first year A&P courses are often associated with a high DFW rate. There is no single attributing factor leading to a high DFW rate in these foundational A&P courses, however, a combination of factors may contribute to students’ poor performance. To gain a deeper understanding of these issues, we underwent a one-year period of intensive “course-redesign” for our A&P courses, in collaboration with our nursing colleagues. Many aspects of the course and its delivery were well dissected. Come and find out what we learned from this process and the positive impact it may provide to our students.

205 (Room BV 3.330) – Rational Course Design – 60 Minutes
Wendy Riggs, College of the Redwoods, wendy-riggs@redwoods.edu, Margaret Weck, St. Louis College of Pharmacy, Margaret.Weck@stlcop.edu
In this session an outline for a system of backwards course design will be presented. Members of the Fall 2014 HAPS-I course: Rational Course Design will present their impressions of the value and frustrations of their first attempts to apply the principles of backwards course design to their personal teaching contexts.

206 (Room DB 2.228) – MasteringA&P and MyReadinessTest: A First-Timer’s Guide – 60 Minutes
Shawn Macauley, Muskegon Community College, Shawn.Macauley@muskegoncc.edu
*Sponsored by Pearson*
This session will introduce participants to MasteringA&P, an advanced online science tutorial and homework system that allows instructors to give students personalized attention outside of office hours, and MyReadinessTest, a powerful online system designed to assess pre-A&P students’ proficiency in the foundational concepts needed for success in human anatomy and physiology courses and efficiently remediate gaps in targeted topics. Come see how Dr. Shawn Macauley uses MyReadinessTest and MasteringA&P in his course, which will include an overview of creating homework assignments, reviewing student work, and exploring available teaching diagnostics to increase student success.

207 (Room DB 2.304) – An Integrative Approach to Course Assessment and Feedback – 60 Minutes
Nahel Awadallah, Johnston Community College, nwa@johnstoncc.edu
Many of us teaching A&P seek to assess student understanding for every chapter. Course Assessments involves everyone, from top-level administrators to teaching faculty and students. Faculty must demonstrate that specific learning objectives are being met by students under the guidance of their departments. Is that enough? What are we missing? This presentation will discuss technology used to streamline and simplify assessment. It will include a new integrative approach to assess student mastery of anatomy and physiology. The integrative assessment approach will shape and revise your teaching methodology to make it work best for your students. It is a challenging and exciting approach.

208 (Room DB 2.306) – Connecting Students to Cellular Respiration – 60 Minutes
Patricia Visser, Jackson College, patricia_visser@jccmi.edu
Having problems with students making the connections between cell activity, ATP production, carbon dioxide (and other waste) production and cardiovascular modifications? Learn about a simple lab activity that measures carbon dioxide production during various levels of activity -- where you get to be the student this time. Calculations and post-activity “thought” questions will also be presented.
209 (Room DB 3.316) – Setting the New Standard for Immersive, Interactive Learning with Lt – 60 Minutes
Wes Colgan, ADInstruments Inc, w.colgan@adinstruments.com, Arianna Boulet, ADInstruments Inc, a.boulet@adinstruments.com, Chris Wright, ADInstruments Inc, c.wright@adinstruments.com
*Sponsored by ADInstruments Inc*
This workshop is a repeat of session 609
After 27 years at the cutting edge of life science education, ADInstruments is bringing a new element to the table. Lt is the only cloud-based teaching system that allows you to record and analyze physiological signals with your teaching curriculum to engage and inspire your students. Lt is optimized for any browser or mobile device for continued learning most anywhere. Lt was designed to have comprehensive course management capabilities combined with more intuitive authoring tools that make teaching easier, and learning more engaging. Come and see some of your favourite anatomy and physiology topics elevated to a completely new level.

210 (Room FS 1.512) – An Active Learning Approach Utilizing Case Study Presentations to Demonstrate Physiological Principles in A & P – 60 Minutes
Bernadette Dunphy, Monmouth University, bdunphy@monmouth.edu
Student engagement, interactive learning and flipping the classroom are all possible techniques to better deliver material to students for increased learning. A student presentation of case studies with analysis on physiological processes is an alternative to these other non-lecture approaches. This workshop will review the methods by which case study presentation can be used to compare normal physiological principles to abnormal physiology leading to a disease process.

211 (Room FS 2.520) – Collaborative Learning/Testing of Human Muscles – 60 Minutes
Joyce Jennings-Pineda, Missouri State University West Plains, joycepineda@missouristate.edu
In the past, the one lab exam given in our Human Anatomy course at Missouri State University West Plains which proved for many years to “make or break” many nursing and allied health students’ ability to succeed has been human muscle nomenclature. To improve student learning of human muscles in the Human Anatomy course at Missouri State University West Plains, a collaborative approach was used in both learning and testing of human muscle nomenclature. Comparison of three fall semesters using the new approach showed there was an average increase of 36% of students meeting the course objective related to recognizing nomenclature of human muscles.

Tuesday, Session 3

301 (Room BV 3.306) – Bloom’s Taxonomy - A Way to Determine Cognitive Level of Course Materials When used Correctly – 60 Minutes
Janet Casagrand, University of Colorado, Boulder, Janet.Casagrand@colorado.edu
Bloom’s taxonomy is a widely accepted tool for delineating understanding into six cognitive levels: knowledge/remember, comprehension/understand, application/apply, analysis/analyze, synthesis/create, and evaluation/evaluate. Bloom’s taxonomy offers a means for developing assessments at appropriate levels; categorizing levels targeted by learning objectives or assessments; and assessing curricular alignment. Although Bloom’s taxonomy can be a useful tool, there can be confusion/misconceptions when ‘Blooming’ course materials. For example, a question may be higher level initially, but if given again becomes merely remember level. After discussing the categories, participants will work with a dichotomous key and sample questions.

302 (Room BV 3.318) – Conscience in Crisis: the Nazi Academics – 60 Minutes
Aaron Fried, MVCC, afried@mvcc.edu
Anatomists benefited from the Nazis. Universities accepted bodies from political prisons. Prisoners executed for espionage were being used for teaching and research. Academics were flourishing with a large supply of cadaver materials for research and teaching. After World War II, most who worked the Nazi camps were tried as war criminals while the academics kept working without rebuke, often using the source materials gained unethically. This workshop will examine the history of academic anatomists under the Nazis. How should these specimens have been dealt with? What do you do with the knowledge gained from experiments and work with these tissues?

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Identifying the Core Concepts of Human Anatomy – 60 Minutes
Murray Jensen, University of Minnesota, msjensen@umn.edu, Bradley Barger, Indiana University, jbbarger@indiana.edu

Students enrolled in human anatomy courses frequently complain about the amount of memorization required. Experienced educators know that a deeper, conceptual understanding of human anatomy requires more than just memorization. This workshop marks the beginning of a long-term project to identify the core-concepts of human anatomy and target successful teaching and learning methods to move students beyond the idea of rote-memorization. The products from this workshop will be used to develop inquiry-based curriculum materials for entry-level human anatomy students. Anatomy educators with several years of teaching experience are especially needed for this project – we need your wisdom!

Updates to Advising for Medical School: Myths and Facts – 60 Minutes
Barbara DeHart, Pennsylvania State University, bzd2@psu.edu

Medical school ranks as one of the most popular career goals among incoming first-year students in the Life Sciences. As such, this presentation will focus on how faculty and advisers can help their students prepare and succeed when applying to medical school. The information provided will help faculty and advisers to become familiar with current medical school statistics, the characteristics of a competitive applicant, the 2015 MCAT, changes to the applicant pool, and to distinguish between medical school myths and facts. Furthermore, we will look at traditional and non-traditional ways of applying as well as alternative medical careers, and the important role that faculty and advisers play in this process. The presentation will be followed by a question and answer session.

Using Role-Playing Simulations To Teach Endocrine and Respiratory Physiology – 60 Minutes
Kerry Hull, Bishop's University, khull@ubishops.ca

Role-playing simulations can help students master complex processes. By acting out physiological events, students can clarify their understanding of cause-and-effect relationships and more easily remember multistep pathways. Students watching the simulation can be engaged by dividing the class into support groups for the actors, and asking groups to predict how the simulation will change under various conditions. In this workshop I will introduce simulations designed to teach 1. feedback in the hypothalamo-pituitary-target gland axis using music; and 2. ventilation mechanics. I’ll also present data evaluating the effectiveness of the simulations and discuss methods to maximize student engagement and account for student diversity.

Lakshmi Atchison, Chestnut Hill College, latchiso@chc.edu
*Sponsored by Mala Scientific*

Students struggle understanding blood cell anatomy and changes that occur during disease states. A classroom-tested, blood cell model is shown to enable students to instantly grasp normal blood cell anatomy, and many types of leukemia. Using lesson plans and disposable kits, students create their own blood cell models to understand what goes wrong leading to disease states. Students also learn quantitative analysis of blood cells and use kits to key down specific diseases. The blood cell kits presented here can be used at all levels from high school to medical school providing students an instant grasp of blood cell disorders.

Teaching the Five Senses through the Art of Beer – 60 Minutes
Tom Lehman, Coconino Community College, tom.lehman@coconino.edu

The key to learning is passion. Understanding – truly understanding – the human body involves internalizing your experiences while learning about the senses. One of my passions is brewing beer and I can show you how to use that passion to enliven your students’ appreciation of their senses. Come experience the ingredients in a way you never thought of before. 

“Neuro 101” – 60 Minutes
Steve Kish, Zane State College, skish@zanestate.edu
*Sponsored by Anatomy in Clay® Learning System*

The brain functions as an important regulatory organ. The various lobes and regions of the brain are responsible for interpreting sensations, creating memories, and controlling or influencing body function. Participants will use modeling clay and Maniken™ models to build the anatomy of the brain.
309 (Room DB 3.316) – Using Student Focus Groups to Improve Subject Design and Faculty Performance – 60 Minutes
Robert Paine, LaTrobe University, r.paine@latrobe.edu.au
We use student focus groups to evaluate our subjects and teaching. The purpose of this workshop is to share ideas and search for best methods in setting up and conducting the focus groups.

310 (Room FS 1.512) – In-Class Activities and Strategies for the Flipped Classroom – 60 Minutes
Jeanine Page, Lock Haven University, jpage2@lhup.edu
One of the most challenging aspects of teaching anatomy and physiology in the flipped classroom setting is creating new and engaging in-class learning activities. I have developed activities that will keep students focused and engaged, and allow the students to see the material from a new and more approachable perspective. These activities can be easily adapted to a variety of classrooms. This workshop will focus on giving instructors new ways to present, and even demonstrate, difficult concepts including: glomerular filtration, lung volume and pressure relationships, muscle contraction and ABO blood typing.

311 (Room FS 2.520) – Increasing Student Motivation Using Assignments and Grading Schemes that Foster “Hope and Grit” – 60 Minutes
Kevin T. Strang, University of Wisconsin, kstrang@wisc.edu
*Sponsored by McGraw Hill Higher Education*
One determinant of student success is the degree of motivation. Some students may perform poorly, not because of a lack of intelligence, but because the structure of assignments and grading schemes either fail to motivate or implicitly discourage them. Class performance data from two successive years of the same large physiology class will be presented: a control year, and then a year in which a “Hope and Grit” grading scheme was adopted and homework assignments were presented in measured doses. Did these changes have a significant impact on the motivation of students in the lower quintiles? Come and find out!

Tuesday, Session 4

401 (Room BV 3.306) – Beyond the Hype: Three Types of “Must-Have” Data – 60 Minutes
Holly Houtz, Hands-On Learning, holly.houtz@holscience.com
*Sponsored by Hands-On Learning*
New technologies are all the rage. Today’s tools claim to drive retention and student engagement. But are we getting the data we need? How can data truly ignite actions that improve educational effectiveness? This workshop will help educators work smarter, not harder by teaching them how to get the three types of data they need to track student knowledge gain, apply actionable analytics in the A&P classroom, and predict trends in a larger population of students. We’ll cover all the basics, from generating quantifiable learning objectives to analyzing student performance. Come ready to proof out your best teaching practices!

402 (Room BV 3.318) – Integrating Anatomy & Physiology Revealed into your Classes – 60 Minutes
Greg Reeder, Broward College, greeder@broward.edu
*Sponsored by McGraw Hill Higher Education*
Most of us are limited in our teaching of ‘human’ anatomy to the use of plastic models or preserved animals for dissection. In this workshop, you will be able to see how A&P Revealed 3.0, the customizable human cadaver dissection program, can enhance any class. Come and learn how easy it is to use, how it integrates with Connect, and how to access many amazing free resources. This workshop will let exciting new information “out of the bag” regarding the Anatomy & Physiology Revealed Cat and Fetal Pig versions now available.

403 (Room BV 3.324) – Now You’re the Doctor – A Diagnostic Game – 60 Minutes
Tirzah Birk, Ivy Tech, tbirk1@ivytech.edu
This active-learning game provides a technology-free alternative to engage the entire class. Given a set amount of money, the student “doctors” purchase diagnostic tests and treatments while cost increases with each decision. In this session participants will experience the game, learn student responses from a case-study, and understand how to recreate this experience.

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404 (Room BV 3.326) – How to Make a Large Classroom Feel Small – 60 Minutes
Jon Runyeon, University of Oregon, jrunyeon@uoregon.edu, Jacqlyn King, University of Oregon, jhyler@uoregon.edu
Large class sizes are a reality for many who teach in higher education. The physical design of large classrooms imposes a teacher-centered approach, where the instructor is viewed as the content expert and students assume the role of passive and invisible participants. During this workshop, we will share techniques to help you transform your large (or small) classroom into an engaging experience where students have the opportunity to apply knowledge from their preparatory assignments and interact with their team of instructors. You will leave this workshop with a new outlook on what can be achieved in a large-class room setting.

405 (Room BV 3.328) – Estrogen and Estrogen Receptors in the Aging Female Heart: What Happened to Hormone Replacement Therapy? – 60 Minutes
Nanette J. Tomicek, The Pennsylvania State University, njt128@psu.edu
Heart disease remains then number one killer of women, and disease prevalence increases 2- to 3-fold following menopause. Clinical trials, such as the famous Women’s Health Initiative (WHI) of the 1990s, have failed to demonstrate cardioprotective benefit from chronic estrogen replacement therapy. Where are we now with estrogen therapies? Topics to be discussed include a review of past estrogen therapies, original research on estrogen receptors, and a current update on therapies for prevention and treatment of aging women with heart disease.

406 (Room BV 3.330) – Whole Body Anatomy & Physiology Final Projects: Using Student Presentations to Prepare for the Comprehensive Exam – 60 Minutes
Brenda del Moral, Edgewood College, bdelmoral@edgewood.edu
Students often struggle to find meaningful ways of preparing for their anatomy and physiology comprehensive exam. The presenter will introduce a method that has students prepare each other for the exam in the final day of class. A group of students are assigned a body system and asked to create a 10-minute presentation on normal homeostatic function and disruption in type 2 diabetes mellitus. Details of the presentation and assessments will be provided, and then we will break up into groups to create our own presentations. Participants will be encouraged to share their feedback on the process.

407 (Room DB 2.304) – Teaching with Analogies to Make Meaningful Associations for Students – 60 Minutes
Bobbi Patton, York College of Pennsylvania, bpatton2@ycp.edu
Closet cleaning? Toilet flushing? Conveyor belts? How can these topics be used to teach physiology? Strategic, effective analogies enable students to learn new concepts by making associations with their existing knowledge. Have you considered the strengths or weaknesses of the analogies you use or whether they are tailored to your student population? This workshop will describe the teaching-with-analogies model and evaluate some analogies specific to anatomy and physiology. Most importantly, you will generate some of your own analogies working in small groups so you can leave with new meaningful associations for your students to apply to difficult concepts.

408 (Room DB 2.306) – The Musculated Skeleton – 60 Minutes
Thomas H. Lanthorn, LoneStar College System, Montgomery, Thomas.Lanthorn@lonestar.edu
Teaching how muscles make bones move can be challenging because of the disconnect between the full-size, articulated skeletons and the solid, immovable muscle models that cannot be connected with the skeleton. The musculated skeleton combines both using springs/bungee cords that can be attached to the origins and insertions of 26 muscles -- the primary ones used to teach muscles and their origins and insertions. Students learn, by doing and directly observing, 1) how muscles move bones, 2) how muscles stabilize joints, and 3) why specific origins and insertions are critical for specific movements.

409 (Room DB 3.316) – Decoding Genetics: Fun Hands-On Material to Teach Introductory Concepts of Genetics – 60 Minutes
Shani Golovay, Simpson University, sgolovay@simpsonu.edu
Teaching the genetics section of an anatomy and physiology course can be costly and often inefficient. There are many great free resources such as paper PCR and extraction of DNA from a strawberry using household products that can curb the cost of more expensive genetics labs. We will discuss strategies for dealing with Punnett squares, transcription & translation, gel electrophoresis, PCR, and genomic libraries. What is fundamental genetics information? We will discuss strategies to make this section more memorable and engaging.

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410 (Room FS 1.512) – It’s Time to Start Using the HAPS Comprehensive A&P Exam - We Will Show You How and Why – 60 Minutes
Jennifer Burgoon, The Ohio State University, jennifer.burgoon@osumc.edu, Members of the Testing Committee
*Sponsored by HAPS*

The HAPS Comprehensive Exam has seen amazing growth in the past few years, and has had tremendous work accomplished in validating the test both with content experts and psychometricians. The exam is among the most inexpensive on the market, yet offers top tier security and reporting. The test follows the HAPS learning outcomes and is used to characterize entire programs, individual instructors, and has been used as a final exam for individual students. We will answer all of your questions and show you how easy it is to implement this assessment tool into your curriculum.

411 (Room FS 2.520) – Mysteries at the Microscope: Histopathology Case Studies as a Tool for Teaching Undergraduate Histology – 60 Minutes
Nina Zanetti, Siena College, zanetti@siena.edu

Histology is often perceived by undergraduates as difficult, dull, and irrelevant. This workshop explores how instructors can use case studies, with photomicrographic images of actual pathology specimens, to improve student engagement in learning histology. Participants will work in groups to “solve the mystery” of several histopathology-oriented case studies taken from the “Histology Challenge,” a regular feature on the HAPS website. Each case will involve reviewing basic histology, interpreting photomicrographs, and ultimately diagnosing the disease. We’ll also share resources for case study materials and ideas for using them to reinforce students’ mastery of basic histology in A & P courses.

412 (Room FS 3.512) – Increasing Student Engagement – and Educator Satisfaction – with Biopac Student Lab 4.1 – 60 Minutes
Ken Graap, BIOPAC Systems, keng@biopac.com, William McMullen, BIOPAC Systems, William@biopac.com
*Sponsored by BIOPAC Systems*

Life science educators aspire to deliver great teaching that allows the students to obtain a high degree of knowledge while building a confident commitment to learning. Based on extensive input from educators across the globe, the new Biopac Student Lab 4.1 features a variety of new functionality that helps educators deliver more inspired teaching including brand new lessons, Dropbox integration for lesson access anywhere and new hardware support. This workshop will detail these new features and the new Curriculum Management System (CMS) licensed feature that allows instructors to control and customize all aspects of the lesson content using a simple visual text editor.

Wednesday, Session 5

501 (Room BV 3.306) – What Type of Learner are You? Learning Styles of Undergraduate Gross Anatomy Students. – 60 Minutes
Melissa M. Quinn, The Ohio State University, quinn.269@osu.edu, Jennifer Burgoon, The Ohio State University, jennifer.burgoon@osumc.edu

In order to categorize ways that people learn, learning styles instruments have been created and administered. These tools are useful as they allow instructors to learn more about students, as well as aid in the development and application of useful teaching approaches. Because anatomy is at the core of health professions, there has been much research in understanding its instruction in professional programs (i.e., medical and dental) and how learning style preference can influence students’ achievement. At the undergraduate level, research has focused on learning style preferences of physiology students, with a noticeable lack in the gross anatomy field.

502 (Room BV 3.318) – Using Embedded Common Finals to Promote Learning and an Assessment Culture – 60 Minutes
Abass Abdullahi, Bronx Community College of CUNY, abass.abdullahi@bcc.cuny.edu, Maureen Gannon, Bronx Community College of CUNY, maureen.gannon@bcc.cuny.edu

Embedding questions in comprehensive finals is an efficient way to provide content analysis to assess if students are meeting the course learning outcomes. Common questions are part of our final cumulative exams in all anatomy and physiology sections, thus reporting the results are as automatic as reporting final grades. This presentation will discuss efforts by course coordinators to promote a faculty driven practical assessment culture that reveals student learning, while maintaining academic freedom. This process has been streamlined and has led to a systemic and sustainable assessment practice, which has allowed for easier implementation of course and curricular improvements.
503 (Room BV 3.324) – Hypothesis Driven Learning: Student Led Short-Term Research Studies in Physiology using Human Subjects – 60 Minutes
Rachel Hopp, Houston Baptist University, rhopp@hbu.edu, Benjamin Miller, Texas Wesleyan University, brmiller@txwes.edu
Critical thinking is an essential student learning outcome for science courses. Help your students think outside of the box (lab manual) by teaching them to design their own experiments. By guiding your students through the scientific method of hypothesis formation, experimental design, data collection and analysis, research paper preparation and poster presentation preparation, your students will improve their critical thinking skills and gain deeper knowledge in their particular research area. Additionally, students practice their “soft skills” such as creativity, problem solving, organization, time management, and communication. The presenters have used this assignment for more than five years. Sample research projects from freshman-senior level courses will be presented.

504 (Room BV 3.326) – Avoiding CATastrophe: Distance Labs that Rock – 60 Minutes
Holly Houtz, Hands-On Learning, holly.houtz@holscience.com
*Sponsored by Hands-On Learning*
Science in the distance classroom is often belittled, frowned upon, and outright argued against. “How could we ever create an online lab course better than the traditional classroom?!” Join this workshop for a lively discussion about ways that distance labs trump traditional labs. Leave prepared to convince your skeptical colleagues. The conversation will be modeled around cat dissections, and we’ll cover: (1) Learning Anytime, Anywhere, (2) The Un-Diluted Experience, (3) Lengthy Activities, (4) Having it All in One Place.

505 (Room BV 3.328) – The Importance and Benefits of Low-stakes Online Practice Exams for Student Success in A&P classes – 60 Minutes
Peter Reuter, Florida Gulf Coast University, preuter@fgcu.edu
The session presents the results of a study that examined the effects of completing online practice exams by students enrolled in Human Anatomy & Physiology I and II on individual formal exams and overall course success. Results showed that students who took all four practice exams had a higher passing rate than the class as a whole, including students that did not take any practice exams. The study also showed that the percentage of students getting an A as a final grade was more or less constant regardless of whether students took all, some or none of the practice exams.

506 (Room BV 3.330) – Engaging the Community in Science: An Often Overlooked Scientific Skill – 60 Minutes
Louise Lexis, La Trobe University, l.lexis@latrobe.edu.au
Effectively communicating science to multiple audiences is a critical skill for scientists, medical and dental professions, and allied health disciplines. Our students were tasked with creating a piece of work (their choice of medium) to communicate an aspect of human physiology to a chosen target audience. Students created a range of pieces including video clips, claymations, animations, board games, brochures, and story books. Target audiences included primary school students, high school students, the general public, and populations with a variety of illnesses. We describe the scaffold used to support students through this skill-building exercise, and provide examples of students’ work.

507 (Room DB 2.304) – Understanding the Mediastinum and Thoracic Surface Anatomy – 60 Minutes
Mark Nielsen, University of Utah, marknielsen@bioscience.utah.edu
For the medical professional there is really only one region of importance in the thorax - the mediastinum. A strong knowledge of mediastinal anatomy and its structural relationships is paramount to surgical procedures of the thorax, reading MRI and CAT scan films, and understanding the spread of disease and inflammation. This presentation will use embryological principles to illustrate simple patterns in the structural organization and relations of the mediastinal anatomy and clearly show how this anatomy can be visually mapped to the surface of the body.

508 (Room DB 2.306) – “Express it and guess it”: A Word Game to Review Anatomy and Physiology Terms – 60 Minutes
Kathy Burleson, Hamline University, kburleson01@hamline.edu
Learning the terminology is an important part of mastering anatomy and physiology content—why not make it fun? In this workshop, a customizable version of a popular board game will be introduced which can be modified for a variety of classes to give students an interactive review of course vocabulary. An overview of the game and student feedback will be presented, and participants will get a chance to play the game themselves.
509 (Room FS 1.512) – **Do Something! A Toolkit of Strategies to Promote Active Learning** – 60 Minutes
Wendy Riggs, College of the Redwoods, wendy-riggs@redwoods.edu
Active learning increases student engagement and success. This workshop will facilitate the sharing of different classroom strategies to promote active learning in a lecture-based or flipped class.

510 (Room FS 2.520) – **Pre-lecture Reviews with Anatomy Tunes** – 60 Minutes
Anthony Weinhaus, University of Minnesota, weinh001@umn.edu, Jason Massey, University of Minnesota, masse051@umn.edu
Designed to engage students, review material, and introduce new topics, we developed a new learning tool which is conducted before lecture to incentivize student attendance and encourage early arrival. This tool consists of playing a programmed, continuously looping, quick-paced slide presentation which reviews the material from the previous lecture. Popular music is played with themes consistent to introduce the subsequent lecture. Students find the exercise a productive use of time. We will share tips from the classroom on creating, timing, and running the presentation. Will also share our lists of anatomy-related music (also bring your own ideas to share).

511 (Room FS 3.512) – **Teaching Online Anatomy/Physiology: Digital Techniques that Appeal to the Senses and Emotions** – 60 Minutes
R.S. Pozos, San Diego State University, bpozos@gmail.com
*Sponsored by Anatomy in Flashcard Learning System*
Online courses of Anatomy/Physiology require a presentation style that appears to the auditory and visual sense to be effective. The workshop will demonstrate various new digital techniques used to engage students. The unifying concept of this workshop is the use of dynamic moving cursors that highlight images or graphs and their associated music/sounds which enhance the mastery of concepts in Anatomy/Physiology. In addition, these techniques engender emotion(s) which may assist the student in mastering concepts or remembering facts. Examples of these digital techniques will be available for free download.

**Wednesday, Session 6**

601 (Room BV 3.306) – **Role Play, Model Creation, and a Few More Ways to Enhance Understanding** – 60 Minutes
Patricia Hernandez, Abilene Christian University, hernandezp@acu.edu
Role-playing and creating models are approaches that help students conceptualize and understand challenging biological processes. In role-play students “act out” interstitial fluid formation, peripheral resistance and plaque formation in a blood vessel, and neurotransmitter release. Using model magic, protein synthesis is simulated, ion channels are visualized, muscle fiber structure is created, and a 3D model of the nervous system structure is created. To understand the generation of an action potential, two colors of sticky notes are used to represent ions and are accompanied by a summary illustration. These activities incorporate all learning styles to learn complicated concepts in their own way.

602 (Room BV 3.318) – **Graphic Representation in Undergraduate Anatomy and Physiology: Less is More?** – 60 Minutes
Vasiliy Kolchenko, New York City College of Technology, vkolchenko@citytech.cuny.edu
Good graphics can be extremely helpful for anatomy and physiology students. On the other hand, some images can be confusing or overwhelming. How much is too much? Too little? We will discuss different types of graphic representation, from realistic to more abstract, trying to identify the optimal levels of abstraction for different media (print, video, slide presentation). We will also show how symbolic graphics can guide student learning in a more efficient way and will provide examples of successful implementation of the approach. This work is supported by the NSF TUES grant (Transforming Undergraduate Education in STEM).

603 (Room BV 3.324) – **Comparative Study of Online, Hybrid, and Traditional Anatomy and Physiology Courses** – 60 Minutes
Nahel Awadallah, Johnston Community College, nwwadallah@johnstoncc.edu
Many colleges are offering traditional anatomy and physiology courses and few hybrid course sessions. There is an increase interest for online A&P course offering at different colleges. The study will compare success rates of students who took these courses; In addition, I will share the joy and challenges for each course format. The preliminary data might surprise you.

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604 (Room BV 3.326) – Re-packing for our Teaching Journey – 60 Minutes
Terry Thompson, Wor-Wic Community College, tthompson@worwic.edu
*Sponsored by the HAPS-Thieme Award for Excellence in Teaching*
We all discover, borrow, adapt and even create new methods for our teaching tool-kits, but we can easily overwhelm ourselves and our students. We strive to improve assessments that measure students’ learning, but are we always aware of what is “under” that apparent understanding? I’ll share lessons learned from colleagues and students, experiences that have been most valuable in re-packing my own tool-kit and ways I’ve learned to prompt my students, exposing understanding gaps so I can anticipate and incorporate simple ideas into content overloaded A&P. Participants will be encouraged to share and take-away specific activities for their own re-packing.

605 (Room BV 3.328) – Moving Students from “What?” to “Why?” – 60 Minutes
Dean Furbish, Wake Technical Community College, dfurbish@waketech.edu
One measure of true learning is demonstrated by students who have moved from memorization to understanding. When students can explain why something is the case rather than merely reciting facts, they have successfully moved from “what” to “why.” Two unrelated theories (Myers-Briggs and philosophy of science) explain why the majority of students struggle with this transition. In this session, participants will receive tangible strategies that enable students to move from “what?” to “why?”

606 (Room BV 3.330) – Pre-semester Bridge Programs: How can they be used to Improve Student Retention in A&P? – 60 Minutes
Theresa Young, Middlesex County College, tyoung@middlesexcc.edu, Kimberly Fouad, Middlesex County College, kfouad@middlesexcc.edu
Looking for an intervention to improve student retention in your A&P course? Pre-semester bridge programs have been used for decades to help prepare at-risk students to be successful in their college careers. In this session we will engage in open discussion about ways that A&P instructors can adapt this common intervention to specifically target entering A&P students. Join us to share your ideas about what A&P students need to be successful and to discuss the use of pre-semester bridge programs as effective interventions. We will also share our plans for an A&P summer bridge program.

607 (Room DB 2.304) – Increase Student Success Using MasteringA&P’s Adaptive Learning Tools – 60 Minutes
Terry Austin, Temple College, taaustin@templejc.edu
*Sponsored by Pearson*
Combining diagnostics from pre-lecture assignments, additional post-lecture practice opportunities, and exam prep quizzes, MasteringA&P helps students with self-assessment and increases their success on exams. But what else can be done for students that accumulate gaps in their understanding of key A&P content as the semester progresses? Take your use of MasteringA&P to the next level by incorporating Dynamic Study Modules and Adaptive Follow-Up Assignments. See how these tools harness the latest educational research in neurobiology, cognitive psychology, game studies, and adaptive learning technology to help your students maximize their potential in your classroom.

608 (Room DB 2.306) – The Nerve of it All: The Brachial Plexus in 3-D – 60 Minutes
Christine Yu, Indiana University Bloomington, cid@indiana.edu
This workshop will present and encourage you to make the Brachial Plexus with pipe cleaners. The purpose of this activity is twofold: it provides you with a kinesthetic tool to aid student learning of the Brachial Plexus, and it will provide you with a super cool Brachial Plexus model that you can bring to parties and show to your friends (though it is not to scale). Materials and assembly instructions will be provided. Highlights from “A novel technique for teaching the brachial plexus” (2011) will be presented. Discussing “replication and extend” studies is an aim of this workshop as well.

609 (Room DB 3.316) – Setting the New Standard for Immersive, Interactive Learning with Lt – 60 Minutes
Wes Colgan, ADInstruments Inc, w.colgan@adinstruments.com, Arianna Boulet, ADInstruments Inc, a.boulet@adinstruments.com, Chris Wright, ADInstruments Inc, c.wright@adinstruments.com
*Sponsored by ADInstruments Inc*
This workshop is a repeat of session 209
After 27 years at the cutting edge of life science education, ADInstruments is bringing a new element to the table. Lt is the only cloud-based teaching system that allows you to record and analyze physiological signals with your teaching curriculum to engage and inspire your students. Lt is optimized for any browser or mobile device for continued learning most anywhere. Lt was designed to have comprehensive course management capabilities combined with more intuitive authoring tools that make teaching easier, and learning more engaging. Come and see some of your favourite anatomy and physiology topics elevated to a completely new level.

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610 (Room FS 2.520) – View It, Then Capture It: A Histology Atlas for Better Understanding and Learning – 60 Minutes
Hisham S. Elbatarny, St. Lawrence College, Queen’s University, Helbatarny@sl.on.ca
Student performance in histology, the microscopic study of tissues, can be significantly enhanced by several laboratory pedagogical tools. In a recent workshop, we proved that projecting real-time slide images (using a light microscope fortified with built-in camera) significantly improved students’ understanding and learning outcomes. In this workshop, I demonstrate how we used this microscopy to develop our own histology atlas. This important study resource, which features several slide views and magnifications, now allows students to take home an exact copy of specimens seen in the lab for independent review and reinforcement.

611 (Room FS 3.512) – Fostering Collaboration: Two (or more) Heads are Better than One – 60 Minutes
Daniel Kifle, Community College of Baltimore County, dkifle@ccbcmd.edu, Ellen Lathrop-Davis, Community College of Baltimore County, elathrop@ccbcmd.edu, Ewa Gorski, Community College of Baltimore County, egorski@ccbcmd.edu
Join us as we explore the benefits and challenges of projects involving student collaboration in face-to-face and online courses. Among the challenges to be addressed will be overcoming student reluctance, assessing student participation and involvement, assigning groups, and fostering true collaboration rather than splitting of workload.

Wednesday, Session 7

701 (Room BV 3.306) – A Non-Major Problem: How to Keep Non-Majors Interested in Your Biology Electives and General Education Courses – 60 Minutes
M. Esa Seegulam, Culver-Stockton College, mseegulam@culver.edu
What place do basketball and soccer have in teaching anatomy? While we want ALL our majors to have the critical thinking and problem solving prowess that every successful graduate needs, a key roadblock has been getting them to enjoy it. If you care about this, you’ve come to the right place. We will discuss how slight curricular adjustments and interdepartmental cooperation can yield successful course outcomes by bringing something enjoyable – sports – into the mix of learning activities. I will share my practices in teaching the course “How the Body Works,” that yielded very positive outcomes in the liberal arts setting.

702 (Room BV 3.318) – Ending the Depth versus Breadth Debate: How to Utilize Innovative Techniques to Develop Curricula Based on the Recommendations from Vision and Change – 60 Minutes
Jason LaPres, Lone Star College-University Park, jason.h.lapres@lonestar.edu
*Sponsored by McGraw Hill Higher Education*
Vision and Change established that the way science has been traditionally taught no longer works and innovative methods of teaching and assessing are the future of biology education. In this workshop, participants will be introduced to innovative ways to leverage the McGraw-Hill suite of educational tools to enhance their courses and move in the direction of teaching concepts in a student-center classroom rather than just presenting a list of facts in a boring lecture. Additionally, the presenter will share features from newest edition of Gunstream’s Anatomy and Physiology that facilitate a student-center environment.

703 (Room BV 3.324) – Zombie A&P – 60 Minutes
Christopher Marks, University of Mount Union, markscp@mountunion.edu
Have you ever wondered how the undead body would function? This workshop provides insight into a fun activity aimed at reviewing two semesters of content. Students are assigned a specific organ system and challenged with the task of imaging how it would function in a zombie. Zombie geeks welcome. Not for the squeamish!

704 (Room BV 3.326) – Integrating Virtual Dissectors into a Hybrid, Graduate Anatomy Course which also Utilizes Cadaveric Study – 60 Minutes
Thomas P. Arnold, Nova Southeastern University, tarnold1@nova.edu
Physical and Occupational Therapy (DPT and OTD) students learn using a hybrid format in which students learn for 3 weeks online followed by 4 days with face-to-face instruction. Lectures are delivered via asynchronous and synchronous platforms. The challenge in an anatomy curriculum delivered in a hybrid format is selecting instructional strategies for both virtual and classroom experiences. Virtual strategies include recorded lectures, videos and dissectors, whereas face-to-face strategies are active, hands-on, and collaborative learning. Access to the virtual dissectors are at the on-line library portal via any device (computer, lap-top or tablet) with internet access.

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705 (Room BV 3.328) – Student Engagement; Join the Conversation! – 60 Minutes
Mari Hopper, IU School of Medicine, mkhopper@iupui.edu
College administrators use data from the National Survey of Student Engagement (NSSE) to drive curricular revision. Faculty are strongly encouraged to improve student engagement (SE), yet NSSE data is not applicable to individual courses. An Advanced Human Physiology course was designed employing methods to maximize SE. An engagement survey was administered in multiple biology courses and SE was significantly higher (p<0.001) in the advanced physiology course. Come join a conversation to: 1) discuss how NSSE data should be utilized; 2) what means are available to directly assess SE in your classroom; and 3) share strategies and methodologies to maximize SE.

706 (Room BV 3.330) – Role Playing through Medical Terminology – 60 Minutes
Brenda del Moral, Edgewood College, bdelmoral@edgewood.edu
Many students take a medical terminology class in addition to a year-long sequence in anatomy and physiology at Edgewood College. In this hands-on workshop, the presenter will introduce the framework for a dynamic, group-based way of teaching medical terminology online, and then we will form groups to try it out ourselves. Find out why students enjoy learning medical terminology by rotating through the roles of attending physician, intern, nurse, and medical technologist using published case reports. A discussion will ensue that addresses how this active learning method can facilitate the learning and the review of anatomy and physiology.

707 (Room DB 2.304) – Diagnosing How Students Organize Their Knowledge – 60 Minutes
Eileen Bush, Mohawk Valley Community College, ebush@mvcc.edu
Many instructors wonder if students are making accurate, meaningful connections between various concepts during their study of anatomy and physiology. The use of concept maps is just one way instructors can uncover the accuracy and depth of connections being made between concepts during the learning process. If you are unfamiliar with the use of concept maps and would like to explore their use with students, this workshop is for you.

708 (Room DB 2.306) – “Kneesy Does It” – 60 Minutes
Steve Kish, Zane State College, skish@zanestate.edu
*Sponsored by Anatomy in Clay® Learning System*
Regional anatomy allows a person to study the relationship between various structures located within that region. Participants will build the anatomy of the knee joint using Maniken™ models. The focus will be on the relationships between the skeletal, muscular, nervous, and vascular components, how they are supposed to function under normal conditions, and explore disorders that can affect the knee joint.

709 (Room FS 1.512) – Teaching a Study Skills Course to Anatomy Undergraduates: Activities and Lessons Learned – 60 Minutes
Bradley Barger, Indiana University, jbbarger@indiana.edu
Have you found your anatomy students lack the study skills needed for success? In this workshop I will detail my experiences teaching a course in anatomy study skills to undergraduates. I will demonstrate several of the in- and out-of-class activities used in this course, as well as discuss student feedback and data collected. The workshop will deal with my experiences in the first two semesters of this new course, and will focus in lessons learned and future directions for this course. I will also discuss ways of incorporating study skills instruction in an already busy curriculum.

710 (Room FS 2.520) – You Can’t Teach Them If You Can’t Keep Them: Improving Retention in A&P I – 60 Minutes
Karen Hlinka, West Kentucky Community and Technical College, karen.hlinka@kctcs.edu
Insights derived from retention and cognitive development theories led to implementation of practices purposefully designed to increase students’ feelings of validity, encourage active learning, and guide the processing of course content beyond memorization to deeper levels of learning and application. Revisions in attendance, withdrawal, and course repeat polices were undertaken to promote retention. A “Prep for A&P” course was developed to build skills prior to taking or re-taking A&P I. These efforts have resulted in a steady increase in retention rates. Come prepared to share your own retention strategies.

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Wednesday, Session 8

801 (Room BV 3.306) – Adaptations for Lab-Based Online Anatomy and Physiology Courses – 90 Minutes
Norma Hollebeke, Carolina Biological Supply, norma.hollebeke@carolina.com, Stephanie Songer, Carolina Biological Supply, stephanie.songer@carolina.com
*Sponsored by Carolina Biological Supply*
Science education has been challenged by the rapid growth of online instruction. Using lab kits as part of a hands-on approach to online A&P courses infuses active learning and emphasizes student engagement. We will explore ideas to adopt and adapt a hands-on, inquiry model for online biology labs that achieve essential lab skills and learning outcomes. Participants will actively take part in hands-on lab investigations developed for online A&P courses. These investigations have been designed for the off-campus setting while maintaining the college-level rigor.

802 (Room BV 3.318) – Adaptive Learning in A&P: From Reading Assignments to Lab Prep, Tailor their Learning and Hold them Accountable – 90 Minutes
Steve Sullivan, Bucks County Community College, stephen.sullivan@bucks.edu
*Sponsored by McGraw Hill Higher Education*
Adaptive learning is a method of education that personalizes learning by continually assessing students’ knowledge, skill and confidence levels, allowing the design of targeted study paths based on those data. This helps instructors bolster students’ understanding in the areas where they need to improve the most. By helping students to focus their outside-of-class study time on the topics and concepts that are most challenging to them, adaptive learning has been shown to help students study more efficiently, develop greater proficiency, and earn better grades (ideal for traditional, hybrid, online, or flipped classroom).

803 (Room BV 3.326) – Connecting Art and Science: The Cultural History of Art and Anatomy in Italy – 90 Minutes
Kevin Petti, San Diego Miramar College, kpetti@sdccd.edu
*Sponsored by HAPS-Institute*
Italy’s medieval universities established the study of human anatomy for physicians. To heighten their art, Renaissance masters clandestinely conducted human dissection. The connection between art and science is best demonstrated by Michelangelo’s genius. Indeed, the wooden crucifix he carved in gratitude for secret access to corpses still hangs in the Basilica of Santo Spirito in Florence. This lecture tells the story of anatomy as an academic discipline, and its connection to art and culture. Learn how to apply these interdisciplinary ideas into your classes, and how you can travel to Italy in a HAPS-I course that lives this lecture.

804 (Room BV 3.328) – Validating and Norming Assessment Rubrics – 90 Minutes
Margaret Weck, St. Louis College of Pharmacy, Margaret.Weck@stlcop.edu
Currently program assessment depends heavily on rubric scoring of student work samples. In this workshop we will briefly review the fundamental principles behind determining the validity and reliability of “measurements” of learning based on rubric scoring. Following the review of principles the participants will engage as content experts in examining the face validity and content validity of a rubric for conceptual understanding of scientific and mathematical principles. Implications for development of rubrics tailored to the needs of participants’ programs and home institutions.

805 (Room BV 3.330) – The State of Online Anatomy & Physiology Lecture/Lab Course Delivery: Are We Ready for Prime Time? – 90 Minutes
Shari L. Gray, Regis College, shari.gray@regiscollege.edu, Ellen Lathrop-Davis, CCBC - Catonsville, elathrop@ccbcmd.edu, David Evans, Penn College, devans@pct.edu, Ewa Gorski, CCBC-Catonsville, egorski@ccbcmd.edu, Tom Lehman, Coconino Community College, tom.lehman@coconino.edu, Robert Leopard, Monroe Community College, rleopard@monroec.edu, Betsy Ott, Tyler Junior College, bott@tjc.edu
Online learning is now firmly rooted in higher education but can this modality be done well with laboratory sciences? A&P, as a discipline, has its share of pioneers exploring the best ways to design a two semester course sequence with rigorous laboratory exercises comparable with traditional in-class/lab offerings. This panel discussion will provide a forum for HAPS attendees to discuss best practices – currently in use or proposed – for A&P hybrid courses (online lectures/on-campus labs) and fully online courses with online labs. The goal is to ensure these courses will meet HAPS Learning Outcomes and satisfy the Distributed Learning Position Statement.

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806 (Room DB 2.228) – Screencasts & Lecture Capture – Tips and Best Practices – 90 Minutes
Janet Casagrand, University of Colorado, Boulder, Janet.Casagrand@colorado.edu
Have you ever wanted an easy way to create instructional videos (screencasts) for your students -- to answer frequently asked questions, review prerequisite concepts, cover concepts that require more time than you have in class, show problem solutions, or communicate with students in a different way? Or to record your lectures so students can review them later? This workshop will discuss options, tips and best practices for creating screencasts and performing lecture capture. Participants should bring a laptop.

807 (Room DB 2.304) – Students Helping Students Engage and Succeed in Anatomy and Physiology: A Pilot Study of a Peer-Assisted Learning Program – 90 Minutes
Sarah Blank, Berea College, sarah_blank@berea.edu, Chioma Amaechi, Berea College, Chioma_Amaechi@berea.edu, Willie Gosnell, Berea College, Willie_Gosnell@berea.edu, Gladys Kamau, Berea College, Gladys_Kamau@berea.edu, Yunpeng Xia, Berea College, Yunpeng_Xia@berea.edu
A pilot study was designed to compare student success between A&P courses taught with or without an associated Peer-Assisted Learning (PAL) program. Following a presentation of the preliminary findings by PAL leaders, participants will be provided an opportunity to engage in innovative educational manipulatives and games that were created and used in PAL sessions to make learning A&P fun and effective. Preliminary data suggest that the PAL program was beneficial to both A&P I and II students as well as to PAL leaders. If you have too many unsuccessful students in your A&P course, this workshop is for you.

808 (Room DB 2.306) – From “What’s a Humerus?” to “No two Deltoid Tuberosities are Created Equal” or Teaching Anatomy Labs Effectively at All Four Levels – 90 Minutes
Molly O’Shaughnessy, Oregon Institute of Technology, molly.oshaughnessy@oit.edu, Greg Pak, Lloyd Parratt, Oregon Institute of Technology, greg.pak@oit.edu, Hui-Yun Li, Oregon Institute of Technology, lloyd.parratt@oit.edu
At Oregon Tech, anatomy and physiology is taught at all four levels, to students on a variety of career paths. Our teaching at all of these levels emphasizes hands-on laboratories. We will demonstrate how we use the same resources (models and cadavers) with different expectations at each level. Activities target a variety of learning styles; you’ll learn what yours is and how to use it to modify your teaching. Come experience some techniques from our bag of tricks and share with us some of your favorites.

809 (Room DB 3.316) – Tubes and Twists: A Hands-on Activity to Teach Development of the Digestive System – 90 Minutes
Keely Cassidy, Indiana University, kmcassid@indiana.edu
When learning about digestive system development, students are often frustrated by how the simple gut tube changes shape, size, orientation, and direction in order to form the adult organs – all while planning to fit neatly inside the abdominal cavity! How do we teach this without overwhelming our both students and ourselves? This workshop will begin with a discussion of teaching embryological topics using hands-on techniques. Then using simple and inexpensive materials (supplied by presenter for the first 10 participants) that can be found in any office or classroom, participants will create a tried-and-true learning tool that can be used in their own courses.

810 (Room FS 1.512) – A “How-to” Guide for Developing a Publishable Scholarship of Teaching Project – 90 Minutes
Valerie D. O’Loughlin, Indiana University, vdean@indiana.edu
*HAPS Presidential Initiative*
Have you altered some aspect of your teaching to achieve greater student learning? Have you wondered if these attempts were successful, and how you could document your findings? As part of the Presidential Initiative: Expanding A&P Educational Research in HAPS, Past President Valerie O’Loughlin will discuss performing pedagogical research. We’ll explore developing a clear research hypothesis, reviewing the literature, obtaining Human Subjects approval, and determining appropriate methods of assessment. Participants will work in groups and come prepared with a hypothesis they want to test. Each participant will leave with a refined research hypothesis and potential assessments to test the hypothesis. (Note: attendance to this workshop is REQUIRED for those participating in the HAPS-I course on Educational Research methods.)
Thanks to our HAPS 2015 San Antonio Annual Conference Committee!

Annual Conference Coordinators............................. Anita Moss & Jason LaPres

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Janice Smith
Chad Wayne

UTSA Student Volunteers........................................ Danielle Eastman
Melinda Fountain
Kristen Haley
Mary McKay
Andra Nauls

Special thanks to:
Dr. George Perry, Dean of the College of Science, UTSA
Dr. Edwin J. Barea-Rodriguez, Chairman of the Department of Biology, UTSA
Dr. Jyotsna Sharma, Faculty, Department of Biology, UTSA
Office of the Vice Provost for UTSA Downtown and Academic and Faculty Support
“I love seeing the students’ faces that first day of class, when they realize that their textbook is free.”

Michael Wolchonok
Adjunct Professor, Anatomy and Physiology
Massachusetts Bay Community College

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36.13 Pulmonary Circulation
Deoxygenated blood is pumped from the heart's right ventricle into the pulmonary trunk and enters the pulmonary arteries in the lungs, where gas exchange occurs. Newly oxygenated blood drains through the pulmonary veins to the left atrium.

- Right ventricle
- Pulmonary trunk
- Pulmonary arteries
- Pulmonary veins
- Left atrium

16.3 Muscle Contraction: Action Potential
In order to produce movement in the body, the muscular, nervous, and skeletal systems interact in a process called muscle contraction. Muscle contraction begins when the nervous system generates a signal. A motor neuron conducts an action potential to its link with a muscle fiber. At the neuromuscular junction, a neurotransmitter called acetylcholine is released. This chemical binds to receptors on the muscle cell. Acetylcholine receptors are typically gated ion channels, and when a nerve impulse binds, they allow an influx of sodium ions into the...