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Margaret Weck and Judy Jiang
HAPS-EDucator is the official publication of the Human Anatomy and Physiology Society (HAPS) and is published four times per year. Major goals of the Human Anatomy and Physiology Society are: to promote communication among teachers of human anatomy and physiology in colleges, universities, and related institutions; to present workshops and conferences, both regional and national, where members can obtain information about the latest developments in the health and science fields; and to encourage educational research and publication by HAPS members. HAPS was established in 1989.

Annual membership dues are $50 for full time faculty, and $35 for part time and retired faculty. Annual membership renewals shall be due on January 1, April 1, July 1, or October 1. New members shall renew on whichever date most closely follows the date of their initial membership. HAPS Hotline: (800) 448-HAPS (4277). Information on membership, meetings, and more! Send correspondence to: HAPS, 8816 Manchester, Suite 314, St. Louis, MO 63144. Check out our new webpage at: http://www.hapsweb.org/

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CONTACT THE HAPS-EDucator Editor: Susan Baxley, Troy University Montgomery Campus, College of Arts & Sciences, P.O. Drawer 4419, Montgomery, AL 36103-4419, (334) 241-5473, (334) 241-8665 fax. sbaxley@troy.edu
As our academic year winds down, I hope you are finding satisfaction and reward for all of your dedicated efforts. Teaching human anatomy and physiology is, perhaps, one of the most challenging disciplines to teach to undergraduates. With significant research being published in nanoseconds and with rapidly advancing technological capabilities for disseminating information to our students, we never lack challenges as educators. Our students tend to be some of the most competitive in undergraduate programs, a fact that certainly adds another level of challenge for us. HAPS is an organization which embraces the demands and challenges we face and continues to be an incredible source of new information, support, and networking opportunities for all of us.

Your HAPS Board of Directors, Committee Chairs, Web Editor, and Business Manager have all been very busy learning how to use our new web site for official business and for disseminating information to our members. We are fortunate to have had an official web site lesson from Carl Shuster, our Web Editor (otherwise known as the “webgod”), at the midwinter meeting in January. Not only did all of the Committee Chairs and Board members learn about the capabilities of the web site, but we also were able to actually work with it and see first-hand how our new web site is already changing our organization in a very positive way.

Because our HAPS Headquarters is centrally located in St. Louis and the 2005 Annual Conference will be held there, it made sense to me to hold the midwinter meeting of the Board of Directors and Steering Committee there as well. I want to thank all of our Committee Chairs for attending, for being so well prepared, and for their outstanding reports during our joint meeting! The HAPS committees are really the working “guts” of our organization and we all benefited from hearing about all of the ongoing activity within the HAPS committees. While each of our committees is busy addressing current issues applicable to the mission of HAPS and engaging in long-range planning for HAPS, your Board of Directors is busy discussing and making decisions which affect the day-to-day operation of the organization, as well as future organizational plans. Some of the accomplishments of the midwinter meeting include: a new marketing committee structure, approval of guidelines for our monthly electronic Board of Directors meetings, approval of the new comprehensive HAPS Safety Guidelines document, establishment of a new category of membership for international members, improving membership recruitment and retention efforts, and much more. You will be able to see the fruits of much of our labor on the HAPS web site. Please know that there are some documents which are approved, but are not yet ready for posting on the web site. Check the web site frequently and, if you have specific questions or concerns, please let your Regional Director know so your question or concern can be addressed expeditiously.

When I was a new HAPS Regional Director, I attended my first midwinter meeting which was held in Chicago. Some who attended that meeting actually stayed at Bob Anthony’s house, while some stayed at a nearby motel. Our first meeting of the weekend was the joint meeting of the Steering Committee and the Board. After about three hours of listening to all the committee reports and all of the discussion associated with those reports, I, in one single evening, had a whole new perspective of our organization, and was amazed to learn of all the work that was going on in HAPS. And all of this was to promote our mission “dedicated to promoting excellence in the teaching of anatomy and physiology.” However, I was even more in awe of the sincere camaraderie of all of the HAPS leaders. I thought, “Wow, these folks really like each other and really like being part of the leadership of HAPS.” I do hope that you will consider how you might contribute to HAPS in the future, as a committee member, a Regional Conference Coordinator, an Annual Conference Coordinator, a mentor to new HAPS members, a workshop or poster presenter, or as one of our leaders. There is no doubt in my mind that you will find any of the above responsibilities most educational and rewarding.

Without a doubt, the most significant event each year for HAPS members is our annual conference. This year we have an incredible conference planning team led by Margaret Weck, 2005 Annual Conference Coordinator. We will be meeting in St. Louis, Missouri from May 29–June 1. Update seminars, receptions, vendor exhibits, and the banquet will be held at the beautiful Marriott Hotel in downtown St. Louis. I was fortunate to visit the Marriott when I was there in January, and it is a lovely and spacious venue for our conference. The room rates are excellent this year, so be sure to make hotel reservations as soon as possible if you are planning to attend. Our workshops will be held at the St. Louis College of Pharmacy, the co-sponsoring institution for this year’s conference and workshops. Margaret and team have planned a great conference with exciting update seminar speakers, great workshops, and wonderful networking and sight seeing opportunities. You can check it all out on our web site.

I am pleased to report that HAPS is financially sound and operating very efficiently, but your Board of Directors continues to strive for improving the way in which we function. I am convinced that our healthy society is due to the dedication and passion of our members toward our profession and toward HAPS. We paused for a moment during our midwinter meeting to reflect upon how many lives we, in HAPS, have touched as educators in this field. Just looking at numbers alone, it is mind-boggling. Figure over 1000 HAPS members, each with “x” number of students each year, multiplied by the years we have all taught, and you come up with, well, you figure it out. No doubt the influence of our organization and what we do is far-reaching.
We have a great conference planned for you May 29th - June 1st, 2005. Social events are linked to the Lewis and Clark Expedition and the 1904 World’s Fair. Our Banquet/Keynote speaker will be Debra Crank-Lewis, a descendant of both the Meriwether Lewis family and the Stephen Clark family. Her working title is: A Journey of Discovery: 100 Years Later (Reflections on the Lewis & Clark Expedition, including scientific aspects)

Planned Update Seminars on May 29 and May 30, 2005 include:

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Title</th>
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<tr>
<td>Paul Quinton, Ph.D.</td>
<td>UC San Diego sponsored by APS</td>
<td>Romantic Solutions and Cystic Fibrosis*</td>
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<tr>
<td>Thomas C. Westfall, Ph.D.</td>
<td>St. Louis University</td>
<td>Cotransmission and signaling in ANS: practical implications in understanding disease mechanisms &amp; therapies*</td>
</tr>
<tr>
<td>Andrew Payer, Ph.D.</td>
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<td>Reinventing Anatomy: Update on Education in Anatomical Sciences in Medical Schools*</td>
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<td>Mary Case, M.D.</td>
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<tr>
<td>Sarah Elgin, Ph.D.</td>
<td>Washington University</td>
<td>Chromatin, the RNAl system, and gene regulation*</td>
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Once again we have a wonderful line-up of exhibitors. Our vendors are very supportive, and are generously underwriting many events, thus enhancing the quality of our conference experience. Please make sure to spend some time in the exhibit hall between update seminars. There is always something new and interesting to see.

We have a full slate of interesting and practical teaching workshops scheduled for May 31st and June 1st, on the St. Louis College of Pharmacy Campus. The local light rail system (called Metro Link) connects Downtown St. Louis to Lambert St. Louis Airport. The conference hotel and College of Pharmacy are both convenient to the Metro Link (1 1/2 blocks and 2 blocks from a Metro Link station, respectively), so we will take advantage of Metro Link for our transportation to our workshop campus. (Tickets will be part of your registration packet.) No waiting on busses this year!

Here at the southern edge of the Great Plains we have no mountains or volcanoes to impress our visitors, so the optional day trip on June 2 will continue our history theme and include:

- a trip to Cahokia Mounds, one of the last remnants of the thriving Mississippian Culture of pre-Columbian North America,
- a stop at the new Confluence State Park commemorating the over wintering campsite of the Lewis and Clark Expedition at the confluence of the Mississippi and Missouri Rivers, and
- a visit to Hannibal Missouri, boyhood home of Samuel Clemens.

We have no distinctive hats, we have no trademark yells, but we do have a lot of friendly hospitality. The Conference Organizing Committee invites you to meet us in St. Louis (again) for another great meeting, the HAPS 19th Annual Conference. See you here!
Learning to Learn Human Anatomy and Physiology

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Students are often intimidated by the study of anatomy and physiology and approach this content area with misconceptions and misgivings. This paper will provide an integrated approach for active involvement in developing and enhancing the understanding of anatomy and physiology. Students who stay with this proposed strategy will inevitably become better learners. They will acquire the necessary life-long tools for increasing their understanding and appreciation of anatomy and physiology and the learning process. The instructor’s role should be to stimulate students to think, to keep their interest and enthusiasm, and to guide them in ways that refine and enhance their knowledge. Letting students learn how to become self-reliant in the learning process will enable them to develop the self-confidence that is so important for lifelong learning.

The following are insights offered to students by former colleagues and mentors, Jeffrey L. Smith (Delgado Community College, New Orleans, Louisiana) and David B. Fankhauser (University of Cincinnati Clermont College, Batavia, Ohio). It is essential to always read the chapter before the lecture. The lecture is much more meaningful if the student is even vaguely familiar with the material to be covered. Most human anatomy and physiology textbooks have chapter objectives that identify what is considered to be most important. In addition, the study outline, one of the most useful features of a textbook, is usually a summary of the major topics and vocabulary included in the chapter. For review, some end-of-chapter questions will test recall of specific pieces of information. Some questions require an understanding of concepts and the ability to synthesize ideas. Other questions help to develop critical thinking skills.

Students should set aside about 30 to 60 minutes each day for study. This is much more productive than marathon studying, for after becoming mentally fatigued, little or no learning is accomplished. While reading each chapter, pay particular attention to the terminology, the illustrations, and the tables. Much information is presented in the form of figures and tables. Word construction (word-stems) provides a fundamental tool for the understanding of the language of human anatomy and physiology. A constant use of major terms and an understanding of their etymology will aid in the learning of new nomenclature. As previous material is mastered, new material will be much easier to grasp.

In order to obtain maximum benefit in the study of anatomy and physiology students must also develop the discipline necessary to take good notes and to keep up with reading assignments. To do so will markedly improve comprehension during lectures. To put off the assigned readings until just before exams will make learning interesting material seem like painful drudgery. Students should not attempt to record lectures verbatim but rather leave space in their notes for additions after class. Scheduling at least 15 minutes following each lecture to read over the day’s notes, with textbook at hand, is a worthwhile practice. Fleshing out the material while it is fresh will allow for clarification or addition of detail. Inefficient study habits make it appear as if little learning is being accomplished. Thus, the rewards of successfully adopting good study habits are worth the time and energy. If current study habits are not working, change them.

Studying human anatomy and physiology is not a speedy process, nor does the learning process happen instantaneously. The ability to learn requires a collection of skills. These skills rely on habits developed to increase the efficiency of the learning process. The time required to effectively master anatomy and physiology might be different from one student to another. The ability to develop and improve these skills helps to distinguish the successful learner from the unsuccessful learner. It may not be easy, but sticking with the process ultimately spotlights the best learners.
New Approaches to Teaching Human Anatomy and Physiology

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The way human biology is taught in high school is boring for the average student. Students are asked to memorize a large body of facts without being shown how these facts fit into their daily lives. What typical high school student wants to learn the biochemical structure of carbohydrates, fats, proteins, and DNA, or how cells work?

I advocate flipping the teaching process by starting with an everyday experience or observation about the body and asking why—what is the underlying anatomy and physiology? For example, when your father comes in at five o’clock in the morning to go fishing with you and flips the lights on, why do you squint? Why do you have so much trouble finding a seat when you first walk into a movie theater? Why should children not run around with pencils in their mouths? How is it possible for a person to wake up from a coma after two years? How does hanging kill a person? What happens when someone experiences an asthma attack, and why do some people carry a syringe of epinephrine with them in case they are stung by a bee? What is a vitamin? Why do fragrances sometimes evoke such emotional memories? Do drugs damage the brain?

It is easy to capture a young person’s interests if you ask just the right question, a question to which that student can relate. By presenting the clinical problem first, students now have a reason to learn the underlying anatomy and physiology because they can be applied immediately to an everyday experience or observation. By understanding how drugs, smoking, muscle-building steroids, fatty foods, and lack of exercise disrupt normal physiology, young adults can begin to make intelligent decisions about their bodies.

Another approach to human anatomy and physiology is to have the students build their own human body. First, let them decide why they need each of the organ systems of the body—what is the purpose of the special senses or the integumentary, immune, respiratory, cardiovascular, gastrointestinal, endocrine, urinary, reproductive, skeletal, and nervous systems? Next, have the students design each organ system as you point out the problems their designs must overcome. For example, if the heart is going to pump blood all the way to the legs and back, it has to pump with a great deal of pressure. However, the lungs are very delicate and will be shredded by a jet of high pressure. How do you design the heart to solve this engineering problem? For the immune system, what mechanism explains how white blood cells leave the vascular tree at the appropriate location to fight an infection? For the urinary system, what mechanism explains how the kidneys remove the appropriate substance from the bloodstream?

Now provide the students with case histories of actual patients, detailing their symptoms and the signs discovered by their doctors on a physical exam. Ask the students to figure out which organ system they think is malfunctioning and how they arrived at their conclusion. At this point, students will be eager to understand how x-rays, ultrasound, CT scans, MRI scans, and blood tests can aid them in revealing the structural and functional status of each organ system.

The next step is to demonstrate why a single organ system begins to malfunction. What pathophysiological process interrupted its normal internal chemistry resulting in infection, inflammation, tumor infiltration, ischemia, drugs, genetic disturbance, or some mechanical disturbance such as compression, laceration, or obstruction?

At this point, the only thing separating students from doctors is understanding the specific diseases that precipitate these pathophysiological processes, how the diseases are diagnosed, and how best to treat them.
Dalton’s Law of partial pressures and the correct concepts of both the composition of room air, alveolar air, and why certain exchanges take place are not easy to teach. I have taught this to medical technology students for 20 years, in addition to reviewing it for various interns, residents, and attending physicians. I have noticed that the only facts that seem to stick in the mind are that a normal Po2 is about 100, and a good Pco2 is about 28-35 mmHg. This is really not adequate for a good understanding of gas exchange.

The concepts important in gas exchange can be illustrated in a brief exercise using colored gummy bears to represent different gas molecules. Each student is given a disposable culture dish and access to paper plates of gummy bears, with a different color of gummy bear on each plate. A culture dish will hold about 20 gummy bears—each bear representing about 5% of the gas molecules in any gas mixture.

During the exercise, students respond to the following questions:

**Question 1** “What is the percent of oxygen in room air, and what other gases are represented?”

Generally, after a few tries the class will come up with 20% oxygen and about 80% nitrogen in dry air.

**Question 2** “How can you represent the gas mixture in your Petri dish with gummy bears?”

Since each bear represents about 5% of the air contents, we will generally use four red bears for oxygen, and sixteen pale yellow bears for nitrogen molecules. Now the students enjoy placing bears in their own culture dish, (a few will accidentally be devoured). Using N for Nitrogen, O for Oxygen, H for H2O and C for CO2, we can diagram the results after each step.

**Dry Air**

\[
\begin{array}{c}
\text{N N N N} \\
\text{N N N N} \\
\text{N N O O} \\
\text{N N O O}
\end{array}
\]

**Approximate percentages**

- 80% Nitrogen
- 20% Oxygen

**Question 3** “What happens to this mixture when you breathe in through your nostrils?”

Usually some student will immediately try to talk about CO2. I encourage the students to not go that far, just to think of what it would be like to be drawn into a warm moist dark space. Once they realize that the first effect is to become warmed to 37 °C and 100% humidity, they will want to add a blue or green gummy bear into their dish to represent water.

**Moist Air**

\[
\begin{array}{c}
\text{N N N N} \\
\text{N N N H} \\
\text{N N N O} \\
\text{N N N O}
\end{array}
\]

- 75% Nitrogen
- 5% H2O
- 20% Oxygen

Now I introduce the critical teaching point. Because the 20 gummy bears represent all the atmospheric pressure, whatever it is at the present moment, they cannot add another bear without removing one that is already in there. I illustrate this concept by describing what it is like to get in a very warm shower that totally saturates the room with moisture. They quickly recognize that Dalton’s Law means that, for any given pressure, the addition of new gas molecules reduces the number of other molecules present. Since there are 80% nitrogen molecules in air, it is likely that nitrogen more than other molecules will be displaced as we add oxygen (a blue gummy bear). (Nitrogen should
Teaching Tips - continued from page 7

be eaten at this point, because bears should not be placed back on the paper plates.)

I remind the students about Avogadro’s number of molecules in every mole of gas (and point out that it would be very difficult for the university to purchase that number of gummy bears for this particular exercise). In fact, because of the addition of water molecules, nitrogen concentration drops from about 80% to 76% and oxygen concentration drops from about 20% to 19%, but the fifteen gummy bears for nitrogen, four gummy bears for oxygen, and one gummy bear for water still give us a good idea of the relative amount of the three gases present in humidified air as it travels down the main stem bronchi.

Question 4 “Next, what may happen to this mixture of gases as it approaches the terminal alveoli?”

This is an excellent chance to mention the mixing of gases that happens in the secondary, tertiary, and terminal bronchi, as well as to review the anatomy of each region. We can also point out that the Pco₂ will continue to rise as inspired air approaches the terminal alveoli, where the gases dissolve in liquid (alveolar fluid) before exchange takes place.

Question 5 “How many red gummy bears, representing oxygen, do you think will be taken up by the alveoli, and how many orange gummy bears, representing CO₂, do you think will be added?”

The tendency for most students is to think that, once oxygen is taken into the lungs, it will all diffuse into the blood. In fact, this is impossible because the Po₂ must remain high to maintain a good diffusion gradient that will always be about double that of the Pco₂. Depending on how high the patient’s Pco₂ is, we will discover that only 1 or 2 red gummy bears should be removed to be replaced by orange ones representing Pco₂.

<table>
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<tr>
<th>Alveolar air</th>
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<tbody>
<tr>
<td>N N N N N</td>
<td>75% Nitrogen</td>
</tr>
<tr>
<td>N N N N H</td>
<td>15% Oxygen</td>
</tr>
<tr>
<td>N N N O O</td>
<td>5% H₂O</td>
</tr>
<tr>
<td>N N N O C</td>
<td>5% CO₂</td>
</tr>
</tbody>
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The closer to the alveolar membrane, the point of entry of blood CO₂, the higher the Pco₂ will be. As alveolar air is expired, the Po₂ rises since O₂ is added as mixing occurs with recently inspired air in the airways. The Pco₂ falls since blood has lost CO₂ to the recently inspired air. In cases of emphysema or other chronic lung diseases, the alveolar Pco₂ will be higher since ventilation into the terminal bronchioles is poor.

Finally, I guide a review of four significant points:
1. dry air has about 20% oxygen
2. humidified air about 15% oxygen
3. alveolar air about 12% oxygen
4. expired air perhaps 10% oxygen
5. all air also has CO₂

This exercise leaves students with real visual and kinesthetic memories of the composition of gases at any given barometric pressure that they can use in the future. It also reinforces the anatomy and the dynamics of gas exchange in an easy to remember fashion.

HAPS Needs You

To Host a Regional Conference

1. Low travel expense—draws people from a 250-mile radius, some of whom cannot attend the annual conference
2. Low registration cost—often under $50 for registration & lunch
3. Convenience—usually held on weekends
4. Relevant topics & updates in your teaching field
5. Incentives—free registration at your conference and recognition by your peers

Contact: Regional Conference Chairperson (or your Regional Director)
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Histology is an integral component of most Human Anatomy & Physiology courses. Unfortunately, students often perceive this subject as being difficult, dull, and irrelevant to their careers. One approach to helping students see the value of histology is to show them direct correlations between this subject and the study of disease. Specifically, students are often intrigued to discover that learning to read microscope slides of normal tissue specimens enables them to analyze certain pathological conditions. Alternatively, an examination of pathological specimens can be used to reinforce basic patterns and concepts of normal histology.

This article describes several examples of pathological correlations that could be used to illustrate basic concepts of normal histology. In particular, I have chosen examples that emphasize general aspects of cell structure and the four basic tissue types: epithelium, connective, muscular, and nervous commonly taught in the tissues chapter of an A&P course. In addition, these examples were chosen because they illustrate the potential usefulness of learning to interpret microscopic images of normal histological specimens.

Mitosis, Growth, and Cancer

The study of mitosis and recognition of mitotic figures is a common exercise in A&P, histology, and general biology labs. Students are often asked to observe mitosis in slides of onion root tips or fish embryos and to find examples of cells in various phases of mitosis. Once students have acquired some proficiency in identifying mitotic figures in these classic examples, they may be interested to see what mitotic figures look like in typical animal tissues, such as the intestinal crypts. Even more striking are the numerous and often bizarre mitotic figures that appear in malignant tumors. Instructors can provide students with images of malignant tissue, encourage the student to attempt to identify mitotic figures in the specimen, and point out that pathologists routinely identify and count mitotic figures as part of the process of grading (estimating the aggressiveness or level of malignancy) of tumors.

Epithelium and Metaplasia

One of the first tasks faced by every student of histology is learning the different types of epithelial tissues. Textbooks and lab atlases describe and illustrate simple vs. stratified epithelium and provide information about where each type occurs in the body. A clinical correlation that emphasizes the different types of epithelium is the general topic of metaplasia. Metaplasia, a response of tissues to injury, involves the replacement of one adult tissue type by another adult tissue type. A particularly interesting type of metaplasia is a condition known as Barrett’s esophagus, in which the normal stratified squamous epithelium of the esophagus is replaced by a simple columnar epithelium with goblet cells, similar to that of the small intestine. This type of metaplasia is associated with Gastroesophageal Reflux Disease (GERD) and considered a premalignant condition (adenocarcinoma). Students who have come to recognize both of these tissue types and to understand their functional significance will be surprised to observe the intestinal type of epithelium in specimens of Barrett’s esophagus.

Basement Membranes and Invasiveness of Tumors

A basic study of epithelial tissues also emphasizes the importance of the basement membrane that underlies all epithelia. A clinical correlation that points out the significance of the basement membrane is the difference between infiltrating vs. in situ cancer. If students have learned to recognize the basement membrane in normal histological images, they will be able to detect the difference between DCIS (ductal carcinoma in situ), a pre-cancer condition in which the tumor cells remain within a basement membrane, and infiltrating (invasive) breast cancer, in which the tumor cells have breached the basement membrane. Discussion of the difference in prognosis for patients with either of these two conditions would further emphasize the importance of the basement membrane.

Desmosomes, Epithelium, and a Blistering Disease

In teaching about keratinized, stratified squamous epithelium, textbooks and instructors often encourage students to observe the "prickles" of the "spiny layer" of thick skin. The lesson usually continues with an explanation of how the "prickles" reflect the presence of desmosomes and why desmosomes are important to this type of epithelium. A clinical correlation that emphasizes the importance of desmosomes is found in the disease known as pemphigus vulgaris, a type of "blistering disease" as an autoimmune disorder in which a patient’s serum contains antibodies against desmosomal proteins. The resulting reduction in desmosomal function causes the layers of skin to separate from each other, resulting in large blisters. The separation of tissue layers is easily seen in micrographs of skin specimens taken from patients with pemphigus vulgaris.

Collagen Fibers and Scar Formation

In their study of connective tissue, students are usually urged to observe the large, pink-staining collagen fibers that give connective tissue its tensile strength. Scar formation or fibrosis provides an example of how collagen fibers function in a pathological situation. Students can usually recognize the large collagen fibers...
Teaching Tips - continued from page 9

Macrophages and Giant Cells

A basic study of connective tissue also involves learning to recognize some of the cells of connective tissue. Macrophages provide an excellent example of structure-function correlation because their function (trash collector) is so nicely reflected in the appearance of their cytoplasm (frothy or vacuolated because of accumulated “trash”). Students are always interested to see images of lung tissue taken from patients with anthracosis. The lung macrophages in these specimens contain large accumulations of black carbon. Alternatively, the significance of macrophages can be illustrated by showing images of foreign body giant cells, which can often be found in pathological specimens containing bits of suture material.

Adipose Tissue, Lipomas, and Fatty Change

Most introductory chapters on histology include a survey of the different types of connective tissue. Adipose tissue is one of the easiest types to identify and students will usually have no trouble recognizing the similar structure of adipose tissue in a normal location (such as the deep portion of the skin) versus that in a lipoma (benign tumor). Another clinical correlation that emphasizes the empty appearance of fat-containing cells is the process known as fatty change, or steatosis. In this condition, cells, such as hepatocytes, accumulate large amounts of fat. The presence of the fat within the cytoplasm gives these cells an appearance somewhat like that of adipose cells.

Blood Cells and Acute vs. Chronic Inflammation

Probably all A&P courses include a lab in which students are asked to learn to identify the cells of peripheral blood. In learning the white blood cells, students discover the usefulness of being able to recognize whether a cell’s nucleus has a highly lobed or, alternatively, a more solid (mononuclear) form. Once students can see the difference between the two basic forms of leukocyte nuclei, they will be able to understand how a pathologist distinguishes between acute vs. chronic inflammation. If shown good examples of tissue specimens containing areas of inflammation, students will be able to discern the highly lobed nuclei of neutrophils that predominate in acute inflammation, as compared to the abundance of round lymphocyte nuclei in chronic inflammation.

Skeletal Muscle and Atrophy

In learning about skeletal muscle, students are directed to notice the large size, both length and width, of skeletal muscle fibers. A simple pathological correlation that gives students practice in recognizing skeletal muscle fibers and that will remind them of the (normally) large size of these fibers, would be to compare the microscopic appearance of normal vs. atrophied skeletal muscle.

Neurons and Hirschsprung’s Disease

Even the most basic introduction to nerve histology introduces students to the structure of neurons. Texts and atlases usually direct students to observe spread preparations of neurons and to notice the large cell body, with its large “owl eye” nucleus. Students who have learned to identify neurons in spread preparations may find it more difficult to identify the neurons of intestinal plexuses, but usually, with help, can see the distinguishing nerve cell bodies and large nuclei. At this point, the student may be interested to learn that, in order to diagnose Hirschprung’s disease (congenital megacolon), a pathologist must examine a proscribed length of intestine and count the number of neurons present in the specimen. The absence or reduction of normal myenteric and submucosal plexus neurons (ganglion cells) supports the diagnosis of Hirschprung’s disease.

As these and many other examples suggest, pathological correlates can provide students with unusual examples of microscopic features that enhance or emphasize basic principles of normal histology. In my experience, students who have acquired even a minimal amount of ability to read normal histological images are delighted to discover that, with some help, they can recognize clinically significant patterns in pathological specimens. For instructors who wish to use this approach, but do not have a collection of pathology slides, numerous examples of images are available on various websites, some examples of which appear in the list below.

Selected Websites for Histology and Pathology:

- http://www.pathguy.com/histo/000.htm
- http://www.udel.edu/Biology/Wags/histopage/histopage.htm
- http://pathology.mc.duke.edu/research/PTH225.html
- http://www.siamed.edu/~dking2/intro/IN008b1.htm
- http://www.path.uiowa.edu/virtualslidebox/
- http://www.kumc.edu/instruction/medicine/anatomy/histoweb/
- http://www.csee.umbc.edu/~mikeg/dissert/slides.html
- http://medlib.med.utah.edu/WebPath/webpath.html

The content of this paper was presented in a workshop given by the author at the 2004 HAPS conference.
Using cadavers in A&P classes certainly enhances the learning experience for students. But, are you getting the most out of your cadavers? Are your students getting the most out of their cadaver experience?

Are you a professor who has been using cadavers in your classes for a number of years, or one wanting to use cadavers in your classes? Since there are cadaver users at opposite ends of the spectrum and everywhere in between, this article will answer the question, “How does one make maximum use of cadavers if the professor does not have the time or other resources to perform dissections?”

At my university, three professors teach A&P on a regular basis. Approximately 250-300 students take A&P courses during the academic year. We use two cadavers, a male and a female, which are replaced after two years using an alternating schedule so that one fresh cadaver is available at the beginning of each fall semester. In my labs students are not required to perform cadaver dissections as part of the course requirement, but they may do so voluntarily. I allow teams of students (four students per team) to select a region of the body and perform a specialized dissection for up to 20 extra credit points per student. These bonus points are not awarded automatically.

After teams meet with the professor to plan their dissection, they select an area of the body, such as the shoulder, the knee, the forearm, or the leg, to dissect. Using reference manuals, teams formulate their dissection procedure and then meet with the professor, again to have their plan approved prior to beginning the dissection. Dissections are performed during times when the lab is not in use. The professor is available during scheduled lab sessions as well as at other times to critique and offer helpful suggestions as dissections are being performed. When students perform their dissections, they are permitted to take digital photos and/or movies of all parts of the body except the face.

One would think that with so many teams of students doing dissections that the cadavers would be “dissected” beyond recognition. Surprisingly, this has not been the case. Students enjoy the opportunity to perform a dissection on a cadaver and do not mind putting in the extra time it takes to do a good job, especially when they may receive up to 20 bonus points.

How do students receive credit for their work?

After dissections are completed, students prepare a PowerPoint™ or other similar presentation of their dissections. Some have used video editing software such as Apple’s iMovie™ or Final Cut Pro™ to enhance their presentations. The advantage of these software programs is that real time video can be more easily edited, captioned, compressed, and then transferred to CD or DVD for permanent storage, sharing, or archiving. Professionals at the University Media Center help students work with video editing software programs. Thus, the students also learn some video editing techniques, as well as teaching, on how to transfer the video/digital images of their dissections to CD and or DVD.

Since the dissections are for extra credit, teams must formally present their results. To do this, groups meet one or two evenings a semester (depending upon the number of groups) to present their results. Each team has 15 minutes to present its results, including time for questions. The presentations are evaluated not only by the professor, but also by members of the other teams. The scores for each team are compiled and averaged, and a team score is assigned. The beauty of this approach is that team members from all the dissection teams attend presentations by all the other teams. Since they are taking part in the evaluation process, they pay more attention.

A bonus I have found from student dissections is that just about the time I begin to get frustrated with students’ lack of discipline, their poor study habits, and their apparent lack of interest, something happens. Listening to them present, seeing their creativity, their alternative approaches to the presentation of material, and their humor warms my heart and helps rekindle the fact that all is not lost. It gives me a sense of pride in my students, uplifts me, and helps increase my enthusiasm for teaching my class.

What are other strategies to maximize the use of cadavers?

Another opportunity to maximize the use of cadavers is to invite surgeons to do specialized dissections. This really is PROsection, and it is free. My most recent guest dissector was a pathologist who was invited to remove the brain from one of the cadavers. In the past, I have invited a plastic and reconstructive surgeon to do reconstruction of the nose and breast, an otolaryngologist to dissect the muscles of the neck and face, and an orthopedic surgeon to do a dissection of the knee. The dissections are done in the evenings, last about two
hours and A&P students are invited to attend. Since the space around
the cadaver tank is limited, names are randomly drawn from a list
of interested students to choose eight students to observe the guest
dissection. The student whose name is drawn first gets the honor
of assisting the surgeon.

In order to allow all interested students the opportunity of at-
tending a dissection done by a surgeon, students are permitted to
attend only one of the “live” surgical dissections unless space is
available. Other interested students whose names are not drawn
are invited to watch the dissections over a live feed via video moni-
tors in the lab. This gives them the opportunity to ask the surgeon
questions and be a part of the discussions.

I have negotiated with faculty from the Media Studies Depart-
ment to identify students majoring in Media Studies who would be
interested in videotaping dissections performed by the surgeons.
These students, in cooperation with the A&P professor, edit the
taped dissections. The edited, captioned, voiceover versions of the
dissections are copied to DVDs and are made available for use in
various classes.

Another strategy for maximizing the use of cadavers is to al-
low A&P professors from nearby universities/colleges/community
colleges (who do not have cadavers) to visit our lab with their stu-
dents and to use the cadavers for demonstration purposes. Often,
resident A&P faculty host these groups and offer lectures. We know
the professors from the visiting institutions and are confident that
the time spent by them and their students in observing the cadav-
ers will be in a respectful, professional manner. We stress this point
so they can stress it to their students. Visits, hosted by resident
A&P faculty, last about 45-60 minutes and are usually conducted
on a Friday afternoon or a Saturday morning. We also host visits
from practical nursing classes, massage school classes, and even
high school A&P classes.

Before letting the cadaver go, check state laws to determine if
you are permitted to remove and keep, as part of your specimen
holdings, cadaver organs and appendages. The laws in Virginia
permit us to remove organs and appendages from cadavers and
keep them for teaching purposes. We have removed and preserved
brains, hearts, lungs, livers, kidneys, reproductive organs, and stom-
achs, as well as arms and legs and have them available in the lab as
part of our specimen holdings for supplemental teaching and dem-
stration.

Perhaps you have implemented a unique use of cadavers and
would like to share your idea with fellow professionals. If so, please
send me a detailed description. I will compile the ideas I receive
and will forward the compendium to Paul Krieger so it can be
posted and made available to the membership. My email is:  
szeakes@radford.edu.

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**HAPS ANIMAL USE COMMITTEE**

*is in need of committee members*

This committee is charged with compiling, assessing, and disseminating current information regarding the
responsible use of animal specimens, both live and preserved, on college campuses for teaching human
anatomy and physiology. If you are interested in serving as either a committee member or as a friend of the
committee, please contact:

Don Kelly, committee co-chair  
DKelly@mvcc.edu

Melaney Birdsong Cook, committee co-chair  
melaney.cook@slcc.edu

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EDU-Snippets is a column designed to let you, the members of HAPS, share your personal or institutional educational experiences. So, here is this edition’s contributions!

For the sake of column continuity, we have done a bit of editing. We have also avoided quotation marks (except in-text). However, we think everyone will be able to tell where our introductions and commentaries end and our contributors’ words begin. We have also used a modified outline format to help with the organization.

In this issue, we have tried to stress the use of theoretical ideas for your classroom or laboratory. We did not have as many contributions this time as we usually have. However, we think you will find these theoretical EDU-Snippets to be solidly practical!

I. Thoughtful Bloopers

Before we present the ideas of the day, we did want to share a few more of the educational pundits that keep crossing our desks. As always, these bloopers are not presented for us to laugh at the students, but rather to hear what sometimes is said and to hear what sometimes is heard!

David Evans (Penn College, devans@ptc.edu) told us that a local high school health teacher called it “adequate tissue” instead of adipose tissue. David says he supposes it depends on where “it’s at.”

Alice Mills (University of Tennessee at Martin, amills@utm.edu) tells us about a colleague who tripped over her tongue and said “simple squamous episquelium.”

One of the writers of this column made a blooper quite a few years ago that she still uses as an example of how something potentially embarrassing but horribly funny mistakes can be used to help everyone remember a point. It seems that human males have an holandric gene which causes coarse head hair to grow on the pinna of the ear. The instructor in question did not say, “hairy pinna.” (We wonder what she did say!) Amazingly, no one missed the test question on the definition of holandric gene.

II. Do Not Try This at Home (or School)!

Alan Magid (Durham Technical Community College, amagid@nc.rr.com) was involved in a discussion on the HAPS discussion list—a discussion about Stupid Human Tricks from television. Alan thought we should include some of those here in our column because they can be used as solid demonstration points about both human anatomy and human physiology. We agree. Alan says…

It was Letterman’s Show, the Stupid Human Tricks segment. I had the good fortune to witness it when it was first broadcast. The fellow drank the milk, and then forced it retrograde out the nasolacrimal duct. Arced about five feet. Letterman et al. were grossed out.

I mention this incident when presenting the anatomy of the eye. Students find it quite memorable. I hope this helps them begin to understand the anatomy of the face just a little better! I also remind them about how they can soon taste medicine instilled into the eye. Suddenly it makes sense! Gives them an a-ha experience.

Alan also had another “Stupid Human Trick” for us. Alan says this one is about a Turkish construction worker who poured milk into his hand, loudly snorted it up his nose, and squirted it 9.223 feet out of his left eye in what he hopes will be recognized as a new world record.

We at the EDU-Snippets desk are not exactly promoting these spurious adventures, but we definitely see how they can be used to teach our students a few basic anatomical facts that may have previously been simply squirted into their brains!

III. Thinking it Through

Nina Zanetti (Siena College, zanetti@siena.edu) sent us several examples of a way she has for helping to be certain her students are “getting it.” Nina gives the students a thought question, allows a few minutes for them to think it over, and then takes a vote. She said…

For example, I might ask: “Knowing what you do about protein synthesis and the function of plasma cells, do you think that a plasma cell would have an extra abundance of membrane-bound ribosomes or free ribosomes? Let us see hands to vote for free ribosome or rough ER (membrane bound) ribosomes?”

Another example: After explaining the steps of oogenesis and when/where each occurs, I ask, “Which kind of cell are we most likely to find in a human ovary: an oogonium, a primary oocyte, or a mature ovum?”

If I ask questions that are too easy, the majority vote is usually correct. In that case I usually ask one of the correct “voters” to justify/explain his or her reasoning. I usually have to help them through the justification process. (Plasma cells secrete antibodies, antibodies are proteins, membrane bound ribosomes synthesize secreted proteins.) Sometimes, especially if the “wrong answer” received a majority vote, when I ask someone to explain the rea-
soning, the questioning often reveals which part of the information the students are “getting,” and which part has them confused.

IV. Stand by for News!

All of these ideas reminded Roberta Meehan (Troy University Montgomery Campus, biology@ctos.com) of The Newspaper File.

Our students are often sorely oblivious of anatomy and physiology in the news. To help overcome this spurious situation, I assign a semester-long project called “The Newspaper File.” Most students groan with great anguish when I first announce it. However, by the end of the semester, most tell me they really learned a great deal and that they really had had no idea that anatomy and physiology are literally everywhere.

I usually assign 40 articles. Occasionally I assign more. More articles can always be done for extra credit. All articles must be dated no earlier than the Sunday prior to the beginning of the semester. Articles can come from any newspaper – paper or electronic. In these days of Internet technology, no one has an excuse.

Each article is worth 5 points. The first three points are essentially free points. First, attach the article. Second, identify the article. Third, give a brief summary of the article. (Some of them do not realize that longer articles are easier to summarize!)

The fourth and fifth points are not quite as free. Point four is for a statement of how the article applies to Anatomy/Physiology. This has to be specific. Point five is for a commentary. Depending on the article, this might be an editorial, a personal reaction, a statement of approval, whatever. It is difficult to describe this point because articles are so different, ranging from features on government spending to the ravages of an epidemic to the respiratory problems suffered by firefighters. Sometimes students bring in personal examples. “My uncle died of this disease and I believe we should be spending more on research.” Sometimes the comments are educational. “The schools need to spend more time promoting education in this area.” Naturally, I require more than a one-sentence comment!

The first time or two I gave this assignment, I did have a bit of a problem grading them. However, I soon developed a system and now can grade them quickly and easily. I do encourage the students to submit them in batches of five (because it helps with the grading process). Also, I do not hand them back until the end of the semester because I am always afraid I will see the same set of newspaper articles again!

And, to repeat, students get in the swing of doing the files and are amazed at how many anatomy/physiology related articles are in the news each day, every day!

V. And We Hope You Will….

Keep those cards and letters coming! We thank you all for your EDU-Snippet contributions. Submit your ideas now and maybe you too will see your EDU-Snippet in print.

WebAnatomy is a simple quiz tool that helps students to learn the basic anatomy of almost every topic in entry-level anatomy and physiology courses (http://www.msjensen.gen.umn.edu/webanatomy). During the 2003-2004 academic year, the site received over 3 million hits from users located all over the world. WebAnatomy is popular with students for two reasons: it is free and easy to use.

Two years ago, there was an attempt at the University of Minnesota to move all computer-based curricular materials to a course management program called WebCT™. Since WebAnatomy would not fit into WebCT™ templates, the files could not remain on the original web server. My bosses liked the idea of WebAnatomy being used by students outside the University of Minnesota and worked to find a new location for the site. There is now a new server for WebAnatomy, which, we hope, will be its location for many years to come.

Over the next few months, I will be fixing broken links and updating the files. At this time the site is functional but far from perfect. If you have any questions or comments about WebAnatomy, please contact me at msjensen@umn.edu.

Editor’s note: I have a link on my web site to Murray’s WebAnatomy. My students have used it and recommend it to others.
On September 17 and 18, 2004, North Hennepin Community College (NHCC) in Brooklyn Park, Minnesota, hosted a combined Minnesota Biology Discipline/HAPS Central Regional HAPS conference. This was the first time for a regional HAPS meeting in Minnesota. Members of the organizing committee were: Peggy LePage, Chair, Mary Januschka, Mitch Albers, Randy Strobel, Tinna Ross, and Murray Jensen. Participants were primarily from the Minnesota State Colleges and University System (MNSCU), but also present were HAPS members from Minnesota, North Dakota, Wisconsin, and Illinois in attendance. A total of approximately 40 instructors participated in the two-day event.

After a well organized check in and nice continental breakfast, we were welcomed to campus by NHCC President, Ann Wynia, CLT Faculty Development Coordinator, Carol Steimer-Bailey, and members of the planning committee. All the participants introduced themselves as well. Central Regional Director Elizabeth Becker represented the HAPS Board of Directors.

The morning seminar was: “Updates for Exercise: the Exercise Medicine Clinic at the Children’s Hospitals and Clinics, St. Paul, MN” presented by Dr. Dan Halvorsen, University of Minnesota. Dr. Halvorsen spoke of the benefits of exercise and of coupling exercise with medicine to improve the treatment of disease. By improving health, fitness, energy, and performance patients could also improve their body’s ability to fight disease. The talk itself was exceptionally interesting and sparked a great deal of conversation during the luncheon break.

After lunch Dr. Dee Silverthorn, University of Texas, Austin, gave a presentation on “Why Active Learning is Better.” Dr. Silverthorn brought us a number of ways we could encourage more active learning in our classrooms. These included the use of “minute papers,” peer teaching, group responses, and inquiry/discovery projects. One thing Dr. Silverthorn emphasized was that the faculty member’s core beliefs must be consistent with active learning and teaching, therefore not everyone is going to be successful with this method.

The workshops commenced following a brief break. Topics included “Finding Out What Students Know: High-tech and Low tech Feedback Strategies,” “Case Studies and Cooperative Learning,” “Teaching Key Organ System Concepts Using Examples of Disease-Related Organ Dysfunction,” “Tips and Tools for Creating a Dynamic and Successful Online Course,” and “Biosafety and the Microbiology Laboratory.” Such an extensive listing of subjects made it difficult to choose only one workshop. Based on the positive comments heard afterward, it seemed that everyone had found a workshop that worked for them.

The evening dinner was held at the nearby Edinburgh Country Club. Everyone had a nice chance to unwind and discuss a bit before dinner. The dinner itself was excellent and enjoyed by all who were there.

Saturday began with concurrent meetings for the MNSCU Biology Discipline group and HAPS. Murray Jensen led a group of about 15 individuals in discussion. It was nice seeing some familiar faces and having the chance to meet several new individuals who are interested in HAPS. We hope that some of those new faces have joined HAPS and are reading the HAPS-EDucator right now.

Dr. Mark Pereira of the University of Minnesota presented the morning seminar “A Physiological Basis for Human Nutrition in Health and Disease,” which addressed the role of proper nutrition, or the lack thereof, in many chronic diseases. There was a special focus on such topics as cancer, obesity, diabetes, and cardiovascular disease and their relationship to nutrition.

After another great lunch there were more workshop sessions. Some of the workshops from Friday were repeated to give more people a chance to participate. Additional workshops were also presented. These included: “Independent Projects in Human and Animal Physiology Instruction,” “Teaching Strategies to Help Under-Prepared Students Survive an Anatomy and Physiology Course,” “Computer Simulation to Teach Students about the Nerve Action Potential,” and “Incorporating a Scientific Research Experience into the Undergraduate Biology Classroom – A Unique Approach.”

After the final workshop session, we reassembled for a final time. At the end of our two days, everyone was ready to head out and start putting some of what they had gained from the meeting back into their classrooms. All were very positive about the experience. Thanks again to our hosts at North Hennepin Community College for a great meeting.
Title of Project: Development and initial assessment of laboratory exercises to improve endocrine understanding (Grant Awarded at the Maui 2001 Annual HAPS Conference)

The purpose of this grant was to provide funds for developing two different endocrinology laboratory exercises for use in the classroom. These exercises provide alternatives to similar exercises that are currently available as kits from various manufacturers. The exercises to be developed were 1) gel electrophoresis to demonstrate gender specific differences in serum proteins, and 2) an enzyme linked immunosorbent assay (ELISA) to measure the amount of hormone (human chorionic gonadotropin: hCG) in artificial urine/blood samples. The skills that the students developed, as well as the usefulness for demonstrating endocrine concepts in the laboratory were to be evaluated.

The gel electrophoresis project has been completed. A laboratory protocol has been prepared that allows students to conduct the proposed laboratory exercise and, if completed properly, identify serum proteins that exhibit sex specific differences. Students identify these proteins through the use of molecular weight markers to develop a standard curve. The process of preparing the standard curve and then determining the molecular weights of the proteins enhances the laboratory activity and integrates concepts to which students may have been introduced in other courses. The students can accurately identify the presence of proteins in the serum of laying hens and in egg yolks that are not present in the serum from roosters and non-laying hens. In evaluating the answers to specific questions on quizzes, exams, and laboratory assignments related to this experiment, most students demonstrate improved understanding of the concepts of sex-specific differences. This improved understanding is based on the comparison of students who completed the course prior to the implementation of this laboratory exercise to those who completed the course following its implementation.

The hCG ELISA exercise initially encountered problems with the pH of the solutions due to a faulty pH meter in the lab. After correcting the pH of the solutions, it was found that the initial methodology (absorbing antibody from wells) produced excessively high background. After consulting with a number of colleagues, the methodology was altered so that the sample was absorbed from the wells. This methodological change resulted in a linear standard curve and the ability to detect hCG concentrations in samples within the physiological range expected. All of this initial work has been completed using microtiter plates and without altering incubation times and temperatures or the antibody dilutions. A viable assay has been developed using microtiter plates. However, the assay system has not been able to be converted to one using larger volumes so that a spectrophotometer could be used to determine the absorbances and subsequent hormone concentrations. The students have generated standard curves that are linear and can be used to determine the concentration of hCG within unknown samples. Students then relate the data obtained to the specific point in pregnancy. This laboratory exercise has provided students with a greater understanding of both methods of hormone quantification as well as hormonal changes during pregnancy.

Please help the \textit{HAPS-Educator} by providing an abstract (2-3 paragraphs) of Update Seminar #________ or Workshop #________. Selected abstracts are published during the year to further share the ideas and information presented in this workshop to the general membership. You will be contacted by the editor of the \textit{HAPS-Educator} to remind you to submit your abstract. Due dates for submission are: August 1 (Fall issue), November 1 (Winter issue), February 1 (Spring issue), and March 15 (Summer issue). Your abstract can be submitted to the editor at sbaxley@troy.edu.

Thank you for helping to keep our membership informed of the many valuable experiences of our annual conference.

(Your name)_______________ at (e-mail address) __________________________
is volunteering to write an abstract of

Update Seminar #____________________ or Workshop #____________________

Presented by ____________________________

Please leave the bottom part of this form in your workshop room or return it to Susan Baxley, Editor of \textit{HAPS-Educator}.
The Robert Anthony Scholarships 2005 for new instructors in Anatomy and Physiology have been selected. Congratulations to:

- Casey Armour, Daemer College, Amherst, NY
- Cynthia Drake, Delta College, University Center, MN
- Jill Feinstein, Richland Community College, Decatur, IL

The purpose of the Robert Anthony Scholarship is to encourage instructors during their first three years of teaching anatomy and physiology to network with seasoned colleagues by attending the Annual Human Anatomy and Physiology Society Annual Conference to be held this May in St. Louis, MO. The award covers the registration fee and cost of the banquet at the annual conference.

Criteria:
1. must be a HAPS member in good standing
2. must be a full-time faculty member
3. must verify his/her status by having a letter from the Department Chair or Dean stating that the applicant has a full-time appointment and is in the first three years of teaching anatomy and/or physiology
4. must have a teaching load that includes at least one section of Human Anatomy and Physiology

Applications were received by the Grants and Scholarship Committee at the end of 2004. Recommendations of the committee were forwarded to the Board of Directors at their mid-winter meeting in St. Louis. The Board approved the recommendations of the committee and the recipients were notified by e-mail by the chair of the Grants and Scholarship Committee.

There were three recipients this year, three in 2004, two in 2003, and one in 2002. The program is growing and you can help it grow by donating to the Robert Anthony Scholarship at any time. The membership form has an option to donate during renewal of membership or when a new member joins the society. For further information contact Richard Faircloth.

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Proposal for a Regional Conference

| Name of Conference Coordinator | ______________________________ |
| Coordinator’s Address | ______________________________ |
| Phone Number | ______________________________ |
| Proposed Site/Host Institution | ______________________________ |

Send copy to:
Javni Mody, Chair
Biology Department
Anne Arundel Community College
101 College Parkway
Arnold, MD 21012-1895
(410) 777-2265
(410) 777-2525 fax
jmody@aacc.edu

Please supply the following information on separate sheets of paper:
- Outline of proposed budget (see budget section of Guide for Coordinators of HAPS Local Conferences)
- Written statement of administrative support/approval from the host institution agreeing to co-sponsor the HAPS Regional Conference and to allow use of its facilities
- Request for seed money, if needed (see HAPS support in Guide)
- List of 3-digit zip codes (first 3 digits) for areas to be included in mailings (usually not more than a 250-mile radius)
The heart can be a challenging organ for students as it is often difficult to comprehend how this double pumping muscle performs and meets the changing demands placed on it. The new SLW Functional Heart Model, presented by Daniel E. Lemons reduces some of the mystery. Through the use of this model and associated curriculum, students can begin to apply and internalize terminology related to cardiac function. Students can measure and analyze relationships and volumes associated with cardiac output, while observing how pressure plays a role in opening and closing valves to maintain one-way flow through the heart. Once these concepts are understood, students can move on to problem solving and gain insight to pathological or abnormal cardiac function.

During the workshop, participants were divided into collaborative learning groups and given task specific assignments. The given curriculum guided the participants through pre-lab exercises to lay down terminology and relationships in accordance with the human heart and the pumping model. After a demonstration, the group proceeded to selected activities that focused on inter-cycle intervals to explore relationships between pump rate, EFV, and EEV, as well as maximum pump output by squeezing a hand-held bulb to compress the ventricles of the heart model. While in groups the participants were to discuss and investigate their findings with each other, as peer teaching can also be a great learning tool. Post activity analysis, such as graphed relationships and the study of sheep hearts and models, will also help internalize these concepts.

The new SLW Functional Heart Model can help students overcome the barriers to studying the heart mechanics. It provides an exciting and kinesthetic experience for the students in learning the complex concepts related to cardiac mechanics.

This review describes a workshop presented by a vendor at the last HAPS conference. Although it features products that could be purchased from a commercial supplier for profit, HAPS neither endorses nor promotes products or services. This review is published as a service to our members.
in being successful in the A&P course sequence. The other, called “Strategies Optimizing Student Success” or SOSS groups, was described from a first-hand perspective by the students, as well as by Dr. Le Page and Mr. Staael.

The need for students to be aware of the amount of work necessary to be successful in an A&P course led to the development of an on-line pre-class assessment based on the analogy of travel to a very foreign country such as Tibet. Some of the questions students were directed to ask themselves before the start of the course are: Why do you want to go? What are your current resources? Do you have the time for such a trip? What sort of terrain do you expect? Do you have a valid passport/visa? Are there guides/additional resources available if you run into difficulties? Explicit parallels were drawn to how these questions pertained to the study of human anatomy and physiology. Evaluation materials in the pre-class assessment included a student profile, motivation survey, reading assessment, and biology and chemistry review quizzes. This exercise has allowed both the students and the instructors to gain the information and insights needed to prepare for A&P courses.

Another resource available to A&P students is the SOSS groups. There were two SOSS groups of 10-12 for a class of 140 students for academic year 2003-2004. SOSS attempted to solve the problems stated above by “scaffolding”. Students from various backgrounds who volunteered to join the program were asked to participate in a focus group to give instructors feedback from the class about how particular activities were perceived by students, as well as to give general feedback about the course during the semester. During the meetings outside of the classroom, the instructor demonstrated and discussed various learning strategies, and students developed and practiced the learning techniques. These students were given a free reign to create projects, such as “Summary of Events During Cardiac Cycle” and “Hemostasis in Action,” and then presented them to the class. By this method, SOSS students had effectively created an efficient and focused study group and created their knowledge base through peer interactions, technology, and other learning resources. In addition, their activities involved the entire class in these learning processes. Instructors also benefited from this experience. Because they had more confidence in the students’ learning abilities. The instructors changed their focus from content to the achievement of learning objectives. Although the members of the SOSS groups did not receive extra instruction or one-on-one tutoring, the original plan was for the SOSS groups to function as an additional support mechanism for high-risk students. The reality turned out to be somewhat different. The most at-risk students simply did not volunteer to join the SOSS groups.

Students reported that the benefits they perceived from being involved in the SOSS groups were related to their own deeper understanding of the content of the course. The groups functioned as informal collaborative learning sessions. These students developed a sense of cohesion, and some students plan to continue working with the members of their SOSS group in other courses throughout the rest of their nursing curriculum. The students also reported greater awareness and appreciation for the role of the student in the teaching/learning process.

Implementing SOSS was not as universally successful as originally intended, however. The process required a significant time commitment on the part of the instructors and the SOSS group members. It was hard to get volunteers (bonus points were a more effective incentive than money). Those students who did volunteer were sometimes perceived by other students as teacher’s pets, and the demonstrations to the class of work done by members of the SOSS groups were often assumed to be the reporting of information provided to the SOSS group by the teacher rather than their own work. Not all students were entirely ready for active learning experiences, as active learning requires skills, attitudes, and self-regulation that are not necessarily fostered by previous educational experiences.

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A three-year plan includes widely distributing the HAPS policy statement, developing animal use Internet links on the HAPS Home Page, monitoring relevant legislation, and creating a resource packet for HAPS members.

ANNUAL CONFERENCE
Henry Ruschin, Chair
Humber College
205 Humber College Boulevard
Toronto, Ontario, Canada M9W 5L7
(416) 675-9555 x4641
(416) 675-2015 fax
henry.ruschin@humber.ca

Formulates conference guidelines, assists the annual conference coordinators, and generates a list of conference sites.

CADAVER USE
Paul Krieger, Chair
Grand Rapids C.C.
143 Bostwick Ave. NE
Grand Rapids, MI 49503
(616) 234-4250
pkrieger@grcc.edu

Develops guidelines for the use of cadavers in anatomy instruction.

CURRICULUM AND INSTRUCTION
Carol Veil, Chair
Anne Arundel Community College
101 College Parkway
Arnold, MD 21012-1895
(410) 777-2848
(410) 777-2525 fax
cveil@aacc.edu

Reviewing and revising, as needed, the HAPS Course Guidelines for Undergraduate Instruction of Human Anatomy and Physiology.

GRANTS AND SCHOLARSHIPS
Richard Faircloth, Chair
Anne Arundel Community College
101 College Parkway
Arnold, MD 21012-1895
(410) 777-2272
(410) 777-2525 fax
RFaircloth@aaccc.edu

Reviews all grant and scholarship proposals, selects proposals to receive funding, and submits its recommendations to the Board of Directors for approval.

HAPS-EDUCATOR
Nancy Kincaid, Chair
Troy University Montgomery Campus
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Montgomery, AL 36104
(334) 241-5474
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nkincaid@troy.edu

Provides advisory and support services to the HAPS- Educator, such as soliciting and reviewing articles, and proofreading the final draft of the HAPS-Educator before it goes to press.

Susan Baxley, Editor
Troy University Montgomery Campus
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Montgomery, AL 36104
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sbbaxley@troy.edu

An experienced advisory group including all Past Presidents of HAPS. This provides advice upon request and adds a sense of HAPS history to the deliberations of the Board of Directors.

REGIONAL CONFERENCE
Javni Mody, Chair
Anne Arundel Community College
101 College Parkway
Arnold, MD 21012-1895
(410) 777-2265
(410) 777-2525 fax
jmody@aaccc.edu

Mentor coordinators of regional conferences. Anyone interested in hosting a regional conference should contact the Chair.

SAFETY
Karen McMahon, Chair
University of Tulsa
600 S. College Ave.
Tulsa, OK 74104
(918) 631-3129
(918) 631-2762 fax
karen-mcmahon@utulsa.edu

Develops standards for safety in the laboratory.

STEERING
Thomas Lehman, Chair  (see HAPS Web site Committee for information)
The Steering Committee consists of all Committee Chairs, coordinates activities between committees, and represents collective committee activity to the HAPS Board of Directors.

TESTING
Janis Thompson, Chair
Lorain County Community College
1003 North Abbe Road
Elyria, OH 44035
(440) 366-7245
(440) 366-4342 fax
jthomps0@lorainccc.edu

Completed, tested, and approved the HAPS Comprehensive Exam for human anatomy and physiology. Any HAPS member may obtain a copy of the test by writing to the Chair.

CONFERENCE COORDINATORS
2005 in St. Louis, Missouri
Margaret Weck, Coordinator
St. Louis College of Pharmacy
4588 Parkview Pl.
St. Louis, MO 63110
(314) 446-8483
(314) 446-8460 fax
mweck@slccop.edu

2006 in Austin, Texas
Mary Lou Percy, Coordinator
Navarro College
3200 W. 7th Ave.
Corsicana, TX 75110
(903) 875-7519 x381
marylou.percy@navarrocollege.edu

The committee chairs invite input from HAPS members and willingly provide information on the activities of their committees.
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