Promoting Excellence in the Teaching of Human Anatomy and Physiology

28th Annual Conference
May 24 - 29

HAPS 2014
Jacksonville
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
# Table of Contents

Welcome from Peter English, HAPS Executive Director ....................................... 5
Letter from the Mayor of Jacksonville .................................................................. 6
About HAPS ....................................................................................................... 8
HAPS Presidents and Conference Coordinators .................................................. 9
HAPS Committees ............................................................................................ 10
Exhibitors and Sponsors ................................................................................... 13
HAPS Institute .................................................................................................. 14
HAPS Foundation ............................................................................................. 16
Schedule of Events ........................................................................................... 17
Hyatt Hotel Layout ............................................................................................ 21
Update Seminar Speakers ................................................................................ 22
Poster Abstracts ............................................................................................... 37
Letter from the Jacksonville State College President ......................................... 51
Letter from the Jacksonville South Campus President ....................................... 52
Campus Room Layouts ..................................................................................... 53
Workshop Schedules and Abstracts ................................................................... 56
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Welcome to HAPS 2014!

This is my second HAPS Annual Conference, so now I understand the enthusiasm and delight with which so many members come to be together. All the old hands know what I am talking about, and the first-timers are in for a great first HAPS conference.

The real strength of HAPS is its members, and nothing highlights that fact more than bringing a big group of HAPS members together! We have an impressive array of five Update Seminars, three poster sessions, and a Town Hall meeting planned for Sunday and Monday. On Tuesday and Wednesday we have almost 90 workshop presentations at Florida State College. And some of you are earning graduate credit by taking part in the in-person phase of your HAPS Institute courses. 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 beautiful Jacksonville and its famous Jazz Festival just outside the door!

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.

We are trying some new things this year with the workshops. There is a new category of “sponsored workshop” so that everyone is clear that such a workshop is presenting a specific product or entity. I would love to hear your thoughts about this 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 2014 in Jacksonville and share our sincere hope that you have a great experience while you are here.

Sincerely,

Peter English, Ph.D.
October 22, 2014

The Human Anatomy & Physiology Society
Main Office
c/o Shanan Molnar, Business Manager
251 SL White Boulevard
LaGrange, Georgia 30241

Dear Friends:

It is my pleasure to welcome you to the 28th annual conference of The Human Anatomy & Physiology Society. Jacksonville is proud to host such a distinguished group of educators, students and science-minded individuals from across the globe.

Your goal to enhance quality of instruction on a collegiate level, to encourage innovation and research, to offer professional development and to open conversations with all sectors of the scientific community, is to be commended. Thank you for choosing Jacksonville for this much-anticipated opportunity to reconnect with colleagues and strengthen the Society’s overall camaraderie.

For some of you, this may be your first visit to Florida’s First Coast. I trust you will enjoy your stay and have time to take in Downtown Jacksonville as well as our beaches, parks and the beautiful St. Johns River. Northeast Florida has much to offer residents and guests alike, and I hope this brief visit encourages you to return often.

Sincerely,

Alvin Brown
Mayor
Introducing
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Visit our session during the conference:
Flipping the Classroom with A.D.A.M. OnDemand Mobile-Ready Learning Programs
Wednesday, May 28, 2014
11:30 AM - 12:30 PM
Session: 6 Room: M2105

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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 27). 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 2013-2014

President: Valerie O’Loughlin
Past-President: Dee Silverthorn
President-Elect: Tom Lehman
Secretary: Carol Veil
Treasurer: Elizabeth Becker
Central Regional Director: Murray Jensen
Eastern Regional Director: Javni Mody
Southern Regional Director: Jason LaPres
Western Regional Director: Anne Geller

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

A current list of Board members and their contact information can be found on the governance area of the website.
HAPS Presidents & Conference Coordinators

Current President
Dee Silverthorn, 2012-2013

President Elect
Valerie O’Loughlin, 2013-2014

Past Presidents
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
2013 – Las Vegas, NV (Kebret Kebede)

Coming Attractions
2014 – Jacksonville, FL (Lourdes Norman & Steve Wood)

Previous HAPS Conferences
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 Committees
2013-2014 Committee Chairs

HAPS has a number of committees that deal with a wide variety of topics within the Society. Below are the chair 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**
Nick Despo

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**
Valerie O'Loughlin

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

2013-2014 Committee Chairs... *continued*

<table>
<thead>
<tr>
<th>Committee</th>
<th>Chairs/Representatives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Foundation Oversight Committee</strong></td>
<td>Don Kelly &amp; Bob Crocker</td>
</tr>
<tr>
<td><strong>HAPS-EDucator Committee</strong></td>
<td>Sarah Cooper &amp; Jenelle Malcos</td>
</tr>
<tr>
<td><strong>HAPS-Institute Committee</strong></td>
<td>Peter English</td>
</tr>
<tr>
<td><strong>Marketing Committee</strong></td>
<td>Elizabeth Hodgson</td>
</tr>
<tr>
<td><strong>Membership Committee</strong></td>
<td>Elizabeth Pennefather-O’Brien</td>
</tr>
<tr>
<td><strong>Nominating Committee</strong></td>
<td>Tom Lehman</td>
</tr>
</tbody>
</table>

### 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 & Jenelle 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-Institute Committee
Peter English

We organize short graduate courses and other continuing professional education opportunities for HAPS members.

### Marketing Committee
Elizabeth Hodgson

We create and sustain relationships between HAPS and scientific and publishing exhibitors.

### Membership Committee
Elizabeth Pennefather-O’Brien

We work to increase HAPS general membership by maintaining ties with current members, creating awareness of HAPS’ value, and introducing HAPS to potential members.

### Nominating Committee
Tom Lehman

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

2013-2014 Committee Chairs... *continued*

<table>
<thead>
<tr>
<th>Presidents-Emeriti Advisory Board</th>
<th>Safety Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dee Silverthorn</td>
<td>Karen McMahon</td>
</tr>
</tbody>
</table>

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

**Safety Committee**

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 in the Human A&P laboratory.

<table>
<thead>
<tr>
<th>Steering Committee</th>
<th>Testing Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ron Gerrits</td>
<td>Curtis DeFriez &amp; Eric Sun</td>
</tr>
</tbody>
</table>

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.

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 28th Annual Conference possible.

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Touch of Life Technologies
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Wolters Kluwer Health
zSpace, Inc.
Welcome to the Eighth 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.

Participants who successfully complete HAPS-I courses earn graduate biology credit through Alverno College in Milwaukee, Wisconsin.

There is one 2-hour semester graduate credit course coordinated with the 28th Annual Conference. More online courses are planned for Summer and Fall 2014 and will be announced as they are finalized.

**Conference Course for 2014**

**Teaching Respiratory Physiology I - Functional Anatomy and Ventilation**  
(2 credits) April 18 - June 28, with Conference attendance May 2014  
Jason LaPres M.H.S., Lone Star College - University Park, Houston, TX  
This course is designed to provide college-level instructors with the opportunity to expand their understanding of the anatomy of the respiratory system and pulmonary ventilation. Additionally, students will collaborate on projects that help them to better teach these topics. Students will begin their coursework prior to their scheduled laboratory meeting. Students will have a variety of reading topics, including publically available peer-reviewed articles that they use as a basis of their research project. Students will apply what they learn in the online and face-to-face instruction to write a lesson plan appropriate for A&P faculty teaching undergraduate courses who wish to integrate functional anatomy and/or the mechanisms of breathing into their A&P courses. Students will be evaluated on the basis of a variety of criteria, including attendance, participation in preparatory and workshop activities, and quality of final submitted materials.

This course requires participants to attend the HAPS Jacksonville Annual Conference in May of 2014.

**Summer 2014 Travel Course**

**Anatomia Italiana: The Cultural History of Anatomy Along the Italian Peninsula**  
(3 credits) June 1 - August 31, 2014  
Dr. Kevin Petti - San Diego Miramar College  
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 Anatomialtaliana.com.

**Summer 2014 Online Course**  
**Current Issues in Obesity Prevention and Treatment**  
(2 credits) July 8 - Aug 31, 2014  
*Krista Lee Rompolski, Ph.D. - Drexel University, Philadelphia, PA*

Obesity is thought to be caused by the interaction of a genetically susceptible individual with the obesogenic environment. Significant advances in the treatment of obesity, whether behavioral, surgical or pharmacological, have been proven successful at the individual level. However, little success has been achieved in preventing weight gain or maintaining weight loss at a population level. Given obesity’s recent classification as a disease state, it is imperative that instructors of human anatomy and physiology-based courses are familiar with the growing body of knowledge on obesity prevention and treatment. Therefore, the purpose of this course is to understand obesity with a multifactorial approach, addressing the genetic, biological, environmental, societal and behavioral aspects that interact on an individual and population level. Special emphasis will be placed on the integration of knowledge gained from discussion and critique of published clinical and epidemiological studies into an instructor’s curriculum.

<table>
<thead>
<tr>
<th>HAPS Institute 2014 Sponsors</th>
</tr>
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<tbody>
<tr>
<td><strong>ACADEMIC PARTNERS 2014</strong></td>
</tr>
<tr>
<td>Alverno College (Milwaukee, WI)</td>
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<tr>
<td>American Association of Anatomists (AAA)</td>
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<tr>
<td>American Association of Clinical Anatomists (AACA)</td>
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<tr>
<td>American Physiological Society (APS)</td>
</tr>
<tr>
<td>American Society of Microbiology (ASM)</td>
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<tr>
<td>Florida State College Jacksonville</td>
</tr>
</tbody>
</table>
HAPS Foundation
## Schedule of Events

### Friday, 23 May

**Hyatt Regency Jacksonville Riverfront**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 AM – 5:00 PM</td>
<td>Board of Director’s Strategic Planning Meeting</td>
</tr>
<tr>
<td>8:00 PM – 9:30 PM</td>
<td>BOD Meeting, President’s Suite</td>
</tr>
</tbody>
</table>

### Saturday, 24 May

**Hyatt Regency Jacksonville Riverfront**

<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: Grand 5-8 Posters Set up: Ballroom Foyer</td>
</tr>
<tr>
<td>9:00 AM – 12:00 PM</td>
<td>Board of Directors Meeting: Boardroom 1</td>
</tr>
<tr>
<td>9:00 AM – noon</td>
<td>Steering Committee Meeting: Boardroom 4</td>
</tr>
<tr>
<td>1:00 PM – 6:00 PM</td>
<td>Registration: Registration Office (on 2nd floor)</td>
</tr>
<tr>
<td>12:00 PM – 1:30 PM</td>
<td>Board of Directors and Steering Committee Luncheon: Orlando</td>
</tr>
<tr>
<td>1:30 PM – 4:00 PM</td>
<td>Board of Directors and Steering Committee Meeting: Boardroom 1 or 4</td>
</tr>
<tr>
<td>4:30 PM – 5:30 PM</td>
<td>HAPS Institute Course Orientation: (registered course participants only) HAPS-I orientation by Peter English</td>
</tr>
<tr>
<td>7:45 PM – 9:30 PM</td>
<td>Registration: Registration Office (on 2nd floor)</td>
</tr>
<tr>
<td>8:00 PM – 10:00 PM</td>
<td>Welcome Reception: River Deck 2 – Lower Deck Registration will be open during the welcome reception</td>
</tr>
</tbody>
</table>

(Schedule continued on next page)
## Sunday, 25 May

**Hyatt Regency Jacksonville Riverfront**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 AM – 5:00 PM</td>
<td>Registration: Registration Office (on 2nd floor)</td>
</tr>
<tr>
<td></td>
<td>(closed from 12-1)</td>
</tr>
<tr>
<td>7:30 AM – 8:30 AM</td>
<td>First-timers’ Breakfast: River Terrace 3</td>
</tr>
<tr>
<td></td>
<td>Sponsored by ADInstruments and McGraw-Hill</td>
</tr>
<tr>
<td>7:30 AM – 8:30 AM</td>
<td>Continental Breakfast: (for all other attendees) Grand 5</td>
</tr>
<tr>
<td>7:30 AM – noon</td>
<td>Exhibits: Grand 5-8</td>
</tr>
<tr>
<td>1:00 - 5:15 PM</td>
<td>(Exhibits are open except for the lunch hour noon-1:00 PM)</td>
</tr>
<tr>
<td>8:30 AM – 8:45 AM</td>
<td>Welcome and Opening Remarks: Grand 1, 2 &amp; 3</td>
</tr>
<tr>
<td>8:45 AM – 9:45 AM</td>
<td>Update Seminar I: Grand 1, 2 &amp; 3</td>
</tr>
<tr>
<td></td>
<td>Timothy D. Wilson, PhD, University of Western Ontario, Canada</td>
</tr>
<tr>
<td></td>
<td>Sponsored by American Association of Anatomists</td>
</tr>
<tr>
<td></td>
<td>“Visualization potential meets cognitive load in anatomical education”</td>
</tr>
<tr>
<td>9:45 AM – 10:30 AM</td>
<td>Refreshment Break &amp; Exhibits: Grand 5</td>
</tr>
<tr>
<td></td>
<td>Posters: Ballroom Foyer</td>
</tr>
<tr>
<td></td>
<td>Poster session 1: presenters available 9:45-10:30 AM</td>
</tr>
<tr>
<td>10:30 AM – 11:30 AM</td>
<td>Update Seminar II: Grand 1, 2 &amp; 3</td>
</tr>
<tr>
<td></td>
<td>Teresa Balser, PhD, University of Florida</td>
</tr>
<tr>
<td></td>
<td>Sponsored by American Society of Microbiology</td>
</tr>
<tr>
<td></td>
<td>“Education at the crossroads - teaching as if learning mattered”</td>
</tr>
<tr>
<td>11:30 AM – 1:30 PM</td>
<td>Lunch on your own</td>
</tr>
<tr>
<td></td>
<td>Exhibits closed 12-1</td>
</tr>
<tr>
<td>1:30 PM – 2:30 PM</td>
<td>Update Seminar III: Grand 1, 2 &amp; 3</td>
</tr>
<tr>
<td></td>
<td>Judith S. Bond, University of North Carolina School of Medicine</td>
</tr>
<tr>
<td></td>
<td>“Policies that Affect Our Future and the Biomedical Workforce”</td>
</tr>
<tr>
<td>2:30 PM – 3:15 PM</td>
<td>Refreshment Break &amp; Exhibits: Grand 5-8</td>
</tr>
<tr>
<td></td>
<td>Posters: Ballroom Foyer</td>
</tr>
<tr>
<td></td>
<td>Poster session 2: presenters available 2:30-3:15PM</td>
</tr>
<tr>
<td>3:15 PM – 4:15 PM</td>
<td>Town Hall: HAPS Strategic Planning</td>
</tr>
</tbody>
</table>

(Schedule continued on next page)
### Monday, 26 May

*Hyatt Regency Jacksonville Riverfront*

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 AM –</td>
<td>HAPS Foundation Walk-run leaving from the hotel</td>
</tr>
<tr>
<td>8:45 AM</td>
<td></td>
</tr>
<tr>
<td>7:30 AM –</td>
<td>Continental Breakfast: Grand Ballroom F-G-H</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>Exhibit Area: Grand 5</td>
</tr>
<tr>
<td>8:00 AM –</td>
<td>Registration: Registration Office (on 2nd floor)</td>
</tr>
<tr>
<td>5:00 PM</td>
<td>(closed 12 noon – 1 PM)</td>
</tr>
<tr>
<td>7:30 AM –</td>
<td>Exhibits: Grand 5-8</td>
</tr>
<tr>
<td>noon</td>
<td></td>
</tr>
<tr>
<td>9:00 AM –</td>
<td>HAPS Annual Membership Meeting: Grand 1, 2 &amp; 3</td>
</tr>
<tr>
<td>10:30 AM –</td>
<td>Refreshment Break &amp; Exhibits: Grand 5-8</td>
</tr>
<tr>
<td>11:15 AM</td>
<td>Posters: Ballroom Foyer</td>
</tr>
<tr>
<td></td>
<td>Poster session 3: presenters available 10:30-11:15 AM</td>
</tr>
<tr>
<td>11:15 AM –</td>
<td>Update Seminar IV: Grand 1, 2 &amp; 3</td>
</tr>
<tr>
<td>12:15 PM</td>
<td>R. Shane Tubbs, MS, SA, PA-C, PhD, Children’s of Alabama, Birmingham, AL</td>
</tr>
<tr>
<td></td>
<td><em>Sponsored by American Association of Clinical Anatomists</em></td>
</tr>
<tr>
<td></td>
<td>“Is Anatomy a Dead Science?”</td>
</tr>
<tr>
<td>12:15 PM –</td>
<td>Lunch on your own</td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Exhibits close for lunch from noon-1:30 PM</td>
</tr>
<tr>
<td>2:00 PM –</td>
<td>Update Seminar V: Grand 1, 2 &amp; 3</td>
</tr>
<tr>
<td>3:00 PM</td>
<td>Ann Schreihofer, PhD,</td>
</tr>
<tr>
<td></td>
<td>University of North Texas Health Science Center, Fort Worth, TX</td>
</tr>
<tr>
<td></td>
<td><em>Sponsored by American Physiological Society</em></td>
</tr>
<tr>
<td></td>
<td>“Cardio-respiratory integration by the caudal ventrolateral medulla: Insights from acute and chronic intermittent hypoxia”</td>
</tr>
<tr>
<td>3:00 PM –</td>
<td>Refreshment Break &amp; Exhibits: Grand 5-8</td>
</tr>
<tr>
<td>4:00 PM –</td>
<td>Exhibits and door prizes: Grand 5-8</td>
</tr>
<tr>
<td>5:00 PM</td>
<td></td>
</tr>
<tr>
<td>6:00 PM –</td>
<td>HAPS Social (for all participants): River Terrace 1/Deck 1</td>
</tr>
<tr>
<td>9:00 PM</td>
<td>Sponsored in part by Wiley</td>
</tr>
</tbody>
</table>

*(Schedule continued on next page)*
## Tuesday, 27 May

At Florida State College – South Campus

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 AM – 9:00 AM</td>
<td>Transportation: Guests will find their way to the buses for the trip to Florida State College - South Campus</td>
</tr>
<tr>
<td>9:00 AM – 9:30 AM</td>
<td>Welcome Breakfast</td>
</tr>
<tr>
<td>9:30 AM – 12:30 PM</td>
<td>Workshops</td>
</tr>
<tr>
<td></td>
<td>Session 1: 9:30 – 10:30 AM</td>
</tr>
<tr>
<td></td>
<td>Session 2: 11:00 AM – 12:30 PM (90 minutes)</td>
</tr>
<tr>
<td>12:30 PM – 1:30 PM</td>
<td>Lunch sponsored by Pearson</td>
</tr>
<tr>
<td></td>
<td>(box lunches are provided)</td>
</tr>
<tr>
<td></td>
<td>Committee Meetings</td>
</tr>
<tr>
<td>1:30 PM – 4:30 PM</td>
<td>Workshops</td>
</tr>
<tr>
<td></td>
<td>Session 3: 1:30 – 2:30 PM</td>
</tr>
<tr>
<td></td>
<td>Session 4: 3:00 – 4:00 PM (60 minutes)</td>
</tr>
<tr>
<td></td>
<td>3:00 – 4:30 PM (90 minutes)</td>
</tr>
<tr>
<td>Starting at 4:00 PM</td>
<td>Bus transportation back to hotel</td>
</tr>
</tbody>
</table>

## Wednesday, 28 May

At Florida State College – South Campus

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 AM – 9:00 AM</td>
<td>Transportation to Florida State College - South Campus</td>
</tr>
<tr>
<td>9:00 AM – 9:30 AM</td>
<td>Breakfast</td>
</tr>
<tr>
<td>9:30 AM – 12:00 PM</td>
<td>Workshops</td>
</tr>
<tr>
<td></td>
<td>Session 5: 9:30 – 11:00 AM (90 minutes)</td>
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<tr>
<td></td>
<td>Session 6: 11:30 AM - 12:30 PM</td>
</tr>
<tr>
<td>12:00 PM – 1:00 PM</td>
<td>Lunch (box lunches are provided)</td>
</tr>
<tr>
<td>1:00 PM – 4:00 PM</td>
<td>Workshops</td>
</tr>
<tr>
<td></td>
<td>Session 7: 1:30 – 2:30 PM</td>
</tr>
<tr>
<td></td>
<td>Session 8: 3:00 – 4:00 PM</td>
</tr>
<tr>
<td>Starting at 4:00 PM</td>
<td>Bus transportation back to hotel</td>
</tr>
</tbody>
</table>

## Thursday, 29 May

Optional Day Trip

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 – 5:00 return</td>
<td>Optional day trip to St. Augustine (transportation included in price)</td>
</tr>
<tr>
<td></td>
<td>Lunch on your own – return to hotel by 5:00 PM</td>
</tr>
</tbody>
</table>
Hyatt Hotel Layout
Visualization potential meets cognitive load in anatomical education

Abstract: The educational attraction to the use of emerging technologies for anatomical, indeed for most STEMM (science, technology, engineering, math, & medicine) disciplines, is strong. After all, our students are digital natives aren’t they? Gobbling up anything we give them; these technical efforts can only serve to increase the learning impact and thus student success, right? We know through practice and research however that this simply is not true, yet we try to balance our need to remain current, hip, and “with it” both in substance and modality in order to offer “the best student experience.” Research suggests however that learners may not necessarily know what is good for them. Almost ubiquitously, learners prefer the flashy, animated, complex demonstration gadgetry. In the context of students regarding themselves as customers rather than learners, many are choosing the more difficult learning tool and they are being cognitively bombarded. The ability, and our tendency, to visually overload our learners is very real and this has significant consequences on the very objective we have for making our flashy presentations; enabling students to remember stuff. If the educator makes the attempts to reduce extraneous cognitive load with their demonstrative tools, the probability of learning is increased. This presentation will speak to examples of extraneous cognitive load in anatomical education and how we as educators can identify and mediate the deleterious effects in our own practice.

Dr. Tim Wilson received his PhD from the University of Western Ontario. After a fellowship at the Eye and Ear Institute at the University of Pittsburgh Medical Center he returned to Western to take an assistant professorship first in Health Sciences and then in Anatomy and Cell Biology (ACB) at the Schulich School of Medicine and Dentistry. He was central to the development of the Anatatorium, a non-dissection...
anatomy laboratory that utilizes stereoscopic three-dimensional projection as part of the undergraduates’ laboratory experiences. Now an associate professor in ACB, he is the founder and director of the CRIPT Lab, the Corps for Research of Instructional and Perceptual Technologies. Graduate students and colleagues undertake projects in this environment exploring a wide spectrum of development and application of anatomical visualization. Works undertaken in the CRIPT have helped form de novo knowledge ranging from the technical creation of digital anatomical learning objects to the pedagogic impact these visualization technologies impart on learner physiology, behaviour, and performance. Dr. Wilson is an awarding winning educator, cited at the faculty, university, and provincial levels for teaching excellence across his career. He teaches gross anatomy to undergraduate, graduate, and professional classes as well as a course in professionalism to a unique group of Clinical Anatomy graduate students. He has over 35 peer reviewed publications and several chapters in a multiple areas of research. He is an associate editor for Anatomical Sciences Education and reviews consistently for a variety of journals. Finally, when time permits and the weather is warm, you will find him and his wife at their hop farm in southern Ontario.

NOTES:
Update Speaker II: Grand 1, 2, & 3

Sunday, May 25 from 10:30 – 11:30 AM

Teresa Balser, Ph.D.
Sponsored by American Society of Microbiology

Professor, Soil and Water Sciences
University of Florida
tcbalser@ufl.edu

Education at the crossroads - teaching as if learning mattered

Abstract: Higher education is in a period of unprecedented change. Shifts in funding and demographics, coupled with increasing accountability and technological reliance, challenge us to reimagine nearly all of our concepts about teaching and learning. There are many questions about how to we balance the “production capacity” of our human capital, against budgetary realities, and how do we manage the increasingly strident calls for “workforce ready” students? Even more importantly, perhaps, is how do we make sense of the morass that is content and pedagogy? We are given lists of “best practices,” and we are exhorted to “teach scientifically.” We read articles and organize book groups on “what the best teachers do,” and “how people learn.” But still, the overwhelming evidence appears to be that true learning is rare among our undergraduates. Why is that? In this presentation we explore the ways that the world of information is changing how education happens, and to discuss the future of teaching in a world of increasing information and rapid globalization. In particular, I am interested in what, if anything, must change about the way we approach our role and actions as teachers? And what are the various factors at play in the classroom that impact learning? How can we ensure a quality educational experience for our students?

Dr. Teresa Balser is the former Dean of the College of Agricultural and Life Sciences, and a Professor of Soil and Water Science at the University of Florida. Dr. Balser earned her Ph.D. in soil microbiology from the University of California at Berkeley, followed by postdoctoral research in ecosystem ecology at Stanford University. In 2001, Dr. Balser joined the University of Wisconsin-Madison Department of Soil Science as an Assistant Professor of Soil and Ecosystem Ecology. Following tenure and promotion to Associate Professor she was appointed as Director of the cross-campus Institute for Biology Education, responsible for working with the Council of Biodeans in overseeing all aspects of biology education on campus including outreach and continuing education.

In addition to international recognition as a research scholar, Dean Balser has a strong teaching/education record with incorporation of active learning, innovative curriculum design, and teaching-as-research

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to advance educational goals. She has received numerous awards for her teaching accomplishments including recognition as a University of Wisconsin System Madison Teaching Fellow, and selection to be a National Biology Scholar. She has also been recognized nationally with the USDA/APLU National Excellence in College and University Teaching Award (in 2009), and was the 2010 U.S. Professor of the Year (Doctoral and Research Universities) from the Carnegie Foundation for the Advancement of Teaching and the Council for Advancement of Education (CASE). She is a co-founder of the Society for Advancement of Biology Education Research (SABER) and is currently a National Vision and Change Fellow with the NSF, NIH, HHMI Partnerships for Undergraduate Life Sciences Education (PULSE). Dr. Balser regularly delivers workshops and invited talks on active learning, large classes, the impact of fear on learning, and the future of teaching. Her educational research interests focus on how to increase engagement and self-efficacy in the learning environment.
Judith S. Bond, Ph.D.

Emeritus Professor of Biochemistry and Molecular Biology
Penn State College of Medicine

“Policies that Affect Our Future and the Biomedical Workforce”

Abstract: Many policies are made by the US Congress, Funding Agencies and other groups that affect our professional lives, and we have to be ‘at the table’ when decisions are made that affect our careers and professions. HAPS and sister societies such as AAA, APS, and the Federation of American Societies for Experimental Biology (FASEB), all play important roles in speaking for biomedical researchers and teachers, and helping to shape directives and policies important to us. I will discuss some of the issues that FASEB has been actively engaged in including, for example, funding, training the next generation of scientists, career pathways, attitudes towards animals and research, and ‘reproducibility’ of research.

Judith S Bond, PhD, is an Emeritus Professor of Biochemistry and Molecular Biology at Penn State College of Medicine, and an Adjunct Professor in the Department of Biochemistry and Biophysics at the University of North Carolina School of Medicine in Chapel Hill. She is the immediate past president of the Federation of American Societies for Experimental Biology (FASEB), a past Associate Editor of the Journal of Biological Chemistry (1999-2013), and a Past President of the American Society for Biochemistry and Molecular Biology (2004-2006).

Bond received her BS in science from Bennington College in Vermont in 1961, and an MS and PhD in biochemistry and physiology from Rutgers University in 1962 and 1966. She did postdoctoral work at Vanderbilt University until 1968, and then joined the faculty of the Department of Biochemistry at the Medical College of Virginia, Virginia Commonwealth University. She moved to Virginia Tech as Professor and Head of the Department of Biochemistry and Nutrition in 1988, and was Chair of Biochemistry and Molecular Biology at Penn State’s College of Medicine from 1992 through 2011.

Dr. Bond’s research on protein degradation, and particularly on unique and complex metalloproteases called meprins, was funded continuously by the NIH for 35 years. She has authored over 150 refereed papers, and given over 140 invited lectures throughout the world. She and colleagues have found that meprins are candidate genes for diabetic nephropathy in Pima Indians, and for Inflammatory Bowel Disease. Dr Bond has a sustained interest in graduate education, having trained 17 PhD, 4 MD/PhD, and 5 MS students. She has also trained 19 postdoctoral fellows. She was director of the Medical Scientist Training Program at Penn State Hershey campus and obtained federal funding for that program. She served as Assistant Dean for Graduate Education from 1996-99, Co-Director of Graduate Education for the Life Sciences Consortium from 1995-2000, and Co-Director of the Chemical Biology Option of the Integrative Biosciences Graduate Program from 1996 to 2003.

Dr. Bond served FASEB on several committees and the Board of Directors since 2001. She served on several Association of American Medical Colleges Committees, such as the Scientific Foundation for Future Physicians Committee and the Journal Oversight Committee. Dr. Bond’s service includes membership on the NIH Biochemistry Study Section, and on the NIDDK Advisory Council of the NIH. Dr Bond was elected president of the Biochemistry Chairs, the Council of the International Proteolysis Society, and the Council of the American Society for Biochemistry and Molecular Biology. She was named YWCA Outstanding Woman in Science and Health in Virginia in 1989, and Virginia’s Outstanding Scientist in 1988, and was an NIH MERIT Awardee. She was honored by the International Proteolysis
Society, and by Penn State with the title of University Distinguished Professor. She was named an Evan Pugh Professor of Penn State University in 2010. She is an advocate for funding of investigator-initiated research, the globalization of science, and the next generation of scientists and science teachers.
**Is Anatomy a Dead Science?**

Abstract: Over the last several decades, many students and academicians have gravitated away from anatomy as a science. The teaching of anatomy has for most, become the only aspect of this discipline devoted to morphology that students will ever encounter. Moreover, many laypersons and academics perceive anatomy as a dead science and have been lead to believe that all is known and has been studied regarding the gross form of the human body. However, many are unaware of the significant research that has been performed in the anatomical sciences and how such studies have influenced clinical practice. This presentation will illustrate to the audience a new and innovative method of reviving anatomy as a science. The author will discuss his background in translational research and specifically, reverse translational research and its application to gross anatomy and the clinical realm, in general. With a continued decrease in funding for many aspects of human anatomy investigation, researchers must develop different paradigms for their studies. This shift in the traditional methods of anatomical research must latch on to “deeper pockets” and to those who share the interest of gross anatomy and how studying it can affect patient care by increasing efficiency and decreasing morbidity.

Dr. Shane Tubbs is a native of Birmingham, Alabama. He is an anatomist, teacher, researcher, Surgical Physician Assistant and author in Pediatric Neurosurgery at the Children’s Hospital of Alabama. While at the University of Alabama, he received a B.S. in Biology and Chemistry in 1992, a B.S. in the Surgeon Assistant Program in 1994, a M.S. in anatomy in 1998, and a PhD in Anatomy in 2002. While teaching at the University of Alabama School of Medicine for over a decade, he was the recipient of multiple awards. He has authored over 900 scientific publications with most related to anatomy and has written over 10 textbooks on anatomy and related areas. Dr. Tubbs’s research has resulted in improved patient care via an improved understanding of anatomy. Recent textbooks include *Gray’s Photographic Dissector of the Human Body* and *Hypotheses in Medicine*. He is an editor for *Netter’s Atlas of Human Anatomy* 5th and 6th editions and is a current editor for the upcoming 41st edition of *Gray’s Anatomy*. Dr. Tubbs is the current Editor-in-Chief of the journal *Clinical Anatomy*. He was recently made an honorary professor of anatomy at the University of Dundee in the Centre of Anatomy and Human Identification.
Abstract: All too often in Physiology courses the systems of the body are taught as distinct entities, although we know they must interact to achieve homeostasis. For example, control of breathing and arterial pressure is coordinated to maintain consistent oxygenated blood flow to vital tissues. This cardio-respiratory integration occurs by interactions of regulatory regions in the brain stem to coordinate the activities of peripheral nerves that modulate function of both systems. Our laboratory focuses on how the brain regions that control breathing impact those which regulate autonomic function to the cardiovascular system using rodents. In addition to quantifying critical physiological variables under states of physiological challenge, we measure phrenic nerve activity as an index of the brain’s regulation of the diaphragm; with each burst coinciding with a contraction of the diaphragm and inspiration and the silence between bursts indicating a relaxation of the diaphragm and expiration. As an index of the brain’s control of arterial pressure we measure splanchnic sympathetic nerve activity, which regulates constriction of blood vessels in the body’s core to produce acute changes in arterial pressure and chronic changes in disease states. In addition, we record from individual neurons in the ventrolateral medulla of the brain stem, which regulate the sympathetic nerve activity to cardiovascular targets. The rostral ventrolateral medulla (RVLM) provides a major excitatory drive to sympathetic nerves and the caudal ventrolateral (CVLM) is the major inhibitory regulator of the RVLM. As observed in sympathetic nerves to cardiovascular targets, brain stem neurons in these two regions are highly sensitive to changes in arterial pressure, in order to maintain a consistent blood pressure. In addition, these brain stem neurons and peripheral nerves are modulated in relation to the respiratory cycle, suggesting respiratory-related regulatory neurons in the brain stem impact how the brain maintains normal cardiovascular function. Interestingly, individual sympathetic nerves to various peripheral targets display unique patterns of respiratory-related activity (e.g. inspiratory-related activity) that can be observed in individually recorded neurons in the RVLM and CVLM. One of the goals of this project is to better understand the connections between respiratory-regulatory brain stem nuclei and those that control autonomic tone to cardiovascular targets both in resting conditions and under challenges that require adjustments to both systems. For example, hypoxia activates the peripheral chemoreflex to stimulate respiration and sympathetic nerve activity to increase oxygenation delivery of blood to critical tissues. Interestingly, this rise in sympathetic nerve activity is not uniform across the respiratory cycle, with a depression during inspiration and a prominent rise during expiration, suggesting central respiratory-regulatory neurons impact the autonomic response to hypoxia. Indeed, we see these unique patterns of cardio-respiratory integration in individually

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recorded neurons of the CVLM and RVLM (basal pattern of respiratory-related activity predicts the neuron's response to hypoxia). Furthermore, this pattern is observed in clinical states of hypertension that involve altered breathing. Obstructive sleep apnea is characterized by chronic exposure to intermittent periods of hypoxia, which lead to persistent rises in sympathetic nerve activity and arterial pressure even during waking periods. As observed with acute hypoxia, the sympathetic nerve activity is elevated particularly during the expiratory phase of the respiratory cycle, suggesting mechanisms that produce physiological responses to acute hypoxia underlie the pathophysiology of obstructive sleep apnea. This model system has provided an excellent example of how seemingly independent physiological systems must be considered in the context of each other to truly understand the orchestration of homeostatic mechanisms.

Dr. Ann Schreihofer is a Professor in the Department of Integrative Physiology at the University of North Texas Health Science Center at Fort Worth. She graduated with a BS in Psychology from Emory University and a PhD in Neuroscience from the University of Pittsburgh under the mentorship of Dr. Alan Sved. Dr. Schreihofer pursued postdoctoral studies at the University of Virginia with Dr. Patrice Guyenet and became an Assistant Professor at the Medical College of Georgia in 2001. Dr. Schreihofer uses integrative approaches to study how the brain regulates autonomic function to cardiovascular targets in healthy and disease states using rodents as subjects. Currently her work focuses on mechanisms underlying the cardiovascular consequences of cardiometabolic syndrome and exposure to chronic intermittent hypoxia, a model for obstructive sleep apnea. Dr. Schreihofer's work has been funded by NIH and the AHA and has been recognized by awards from the American Physiological Society including the Michael Brody Young Investigator Award, the CNS Section New Investigator Award, the Shi-Chun Wang Young Investigator Award, and the Henry Pickering Bowditch Award Lecture. She served on the Central Nervous System Section steering committee and currently chairs the Section Advisory Committee for the APS. She has served on peer review panels for the American Heart Association and is currently a member of the NIH Hypertension and Micrcirculation study section. Dr. Schreihofer has been a member of the Editorial Board for the American Journal of Physiology- Regulatory since 2004 and now serves as an Associate Editor for the journal.

Notes:
Poster Presentation Abstracts

Poster Session 1 – Ballroom Foyer
Sunday, May 25: 9:45-10:30 AM

Pat Cipriano, M.S., MT (ASCP) MPA
Florida State College at Jacksonville
pciprian@fscj.edu
Co-presenters: Kim Connors, Florida State College at Jacksonville, Kimberly.Conner@fscj.edu, Princess Duterte, Florida State College at Jacksonville, James Crawford, Florida State College at Jacksonville, Waylon McBeth, Florida State College at Jacksonville, David Paly, Florida State College at Jacksonville, Amy vonEberstein, Florida State College at Jacksonville, Marque Roundtree, Florida State College at Jacksonville

Students vs. Faculty Perception of How Students Learn in STEM
Students and faculty developed a learning assessment to assess if the student’s perception of how they learn is the same as the faculty’s perception. Learning Objectives guide educators in preparation for courses, but does a disconnect exist between the faculty’s perception of how students learn and the way they say they learn? If so, is there a way we can bridge this gap and improve student learning? The objective of this learning assessment is to discover differences in perception, explore how we can bridge this gap to improve learning, while building on knowledge gained from last year’s presentation.

Robert Curran, DC
Brooklyn College of the City University of New York
rcurran@brooklyn.cuny.edu

Clinical Relevance of Diastasis Recti
A diastasis recti is a separation of the two rectus abdomis muscles. Any separation larger than 2 cm or 2 fingerwidths apart is considered significant. While studies have reported the incidence of diastasis recti to be approximately 27% in the second trimester, 66% in the third trimester, and 62.5% of postpartum women, the condition also occurs in the obese of both sexes. This is close to the reported 68% of women who report post-partum low back or posterior pelvic pain.

Susan Duraisamy
Manukau Institute of Technology, New Zealand
susan.duraisamy@manukau.ac.nz
Co-presenter: Fay Cobden-Grainge, Manukau Institute of Technology, New Zealand, fay.cobden-grainge@manukau.ac.nz

Self-directed learning of histology slides: a modified ‘Learning Bursts’ approach
Examination of microscopic slides is an important aspect of laboratory learning of the anatomy of the human body. Increasing student numbers on the Nursing degree programme have increased demands on lecturers to use time and resources more creatively. Programme design applying the principles of the ‘Learning Bursts’ model, an innovative model for specific skills training, has resulted in a cost effective development of a series of online activities for self-directed learning. This poster outlines the delivery of digitally captured images of microscopic slides in a fun and engaging way and provides a summary of student evaluations of their self-directed learning.

Sophie Feng, MDm Ph.D.
Nebraska Methodist College
sophie.feng@methodistcollege.edu
Co-Presenter: Mary Lee Lusby, Ph.D., Nebraska Methodist College, marylee.lusby@methodistcollege.edu

*Sponsored by iWorx*

Using iWorx 214 System to Stimulate Innovative Learning in a Medical Science Laboratory
As educators, we facilitate the students’ journey towards independent learning in accordance with current standards in science pedagogy, but must also help students learn how to use technologies in order to seek, organize, analyze, and apply information appropriately. We found that performing simple activities such as ECG, EEG, EMG, and spirometry by using iWorx likely increases students’ comfort levels, knowledge and experience levels, and interest levels of laboratory related skills. We observed these increases while using iWorx especially when students were applying the scientific method to physiological issues, using computer-based laboratory equipment, and demonstrating knowledge of scientific methodologies. Designing hands-on learning and new kinesthetic activities improves conceptual learning in cardiovascular, neurological, muscular, and respiratory physiology in the lectures. Pedagogical objectives can be met in an overwhelmingly positive lab experience for students when health sciences faculty use computer-based technologies.

continued on next page
Rob Gerrits
Milwaukee School of Engineering
gerrits@msoe.edu

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.

Shari Litch Gray
Regis College
shari.gray@regiscollege.edu

iA&P: the Benefits and Potential Pitfalls of Integrating iPad Technology in the Teaching of Human Anatomy & Physiology II
Incorporation of technology in undergraduate science classrooms is not a new concept but often is not considered as fundamental as more traditional methods. At Regis College students are supplied with iPads that they take with them to every class including A&P and expect this technology to be utilized in the delivery and understanding of content. This poster will present the experiences, benefits and potential pitfalls of having this technology as an integral component of the teaching of Human Anatomy & Physiology II.

Karen McMahon
University of Tulsa
The HAPS Safety Committee
karen-mcmahon@utulsa.edu
*Sponsored by HAPS*

Accidents in the human A&P laboratory: survey findings and conclusions
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 in the Human A&P laboratory.

Karen Murch-Shafer, Ph.D.
University of Nebraska at Omaha
kmurchshafer@unomaha.edu

Outliers: success in rural healthcare
Many Nebraska counties are experiencing a shortage of primary health care providers. Analyses of 2013 data revealed that the shortage of Physician Assistants is narrowing but the Nurse Practitioner shortage remains widespread. To supplement and enhance the quantitative data illustrating the need, the qualitative portion of the project pairs photos with the most compelling content from interviews with individuals who work to provide healthcare in rural communities. The resulting posters will hang in area anatomy and physiology labs with the intent of encouraging undergraduates to start thinking about practicing in a rural community early in their education.

Kristen Platt
University of Kentucky College of Medicine
platt.kristen@uky.edu

Co-Presenter: April R. Hatcher, University of Kentucky College of Medicine, arich3@email.uky.edu

A Student Perspective on an Anatomy Teaching Certificate Program
The purpose of this work is to provide perspective on the Anatomy Teaching Certificate Program at the University of Kentucky from a student’s point of view. The focus will be on different aspects of the program, including anatomy teaching strategy/theory; dissection based regional anatomy from both student and teaching assistant (TA) perspective; and, future direction for enhancement of anatomy teaching skill set. As fewer doctoral graduates have the skills required to teach gross anatomy, teaching certificates such as the one offered by the University of Kentucky will become more vital to ensure the continued quality of medical education.
Estimation of Stature Using Arm Span Length Amongst Children And Young Adult In Cross River State Nigeria

We aimed to assess the correlation between arm span length (ASL) and Standing height (H) of individuals in Cross River State Nigeria. Two hundred subjects with sex ratio 1:1 (aged 6-30 years), were assigned to five age subgroups. The values of ASL and H were observed to increase with age. ASL was higher than H (P<0.0G) in all subjects, with higher values compared to females (P). Observed was a correlation between ASL and H for males and females. This study validates the correlation of ASL and H irrespective of sex, even amongs nigerians.

Do “parts lists” improve student performance in laboratory exams involving identification of anatomic structures?

Each semester our course enrolls students with legitimate disabilities. We sought to design a word bank that could: 1) fulfill the “reasonable accommodation” expectation of the ADA, and 2) confer no unfair advantage associated with its use. Students were randomly assigned to take a quiz either as constructed answer (fill-in-the-blank), or as a matching exercise, with all structures covered in the unit listed as numbered choices for each quiz item. All students then retook the quiz using lists, in randomly assigned teams. Four quizzes administered over two terms showed no statistically significant difference in scores between groups.

Modified TBL (Team-based Learning) activities enhanced student engagement, led to improved marks, and benefited all types of learners (visual, aural and kinesthetic) equally, with low-scoring students showing the biggest gains.

The effects of introducing 3 TBL activities into a 1st year Anatomy and Physiology course were studied. Actual and perceived knowledge gains and student engagement levels were measured. TBL results were compared to survey data measuring students’ primary learning styles (VAK; visual, aural, or kinesthetic) and to results of a preliminary background science knowledge test. These measures indicated that the majority of students found the activities enjoyable, and an interesting way to learn, in addition to being foreseen as helpful for long-term memory of the material. It was found that TBL improved every student’s scores, with all three types of learners (VAK) benefiting equally, and with students that had less background science knowledge improving the most.

Students’ academic motivation and grade estimation accuracy in a Human Anatomy and Physiology class

The study investigated student academic motivation using the adapted Academic Motivation Scale (AMS) and examined differences between student expected grade and actual grades in an undergraduate Human Anatomy and Physiology (HAP) class. Results showed that only the Stimulation subscale of the AMS changed over time, while estimated GPA, expected grade, hours studying, HAPI or II and introjected and external subscales of the AMS were significant predictors of final grades. Across both HAPI and HAPII, 75% of students overestimated their final grade. Three variables were significant in predicting the grade difference: class sequence (HAPI vs. HAPII); GPA and study hours.
Melissa Taylor  
Indiana University  
taylomel@iupui.edu  
Co-Presenter: Mary Lou Bareither, University of Illinois-Chicago, mbareith@uic.edu  

Analysis of a High School Enrichment Opportunity in the Anatomical Sciences  
High school students don’t have much exposure to anatomy. These students may be at a disadvantage when they take science college courses. This study examines the implementation of an anatomy program to high school students. The students surveyed various anatomy topics and dissected cadavers. The students completed their own research projects on an anatomy topic of interest and presented them at a spring research forum. Students’ interests in science were surveyed after completing the enrichment program, and the results showed that the majority of the students enjoyed this program and wanted to pursue a science major in college.

Esomonu Ugochukwu G  
Cross River University of Technology-Okuku Campus-Nigeria  
gugoesom@yahoo.com.sg  
Co-presenter: Biobe Ifechukwunde J., Cross River University of Technology-Okuku Campus-Nigeria, ifybio@gmail.com  

Effects of Dextromethorphan on the Pituitary-Testicular Axis  
Dextromethorphan (DM) an NMDA receptor antagonist is a major constituent of over 125 over-the-counter cough syrups. Pure DM at 0.571 and 4.285mg/kg administered daily to rats for 8 weeks caused significant changes (P<0.05) in all sperm parameters; as well as reduction in the size and quantity of interstitial cells of Leydig. Also observed were significant changes (p<0.05) in testicular oxidative stress markers and reduction in the mean values of FSH, LH and testosterone (serum and intra-testicular). The effect of DM is dose dependent and could cause a decline in reproductive functions, following chronic abuse.

Mary Vagula  
Gannon University  
vagula001@gannon.edu  

Mapping the incidence pattern of some ailments and autoimmune disease among young adults from PA, USA sing GIS  
This report presents the incidence pattern of six conditions, namely, myopia, asthma, hyperopia, depression, acid reflux disease and eczema in young adults who are living in Erie, PA. The research method employed was a survey administered to 130 young adults whose responses to a 2-page questionnaire formed the raw data. Analysis of the data revealed that 53% of the population had myopia, 7.7% hyperopia, 13% asthma, 7.79% acid reflux, 6.92% eczema and 6.92% depression. These results will be discussed in the light of national and PA State averages and will be compared to 2013 data obtained from the same place.

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Anatomy Academy promotes the intellectual and professional development of undergraduate and graduate health sciences students through an experiential learning environment  
Anatomy Academy is a service-learning program wherein undergraduate or graduate health sciences students engage elementary students (Students) in the teaching of immediately applicable anatomy, physiology, and nutrition concepts, with the goal of empowerment to take a proactive role in personal health, nurturing of scientific curiosity, and encouragement to pursue higher education. Two Mentors taught a curriculum comprised of didactic and engaged learning activities to groups of 6-8 Students. Mentors completed 1) Pre- and Post-Anatomy Academy teaching self-evaluations that assessed knowledge and confidence working with Students on a four-point Likert scale; and 2) journal-style reflections discussing the nature of teaching and learning after each of the seven lessons. Quantitative data was analyzed using Stata (StataCorp, LP) and qualitative data was analyzed using word frequency and thematic analysis. Data from self-evaluations indicated that more than half of the Mentors improved on all measures of instructor effectiveness: content delivery, student engagement, classroom management, and level of professionalism. The following themes were dominant in the Mentor reflections: 1) realization of an ability to make a difference in the world now; 2) acknowledgement of the importance of listening in
teaching; 3) recognition that lives can and will change with a little love; 4) insight to the effectiveness of guiding students through material rather than lecturing; 5) awareness of the value of respect in the learning environment; 6) cognizance of the power of individualized attention to motivate Students; 7) reflection of one’s own personal growth through the open influence of Students. We found that the engaged and experiential learning environment through Anatomy Academy benefited all program participants through vertical and horizontal mentoring. We propose that Anatomy Academy, and other similar service-learning programs, have an essential, and valuable role in undergraduate and graduate health sciences education.

**Poster Session 2 – Ballroom Foyer**
**Sunday, May 25: 2:30 -3:15 PM**

**Adedayo ('Dayo) Adeeko**
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**Two-stage examination in physiology**
The two-stage examination incorporates collaborative learning during assessment and is thought to improve content retention. The two-stage examination was introduced to third-semester massage therapy students taking physiology at Fleming College, Ontario, Canada. In this pilot study, participants wrote each test first individually, then, in groups of three or four; each group was required to submit consensus answers; four tests were written in this format. To evaluate whether participants could recall content they had discussed in the previous four tests, a fifth test consisting of previously tested content was administered at the end of the study; participants were required to complete this test individually. To evaluate students’ experience at the end of the study, a Likert survey was administered. The two-stage examination was well received by all participants as evidenced by strongly positive responses on the Likeart survey, the collaborative aspect of the tests generated a lot of discussion among group members; not surprising, group scores (83.6±1.6; Mean ± SEM) were significantly higher than individual scores (62.8±3.3). However, individual test scores on the first four tests (62.9±3.1) were no different from those on the fifth test (65.3±3.7), suggesting that collaborative learning failed to improve content recall. This finding opens up discussions on the effectiveness of the two-stage examination as a collaborative learning tool.

**Tirzah Birk**
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**Student perspectives on team-based learning exercises in a first year medical Biochemistry course**
Student perceptions of Team-Based Learning (TBL) exercises were evaluated in a first year medical biochemistry class. Post-TBL surveys asked students to evaluate TBL components. A significant change (p=0.02) in student perspective was seen in the use of TBL to connect clinical information with fundamental biochemistry. In student scores a significant improvement (p<0.0001) was seen in IRAT scores. There were no other significant changes in student perspectives across one semester indicating that students may not yet be accustomed to TBL enough to see changes they may later feel as they become familiar with this teaching approach and with each other.

**B. C. Brantley**
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**A student’s guide to scientific reasoning or how I learned to stop worrying and love the scientific method**
We developed a tutorial template covering identification of critical elements of the Scientific Method. In addition to a guided, interactive tutorial, the project also included pre- and post- surveys to assess student’s perceptions and confidence levels. The template is flexible enough to be adapted for any science course. Our results showed a significant improvement in student confidence levels in identifying elements of the Scientific Method. Students who completed the tutorial also scored significantly higher on an assessment tool given to science students college-wide. The tutorial is being adopted by the science division as a new tool for all science classes.

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Co-presenter: G. Zhao, *University of Ottawa*, gzhao012@uottawa.ca  

**Muscle structure and function: students apply new knowledge in the context of yoga**  

Many students studying musculoskeletal anatomy are destined for careers in nursing, physiotherapy or sports medicine where they will need to apply their new anatomical knowledge when evaluating joint and muscle injuries or planning strengthening exercises. This project involved the development of videos with accompanying interactive exercises so that students could practice applying their knowledge of muscle and joint functional anatomy when investigating the roles of key muscles involved in the acquisition and maintenance of certain yoga positions. Using Adobe AfterEffects students were able to divide their attention between seeing a student actor perform each step of a yoga pose (e.g. Revolved Triangle, Tree Pose) and viewing anatomical diagrams highlighting key muscles while their roles in contributing to body and limb movement were described by the undergraduate student responsible for this project (G. Zhao). Extraneous cognitive load was minimized by providing all relevant yoga information to students within the videos themselves and ensuring that students realized that yoga was simply being used as a context for the exploration of important muscle actions. Hot Potatoes was used to create a set of interactive online multiple choice questions that students could then use to consolidate their understanding of muscle functions after having watched the videos. Both the videos and the interactive formative exercise were made available via the course web site, allowing student use of the tools to be tracked via Blackboard Learn. Student outcomes on the muscle and joint components of summative examinations will be compared between classes that did not have access to this learning tool (2013 winter term) and those that currently do (2014 winter term). It is anticipated that the reinforcement of knowledge within an applied context such as yoga will promote student engagement, support consolidation of related pieces of knowledge, and lead to improved outcomes on summative examinations.

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Tejendra Gill  
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**Does the Class Size Impact Effectiveness of Teaching Human Anatomy & Physiology**  

Teaching freshman level Human Anatomy & Physiology courses to a large number of students in a single lecture class can be a daunting task but it is a challenge that the faculty has to face given the fact that the enrollments are rising in several institutions as more and more students opt for a career in health professions. Although the science remains the same, the way material is delivered and the students are tested, is different from what one would expect in a smaller class. Whereas the faculty makes every effort to ensure that learning objectives are achieved, some students feel that they are not receiving the attention they deserve. Therefore, striking a balance between the objectives of the teacher-and-the-taught is the key to student success in large classes.

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Rosalind Gregory-Bass  
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**The design, implementation, and evaluation of an interdisciplinary module to enhance undergraduate comprehension of gastrointestinal pathophysiology**  

A comprehensive discussion of interdisciplinary concepts within a semester-long mammalian physiology course can pose challenges for both students and faculty. However, this study sought to determine the effectiveness of a week-long module bridges the humanities, social sciences, and natural sciences. The cohort of upper level biology students were introduced to the module using a universal case study varying only in gastrointestinal pathophysiology. Students were assessed using an online examination, written assignment, and capstone presentation to demonstrate acquisition of knowledge. Our results suggest that a well-organized interdisciplinary module is just as effective as lecture-style instruction in meeting course goals and objectives.
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Co-presenter: Ijomone Omamuyovwi, Cross River University of Technology, godmamus@gmail.com  

Performance on motor associated behavioral tests following chronic nicotine administration  

Nicotine is therapeutic for neurodegenerative diseases; and touted to induce behavioral deficits. Forty adult female and male Wistar rats were subcutaneously administered nicotine at 0.25, 2 and 4 mg/kg and normal saline (control) for 28 days. Nicotine induced muscular convulsions for 1-5 minutes following daily treatment, and more severe in females. Compared to control, nicotine did not significantly alter performance in the open field, spring, and step tests. Nicotine treatment at 4 mg/kg significantly increased (p<0.05) time taken to initiate movement in the movement initiation tests. Chronic nicotine treatment produces muscular convulsion and negligible deficit in overall motor coordination.

Barbie Klein  
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Co-presenter: Grace Hongsermeier, Northern Illinois University, grace.hongsermeier@gmail.com  

Atlas of thoracic and abdominal cadaver dissection with accompanying histological samples  

To prepare students for anatomy laboratory practicals, we created a digital dissection atlas of the thorax and abdomen for iPads utilizing iBooks Author. Tissue samples from the dissection were processed using an H&E staining method to integrate both anatomy and histology. We incorporated an interactive review chapter using a variety of questions with instant feedback. Students have access to the NIU Anatomy webpage through a hyperlink within the atlas. A PDF version was produced to view the atlas on other devices and to print bound copies. The final chapter consists of references utilized throughout the project for student consultation.

Vasiliy Kolchenko  
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Infograms for undergraduate anatomy and physiology  

The proposed approach aims to develop and adapt an instructional system based on innovative curricular materials called infograms, or graphic symbolic summaries, implement it in undergraduate Anatomy and Physiology classes and determine its learning outcomes in the comparative study. As a cognitive device, an infogram encodes a chapter of textbook material in one page of graphics and facilitates learning. The infogram consists of a limited number of units constructed of a few graphic symbolic signals – keywords, short phrases, abbreviations, numbers, simple graphs, tables and pictograms. Encoding is iteratively optimized based on student feedback. The approach addresses a great need for providing basic knowledge to support inquiry-oriented methods. Preliminary work in Anatomy and Physiology course suggested the features of the transformative educational experience and prompted further research. The innovation led to improved student comprehension of the complex material, boosted conceptual understanding, enhanced retention of knowledge, increased confidence and supported more positive attitude towards learning. Infogram examples and pedagogical techniques for the first semester of Anatomy and Physiology are presented and discussed. The project is supported by the NSF TUES grant (Transforming Undergraduate Education in STEM).

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Co-presenter: Alfred Noubani, Delaware Technical Community College, anoubani@dtcc.edu  

Scaffolding and designing writing activities for freshman human anatomy and physiology students  

Demonstrating the understanding of physiological processes is key to student success in A&P. Writing can be invaluable in establishing competency in complex subjects, but it is a challenge for many students. We have scaffolded activities to help students perform better on these assessments. These activities help students gather and organize information, and synthesize it into essays, paragraph fill-in-the blanks, vocabulary definitions, and case study summaries. Some of these tools include peer and instructor editing, organizational matrices, and rubrics. Specific examples of student writings, assignments, worksheets, and rubrics will be presented, and a packet provided to take home.
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**Anatomy Academic Assistant (AAA) Internship Program: Engaging Undergraduates as Science Mentors**  
The Anatomy Academic Assistant Internship Program focuses on increasing the retention and success of college students in Anatomy & Physiology courses, and sparking K-12 students’ interest in science. Students in the course will participate in a variety of mentoring activities; teaching, staffing open lab times, formal mentoring of students in A&P I and II courses, and completing service learning projects within the community. The purpose of this internship is to provide these undergraduates the opportunity to learn the material better, teach the material to others, and learn valuable communication and leadership skills. It creates structured opportunities for undergraduate interns to become science mentors to younger students.

Dee Silverthorn  
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**Group peer evaluations using Blackboard**  
Peer evaluation is an important component of student group work. Our goal was to develop a peer evaluation method that would allow timely and honest feedback, protect privacy of the student evaluator, and minimize faculty grading time. The evaluation system in Blackboard uses the test manager template and can be easily copied or modified. The scores and commentary students give their partners are visible only to the instructors. The results download into Excel, which simplifies compilation of data. Students like the online system because of its ease of use and anonymity. Instructors can identify problematic students early and provide counseling.

Zoe A. Soon, Ph.D.  
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**A comparison of 3 activities designed to enhance the learning of specific details of human muscles (name, location, origin, insertion, and action) found students preferred hands-on learning, but want access to all 3 activities for studying purposes.**  
This study compared the effectiveness of learning the human muscle unit through three different types of lab activities (Tiny Tim clay models, plastic models, and diagrams with charts). Learning gains for each activity was assessed using a pre-test and post-test. For each individual, these learning gains were then correlated with: a) each student’s background science knowledge; b) each student’s preferred learning style (Visual, Aural, Reading and/or Kinesthetic); c) each student’s enjoyment level of each activity; and d) each student’s long-term retention of the material (as assessed on final lab and lecture exams). Students found all 3 activities to be useful in gaining knowledge, preferring the hands-on clay and plastic models, but wanting all 3 activities to help prepare for a lab exam that incorporated all 3 activities.

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**Co-presenters: Trent W. Maurer, Georgia Southern University, tmaurer@georgiasouthern.edu, Drew Kosturik, Georgia Southern University**  
**Study guides in Human Anatomy and Physiology and students’ perceptions and academic performance**  
The poster will present the results of a study that evaluated Human Anatomy and Physiology (HAP) students’ perceptions of two study guides (outline vs. completed versions) and their impact on academic achievement in class. The study targeted 750 students taught by the same instructor in 2012. In spring semester, HAPI students received the study guide outline and HAPII received the study guide outline and the completed version. In fall semester, the design was reversed. Survey was administered in class and 586 surveys were returned (78% response rate). Quantitative data was analyzed using SPSS, while qualitative data was organized into categories.
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Co-presenter: Ude Raymond A., Cross River University of Technology, Nigeria, rayude2001@yahoo.com

Antropometric Analysis of The Nose of The Ejagham Ethnic Group in Cross River State, Nigeria

Un-identified individuals are classified using nasal anthropometry. We aimed to derive normal standard values: Nose height (NH), Nose width (NW), Nose length (NL) and Nasal index (NI), across age and sex for the Ejagham ethnic group in Cross River State, Nigeria. Hundred subjects with sex ratio 1:1 (aged 21-45 years) were recruited for this study, and assigned to five age sub-groups. Sexual dimorphism was noted (P<0:05) with higher values in NW and NI for males; higher values in NH and NL (P<0:05) for females. Age variational changes were not significant. This study affirms sex related nasal anthropometric variation.

Mary Vagula
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Innovations in instructional technology to enhance learning experiences of upper level biology students

This presentation reports the effectiveness of instructional technology in student engagement and learning of an upper level physiology course. Students were taught renal, digestive and muscle structure and function using softchalk, prezi, student response systems and iPad case-files. Softchalk is an e-learning authoring tool with which a lesson on urinary system is created and customized. Prezi is zooming presentation software adopted in teaching digestive system. Student response systems are used to enhance student participation. Lastly, iPad case-files apps were used to discuss pathophysiology of diseases. This presentation reports the physiology lessons taught and the detailed student responses and learning outcomes.

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The effective use of teaching assistants to create an engaging learning environment and to maximize student success in anatomy in physiology

As a result of the content-heavy nature of our courses, students must learn massive amounts of information. Students, unfortunately, often confuse effective learning with memorizing, and they approach class as passive participants. One of our solutions to this growing problem has been the development of a teaching assistant program. Teaching assistants (1) lead small groups of 3-4 students during labs, (2) lead study groups throughout the week, and (3) work one-on-one with struggling students. Data, based on student surveys and academic performance, indicate that our teaching assistants increase student learning as they encourage an active, engaging learning environment and motivate students to excel.

Poster Session 3 – Ballroom Foyer
Monday, May 26: 10:30 -11:15 AM

Emily Bradshaw
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Investigation of inotropism and chronotropism using osteopilus septenteronalis: an inquiry based model

Cuban Tree Frog (Osteopilus septenteronalis) tadpole hearts are transparent, allowing students to visualize heart rate and contraction in vivo. This project describes the use of Osteopilus septenteronalis in an inquiry based lab activity to examine chemical regulation of the cardiovascular system in an Advanced A&P course. Students saw first-hand the effects of acetylcholine, potassium, and ephedrine on heart rate and contractility. Survey results indicate a majority of students enjoyed the activity and believed it enhanced their understanding of these concepts. This engaged learning activity introduced students to inotropism and chronotropism in a collaborative learning environment.

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Designing an advanced anatomy lab course for advanced students as dissectors and prosecutors
Each term our gross anatomy lab sections have needs for two kinds of bodies. First, of course, are the cadavers. But no less important are the living bodies (whether grad assistants or not) who will help the students to master the material on the stainless steel tables. We describe in this poster our “pipeline” of courses and teaching activities that comprise the undergraduate teaching pathway at UND. We also have begun to gather data on student satisfaction and effectiveness of this type of program of study and its impacts on later performance in medical, dental and professional schools.

James R. Cronmiller
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A prospective blinded cross-over study assessing the effectiveness of inquiry-based mini-case study and peer group action research in learning topics of high importance in Human Physiology
The Association of American Colleges and Universities (AACU) states that student centered teaching processes in the classroom promote critical thinking, reflective judgment, group collaboration and improves learning. We assessed the effectiveness of two of these teaching processes, case-study combined with action research as a supplement in teaching topics of high importance to three different sections (68 students) of Human Physiology during the Fall 2013. Adding a case-study/action research exercise to the curriculum made a substantial improvement in group collaboration, critical thinking, and grades students achieved on questions pertaining to study topics in Human Physiology.

Hisham S. Elbatarny
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Pedagogical tools to enhance learning in microscopic anatomy laboratory
Histology is a science that can be challenging to study. It requires practice at any educational level. The laboratory component of the human anatomy and physiology course (LUSL 2105) taught to the first year students of the Bachelor of Science in Nursing program in our institute contains a significant histology component with over 60 slides of different tissues to study. Throughout the years we attempted to explore and apply different teaching resources and pedagogical tools to improve students’ skills and abilities to learn. We performed a retrospective study to compare the effectiveness of three different tools used in the laboratory over the past few years. The first was the traditional tool where the instructor provided an oral explanation prior to students’ use of the light microscope. The second tool consisted of the display of electronic diagrams of standard tissue slides using power point presentations prior to students viewing the slides using the microscope. The third tool involved the use of a microscope fortified with a built-in camera projecting a real-time image on a big screen prior to students viewing same slides using the light microscope. The effectiveness of these tools was evaluated on the basis of students’ grades of a structured quiz composed of 10 slides. The analysis of the quizzes’ results showed that tool 3 was associated with a significant improvement of students’ grades compared to tools 1 and 2 (38% and 20% higher grades with tool 3 vs. 1 and 2 respectively). Also, tool 2 was associated with significant improvement of students’ grades compared to tool 1 (18%). Based on these results, we realized that the use of a microscope with a built-in camera projecting real-time images has improved students’ understanding and skills of learning histology. This tool can be further developed through using computer software to capture images for future applications.

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Stature estimation from facial anthropometry of igbo-abakaliki ethnic group of South-Eastern Nigeria
The study estimates the height of Igbo-Abakaliki people of South-Eastern Nigeria from their facial parameters. The facial length, bizygomatic diameter, bignomial diameter, nasal length and nasal breadth of a randomly selected sample of 669 males and 331 females whose age-range falls within 12 years to 45 years were measured directly with a pair of metal spreading calipers. The results show that all the parameters correlated positively (p < 0.01) with stature. The bizygomatic diameter showed stronger correlation (r = 0.55) with stature and gives better prediction of stature. This could be useful in forensic investigations.

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**Attitudes toward the implementation of computerized testing at IU School of Medicine**  
Computerized unit exams recently replaced paper exams at Indiana University School of Medicine to standardize assessment. Medical students (n=100) were surveyed about concerns and preconceptions concerning the system prior to their first ExamSoft test. Initial primary student concerns were technical malfunctions, use of personal computers, and being unfamiliar with the computerized exam format. After several computerized exams had been taken, a second survey revealed differences between students’ year in medical school, but that overall anxiety about technical issues decreased while concerns remained high about not being able to make notes on a paper exam and having to use personal computers.

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Co-presenter: Derek Weber, Raritan Valley Community College, dweber@raritanval.edu  

**Co-opting technology: using cell phones as microscope cameras in the laboratory**  
Non-science majors that are enrolled in lower level Anatomy and Physiology typically struggle with histology. They tend to not have much experience with microscopes and, having never learned histology before, are not sure how to study it. In an effort to increase engagement with the scopes and provide the students with better study aids, I now require the students to take pictures with cell phones and submit them to the course website on our learning management system. This ensures that they have photos of the slides in lab from which to study. Additionally it enables students to view one another’s photos online. I present here preliminary assessment and student-survey data from two semesters of Anatomy and Physiology.

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Co-Presenter: Bahram Sardarabadi, Parker University, bsardarabadi@parker.edu  

**Axillary arch muscle: A case report of variation of the arch of Langer**  
The axillary arch muscle is known to be an abnormal attachment of some parts of the latissimus dorsi muscle. It has been reported to occur in approximately 7% of the population. Dissection of the axillary region of a 92-year-old female cadaver an axillary arch muscle was noted on the left side. The axillary arch muscle arose from the anterior aspect of latissimus dorsi muscle on the left side. This muscle gave rise to a fibrous band that extended proximally to blend into the insertion of the pectoralis major muscle. Structures crossing the axilla were covered by the slip of axillary arch muscle as it traversed the area. Knowledge of the muscular variations of the axilla is important for the clinician to consider when performing axillary examination or procedures. The arch muscle may induce false positive of enlargement of the lateral or posterior lymph nodes during assessment of the region on MRI or palpation exam. Compression of the neurovascular structures by an axillary arch muscle may be considered in cases of thoracic outlet syndrome that may not respond to conventional treatment strategies.

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Co-Presenter: Louise Lexis, La Trobe University, L.Lexis@latrobe.edu.au  

**Teaching simple experimental design via an online assignment**  
Our advanced human physiology capstone program required students to design, implement, and present a research project in written, oral, and poster form. Students had little formal exposure to experimental design; therefore, it was essential to assist students to develop this ability. We designed an online assignment in which students read and answered questions on the article “Teaching simple experimental design to undergraduates: do your students understand the basics?” by Sara Hiebert. We observed that students overwhelmingly devised projects with appropriate study designs and required little input from advisors in the design phase of their projects.

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Kim Kerr  
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**Human cadavers in the undergraduate anatomy lab**

Starting a human cadaver program can seem daunting. Using a human cadaver instead of a cat or fetal pig in a human anatomy lab is the preferred method of teaching about the human body, but how do you get started? I found that starting a cadaver lab is really not as hard as one might think. A colleague and I did some research and visited several schools that use human cadavers. We began with one cadaver and now have a second cadaver. We are in the fifth year of our cadaver program. Student response has been positive and all has gone well. Students even want to stay after class and ask questions on cadaver days.

Louise Lexis  
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Co-Presenter: Brianna Julien, La Trobe University, B.Julien@latrobe.edu.au

**Promoting the development of team work skills in students studying advanced human physiology**

Researchers report that regardless of the subject matter students working in small teams tend to learn more, and employers are increasingly looking for graduates with well-developed team work skills. In an advanced human physiology capstone program, we have successfully created a scaffold in which team work is facilitated, evaluated by student teams themselves, and also assessed by staff. Feedback indicates that students are overwhelmingly of the opinion that the team work activities in the program help to improve their team work skills.

Elizabeth Pennefather-O’Brien  
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**Practical assessment for labs: midterm and final lab practicums versus weekly quizzes**

Until three years ago, anatomy and physiology laboratory courses at Medicine Hat College used a combination of quizzes and 100 point midterm and final practicums as assessment tools. In 2011, space and time constraints impeded the use of these 100 point practicums. Also, 10% of the students require extra time writing exams, adding considerable time to this form of assessment. Thus, alternatives to the 100 point practicums were investigated. Currently, assessments include check-ins, check-outs and weekly 20 or 30 point practicums. This study compares student laboratory results and overall class results using both methods of assessment.

Kevin Petti, Ph.D.  
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**Anatomia Italiana: The Cultural History of Art and Anatomy Along the Italian Peninsula**

An international experience entitled Anatomia Italiana was developed to visit venues important to the cultural history of anatomy education in the first universities. The role of human dissection by the Renaissance masters was also explored. Twenty anatomy professors visited Italy for a two-week tour of university anatomy museums and traditional cultural sites in the summers of 2012 and 2013. Connecting art and anatomy was a major theme of the visit. The interdisciplinary strategies gained are likely to make the participants’ teaching to be deeper and richer.

Salt Lake Community College

**Student cadaveric nervous system dissection and review of current spinal cord treatment and rehabilitation approaches**

The objective of this student project was to produce a detailed dissection of the spinal cord, spinal nerves and plexuses on a prospected human cadaver. The photos documenting our dissection from start to finish, in combination with a literature review of current treatment options, will be made available as a resource to spinal cord injury patients to further educate them on the anatomy and details of their injuries. The prosected cadaver will also be made available as a valuable tool for human anatomy students at Salt Lake Community College when studying the nervous system.
A student-created photographic cadaver prosection database for use by human anatomy students

Human anatomy students often use cadaver prosections to study anatomy. Due to regulations and ethical concerns, however, cadaver photography is generally prohibited in cadaver laboratories. In order to deepen our understanding of anatomy and help future anatomy students, we obtained permission to create a password-protected image database with high-quality labeled photographs of cadaver prosections for the eight cadavers on our college campuses. This work required both literature research, detailed student and faculty prosections to obtain accurate, correctly labeled photographs. By producing this resource, digital media representing the actual cadavers they are studying will complement the laboratory experience of future students.

Exploring the use and application of 3D printing technology in human anatomy and physiology

Students regularly use detailed models to learn anatomical structures in human anatomy and physiology courses. However, these models can be cost prohibitive because of budget constraints. We are interested in learning how 3D printing can facilitate learning human anatomy at a reduced cost. As part of a technology innovation grant, we purchased a Makerbot 3D printer and have printed multiple anatomical models that are currently being evaluated as active learning teaching tools in our human anatomy lab. We hope this innovative technology will reduce our student-model ratio and bring more excitement to learning in the classroom.

Personal response systems enhance learning in Anatomy and Physiology

This presentation will highlight how we use personal response systems to enhance learning in our Human Anatomy and Physiology Classes. I will show how they are used, and provide student responses as to how the system helps them to learn.

Branched chain amino acid; L-leucine ameliorates atrophic muscle changes in cast-immobilized albino rats

Branched chain amino acids especially leucine, are the key amino acids to modulate muscle protein metabolism. Right hind-limb cast immobilization was performed in adult albino rats for 21 days. L-leucine was given orally concomitant with immobilization in another group of rats. Immobilization resulted in significant reduction in body weight, gastrocnemius weight and muscle fibers cross sectional area. Histologically, muscle fibers were extremely thin with hypercontraction areas, marked widening of the interstitial spaces and increased interstitial connective tissue. Ultra-structurally, myofibrils demonstrated disturbed contractile structure, loss of sarcomere organization, shrunken myonuclei and swollen mitochondria. Leucine affords good protection against immobilization-induced muscle atrophy.
“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

NYCC’s Master of Science in Human Anatomy and Physiology Instruction (MSHAPI) program is uniquely designed for those with a professional healthcare or advanced biology degree. 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. 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 www.nycc.edu.
March 25, 2014

Dear HAPS Conference Attendees:

On behalf of the faculty and staff of Florida State College at Jacksonville, I would like to welcome you to our campus for the 28th Annual Conference of the Human Anatomy & Physiology Society. We are honored to have you for the two days of workshops.

The dedication of HAPS to promote and enhance the instruction of human anatomy and physiology and to encourage collaboration among educators and partner organizations is exceptional. I am confident this conference will benefit the instruction of students in the health and science fields now and in the future.

We hope you enjoy the conference and your time here on our campus and in our city of Jacksonville.

Sincerely,

[Signature]

Dr. Cynthia Bioteau  
College President
May 20, 2014

Dear HAPS Conference Attendees:

On behalf of the faculty, students and staff of Florida State College’s South Campus, I would like to welcome you to the 28th Annual Conference of the Human Anatomy and Physiology Society. We are honored to have you join us for two days of workshops.

The prime purpose of the HAPS is to promote and to enhance instruction of human anatomy and physiology and to provide collaboration amongst members. The Jacksonville venue is suitable for professional development and collegiality.

We trust your conference will be worthwhile and that your time in Jacksonville will be enjoyable.

Sincerely,

[Signature]

Dr. Maggie Cabral-Maly
Campus President, South Campus
Florida State College at Jacksonville
11901 Beach Blvd.
Jacksonville, FL 32246
(904)646-2005
Lunch served in U135 and then find seating in the concourse between F and G buildings.

If you drove park in here.

Wilson Center bus drop and breakfast.

East Parking Lot

To Fire Academy of the South and EMS Training Facility
MasteringA&P®

MasteringA&P is the leading online homework, tutorial, and assessment system that improves results by helping students quickly master concepts and gives you the power to teach however you like.

One Mini and Three Major Reasons to Check Out MasteringA&P!

Enter to win an iPad® mini by signing up for a demo of MasteringA&P.

- **NEW! Learning Catalytics™** — a “bring your own device” student engagement, assessment, and classroom intelligence system — allows students to use their smartphone, tablet, or laptop to respond to questions in and out of class.

- **NEW! Dynamic Study Modules** help students quickly learn the information they need to know to achieve higher scores on their tests and exams.

- **NEW! Adaptive Follow-Up Assignments** generate personalized question sets that continuously adapt to each student’s performance.
Visit the Pearson Booth in Jacksonville!

Grab your coffee and meet our authors at the Pearson booth.

Sunday, May 25 at 7:30 – 8:30 am and Monday, May 26 at 7:30 – 9:00 am

• Lori Smith, *Human A&P Lab Manuals; PhysioEx™ 9.1*
• Lori Garrett, *Get Ready for A&P 3e; MyReadinessTest for A&P*
• Nora Hebert, *Practice Anatomy Lab (PAL™ 3.0); PAL™ 3.0 Lab Guide*
• Judi Nath, *Visual A&P 2e; Fundamentals of A&P 10e; Visual Essentials of A&P; A&P 2e*
• Kevin Petti, *Visual A&P 2e*

• Bill Ober, *Visual A&P 2e; Visual Essentials of A&P; Illustrator on all Martini titles*
• Claire Ober, Illustrator on all Martini titles
• Bob Tallitsch, *Human Anatomy 8e*
• Mike Timmons, *Human Anatomy 8e*
• Mike Wood, *Laboratory Manual for A&P 5e*
• Stephen Sarikas, *Visual A&P Lab Manuals; Laboratory Investigations in A&P 2e*
• Dee Silverthorn, *Human Physiology 6e*
• Cindy Stanfield, *Principles of Human Physiology 5e*

Enter Pearson’s sixth annual art contest and compete to win an iPad® mini!

Starts Sunday, May 25 at 7:30 am; ends Monday, May 26 at 4:00 pm

Your rendering of an anatomy or physiology concept could win you an iPad mini. Guidelines and supplies will be provided at the booth. The winner will be announced on Monday, May 26 at 4:00 pm along with the exhibitor door prizes.
### WORKSHOPS-AT-A-GLANCE TUESDAY (MAY 27, 2014)

<table>
<thead>
<tr>
<th>Session 1</th>
<th>60 Minutes</th>
<th>9:30 am - 10:30 am</th>
</tr>
</thead>
<tbody>
<tr>
<td>101 (Room G101)</td>
<td>The HAPS POGIL Project – Final Report</td>
<td></td>
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<tr>
<td>102 (Room M2103)</td>
<td>Drawing-to-Learn: The Effect of an Instructional Drawing Component as a Part of Anatomy Instruction</td>
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<tr>
<td>103 (Room M2105)</td>
<td>Who is the teacher and who is the student? The dual service- and engaged-learning pedagogical model in Anatomy Academy</td>
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<tr>
<td>104 (Room M2106)</td>
<td>The Evolution of the Textbook: Unleashing the Power of Adaptive Learning</td>
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<tr>
<td>105 (M2107)</td>
<td>“Weight weight, don’t tell me!” - weight control as an integrative topic in A&amp;P</td>
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<td>106 (M2108)</td>
<td>Virtual technology utilizing BodyViz: 2D/3D education impacts Anatomy and Physiology and Nursing</td>
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<tr>
<td>107 (N244)</td>
<td>Increase Student Success Using MasteringA&amp;P Adaptive Follow-Up Assignments™</td>
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</tr>
<tr>
<td>108 (N245)</td>
<td>Taking the Leap: A Departure from Traditional Lab Manuals and Lab Assessments</td>
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<tr>
<td>109 (G301 G)</td>
<td>How to Increase Student Engagement</td>
<td></td>
</tr>
<tr>
<td>110 (G301 H)</td>
<td>Estrogen And Estrogen Receptors In The Aging Female Heart: Is There Any Hope For Hormone Replacement Therapy?</td>
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<tr>
<td>111 (A210)</td>
<td>What do flying tennis balls have to do with anatomy and physiology? - Innovative teaching methods for small group environments.</td>
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<tr>
<td>112 (T123)</td>
<td>Sponsored by Visible Body Anatomy in real 3D with Visible Body</td>
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<tr>
<th>Session 2</th>
<th>90 Minutes</th>
<th>11:00 am – 12:30 pm</th>
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<tbody>
<tr>
<td>201 (Room G101)</td>
<td>Sponsored by MasteringA&amp;P Use Learning Catalytics™ to Experience Peer Instruction and the Flipped Classroom from the Students' Point of View</td>
<td></td>
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<tr>
<td>203 (Room M2105)</td>
<td>How to establish a service-learning program in the local community to augment your classroom curriculum objectives: The Anatomy Academy model.</td>
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<tr>
<td>204 (Room M2106)</td>
<td>Sponsored by HAPS and APS How Do I Use the New Next Generation Science Standards in My High School Classroom?</td>
<td></td>
</tr>
<tr>
<td>205 (M2107)</td>
<td>&quot;In Sickness and in Health&quot;: Histopathology is for everyone!</td>
<td></td>
</tr>
<tr>
<td>206 (M2108)</td>
<td>Enhancing Classroom Learning through Digital Dissection</td>
<td></td>
</tr>
<tr>
<td>207 (N244)</td>
<td>Sponsored by Biopac Biopac Student Lab: Budget Beating Physiology Lab Solutions</td>
<td></td>
</tr>
<tr>
<td>208 (N245)</td>
<td>An Active Learning Approach to Acid-Base Physiology</td>
<td></td>
</tr>
<tr>
<td>209 (G301 G)</td>
<td>Sponsored by iWorx Record ECG, EMG and Spirometry with the iWorx Teaching Kit</td>
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<tr>
<td>210 (G301 H)</td>
<td>Digital anatomy and histology notebooks as an active learning tool in A&amp;P Teaching</td>
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<tr>
<td>211 (A210)</td>
<td>3D printed micro and gross anatomy tactile learning objects</td>
<td></td>
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<tr>
<td>212 (T123)</td>
<td>Bodies for Dissection: Where do/did they come from?</td>
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</tbody>
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<tr>
<th>Session 3</th>
<th>60 Minutes</th>
<th>1:30 pm – 2:30 pm</th>
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</thead>
<tbody>
<tr>
<td>301 (Room G101)</td>
<td>Sponsored workshop Teaching made Simple by a Novel Educational Tool to grasp Leukemia and Blood Cell Disorders within Minutes. US Patent # 8,277,225</td>
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<tr>
<td>302 (Room M2103)</td>
<td>“It Hurts When I Do This”</td>
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<tr>
<td>303 (Room M2105)</td>
<td>Sponsored by MasteringA&amp;P Enhance or Flip Your Classroom with Learning Catalytics™</td>
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<tr>
<td>304 (Room M2106)</td>
<td>Using focus groups to supplement pathophysiology subject evaluation</td>
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<tr>
<td>305 (M2107)</td>
<td>Those who CAN do: TEACH! Recruiting the next generation of A&amp;P educators.</td>
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<tr>
<td>306 (M2108)</td>
<td>Osmosis is Not the Diffusion of Water</td>
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<tr>
<td>307 (N244)</td>
<td>The Adventure of Teaching Online Anatomy and Physiology</td>
<td></td>
</tr>
<tr>
<td>308 (N245)</td>
<td>Sponsored by HAPS Using the New HAPS Online Exam</td>
<td></td>
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<tr>
<td>309 (G301 G)</td>
<td>Sponsored by iWorx Psychophysiology - the Stroop Effect</td>
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<tr>
<td>310 (G301 H)</td>
<td>Digital anatomy and histology notebooks as an active learning tool in A&amp;P Teaching</td>
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<tr>
<td>311 (A210)</td>
<td>Sponsored by ADInstruments More options, better tools to teach the way you want (60 minutes)</td>
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</tr>
<tr>
<td>312 (T123)</td>
<td>Sponsored by Biopac Creating Lessons with the Biopac Student Lab System</td>
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</tr>
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<tr>
<th>Session 4</th>
<th>60 or 90 Minutes</th>
<th>3:00 pm – 4:30 pm</th>
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<tbody>
<tr>
<td>401 B (Room A207)</td>
<td>Sponsored by Biopac Cross-membrane transport: A review of transporters, channels, and teaching membrane transport</td>
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<tr>
<td>402 A (Room M2103)</td>
<td>Assessment of chemical and cellular student learning outcomes in community college anatomy and physiology.</td>
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<tr>
<td>403 B (Room M2105)</td>
<td>Best practices in multiple choice question writing and item analysis for undergraduate instructors</td>
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<tr>
<td>404 B (Room M2106)</td>
<td>Making the First Day Interactive and Riveting!</td>
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<tr>
<td>405 B (M2107)</td>
<td>Sponsored by HAPS and APS Bring Vision and Change to Your Undergraduate Classroom</td>
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<tr>
<td>406 B (M2108)</td>
<td>Introducing Calibrated Peer-Reviewed Writing into the Science Classroom.</td>
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<tr>
<td>407 A (N244)</td>
<td>Evolution of Skin Color and Core Principles in Anatomy and Physiology</td>
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<tr>
<td>408 A (N245)</td>
<td>Sponsored by Mastering A&amp;P Flipping the Classroom: A Case Study at Miami Dade College</td>
<td></td>
</tr>
<tr>
<td>409 A (G301 G)</td>
<td>Teaching and understanding electrochemical forces, equilibrium potentials, and ion flow</td>
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<tr>
<td>410 A (G301 H)</td>
<td>Using videos of anatomical drawings as a pre-class preparation tool for students</td>
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<tr>
<td>411 B (A210)</td>
<td>Sponsored by ADInstruments Using LabTutor to develop and implement an inquiry-based ECG experiment</td>
<td></td>
</tr>
</tbody>
</table>

*continued on next page*
## WORKSHOPS-AT-A-GLANCE WEDNESDAY (MAY 28, 2014)

<table>
<thead>
<tr>
<th>Session 5</th>
<th>Session 6</th>
<th>Session 7</th>
<th>Session 8</th>
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<tr>
<td>90 Minutes</td>
<td>60 Minutes</td>
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<tr>
<td>9:30 am - 11:00 am</td>
<td>11:30 am – 12:30 pm</td>
<td>1:30 pm – 2:30 pm</td>
<td>3:00 pm – 4:00 pm</td>
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### Session 5 (09:30 am - 11:00 am)
- **501 (G101)**
  *Sponsored by HAPS-I*
  Anatomia Italiana: Art and Anatomy in the Italian Renaissance

### Session 6 (11:30 am - 12:30 pm)
- **601 (G101)**
  The value of lab kits for online, hybrid, and even traditional A&P courses

### Session 7 (1:30 pm - 2:30 pm)
- **701 (G101)**
  Conscience in crisis: the Nazi academics

### Session 8 (3:00 pm - 4:00 pm)
- **801 (G101)**
  How to use the Homeostasis Conceptual Assessment as a Formative Assessment

### Session 9 (09:30 am - 11:00 am)
- **502 (M2103)**
  Improving Student Performance through Extra Credit Homework Assignments

### Session 10 (11:30 am - 12:30 pm)
- **602 (M2103)**
  How to effectively teach students studying advanced human physiology to write a journal article

### Session 11 (1:30 pm - 2:30 pm)
- **702 (M2103)**
  How to effectively teach students studying advanced human physiology to write a literature review

### Session 12 (3:00 pm - 4:00 pm)
- **802 (M2103)**
  Utilizing the Anatomy & Physiology classroom as a platform for inter-professional education

### Session 13 (09:30 am - 11:00 am)
- **503 (M2105)**
  Beginning with the end in mind: grading rubrics as mechanisms for instructor feedback

### Session 14 (11:30 am - 12:30 pm)
- **603 (M2105)**
  Anatomia Italiana: Art and Anatomy in the Italian Renaissance

### Session 15 (1:30 pm - 2:30 pm)
- **703 (M2105)**
  The “M.S. in Human Anatomy & Physiology Instruction Program”, graduate/student/faculty panel discussion

### Session 16 (3:00 pm - 4:00 pm)
- **803 (M2105)**
  Active Learning in Anatomy and Physiology

### Session 17 (09:30 am - 11:00 am)
- **504 (M2106)**
  The HAPS Laboratory Instructor Survey: Final results and implications for instruction

### Session 18 (11:30 am - 12:30 pm)
- **604 (M2106)**
  “Hormones – It’s a Balancing Act”

### Session 19 (1:30 pm - 2:30 pm)
- **704 (M2106)**
  It’s flippin’ fun: Evaluating the pros and cons of a flipped classroom

### Session 20 (3:00 pm - 4:00 pm)
- **804 (M2106)**
  Teaching (radiological) anatomy through repeated testing

### Session 21 (09:30 am - 11:00 am)
- **505 (M2107)**
  Scientific teaching, active learning and assessment in STEM

### Session 22 (11:30 am - 12:30 pm)
- **605 (M2107)**
  A human-size cell may grab your attention! - Interactive educational event as learning and teaching tool

### Session 23 (1:30 pm - 2:30 pm)
- **705 (M2107)**
  Incorporating a modified “Interteaching” methodology into Anatomy & Physiology lecture settings

### Session 24 (3:00 pm - 4:00 pm)
- **805 (M2107)**
  Are you ready to “Flip”?

### Session 25 (09:30 am - 11:00 am)
- **506 (M2108)**
  Sponsored workshop New ways to share the anatomy and physiology story

### Session 26 (11:30 am - 12:30 pm)
- **606 (M2108)**
  Using Technology to ‘Turbo’ Through Assessment and Accreditation

### Session 27 (1:30 pm - 2:30 pm)
- **706 (M2108)**
  Getting Started with a Flipped Classroom

### Session 28 (3:00 pm - 4:00 pm)
- **806 (M2108)**
  Introduction to comparative anatomy of humans and other vertebrate animals

### Session 29 (09:30 am - 11:00 am)
- **507 (N244)**
  Sponsored by McGraw-Hill Engaging Students with Course Critical, Adaptive Learning Assignments that Provide Enough Data Analytics to Flip the Classroom

### Session 30 (11:30 am - 12:30 pm)
- **607 (N244)**
  Pedagogical tools to enhance learning in microscopic anatomy laboratory

### Session 31 (1:30 pm - 2:30 pm)
- **707 (N244)**
  Conversion of a graduate neuroanatomy course from traditional (face-to-face) instruction to a blended (hybrid) format featuring asynchronous instruction combined with monthly “institutes” with technology based learning, active learning and traditional laboratory exercises.

### Session 32 (3:00 pm - 4:00 pm)
- **807 (N244)**
  Regional anatomy for undergraduate students – preparing students to use anatomy in the real world

### Session 33 (09:30 am - 11:00 am)
- **508 (N245)**
  Pedagogical approaches to the development and use of anatomy and physiology videos

### Session 34 (11:30 am - 12:30 pm)
- **608 (N245)**
  Diagnosing how students organize their knowledge

### Session 35 (1:30 pm - 2:30 pm)
- **708 (N245)**
  Best Practices in Teaching A & P

### Session 36 (3:00 pm - 4:00 pm)
- **808 (N245)**
  Construction and use of a magnetically articulated human skeletal model in teaching anatomy and physiology labs

### Session 37 (09:30 am - 11:00 am)
- **509 (G301 G)**
  Engage, challenge, and inspire your students to success

### Session 38 (11:30 am - 12:30 pm)
- **609 (G301 G)**
  Sponsored by HAPS-I
  How to become a HAPS-I instructor and teach a HAPS-I course

### Session 39 (1:30 pm - 2:30 pm)
- **709 (G301 G)**
  Let their goals be your guide: How to develop a writing exercise using student career plans

### Session 40 (3:00 pm - 4:00 pm)
- **809 (G301 G)**
  Sponsored by Biopac
  Biopac Student Lab: Budget Beating Physiology Lab Solutions

### Session 41 (09:30 am - 11:00 am)
- **510 (G301 H)**
  Teaching anatomy via team-based learning in an online 3D environment

### Session 42 (11:30 am - 12:30 pm)
- **610 (G301 H)**
  Sponsored by OpenStax
  Increasing student success and retention using comprehensive peer-reviewed Open Education Resources

### Session 43 (1:30 pm - 2:30 pm)
- **710 (G301 H)**
  Making students do the lifting – evolving pedagogy through flipping and writing

### Session 44 (3:00 pm - 4:00 pm)
- **810 (G301 H)**
  How is College Different from High School? Helping Students Understand to Succeed

### Session 45 (09:30 am - 11:00 am)
- **511 (A210)**
  Ultrasound in Teaching Anatomy and Physiology

### Session 46 (11:30 am - 12:30 pm)
- **611 (A210)**
  How to Find or Create Problems for Team Based Learning

### Session 47 (1:30 pm - 2:30 pm)
- **711 (A210)**
  Sponsored by HAPS
  The Histology Challenge Wants YOU

### Session 48 (3:00 pm - 4:00 pm)
- **811 (A210)**
  How is College Different from High School? Helping Students Understand to Succeed
Tuesday Session 1

101 (G101) – The HAPS POGIL Project – Final Report and Implications for Classroom Practice – 60 Minutes
Murray Jensen, University of Minnesota, msjensen@umn.edu
*Sponsored by POGIL*

The HAPS POGIL project has generated curriculum activities for entry-level anatomy and physiology students. The materials promote conceptual learning through active learning endeavors and provide a practical alternative to lecture. This session will review the two-year project and outline both its research findings and curriculum products.

101 (M2103) – Drawing-to-Learn: The Effect of an Instructional Drawing Component as a Part of Anatomy Instruction – 60 minutes
Prof. Lucia J. Tranel, Saint Louis College of Pharmacy, ltranl@stlcop.edu

Does tactile, drawing-based instruction improve student comprehension of anatomy concepts over traditional lecture instruction? A pretest was administered to anatomy students with no knowledge base of selected anatomical material. Students were then instructed on the material. The control group was instructed using traditional lecture teaching methods. The experimental group was instructed using hands-on, drawing methods. A post-test was administered. The tests were scored, and the average improvement was calculated for the control and experimental groups. These results were compared, and the data show that the use of a drawing component as part of anatomy instruction drastically improves student retention of anatomical structures.

103 (M2105) – Who is the teacher and who is the student? The dual service- and engaged-learning pedagogical model in Anatomy Academy – 60 minutes
Heather Wilson-Ashworth, Utah Valley University, heather.ashworth@uvu.edu, Jonathan Wisco, Brigham Young University jjwisco@byu.edu, Alex Mageno, Brigham Young University, lonesilverdragon@gmail.com, Autumn Tullis, Brigham Young University, atullis516@gmail.com, Kevin Steed, Brigham Young University, loloboard@gmail.com, Jeff McCleve, Utah Valley University, jeffmccleve@gmail.com, Erik White, Utah Valley University, erikwhite7@gmail.com, Jane Lasseter, Brigham Young University, Jane_Lasseter@byu.edu, Gaye Ray, Brigham Young University, gaye-ray@byu.edu, Gary Seastrand, Brigham Young University, gary_seastrand@byu.edu, David Morton, University of Utah Medical School, david.morton@hsc.utah.edu

Anatomy Academy is a program that teaches anatomy, physiology, and nutrition concepts to 5th and 6th grade elementary school children (Students) with the objective of improving science interest, science knowledge, and health and exercise self-awareness. Undergraduate and graduate health sciences students (Mentors) paired together to teach seven systems-based lessons to 6-8 Students in a group over the course of seven weeks. Students completed (88 percent response) pre- and post-program Likert-scale surveys assessing science interest, science knowledge, and exercise self-efficacy. Mentors completed (89 percent response) pre- and post-program surveys assessing confidence with teaching and completed weekly journal-style reflections discussing the nature of teaching and learning. Students improved in science knowledge (p=0.014) and exercise self-efficacy (p=0.038), but not science interest (p=0.371). More than half of the Mentors improved on content delivery, student engagement, classroom management, and level of professionalism. Mentor reflections indicated a/an: 1) realization of an ability to make a difference in the world now; 2) acknowledgement of the importance of listening in teaching; 3) recognition that lives can and will change with a little love; 4) insight to the effectiveness of guiding students through material rather than lecturing; 5) awareness of the value of respect in the learning environment; 6) cognizance of the power of individualized attention to motivate Students; 7) reflection of one's own personal growth through the open influence of Students. Our results suggest that Anatomy Academy, and other similar service-learning programs, has an essential, and valuable role in elementary and higher education. The Institutional Review Boards of BYU, UVU, and UUSOM approved this study.

Michael Windelspecht, Appalachian State University, michael@ricochetprod.com
*Sponsored by LearnSmart*

The traditional textbooks is not easily personalized to fit the specific needs of a student. The integration of a digital textbook with the LearnSmart adaptive learning platform is changing this environment, allowing students to assess their own knowledge base. It is also now possible for authors to instantly visualize where students are struggling with the content. Authors are now able to assess precisely what it is that the student’s do not know, and target areas of the text for revision or the development of additional learning resources. We will explore some of the data coming from these new platforms, its impact on instruction, and the ways that adaptive learning is driving the evolution of the textbook.

continued on next page
105 (M2107) – “Weight weight, don’t tell me!” - weight control as an integrative topic in A&P – 60 minutes
Krista L Rompolski, Drexel University, klr94@drexel.edu
Many students gain a significant amount of weight in college. Unfortunately, unless enrolled in nutrition courses, students receive little to no instruction on healthy and safe weight control. This workshop will address the effect of excess adiposity on the body and what is known about healthy weight control, with interactive quizzes and challenges for participants. Participants will understand how weight control is an excellent topic to tie together a number of the body systems covered in A&P. Special attention will be paid to overcoming issues surrounding weight stigma, eating disorders and sensitivity for instructors.

106 (M2108) – Virtual technology utilizing BodyViz: 2D/3D education impacts Anatomy and Physiology and Nursing instructional methods through innovative gaming techniques – 60 minutes
Dr. Juan Guzman, Florida Gateway College, juan.guzman@fgc.edu, Dr. Doris Lombo Florida Gateway College doris.lombo@fgc.edu, Scott Rodenburg, BodyViz, Derriel Cribbs-Florida Gateway College, erriel.cribbs@fgc.edu, Dr. Gabriel Pardo, Florida Gateway College, gabriel.pardo@fgc.edu
*Sponsored by BodyViz*
In January 2013, Florida Gateway College began implementing an innovative teaching method utilizing BodyViz. This system allows the transformation of real patient CT’s and MRIs into 2D-3D full color rotatable images. With this software, Anatomy & Physiology and Nursing faculty have the ability to offer high quality dimensional images to the students. This has enhanced the knowledge and understanding of the human body providing educational opportunities for students in these programs. With the assistance from the IT department, lectures and images can be recorded, permitting the students to observe and review the anatomical images at home. The videos have been an invaluable resource to the Nursing and Health Sciences Department. The nursing students can refresh their knowledge of the human anatomy, receive instructional dialogue from internal college resources expanding their depth of pathophysiology of the human body, as well as, present cases on clinical discussions at the professional level.

107 (N244) – Increase Student Success Using MasteringA&P Adaptive Follow-Up Assignments™ – 60 minutes
Rebecca Orr, Collin College, rorr@collin.edu
*Sponsored by MasteringA&P*
Combining diagnostics from pre-lecture assignments, additional post-lecture practice opportunities, and pre-exam quizzing feedback, MasteringA&P can be used to increase student proficiency with difficult concepts and to increase 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 Adaptive Follow-Up Assignments. Learn about how these personalized learning opportunities were developed, gather best practices for preparing for and using them, and review preliminary results indicating that Adaptive Follow-Up Assignments may increase student success.

108 (N245) – Taking the Leap: A Departure from Traditional Lab Manuals and Lab Assessments – 60 minutes
Marnie Chapman, University of Alaska Southeast (Sitka Campus), mdchapman@uas.alaska.edu
Jon Martin, University of Alaska Southeast (Sitka Campus), jmart118@uas.alaska.edu
Distance human anatomy & physiology courses often need different teaching tools than those used in traditional face-to-face settings. A particularly difficult aspect of the E-learning/distance environment for both faculty and students is the mechanism by which we convey potentially complex hands-on laboratory procedures to students who may have little or no science lab experience. We discuss this challenge and show-case an E-Lab manual being developed as an alternative to traditional paper-based lab manuals. We also showcase eLearning strategies for providing formative feedback on lab work, creating lab tests for distance students, and maximizing effective learning interactions among students.

109 (G301 G) – How to Increase Student Engagement – 60 minutes
Nilanjana Caballero, Santa Fe College, nilanjana.caballero@sfccollege.edu
Jodi Long, Santa Fe College, Jodi.long@sfccollege.edu
Keeping students engaged is always a priority for instructors. This workshop highlights some ways to keep students focused and increase knowledge and retention. Giving low-value assessments with frequent feedback gives the students a chance to explore the depths of their knowledge without fear of failure.
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. There are two estrogen receptors, ERα and ERβ, found in the human heart. Targeted estrogen receptor activation/blockade has been proposed as a potential therapy for aging women with heart disease. Previous studies in animal models indicate estrogen receptors may work antagonistically in the body’s tissues. ERα activation is associated with cardioprotection in rodent models. The role of ERβ in the heart, specifically, is unclear. The purpose of the present study was to determine if ERβ activation antagonistically increased damage to hearts subject to a simulated heart attack using a female rat model. Hearts were isolated from adult (6mo; n=9), aged (24mo; n=13), and aged ovariectomized (n=14) female rats and assessed for functional recovery of the left ventricle. The data suggests ERβ activation does not affect functional recovery in female rats. ERβ manipulation currently does not show potential as a viable therapy. To date targeted ERα activation stills show promise, but a cardiac specific drug is still not available. Basic research and ongoing hormone replacement therapy trials, such as the Kronos Early Estrogen Prevention Study (KEEPS) are still in progress today in the hopes of finding an effect therapy for preventing and treating women with heart disease.

Becca Ludwig, Concordia University Wisconsin, rebecca.ludwig@cuw.edu

We are taking the classroom to the next level! Come and learn about original pedagogical methods created by a supplemental instruction (SI) student leader which cultivate knowledge suitable for different learning styles. These approaches have been assessed by using pre-session and post-session surveys to compare learning of students who attend interactive SI, traditional SI, or no SI. We will discuss how to incorporate interactive educational techniques such as using food to model anatomical structures and role playing different physiological processes. Participants will have the opportunity to engage in hands-on activities.

Robb Kneebone, Visible Body, robb.kneebone@visiblebody.com

Visible Body’s 3D anatomical models of the human body make learning and teaching anatomy and physiology visual and engaging. Come see our best-selling apps and learn how they can enhance your lectures and lab time. Outside of the classroom, your students can practice dissections on their PC, Mac, iPad, or Android. They’ll understand the big picture by watching short, dynamic animations of physiological processes.

Dr. Marien Cendon, Miami Dade College, mcendon@mdc.edu

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 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.

Carol Veil, Anne Arundel Community College, cbveil@aacc.edu, Javni Mody, Anne Arundel Community College, jmodyaacc.edu

This interactive workshop will provide a learning style inventory that can help to identify visual, auditory, and tactile learners. Examples will be given of activities that incorporate different learning styles, to improve students’ understanding of difficult concepts in anatomy and physiology. Suggestions will be given for getting students more actively involved in the learning process. Participants are encouraged to bring ideas to share.

continued on next page
203 (M2105) – How to establish a service-learning program in the local community to augment your classroom curriculum objectives: The Anatomy Academy model. – 90 minutes  
Heather Wilson-Ashworth, Utah Valley University, heather.ashworth@uvu.edu, Jonathan Wisco, Brigham Young University, jjwisco@byu.edu, Kevin Steed, Brigham Young University, loloboard@gmail.com, Jane Lasseter, Brigham Young University, Jane_Lasseter@byu.edu, Gaye Ray, Brigham Young University, gaye-ray@byu.edu, Gary Seastrand, Brigham Young University, gary_seastrand@byu.edu, David Morton, University of Utah Medical School, david.morton@hsc.utah.edu

We have developed a program called Anatomy Academy that provides pre-professional undergraduate and allied health sciences graduate students the opportunity to teach health and nutrition concepts together to elementary school children (Students) as an educational intervention to fight childhood obesity. Volunteers (called Mentors) in the program learn how to communicate complex health science information at a level appropriate for Students; prepare and deliver lessons on anatomy, physiology and nutrition that help Students understand the importance of establishing and maintaining a healthy lifestyle; teach groups of Students in didactic and active learning environments; serve as role models for pursuing higher education; demonstrate the utmost professional demeanor; and become exposed to an experiential learning environment that results in immediate, quantifiable behavioral change in Students. Mentor reflections completed during the course of the program Fall 2012 and Winter 2013 semesters indicated the: 1) realization of an ability to make a difference in the world now; 2) acknowledgement of the importance of listening in teaching; 3) recognition that lives can and will change with a little love; 4) insight to the effectiveness of guiding students through material rather than lecturing; 5) awareness of the value of respect in the learning environment; 6) cognizance of the power of individualized attention to motivate Students; 7) reflection of one’s own personal growth through the open influence of Students. In this workshop, we will describe the Anatomy Academy service-learning program and provide guidance for developing a similar program at attendees’ own institutions.

204 (M2106) – How Do I Use the New Next Generation Science Standards in My High School Classroom? – 90 minutes  
Miranda Byse, American Physiological Society, mbyse@the-aps.org
Margaret Shain, American Physiological Society, mshain@the-aps.org

*Sponsored by HAPS & APS*

Experience active learning as you work to familiarize yourself with the newly released Next Generation Science Standards and sample some of the many free resources available in the Archive of Teaching Resources that can help. Engage in two hands-on activities from teacher developed lessons designed to inspire participants to have their students move beyond normal textbook learning into actively engaging students in higher level thinking. Hand-outs of the activities will be provided.

205 (M2107) – “In Sickness and in Health”: Histopathology is for everyone! – 90 minutes  
Nina Zanetti, Siena College, zanetti@siena.edu

Have you ever been invited to present an A & P–related talk to a gathering of non-scientists? And, given the technical demands, does histopathology seem a likely candidate for such a talk? This workshop will present an example of a workshop on histopathology that was developed for a “general public” audience with little or no science background. I’ll share my experience with the challenges and rewards of doing such a presentation, and will invite participants to generate ideas for sharing similar A & P–related topics with a lay audience.

206 (M2108) – Enhancing Classroom Learning through Digital Dissection – 90 minutes  
Samantha Suiter, M.A., 1. Trident Technical College, Charleston, South Carolina  
2. People for the Ethical Treatment of Animals (PETA), Norfolk, Virginia, SamanthaS@peta.org

Alternatives to dissection are increasingly being sought by science educators to avoid animal use, reduce teaching expenses, integrate technology in the classroom and comply with various laws and policies allowing students to opt out of animal dissection. HAPS and other organizations endorse teachers’ decisions to use alternatives to animal dissection and encourage teachers to offer them to students. This interactive workshop will familiarize educators with the range of non-animal teaching methods available, their efficacy and provide hands-on tutorials of several popular anatomy software programs.

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207 (N244) – Biopac Student Lab: Budget Beating Physiology Lab Solutions – 60 minutes
Ken Graap, BIOPAC Systems, info@biopac.com
*Sponsored by BIOPAC Systems*
Students use the Biopac Student Lab system to record life science data from their own bodies. Each lesson includes onscreen guiding text, sample data, and videos to help students focus on principles, not procedure. This workshop is aimed at current Biopac Student Lab users, or those instructors who want to see the full extent of the Biopac Student Lab’s capabilities to engage student minds & increase learning! BSL systems are intuitive and extremely robust. Use the 4-channel MP36 system or the new handheld 2-channel MP45 system with BIOPAC’s extensive curriculum library (60+ lessons) and broad range of transducers. Easily add experiment segments for active learning. Add BSL PRO software to create your own lessons and for independent projects. No programming required, just simple pull-down menu selections. Attend the workshop and be amazed by the power, flexibility and budget beating price options.

208 (N245) – An Active Learning Approach to Acid-Base Physiology – 90 minutes
Dr. Cherie McKeever, Great Falls College - Montana State University, cmckeever@gfcmsu.edu
pH got you down? This session is designed to leave those acid-base blues behind with a fun, practical approach to teaching acid-base disturbances and renal and respiratory compensation. Participants will practice step-by-step, hands-on methods to identify acid-base disorders in real-life case studies. In the latter part of the session, we’ll explore the relationship of H+ and K+, and simple transcellular shifts. Participants will leave with teaching strategies and acid-base case studies ready for immediate classroom use.

209 (G301 G) – Record ECG, EMG and Spirometry with the iWorx Teaching Kit – 90 minutes
Judi D’Aleo, iWorx Systems, Plymouth State University, judid@iworx.com
Josh Brown, iWorx Systems, joshb@iworx.com
*Sponsored by iWorx System, Inc.*
Learn about the new, easy to use and flexible iWorx Teaching Kit. Be involved in live recordings and analysis of ECG, EMG and Spirometry; learn how built-in calibration makes setup so quick and easy! iWorx always delivers the highest quality teaching experience and endeavors to make all aspects of teaching labs as easy and fun as possible. Based on over 25 years of experience, iWorx developed the iWorx TA Physiology Teaching Kit, the latest generation of recording devices focusing on the ease of setup, data collection and advanced analysis.

210 (G301 H) – Digital anatomy and histology notebooks as an active learning tool in A&P Teaching – 90 minutes
Dr. Brian R. Shmaefsky, Lone star College - Kingwood, brian.r.shmaefsky@lonestar.edu
Gross anatomy and histology are two of the more stressful topics for students learn in A&P and related courses. A large amount of memorizing is required within a short period of time. Studying for these topics is further confounded by the variations between specimens in the lab and specimen images from the textbooks and ancillary study materials. A body of educational research is showing that student-centered instruction improves comprehension and retention of rote memory learning. This workshop shows how students can use simple digital cameras to produce digital image spreadsheets that reinforce learning of anatomy and histology. The images can be made by faculty or students using traditional or WiFi digital cameras. The images are imported by students into software such as Paint, Word, or Excel to make a digital notebook that can be shared with other students for group study. Please bring a Wifi enabled tablet or smart phone to the session and a laptop computer if possible.

211 (A210) – 3D printed micro and gross anatomy tactile learning objects – 90 minutes
Michael A. Kolitsky, Ph.D., University of Texas at El Paso, makolitsky@utep.edu
Many 2D images of microanatomy (Histology and Cell Biology) and gross anatomy (cadaver dissection) can be made into 3D printed tactile learning objects especially useful for students who are blind or are kinesthetic learners. Workshop will cover how 3D print files (stl files) can be made from 2D photos of cadaver dissection and microscope slides using PhotoToMesh software or from using 3D scanning technologies such as MakerBot’s Digitizer or Autodesk’s 123D Catch. 3D printed tactile learning objects from the presenter’s collection will be available for a touch and feel experience and some can be seen at www.nextgenemedia.com/3DPrint/3DprintExamples.html and www.nextgenemedia.com/3DPrint2/3DprintExamples1.html.

continued on next page
**Tuesday, Session 3**

**301 (G101) – Teaching made Simple by a Novel Educational Tool to grasp Leukemia and Blood Cell Disorders within Minutes. US Patent # 8,277,225 – 60 minutes**

Lakshmi Atchison, Ph.D., Chestnut Hill College, [latchiso@chc.edu](mailto:latchiso@chc.edu)
Dr. Michael L. Atchison, The University of Pennsylvania, [atchison@vet.upenn.edu](mailto:atchison@vet.upenn.edu)

*Sponsored workshop*

A patented visual blood cell model is presented to teach a) normal blood cells, b) how cells change in number, shape and appearance during leukemia and other disorders, c) how aberrant cells block arteries and circulation, and d) blood cell differentials. Many human anatomic models are available as valuable tools for teachers and doctors. However, no visual blood cell model is currently available. Using this 3-D model, students grasp blood cell anomalies within minutes. This educational tool can be used from high school to medical school, and in physician’s offices for instant grasp of leukemia and other blood cell disorders.

**302 (M2103) – “It Hurts When I Do This” – 60 minutes**

Steve Kish, Zane State College, [skish@zanestate.edu](mailto:skish@zanestate.edu)

Regional anatomy allows a person to study the relationship between various structures located within that region. Participants will build the anatomy of the elbow 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 elbow joint.

**303 (M2105) – Enhance or Flip Your Classroom with Learning Catalytics™ – 60 minutes**

Terry Austin, Temple College, [taaustin@templejc.edu](mailto:taaustin@templejc.edu)

*Sponsored by Learning Catalytics *

Bring your web-enabled device (laptop, smartphone, or tablet) to “test drive” the Learning Cataytics student engagement, assessment, and classroom intelligence system. A&P Professor Terry Austin of Temple College will share examples and results from his class. With Learning Catalytics educators can assess students in real time, using open-ended tasks to probe student understanding; understand immediately where students are and adjust lessons accordingly; improve students’ critical-thinking skills; access rich analytics to understand student performance; add questions to make Learning Catalytics to fit the course exactly; and manage student peer interactions with intelligent grouping and timing.

**304 (M2106) – Using focus groups to supplement pathophysiology subject evaluation – 60 minutes**

Robert Paine, LaTrobe University, Bundoora, Australia, [rpaine@latrobe.edu.au](mailto:rpaine@latrobe.edu.au)

This workshop is designed to discuss the use of focus groups as a part of subject evaluation. At La Trobe University we typically evaluate our subjects at the end of the teaching semester, using a standard questionnaire with a numeric scale for responses. Although we also use open-ended questions in the evaluations, it can be difficult to determine a clear understanding of the students’ responses. The use of student focus groups to supplement our pathophysiology subject evaluation enables us to: 1) explore questions and responses to a greater depth; 2) use group dynamics to clarify issues, and 3) improve planning of new teaching/learning initiatives.

**305 (M2107) – Those who CAN DO: TEACH! Recruiting the next generation of A&P educators. – 60 minutes**

Amy Way, Lock Haven University, [away1@lhup.edu](mailto:away1@lhup.edu)
John R. Waters, The Pennsylvania State University, [johnwaters@psu.edu](mailto:johnwaters@psu.edu)

As advocates for anatomy and physiology education, our obligation extends beyond the undergraduates whom we teach. We can share our love of teaching anatomy and physiology with graduate students who are contemplating a career with a teaching emphasis. We have developed a talk that describes the opportunities that exist in anatomy and physiology education at the college and university level, suitable for delivery to graduate and postdoctoral students, but easily adapted for other audiences. Join us for a discussion on developing and delivering presentations that are designed to inspire consideration of a career in anatomy and physiology education.

**306 (M2108) – Osmosis is Not the Diffusion of Water – 60 minutes**

Phil Tate, McGraw-Hill, [ptate4@gmail.com](mailto:ptate4@gmail.com)

Osmosis is the movement of water across a semipermeable membrane. What causes the water to move? An explanation found in introductory biology, chemistry, and anatomy and physiology texts proposes that osmosis is a diffusion process in which water diffuses from a higher to a lower water concentration. While the diffusion of water explanation is easy to understand, it is not theoretical sound and does not match the experimental data. This workshop will explore common misconceptions about osmosis and the osmosis explanations given by physicists.
307 (N244) – The Adventure of Teaching Online Anatomy and Physiology – 60 minutes
Nahel Awadallah, Johnston Community College, nwawadallah@johnstoncc.edu
Focus will be the start to finish design of an online A&P course with fully integrated online laboratory experiments. Presentation will include how to successfully design your online science course with academically acceptable lab experiments that bring academic quality, convenience, consistency to FTF, success to students, and meet budget requirements. Participants will learn to about available resources to create, develop and customize an online A&P course that is integrated into your LMS. Yes it can be done.

308 (N245) – Using the New HAPS Online Exam – 60 minutes
Curtis DeFriez, MD, MSc., Weber State University, cdefriez@weber.edu
*Sponsored by HAPS*
The new 100-question online examination has been unveiled and is now being administered around the country by HAPS. The HAPS Competency Exam (HAPS CE) has been developed to serve as a tool for measuring outcomes of Anatomy and Physiology instruction by those interested in quantifying student performance and documenting the integrity of their instructional pedagogy. The advantages of administering this exam in an online environment, and the mechanics of the new test will be explained in this workshop. The workshop will also be an ideal setting to answer questions and explain procedures for those instructors not accustomed to giving online exams to their students.

309 (G301 G) – Psychophysiology - the Stroop Effect – 60 minutes
Judi D’Aleo, iWorx Systems, Plymouth State University, judid@iworx.com
Josh Brown, iWorx Systems, joshb@iworx.com
*Sponsored by iWorx Systems*
Come record the physiology of the Stroop Effect using Open Sesame for a fun advanced workshop. Learn how easy it is to integrate data recording and Experimental Design using the iWorx TA. Features make the recording and selection of pertinent data effortless; allow simultaneous measurement from multiple channels; and easily measure a variety of parameters. Use the included instructions, illustrations, and websites to assist students in performing an experiment – all with the click of a button. While recording, easily change display times, pause the data to take measurements, or work in an on-screen notebook as data is displayed.

310 (G301 H) – Innovations in helping students succeed in the anatomy & physiology lab – 60 minutes
Stephen N. Sarikas, Ph.D., Lasell College, Newton, MA, ssarikas@lasell.edu
*Sponsored by Pearson*
Do your students struggle with lab concepts and procedures? Do they get lost in their lab manual? Do you struggle to keep your students engaged with hands-on lab activities? Please join Stephen Sarikas, author of Visual Anatomy & Physiology Lab Manual, as he shares a unique approach to lab instruction that encourages reading, stimulates learning, and promotes confidence and success in the anatomy & physiology lab.

311 (A210) – More options, better tools to teach the way you want – 60 minutes
Wes Colgan III, ADInstruments Inc., w.colgan@adinstruments.com
Shannon Donovan, ADInstruments Inc., s.donovan@adinstruments.com
*Sponsored by ADInstruments Inc.*
ADInstruments is the industry leader in data acquisition for the life sciences. Whether you choose the fully self-contained LabTutor teaching suite or LabChart 8, the most versatile and powerful data acquisition software available today, we have a solution that will fit your courses learning objectives. ADInstruments’ innovative software enhances teaching and learning and is now easier to use for teachers and students. An overview of the latest technology for online, blended (hybrid), and traditional hands-on laboratory course delivery will be demonstrated.

312 (T123) – Bodies for Dissection: Where do/did they come from? – 60 minutes
Bill Perotti, Mohawk Valley Community College, wperrotti@mvcc.edu
Nowadays the bodies used for medical- and health-related education are donated to and obtained through anatomic gift programs generally run out of medical schools. That was not always the case. The history of human body use goes back over 2000 years and involves many countries and cultures. It’s an amazing and often startling and alarming saga. This presentation is an update of a talk first given at HAPS 2013 in Las Vegas. It tells about much of that past as well as the current status of body procurement. Hear about this surprising history and about what’s involved in body donation.

continued on next page
Tuesday, Session 4

401B (A207) – Crossing membranes: A review of transporters, channels, and teaching membrane transport – 90 minutes
Dee Silverthorn, University of Texas at Austin, silverthorn@utexas.edu

The human body is divided into compartments by cell membranes or epithelial cell layers. Movement of solutes and water between compartments takes place by simple diffusion, protein transporters and channels, or membrane vesicles. Transport across an epithelium occurs when substances pass through junctions between the cells or through the epithelial cell membranes. In this workshop we will review the various methods by which substances move across membranes and the forces that promote or oppose movement, including movement of ions. We will then work on assessments that test student conceptual understanding of transport processes.

402 (M2103) – Assessment of chemical and cellular student learning outcomes in community college anatomy and physiology. – 60 minutes
Maureen Gannon, Bronx Community College of the City University of New York, maureen.gannon@bcc.cuny.edu
Dr. Abass Abdullahi, Bronx Community College of the City University of New York, abass.abdullahi@bcc.cuny.edu

Community college student retention and application of concepts learned in the introductory sequence of Anatomy & Physiology (A&P I) is problematic. A pilot study, to determine which concepts covered in A&P I, if any, were retained in A&P II, was conducted. Questions were designed at both lower and higher levels of Bloom’s taxonomy and evaluated by departmental faculty. Results were compared to student performance in departmental common final assessment questions. This study will be presented in the context of how community college assessment efforts could be used to improve student outcomes. Please bring your own observations for an open discussion.

403B (M2105) – Best practices in multiple choice question writing and item analysis for undergraduate instructors – 90 minutes
Jennifer Marie Burgoon, PhD, Division of Anatomy, College of Medicine, The Ohio State University, jennifer.burgoon@osumc.edu
Melissa Marie Quinn, Division of Anatomy, College of Medicine, The Ohio State University quinn.269@osu.edu

With increasing class sizes and the need to quickly return exam scores, more undergraduate instructors are utilizing some form of multiple choice exams in their courses. Composing effective multiple choice questions is not an easy task and requires considerable time and effort. Poorly written multiple choice questions can be confusing and frustrating for students. Therefore, it is important for instructors to learn the appropriate steps and guidelines to compose quality multiple choice questions. This workshop is designed to do just that along with evaluating and modifying existing multiple choice questions through item analysis.

404B (M2106) – Making the First Day Interactive and Riveting! – 90 minutes
Tom Lehman, Coconino Community College, Tom Lehman@coconino.edu

First impressions set the tone for the entire course. Make the most of that first day. Come learn some simple techniques for the integration of group collaboration, terminology usage, and microscopy and model experience. Stations include “That’s a banana?”, “Where’s McBurney?”, “What color’s the nucleus?”, “Which way’s up?”, and “Build a Golgi.” Your students will leave that day with applicable knowledge, an idea of what to expect in the course, and the desire to come back for more.

405B (M2107) – Bring Vision and Change to Your Undergraduate Classroom – 90 minutes
Miranda Byse, American Physiological Society, mbyse@the-aps.org
Margaret Shain, American Physiological Society, mshain@the-aps.org

*Sponsored by HAPS and APS*
Join us in this hands-on discussion of how you can implement Vision and Change in your classroom. This workshop will center around one of the main focuses of Vision and Change in Undergraduate Biology Education: student-centered learning. You will engage in teacher-created activities from the Life Science Teaching Resource Community (formerly the Archive of Teaching Resources) that you can use directly in your classroom to promote active learning. You will also learn about the free student-centered learning resources available to you in the Life Science Teaching Resource Community, of which HAPS is a partner. Hand-outs of the activities will be provided.

406B (M2108) – Introducing Calibrated Peer-Reviewed Writing into the Science Classroom. – 90 minutes
Chad Wayne, Ph.D., University of Houston, cwayne@uh.edu

One of the cornerstones of the sciences is reporting to one’s peers the observations and discoveries made in the laboratory (or field) and then having the analysis of those observations critiqued by those peers to be accepted or rejected into the greater body of knowledge. To this end, it is imperative that students in the scientific disciplines should be exposed to the

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process of empirical evaluation and critical analysis, as well as learning how to report their findings in an appropriate manner. While writing in the disciplines is not particularly foreign, it is usually avoided in large classrooms due to the vast number of reports that must be graded. Using a calibrated peer-review system, not only alleviates the burden on the instructor, but also teaches to student to appropriately analyze and critique the works of their peers and prepares them to enter into the scientific and health associated professions where they will need to use these skills. The discussion focuses on how to design, create, and implement a calibrated peer-review writing assignment for use in the undergraduate science classroom.

407A (N244) – Evolution of Skin Color and Core Principles in Anatomy and Physiology – 60 minutes
Robin McFarland, Cabrillo College, romcfarl@cabrillo.edu
Core principles such as structure/function relationships are central to understanding anatomy and physiology. However, it is challenging for students to apply such concepts to specific body structures or systems. Modern human skin tones range from dark ebony to light peach. This variation provides a fascinating platform for exploration of connections between skin structure, physiological roles in vitamin D synthesis and protection of folate, and human evolutionary adaptation. This workshop presents lecture and laboratory activities that use variation in skin color to promote understanding of key ideas in anatomy and physiology.

408A (N245) – Flipping the Classroom: A Case Study at Miami Dade College – 60 minutes
Dr. Marien Cendon, Miami Dade College, mcendon@mdc.edu
*Sponsored by Learning Catalytics and MasteringA&P*
Students at Miami Dade College report that a flipped classroom with peer-to-peer learning provides more support than traditional lectures and stimulates problem solving and cooperation. But how do we create a successful flipped classroom? How do we prepare effective problem-based learning activities students will find stimulating and engaging? Please join Marien Cendon as she discusses best practices from her use of Learning Catalytics™ in a flipped classroom.

409A (G301 G) – Teaching and understanding electrochemical forces, equilibrium potentials, and ion flow – 60 minutes
Janet Casagrand, University of Colorado, Boulder, Janet.Casagrand@colorado.edu
One especially challenging set of concepts for students (and faculty) to grasp is electrochemical forces, equilibrium potentials, and ion flow. These concepts provide the basis for understanding electrical signaling in body (e.g., membrane potentials and changes in membrane potential due to the ion flow that results from electrochemical forces). Difficulty understanding these fundamental concepts can consequently act as an instructional bottleneck for students to progress in learning nervous system, and also cardiac, function. In this workshop, we will explore these concepts, and some strategies and activities for improving learning.

410A (G301 H) – Using videos of anatomical drawings as a pre-class preparation tool for students – 60 minutes
Bradley Barger, Indiana University, jbbarger@indiana.edu
In this workshop, the instructor will demonstrate the use of in-class drawings as a teaching tool, as well as demonstrate how these lessons can be recorded and used for pre-class preparation. You will be shown simple ways to highlight important anatomical landmarks by drawing basic geometric shapes that students can follow, even without any previous drawing experience. By producing videos of these drawings, students can follow them at their own pace, identify key anatomical relationships, and learn by making their own drawings. By using drawing videos as a pre-class preparation tool, flipped classroom techniques can quickly and easily be introduced.

411B (A210) – Using LabTutor to develop and implement an inquiry-based ECG experiment – 90 minutes
Aaron Fried, Mohawk Valley Community College, afried@mvcc.edu
Wes Colgan III, Ph.D., ADInstruments, w.colgan@adinstruments.com
*Sponsored by ADInstruments LabTutor and LabAuthor*
This is a demonstration of a customized laboratory exercise used at MVCC that demonstrates ECG data collection and cardiac electrophysiology. Using an ADInstruments data acquisition system, participants will participate in a guided inquiry oriented around collecting and analyzing human ECG data. In small groups participants will actively predict and test their hypotheses about ECG variables during a variety of changes in position and activities. This demonstration will also show the steps in planning, customizing, developing, and deploying the ECG exercise using ADInstruments data acquisition software and Lab Author.

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Tuesday, Session 5

412A (T123) – Creating Lessons with the Biopac Student Lab System – 60 minutes
Ken Graap, BIOPAC Systems, info@biopac.com
*Sponsored by BIOPAC Systems*

Learn how to use the power and flexibility of the Biopac Student Lab to customize existing lessons, create your own lessons, or design independent projects. Open to current BSL users and all instructors who want to see the full extent of the Biopac Student Lab’s capabilities. No programming required, just simple pull-down menu selections and easy to set presets and preferences. The BSL PRO software allows you to perform exciting lessons on human and animal subjects. A wide range of BSL PRO lessons are included with BSL Software—BSL PRO Lessons provide the lesson template file and lesson instructions.

Wednesday, Session 5

501 (G101) – Anatomia Italiana: Art and Anatomy in the Italian Renaissance – 90 minutes
Kevin Petti, Ph.D., San Diego Miramar College, kpetti@sdccd.edu
*Sponsored by HAPS-I*

Italy’s medieval universities established the study of human anatomy for physicians. To heighten their art, Renaissance masters examined anatomy through human dissection. The connection between art and science is best demonstrated by the genius of Michelangelo. Indeed, the wooden crucifix he carved in gratitude for secret access to corpses still hangs in the Basilica of Santo Spirito in Florence. This talk examines the nexus between art and science along the Italian Peninsula, and the history of anatomy education in the first universities. The opportunity to visit Italy as a component of a HAPS-I course will also be discussed.

502 (M2103) – Improving Student Performance through Extra Credit Homework Assignments – 90 minutes
Chad Wayne, Ph.D., University of Houston, cwayne@uh.edu

Homework assignments are generally believed to be an effective tool to promote independent thinking, improve retention, and student performance. However, because of the compulsory nature of most homework assignments, students tend to focus their efforts on assignment completion rather than practice which does not always result in positive outcomes in the classroom. Extra credit homework assignments were introduced into a physiology course as study tools to promote retention while attempting to avoid the negative consequences of compulsory homework assignments. This discussion focuses on the efficacy of these assignments on student performance over four semesters and suggests that extra credit (non-compulsory) homework assignments have a positive impact on student retention and performance.

503 (M2105) – Beginning with the end in mind: grading rubrics as mechanisms for instructor feedback – 90 minutes
Margaret Weck, St. Louis College of Pharmacy, Margaret.Weck@stlcop.edu

In this workshop we will examine what grading rubrics are and what they are not. Participants will engage in the process of developing their own rubrics suited to their particular courses and students. The utility of rubric development will be discussed as a means for clarification of what an instructor feels is the relative importance of concepts, skills, and habits of mind essential to success in a particular course or on a particular assignment. Use of grading/scoring rubrics is framed as a means for explicit communication with students about instructor expectations.

504 (M2106) – The HAPS Laboratory Instructor Survey: Final results and implications for instruction – 90 minutes
David Brashinger, American Public University System, david.brashinger@mycampus.apus.edu

The HAPS task force on Laboratory Learning Outcomes conducted an online survey of instructors for introductory undergraduate-level course sequences in human anatomy and physiology for the nursing and allied health student. The goal of this survey was to document the current learning outcomes and activities in the laboratory component of these courses. This workshop will review the final results of the survey and the comments collected at the HAPS Eastern regional conference in March, 2014. The role of the laboratory component in introductory anatomy and physiology and the implications for the HAPS course guidelines and learning outcomes will be discussed.

505 (M2107) – Scientific teaching, active learning and assessment in STEM – 90 minutes
Pat Cipriano, Florida State College at Jacksonville, Kent Campus, pcipriano@fscj.edu
Becky Hailey, Florida State College at Jacksonville, R.Hailey@fscj.edu

After exploring how students learn, we will discuss scientific teaching and present examples of active learning with the goal to encourage student engagement, critical questioning, and personal responsibility for learning. We’ll talk about strategies to assess the process and end with an opportunity for participants to develop an active learning unit. This workshop was co-authored with Kim Conner, Florida State College at Jacksonville.

*continued on next page*
506 (M2108) – Presentation Title: New ways to share the anatomy and physiology story – 90 minutes
Dennis F. Burke, RN, DC, Bunker Hill Community College, dburke@bhcc.mass.edu
*Sponsored workshop*

507 (N244) – Engaging Students with Course Critical, Adaptive Learning Assignments that Provide Enough Data Analytics to Flip the Classroom – 90 minutes
Steve Sullivan, Bucks County Community College, sullivan@bucks.edu
*Sponsored McGraw Hill Connect *
Flipping the classroom allows us to give more personal attention to students in class and turn our traditional lectures into discussions of concepts. To do that, we need to know exactly what the students are learning from our assignments. Tools are available that efficiently provide detailed data analytics from adaptive learning assignments that assess students’ knowledge, skill, and confidence, helping instructors bolster student understanding in areas they need to improve the most. By helping students focus their outside-of-class study time on the topics and concepts most challenging to them, they come prepared for a discussion, rather than a lecture.

508 (N245) – Pedagogical approaches to the development and use of anatomy and physiology videos – 90 minutes
J. A. Carnegie, University of Ottawa, jcarnegi@uottawa.ca
R. Guy, RMIT University, richard.guy@RMIT.edu.au
This workshop explores the use of pedagogical approaches (visual plus auditory processing, role of emotion in learning) to develop videos for health sciences students. Patient-centered videos focus on symptoms, treatment, and patient experiences to expand understanding of the physiological basis of disease. Additionally, short video clips encourage students to use active learning when studying physiological concepts by asking them to interact with video content. Participants will select a topic, identify key learning objectives, and create a “storyboard” outlining video scenes to address those learning goals. Conversion of physiological information to interactive learning experiences is not as easy as it sounds!

509 (G301 G) – Engage, challenge, and inspire your students to success – 60 minutes
Catharine C. Whiting, University of North Georgia - Gainesville, cathy.whiting@ung.edu Kalan Brown, University of North Georgia - Gainesville, Jonathan Casus, University of North Georgia - Gainesville, Mark Green, University of North Georgia - Gainesville, Bobbie Hewell, University of North Georgia - Gainesville, Kristi Palmer, University of North Georgia - Gainesville, Shannon Sutton, University of North Georgia - Gainesville, Nhuvi Thai, University of North Georgia - Gainesville
Creating an engaging and challenging learning environment can be a difficult task. In this workshop, I will share ideas for cultivating such an environment from the first day of class until the final exam. Specific topics will include: developing active learners, using teaching assistants effectively, building rigor into your courses, and encouraging critical thinking. The workshop will include a demonstration of how these techniques can be used to increase motivation and facilitate learning. You will be amazed at what your students can accomplish when they are engaged, challenged, and inspired!

510 (G301 H) – Teaching anatomy via team-based learning in an online 3D environment – 90 minutes
April Richardson Hatcher, College of Medicine, University of Kentucky, arich3@uky.edu
Christena Gazave, University of Kentucky, christena.gazave@uky.edu
The University of Kentucky has designed a new regional anatomy course for pre-healthcare professional students featuring Team-Based Learning (TBL) in the 3D virtual world of Second Life™ (SL). ANA 309: An Introduction to Regional Anatomy is a 5-credit hour online course that includes weekly synchronous virtual TBL exercises to reinforce anatomical concepts. Students study interactive regional anatomy modules, take an individual quiz on Blackboard™, and then log in with a 3D persona to complete group quizzes and clinical discussions in a virtual anatomy classroom. We will demonstrate the online TBL process and discuss results from two semesters of the course.

511 (A210) – Ultrasound in Teaching Anatomy and Physiology – 90 minutes
Richard A. Hoppmann, MD, FACP, University of South Carolina School of Medicine, Richard.hoppmann@uscmed.sc.edu
Tripp Bell, MD University of South Carolina School of Medicine, Floyd.bell@uscmed.sc.edu
Victor Rao, MBBS, DMRD, RDMS, University of South Carolina School of Medicine, Victor.rao@uscmed.sc.edu
The University of South Carolina School of Medicine has been using ultrasound to enhance the teaching of Anatomy and Physiology since 2006. The first part of this workshop will be a didactic overview of the basics of ultrasound and the ways in which it can be incorporated into these courses. The second part will be a hands-on session in which participants will have an opportunity to perform some of the basic scans used in teaching Anatomy and Physiology. Approximately 30 minutes will be didactic and the remaining 60 minutes will be hands-on scanning.

continued on next page
Wednesday, Session 6

601 (G101) – The value of lab kits for online, hybrid, and even traditional A&P courses – 60 minutes
Dr. Brian R. Shmaefsky, Lone Star College – Kingwood, Brian.r.shmaefsky@lonestar.edu
The use of at-home laboratories in distance education A&P courses is the cause of much controversy about course delivery effectiveness. Many colleges are hesitant to teach fully on-line A&P courses because of concerns about the pedagogical value of at-home and virtual laboratory activities. Several programs that adopted fully on-line anatomy and physiology are showing the student learning outcomes are met using at-home laboratory lesson strategies. Plus, educational research studies are supporting arguments about effective learning using at-home exercises using kits and virtual activities. Many of these studies were conducted by university educational researchers. However, the rapid growth of on-line delivery has compelled on-line delivery providers to commission independently-conducted studies about the value of completely on-line coursework compared to hybrid and traditional classes. This session will summarize the findings about the effectiveness of completely on-line anatomy and physiology. Comments from allied health faculty about on-line A&P will also be discussed. Examples of completely on-line delivery can be enhanced to make student learning in lecture and lab sessions equivalent to traditionally structured courses. Audience participation will be encouraged in this session.

602 (M2103) – How to effectively teach students studying advanced human physiology to write a journal article – 60 minutes
Brianna L Julien, La Trobe University, B.Julien@latrobe.edu.au
Louise Lexis, La Trobe University, L.Lexis@latrobe.edu.au
An important skill for scientists to master is the ability to communicate research findings in the form of a journal article. Because students who see the relevance and real-life significance of a task are more likely to be intrinsically motivated, and to take on a deep-learning approach, an authentic assessment task asking students to present the findings of their own research in the form of a journal article was a perfect opportunity to engage them in this process. We developed tools and resources, including a rubric marking scheme, to assist students with writing a journal article in human physiology.

603 (M2105) – Flipping the Classroom with A.D.A.M. OnDemand Mobile-Ready Learning Programs – 60 minutes
Timothy Spaid, A.D.A.M., a business unit of Ebix, timothy.spaid@ebix.com
*Sponsored by A.D.A.M., a business unit of Ebix*
Do you have a flipped classroom environment or have students eager to have an engaging self-study program for their iPad or tablet? A.D.A.M. Education will present its new offering, A.D.A.M. OnDemand, a suite of off-the-shelf or custom mobile Learning Programs. Capture and review data to understand when students login, activity minutes spent, which programs have been completed and more. Let your students take their A&P learning tools with them wherever they go.

604 (M2106) – “Hormones – It’s a Balancing Act” – 60 minutes
Steve Kish, Zane State College, skish@zanestate.edu
The endocrine system functions as an important regulatory system. The various glands found throughout the body produce and secrete a wide variety of hormones that affect tissues. Participants will build the major glands of the endocrine system using Maniken™ models, looking at the hormones produced, their targets and actions.

605 (M2107) – A human-size cell may grab your attention! - Interactive educational event as learning and teaching tool – 60 minutes
Santa Makstenieks, Concordia University Wisconsin, santa.makstenieks@cuw.edu
We as educators know the joy of sharing our knowledge. In this workshop I will talk about two original and successful class projects. They are aimed at teaching students to showcase their newfound knowledge in innovative, interactive and memorable ways to the entire campus community. These projects are multi-step tasks which require practice in professional communication skills, time management, independent in-depth learning, and creativity. The assignment culminates in an exiting educational event with prizes for the winners. Come to find out more and get handouts with project layout details, grading scale, gains and pitfalls discovered along the way.

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606 (M2108) – Using Technology to ‘Turbo’ Through Assessment and Accreditation – 60 minutes
Nahel Awadallah, Johnston Community College, nawadallah@johnstoncc.edu
Many of us teaching A&P seek to assess student understanding for every chapter. Assessments are part of the accreditation process that touches everyone, from top-level administrators to teaching faculty. The College must demonstrate that specific learning objectives are being met by students under the guidance of their instructors. This presentation will discuss technology used to streamline and simplify assessment/ accreditation tasks that would otherwise take us inordinate amounts of time. Existing classroom management solutions can be for assessment / accreditation process what TurboTax is to tax preparation, making it automated, easy, and, above all, accurate.

607 (N244) – Pedagogical tools to enhance learning in microscopic anatomy laboratory – 60 minutes
Hisham S. Elbatarny, St Lawrence College, Queen’s University, HElbatarny@sl.on.ca
Histology can be a challenging science to study. I will present three different pedagogical tools used in teaching histology in my A&P lab prior to students’ use of the light microscope. The first tool provided oral explanation of the slide. The second consisted of the display of electronic diagrams of standard slides using power point presentations. The third tool involved the use of a microscope fortified with a built-in camera projecting real-time images on a big screen. I will show the effectiveness of each approach and how the third one improved students’ understanding and skills of learning histology.

608 (N245) – 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.

609 (G301 G) – How to become a HAPS-I instructor and teach a HAPS-I course – 60 minutes
Peter English, HAPS, peter@hapsconnect.org
*Sponsored HAPS-I*
HAPS-I is a vibrant program that offers graduate-level courses in Anatomy and Physiology in a variety of settings. The design of a course is completely defined by the instructor. Courses can be online, a mix of online and in-person, or wholly in-person. The mechanics of designing a course and shepherding it through the approval process are far more streamlined than many imagine, and approvals take place in a fraction of the amount of time that many of us experience at our home institutions. Peter English, HAPS Executive Director, will discuss requirements of courses and the approval process, mechanics of teaching, the online course management system, and answer questions.

610 (G301 H) – Biopac Student Lab: Budget Beating Physiology Lab Solutions – 60 minutes
Ken Graap, BIORPAC Systems, info@biopac.com
*Sponsored BIOPAC Systems*
Students use the Biopac Student Lab system to record life science data from their own bodies. Each lesson includes onscreen guiding text, sample data, and videos to help students focus on principles, not procedure. This workshop is aimed at current Biopac Student Lab users, or those instructors who want to see the full extent of the Biopac Student Lab’s capabilities to engage student minds & increase learning! BSL systems are intuitive and extremely robust. Use the 4-channel MP36 system or the new handheld 2-channel MP45 system with BIOPAC’s extensive curriculum library (60+ lessons) and broad range of transducers. Easily add experiment segments for active learning. Add BSL PRO software to create your own lessons and for independent projects. No programming required, just simple pull-down menu selections. Attend the workshop and be amazed by the power, flexibility and budget beating price options.

611 (A210) – How to Find or Create Problems for Team Based Learning – 60 minutes
Cindy Stanfield, University of South Alabama, cstanfield@southalabama.edu
Coral Gubler, University of South Alabama, cgubler@southalabama.edu
Julie Estis, Associate Professor of Speech Pathology and Audiology, jestis@southalabama.edu
Dr. Susan Gordon-Hickey, Associate Professor of Speech Pathology and Audiology, gordonhickey@southalabama.edu
Team based learning (TBL) is a style of teaching used in business schools, medical schools, and other professional schools for years. Undergraduate education has caught on to the trend of more interactive classes as opposed to traditional lecture style. We currently use TBL in undergraduate and graduate anatomy, physiology and neuroscience courses. In the undergraduate physiology course, several supplements came with the text that made development of class activities rather easy. However, that was not the case with neuroscience and the graduate level anatomy/physiology courses, where our creativity was put to the test. We will present some of our activities.
Wednesday, Session 7

701 (G101) – Conscience in crisis: the Nazi academics – 60 minutes
Aaron Fried, Mohawk Valley Community College, afried@mvcc.edu
Anatomists benefitted 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?

702 (G101) – The “M.S. in Human Anatomy & Physiology Instruction Program”- graduate/student/faculty panel discussion – 60 minutes
Robert Crocker, New York Chiropractic College, rcrocker@nycc.edu
Innovated in 2010 at New York Chiropractic College, the M.S. in Human Anatomy & Physiology Instruction Program (MSHAPI) is an online multidisciplinary science/pedagogy graduate degree program that fuses anatomy and physiology content expertise with graduate pedagogy training to develop a highly effective educator focused on undergraduate A&P instruction. In this workshop, graduates of the program will join current students and members of the faculty to discuss the mission and vision of the program, the educational experience, and the impact it has on professional development and career advancement.

703 (M2105) – How to effectively teach students studying advanced human physiology to write a literature review – 60 minutes
Louise Lexis, La Trobe University, L.Lexis@latrobe.edu.au
Brianna L Julien, La Trobe University, B.Julien@latrobe.edu.au
A well-written literature review should effectively educate the reader on the current knowledge of a topic area. Conducting a literature review is a difficult task, as the author / student is required to engage in all six cognitive skills, as defined in Bloom’s taxonomy. The levels of cognitive thinking, listed in ascending order are: knowledge, comprehension, application, analysis, synthesis and evaluation. We have developed tools and resources, including a rubric marking scheme, to assist students with conducting and writing a literature review in an advanced human physiology capstone program.

704 (M2106) – It’s flippin’ fun: Evaluating the pros and cons of a flipped classroom – 60 minutes
Wendy Riggs, College of the Redwoods, wendy-riggs@redwoods.edu
In a flipped class, students learn new content on their own time, and then engage in active learning during class time with the direct support of an instructor. After flipping my Anatomy and Physiology classes for four semesters, I have many thoughts about the flipped approach. In this workshop, we will look at different ways you can flip your classes, how to justify the change to your students, what to do during class time, and how to evaluate the effectiveness of the pedagogy.

705 (M2107) – Incorporating a modified “Interteaching” methodology into Anatomy & Physiology lecture settings – 60 minutes
David Mercer, Department of Biology, 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.

706 (M2108) – Getting Started with a Flipped Classroom – 60 minutes
Jeanine L. Page, Lock Haven University, jpage2@lhup.edu
Joshua Drouin, Lock Haven University, jdrouin@lhup.edu
So you have decided to flip your classroom; now what? Getting started is with flipping a class is a daunting task. What is the best way to record my lectures? How can I ensure my students are prepared when they arrive? How do I best utilize the classroom time now available to me? How can I create engaging activities to develop and assess student understanding? In this workshop, our goal is to answer these questions. We will utilize the flipped classroom model to help you. An online presentation regarding technologies and ways to record your out-of-class material will be made available to all participants. The workshop will be focused on working collectively to create a series of activities corresponding to the cardiovascular.
system, respiratory system, endocrine system and the urinary system. Using a team-based approach with the participants themselves, we will build a toolbox full of useful and interactive assignments that the students can complete in-class. These assignments will be designed to enhance both student engagement and understanding.

707 (N244) – Conversion of a graduate neuroanatomy course from traditional (face-to-face) instruction to a blended (hybrid) format featuring asynchronous instruction combined with monthly “institutes” with technology based learning, active learning and traditional laboratory exercises. – 60 minutes
Thomas P. Arnold, NOVA Southeastern University, tarnold1@nova.edu
A foundational course for health professions programs, neuroanatomy, was redesigned from traditional to hybrid format. Blended (hybrid) course delivery combines on-line lecture instruction and interaction with periodic face-to-face and kinesthetic learning. Instruction for this course is packaged into modules with supporting scaffolding including active learning aids, on-line lectures, videos and asynchronous discussions. The lecture materials, lab resources, course management and communications are delivered via a web based platform. Assessments are accomplished in four, week-end “institutes” incorporating a mix of traditional and virtual kinesthetic experiences including learning matrices, laboratory practica, anatome and written exams. Structure and best practices will be shared.

708 (N245) – Best Practices in Teaching A & P – 60 minutes
Dr. Lisa Hight, Baptist College of Health Sciences, Lisa.Hight@bchs.edu
Michelle McDonald, Baptist College of Health Sciences, Michelle.McDonald@bchs.edu
Effective student learning is a primary goal for HAPS participants. Achievement of this is possible when you integrate a variety of methodologies into your A & P course. Combined 30 years of teaching experience and multiple HAPS conferences have led us to assimilate a combination of effective strategies in the traditional and hybrid small to medium-sized classes (50 or less students). This workshop is designed for the novice instructor as well as to solicit input from experienced faculty to share what has worked for them.

709 (G301 G) – Let their goals be your guide: How to develop a writing exercise using student career plans – 60 minutes
Keely Cassidy, Medical Sciences Program, Indiana University School of Medicine, kmcassid@indiana.edu

Designing an authentic writing exercise in anatomy and physiology courses is often a challenge to instructors. Another common struggle is getting students to have a vested interest in the assignment. How can we alleviate both these issues? In this workshop, we will discuss the development and implementation of such a writing exercise used in an upper-level pre-medical human embryology course that used student career goals in the public health and healthcare professions to tailor the final writing assessment. Participants will then work in small groups using the principles discussed to design writing assessments for their own students.

710 (G301 H) – Increasing student success and retention using comprehensive peer-reviewed Open Education Resources – 60 minutes
Nicole Finkbeiner, Rice University, nicolef@rice.edu
David Harris, Rice University
*Sponsored by OpenStax College*
Studies have shown that students are increasingly foregoing purchasing textbooks and other required resources due to costs and accessibility. In this workshop, attendees will learn about peer-reviewed open education resources, including a FREE peer-reviewed A&P textbook, and how faculty across the country are increasing student success and retention using these resources.

711 (A210) – The Histology Challenge Wants YOU – 60 minutes
Nina Zanetti, Siena College, zanetti@siena.edu
*Sponsored by HAPS*
This workshop will explore an exciting feature on the HAPS website, the Histology Challenge. This feature presents actual patient cases, accompanied by photomicrographs of biopsy or surgical specimens. Each case features a series of questions that guide participants through the process of interpreting micrographs and “solving” the case, in an online discussion. In this workshop, we will examine the features of Histology Challenge and will review a few cases, to see how they reinforce basic histology and introduce clinical applications. We’ll invite participants to share ideas on how these Histology Challenges can be used in A & P courses, and how we can encourage increased participation in the online discussions. We also hope to recruit some volunteers to help produce future Histology Challenges.

continued on next page
Wednesday, Session 8

801 (G101) – How to use the Homeostasis Conceptual Assessment as a Formative Assessment – 60 minutes
Dr. Ann Wright, Canisius College, wrighta@canisius.edu
Homeostasis is an important core principle for undergraduate physiology students to understand and apply. Assessment of student conceptual understanding of homeostasis is important for teaching and learning, especially formative assessment to reveal students’ incomplete understanding and ‘misconceptions’. The 3 step process to develop a Conceptual Assessment of Physiology (CAP) instrument for homeostasis will be described. Starting with the conceptual framework for homeostasis that identified component ideas appropriate for undergraduate physiology developed and validated by a cohort of faculty at 2&4 year colleges, universities & medical schools. Next common student conceptions regarding homeostasis and its component ideas were identified (from physiology students and faculty). Finally, multiple choice questions to assess important homeostasis component ideas were developed and tested in student interviews. These questions were then vetted by a cohort of faculty from diverse institutions and students in physiology courses. We will present the CAP questions on homeostasis, the physiology faculty data on the appropriateness of these questions for undergraduate students, and the results of initial testing with students will be presented and discuss how the questions are linked to the conceptual framework and student conceptions & incomplete understandings. Workshop participants will be asked for feedback on the questions and how they would use this assessment.

802 (M2103) – Utilizing the Anatomy & Physiology classroom as a platform for interprofessional education – 60 minutes
Dr. Cathleen Murphy, St. John’s University, College of Pharmacy and Health Sciences, murphyc@stjohns.edu
Currently accreditation mandates are requiring interprofessional education in Allied Health including Physician Assistant and Radiological Science programs. In order to foster interprofessional education practices in these programs, activities must be constructed to bring this to fruition. This presentation will work to provide ideas for utilizing the Anatomy & Physiology classroom as a platform to encourage students to work with other future members of the healthcare team. This presentation will focus on active learning activities, which will foster interaction between students of different programs and build on the relevance of learning Anatomy & Physiology to their defined fields of study.

803 (M2105) – Active Learning in Anatomy and Physiology – 60 minutes
Jay Gump, Greenfield Community College, gumpj@gcc.mass.edu
Most instructors agree that active learning exercises improve student learning outcomes. We will discuss strategies for incorporating active learning into anatomy and physiology classes, including the types of activities that best lend themselves to class time. We will talk about utilization of online resources to deliver content and provide an active interface. Most importantly, we will discuss planning strategies that allow instructors to experiment with new teaching methods without overwhelming the classroom or the instructor’s capacity for creating new curricula.

804 (M2106) – Teaching (radiological) anatomy through repeated testing – 60 minutes
Jon Jackson, University of North Dakota, jon.jackson@med.und.edu
Christina Conneran, University of North Dakota, christina.conneran.2@my.und.edu
Repeated low-stakes testing has been shown to be effective at fostering learning of all kinds of complex new material, from algebra to Swahili. Its utility has moved from primary and secondary education into the curriculum of many universities and professional schools. This workshop will demonstrate how we use repeated testing in conjunction with our cadaver labs, share outcomes data, and provide attendees with materials that they can use immediately to help students master the often difficult translation of 2D radiological images into a complex 3D understanding of anatomic relationships. This workshop was co-authored by Alexis Hanson and Haris Ali, both of the University of North Dakota.

805 (M2107) – Are you ready to “Flip”? – 60 minutes
Karen R. Clark, Davenport University, karen.clark@davenport.edu
The flipped classroom concept has been “the topic” in education. The premise behind the flip is students watch instructor prepared videos on their own time. Freed class time is utilized by engaging students in applying what they have learned. This past year, I flipped units in my Anatomy & Physiology II course. During this workshop I will share my experiences as a first time flipper: successes, challenges, mistakes and student perceptions. If you have incorporated the flipped method into your classroom, please come and share your experiences!

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806 (M2108) – Introduction to comparative anatomy of humans and other vertebrate animals – 60 minutes
Stacey Dunham, Indiana University, dunhams@indiana.edu
Did you know that fish scales and human teeth are homologous? The session will introduce attendees to the basic anatomical similarities and differences observed in classes of vertebrates. We will examine the morphology of the integumentary, skeletal, muscular, circulatory, urinary, and reproductive systems. Attendees will gain knowledge about the comparative anatomy of vertebrates and a better understanding of the evolutionary inheritance of vertebrate features. While the session will have time for only a basic overview, attendees will receive a digital copy of more detailed anatomical information.

807 (N244) – Regional anatomy for undergraduate students – preparing students to use anatomy in the real world – 60 minutes
Mark Nielsen, University of Utah, marknielsen@bioscience.utah.edu
Robert Tallitsch, Department of Biology, Augustana College, roberttallitsch@augustana.edu
We noticed on the HAPS List Serve numerous inquiries about teaching anatomy using a regional approach. As professors who have each used this approach with great success with undergraduates for approximately 30 and 39 years respectively, we thought it would be informative to share our experiences. We will share the pros and cons of this approach and share what we have learned in using and adapting a regional anatomy approach to teach first-time anatomy students. We will discuss how it enhances a dissection-based lab experience and describe available tools to make this a viable option to teach undergraduate anatomy.

808 (N245) – Construction and use of a magnetically articulated human skeletal model in teaching anatomy and physiology labs – 60 minutes
Joe Shellhammer, Wichita State University, joe.shellhammer@wichita.edu
Brandon Williams, Wichita State University, bmwilliams3@wichita.edu
We will present an educational resource workshop that implements the use of a magnetically articulated skeleton that we assembled from a disarticulated plastic human skeletal model and small, rare earth magnets. We already had a complete disarticulated human skeleton of relatively new plastic bones and cartilage. One of my teaching assistants for the Human A and P class that I teach noticed that students really struggle with how bones articulate with one another when viewed in small combinations, such as a couple of bones, without the context of the complete skeleton. Students are evaluated over such details on lab quizzes and practicals. To facilitate efforts to teach articulations as well as the bones themselves, the TA decided to lay out a disarticulated skeleton, a few groups of bones at a time and noticed that it helped not only explain, but reinforce the learning of bones and articulations. To further enable future TAs’ efforts to teach in the same way or with similar resources a proposal was made for building a case with a foam cut-out where each bone would be held in correct location with articulating bones. Furthermore, through using magnetically articulating skulls we were using, it became evident that an entire articulating skeleton would be practical, useful and feasible. The only additional resource we purchased was a set of small cylindrical magnets of various sizes and strengths to hold articulating plastic bones together. The skeleton has been constructed and is now being used in lab for the A and P classes that I teach each semester.

Wednesday session 8, 809 (G301 G)

810 (G301 H) – Making students do the lifting – evolving pedagogy through flipping and writing – 60 minutes
Dr. Hiranya S. Roychowdhury, New Mexico State University-Dona Ana Community College, hroychow@nmsu.edu
Flipped classrooms take off the load of delivering content in a content-heavy classroom. It is even more useful in community colleges where we serve nontraditional students who are either “too busy” to study between lectures, or too afraid to ask questions in the classroom. I will be discussing the tools and best practices I use to engage my students actively in their own learning and in making them effective communicators through semester-long writing projects that involve the “WAC” principles. Through assessments and frequent tests, I have been collecting evidence of their improved learning. I will sharing these findings.

811 (A210) – How is College Different from High School? Helping Students Understand to Succeed – 60 minutes
Dr. Daniel Kifle, The Community College of Baltimore County, dkifle@ccbcmd.edu
Mrs. Ellen Joyce Lathrop-Davis, The Community College of Baltimore County, elathrop@ccbcmd.edu
Dr. Ewa Gorski, The Community College of Baltimore County, egorski@ccbcmd.edu
Student populations in higher education range from very recent high school graduates to older returning students. Often faculty must remind students what is expected of them. This session will provide the opportunity to discuss differences between high School and college and help students take “ownership” of their own learning.
Thanks to our

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