

How does \$20,000 sound? See page 16.

# AMERICAN ASSOCIATION OF ANATOMISTS

RESEARCHERS AND EDUCATORS FOCUSING ON ANATOMICAL FORM AND FUNCTION

# NEWS

VOLUME 18, NUMBER 2, JUNE 2009

## IN THIS ISSUE

- President's letter...2
- Gray Scientific Award...3
- Members in the news...4
- Gray Education Award...4
- Public policy...6
- Ladman Award...6
- Anatomy salaries...9
- Anatomy book shelf...10
- New AAA Fellows...13
- News & notes...13
- Research Means Hope...14
- In memoriam...17
- Animals in research...18
- New mentoring program...19
- Hotlinks...20
- RFAs & RFPs...21
- Annual Meeting highlights...24

## Laitman named President Elect; new Board members chosen

**J**effrey T. Laitman, distinguished professor, professor and director of the Center for Anatomy and Functional Morphology, Mount Sinai School of Medicine, has been chosen as AAA president elect. Laitman, who is also professor of otolaryngology and medical education at Mount Sinai and professor, Graduate Program in Anthropology, City University of New York, will serve as AAA president from 2011-2013. Laitman has just completed a three-year term on the AAA Board.

In his candidate's statement, Laitman noted that, as "traditional departments, leadership, mentoring pathways have morphed or disappeared...AAA has become for many the *de facto* "Department of Anatomy" and we must rise to that responsibility." Among his plans to accomplish this, Laitman would like to assist members with "financial data empowerment (*e.g.*, salary comparables), negotiation strategies, letter/CV assistance, and ombudspeople" and "strengthen our networks/kindle new ideas by reaching out to anatomists in growing constituencies in allied health/college/ secondary schools; and invigorate our linkage efforts with sibling scientific and educational societies in the U.S. and abroad."

- Also elected to the AAA Board of Directors were:
- David H. Bernanke, professor, Dept. of Cell Biology and Anatomy, Medical University of South Carolina
  - Gina C. Schatteman, associate professor of integrative physiology, University of Iowa

- Erica D. Perryn, postdoctoral research associate, Stowers Institute for Medical Research

At the Annual Business Meeting, held on April 20 in New Orleans, President David Burr thanked outgoing Board members Carol Gregorio, Kathy Svoboda, and Ann Zumwalt, presenting them each with a certificate of appreciation.

In other action at its April meeting, the AAA Board:

- Accepted 84 new Regular and 120 new Student and 21 new Postdoc members (compared to 124 Regular/152 Student/Postdoc last year);
- Approved the selection of seven new AAA Fellows (see page 13);
- Established a new Educational Research Platform Presentation Award;
- Established a Professional Development Committee;
- Approved implementation of a Living History Project to be launched this summer. ❖

NETWORKING • RESEARCH • TEACHING TOOLS • NETWORKING • RESEARCH • TEACHING TOOLS



Jeffrey Laitman



David Bernanke



Erica Perryn



Gina Schatteman

**National Office**

9650 Rockville Pike  
Bethesda, MD 20814-3998  
Voice: 301-634-7910  
Fax: 301-634-7965  
email: [exec@anatomy.org](mailto:exec@anatomy.org)  
[www.anatomy.org](http://www.anatomy.org)

**President**

Kathryn J. Jones

**President-Emeritus**

David B. Burr

**President-Elect**

Jeffrey T. Laitman

**Secretary-Treasurer**

Richard L. Drake

**Program Chairs**

Lynne A. Opperman  
Judith M. Venuti

**Board of Directors**

David H. Bernanke (2012)  
Philip R. Brauer (2011)  
Arthur F. Dalley, II (2010)  
Erica D. Perryn (2011)  
Joseph W. Sanger (2011)  
Gina C Schatteman (2012)  
Michelle R. Sukup (2010)  
Kimberly S. Topp (2010)

**Executive Director**

Andrea Pendleton

**Meetings Manager**

Rachel Yablonowitz

**Member Services & Marketing Manager**

Melissa Kraft

**Education & Professional Development Associate**

Carlin Bokal

**Administrative Assistant**

Brenda Valladares

Published quarterly and distributed by the  
American Association of Anatomists  
Circulation: 2,400

Deadlines for submission of articles  
and advertising materials:  
Jan 25 March issue  
April 25 June issue  
July 25 September issue  
Oct 25 December issue

A display ad rate sheet is available upon request and on  
[AnatomyLink](http://AnatomyLink) ([www.anatomy.org](http://www.anatomy.org)).



## View from the Top

### AAA wants to be your Anatomy Department

After a brief stint as “president-elect-elect” and two years as president-elect, it is exciting to be in a position as president to carry on with the ambitious goals and opportunities that are currently the focus of the American Association of Anatomists.

Before moving forward, I'd like to look back for a moment and thank David Burr, our outgoing president, for his exceptional leadership over the past two years and for his longtime commitment to AAA as his “professional home.” It has been a great pleasure to work with David, particularly on the important international initiatives that he has begun and will continue to promote.

From the time I started graduate school in the late 1970s, I have always considered AAA to be my primary professional home. I hope that our newest members, including many graduate students and postdoctoral fellows, will also find good reason to consider AAA their home.

Through most of my career, I have also been a member of the Society for Neuroscience. AAA and SfN are very different, particularly in the size and scope of their annual meetings. I find that they are also complementary, each providing me with distinct and valuable tools to succeed as a scientist in today's world.

Many of you may also belong to other “big” societies and find advantages to having dual scientific homes in science. You might think of AAA as the small liberal arts college version of a scientific society. As in a small college, AAA is a place where you can get topnotch mentoring, have direct access to the leadership, and easily find help in meeting your needs.

With this “small college” concept in mind, AAA has launched a mentoring program (see page 19), which we kicked off at the Annual Meeting/EB 2009, to assist student and postdoctoral members with their transition into the field of anatomy. Mentors in this program come from our distinguished senior members who have become AAA Fellows and can provide their unique career perspectives, as well as from members of our new AAA Advisory Committee for Young Anatomists Alumni Association (A<sup>6</sup>), who can share a more contemporary view.

This mentoring program is just part of an upcoming AAA focus on professional development. Led by our new Education & Professional Development Associate Carlin Bokal, AAA did some Strategic Thinking for Education &

*continued on page 20*

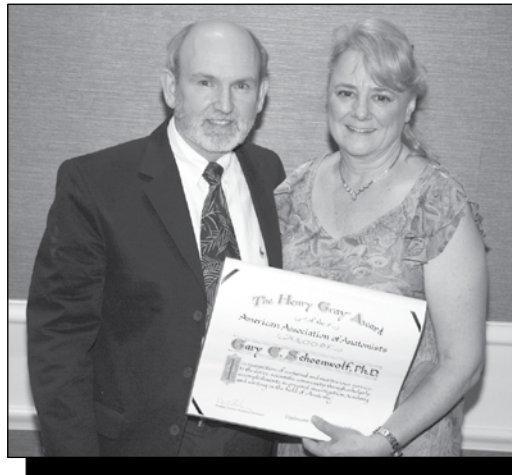
# Gary Schoenwolf Wins Top AAA Accolade For Scientific Achievement

**G**ary C. Schoenwolf is the recipient of the 2009 Henry Gray/Lippincott Williams & Wilkins Scientific Achievement Award, AAA's most prestigious scientific award, presented annually to a member in recognition of his or her unique and meritorious contributions to, and achievements in, the anatomical sciences. Schoenwolf, Distinguished Professor of Neurobiology and Anatomy and Director of the Children's Health Research Center of the University of Utah School of Medicine, Salt Lake City, was nominated for this award by three members: John Fallon, Robert McCuskey, and Lynne Opperman.

Accepting the honor at AAA's Awards Banquet on April 21, Schoenwolf noted that he became an anatomist because he had been mentored by anatomists in his formative years.

Schoenwolf began his academic career majoring in biology at Elmhurst College, Illinois, and received his Ph.D. in the area of genetics and development in 1976 under the mentorship of Ray L. Watterson. His academic appointments show a rapid rise through the ranks from assistant (1979) to associate (1986) and then full professor (1989) in the Department of Anatomy, University of Utah School of Medicine. He has an international reputation as an exemplary scientist and has been recognized by other scholarly societies with elected positions and many awards.

For more than 30 years, Schoenwolf's research has been focused on three aspects of early embryogenesis: determining the role of the organizer and signaling centers; analyzing cell behaviors underlying morphogenetic movements during gastrulation and neurulation; and elucidating cell-cell interactions in embryonic tissue regionalization. His pioneering work on gastrulation and neurulation over 20 years includes such notable examples as mapping the primitive streak origin of the cardiovascular system, the mechanism of cardiogenic precursor induction, movement and fate of mesoderm during gastrulation, the origins and role of endoderm in specifying germ layer identity, the morphogenetic movements associated with body folding, and investigations into the mechanisms of neurulation. He maintains an active laboratory, and has been continuously funded by NIH and other extramural grants.



Gary Schoenwolf & Kathy Svoboda

It is his striving for excellence that has led to his publishing more than 120 original publications, 36 review papers/book chapters, 11 books, and video materials for laboratory studies and teaching developmental biology. Opperman pointed out that “five publications from 1990 have been cited over 100 times, including a *Science* publication from 2000 on the identification of synergistic signals initiating inner ear development. Ten other publications have been cited more than 50 times, of which only one of these publications predates 1990.” Schoenwolf is asked to deliver lectures and seminars all across the

United States and abroad because of the caliber of his science.

He has also served AAA as member of the Board of Directors (1988-1991); vice president (1992-94); and, at one of the most critical points in AAA's history, he was elected president (1996-97). He served in this position with distinction, setting in motion the beginning of the changes that enabled AAA to emerge as the positive force in science and education that it is today. He also continued to serve as past president (1997-1999). While on the Board, Schoenwolf initiated the AAA/

Wiley A.J. Ladman Exemplary Service Award and worked with John Fallon to establish the Mossman Award for Developmental Biology.

Fallon and McCuskey commented that “as the editor-in-chief of *Developmental Dynamics* since 2003, Schoenwolf's management skills, reputation, and scientific acumen have been on full display. The ensuing years have been marked by extraordinary changes and harsh competition in the field of scientific publishing. Schoenwolf stood up to those challenges. The innovations and changes he initiated with the journal raised the community's opinion and respect for *Developmental Dynamics*. He has done and continues to do an outstanding job in this important and time consuming activity.”

Kathy Svoboda chaired the Henry Gray/LWW Scientific Achievement Award Committee, which also included Mary Hendrix and Robert Tomanek. Lippincott Williams & Wilkins provides support for this award. ♦

*Adapted from a longer article prepared by Kathy Svoboda.*



## Members in the News

### Bo Foreman honored for teaching excellence

*K. Bo Foreman*, assistant professor in the Department of Physical Therapy and director of research in the Division of Plastic Surgery at the University of Utah, has received the University of Utah's Early Career Teaching Award. This award recognizes distinction in teaching by faculty at an early stage in their careers.

Foreman has brought updated technology and curricular innovation to both the School of Medicine and the College of Health to improve student learning in the anatomical sciences. This, coupled with his strong commitment to teaching, was the basis for this university-wide award. His enthusiasm for anatomy is infectious and motivates both students and fellow faculty. Foreman is known among students as caring, yet holding high expectations for academic excellence. His experience served him well as a member of AAA's Advisory Committee for Young Anatomists.



*K. Bo Foreman*

### Utah mentoring award named for Gary Schoenwolf

Distinguished Professor *Gary Schoenwolf*, director of the Children's Health Research Center (CHRC) at the University of Utah, was honored at the 6th Annual University of Utah Pediatric Research Conference for his outstanding contributions to mentoring. In recognition of his exceptional role in the success of the CHRC and for the many fellows and junior faculty he has directly mentored, he was named the first recipient of an annual award that will carry his name as "The Gary Schoenwolf Mentoring Award."

Schoenwolf, a former AAA president, currently serves as editor-in-chief of *Developmental Dynamics* and was this year's recipient of AAA's Henry Gray/Lippincott Williams & Wilkins Scientific Achievement Award (see page 3).

## Carmine Clemente Receives AAA's Highest Honor for Anatomy Education

AAA's 2009 Henry Gray/Elsevier Distinguished Educator Award, AAA's highest honor for anatomical sciences education, was presented to Carmine D. Clemente, Distinguished Professor of Neurobiology and Pathology, for his 57 (and counting) years of dedicated service to anatomy education at the David Geffen School of Medicine at UCLA.

Accepting the award at AAA's Awards Banquet on April 21 on behalf of an ailing Clemente, UCLA colleague Shelley Metten noted that Clemente had presented his first paper at an AAA Annual Meeting in 1951.

Throughout the world, there are more than 12,000 physicians, dentists, and scientists who have directly benefitted from Clemente's instruction. Through them, literally thousands of patients have been indirectly affected by Clemente's six decades of dedication to anatomy. It is amazing to consider the impact this man has had and the tremendous legacy of science and care he has built.

In 1952, as a 24-year-old newly minted Ph.D. in anatomy from the University of Pennsylvania, Clemente became a junior research anatomist at UCLA. After one year there, he became a postdoctoral fellow at the University of London. Asked to highlight an incident from his illustrious career, Clemente described his most memorable incident. In April 1954 in London, he opened a letter from the chair of the UCLA anatomy department and learned that he had been named assistant professor of anatomy, a moment that he characterized as "the biggest thrill of my career." Having a title that included the word professor was "a wonderful thing." Characterizing him as a "professor," however, fails to convey the breadth of his influence.

As a founding faculty member of the medical school, Clemente taught virtually all medical, dental, and anatomy graduate students from 1952 through 1996 when he "retired." Additionally, every week for over 30 years, he has taught surgical anatomy to the residents at Drew Medical School. Even in his retirement, Clemente continues to train new generations of students; he has been recalled to UCLA to teach gross anatomy every year for the past 13 years.

Clemente not only retains his enthusiasm for anatomy and teaching, but has transferred his joy of learning to generations of students. His students have consistently remarked that his generosity, dedication, and concern were inspirational. A former student described him as "a wonderful, gracious man whose arms are open very

wide to help others.” Clemente reminisced that he was one of the first professors to give students an outline of his lectures, an action that was frowned upon by several other professors, but earned high praise from his students. Former students recalled his telling “stories” during lecture to help embed concepts in their minds.

Time spent preparing lectures earned Clemente high marks from his students, who describe him as the “anatomy God” and one of the “Fathers of American Anatomy.” His numerous teaching awards include the UCLA Excellence in Education Award (1996) and the Alpha Omega Alpha Robert J. Glaser Distinguished Teacher Award from the Association of American Medical Colleges (2006). In recognition of his pivotal role at UCLA, he received the UCLA Award for Excellence in Medical Education (1996) and the Award of Extraordinary Merit: UCLA Medical Alumni Association (1997).

Among students, Clemente is universally recognized for his anatomy texts: *Anatomy: A Regional Atlas of the Human Body* (1975, 1981, 1987, 1997, and 2006); the 30th American edition of *Gray’s Anatomy* (1985); and *Clemente’s Dissector: A Brief Text and Guides to Individual Dissections in Human Anatomy* (2002 and 2007). In addition, he produced 42 dissection films, which have been used in 170 medical schools worldwide.

Throughout his career, Clemente has also been a role model and mentor to young faculty members. He advises new faculty members to get their research programs going quickly and to spend time preparing their lectures, but to strive to find a balance. Clearly, he has taken his own advice.

Clemente’s research contributions to anatomy have been monumental. He has presented more than 50 papers to international audiences and published more than 200 articles detailing his own research and describing the contributions of other anatomists. In recognition of his research accomplishments, he was elected to the National Academy of Sciences in 1979.

Clemente has a notable record of service, having been on the editorial board or editor or associate editor of six journals (*The Anatomical Record*, *Experimental Neurology*, *American Journal of Anatomy/Developmental Dynamics*, *Brain Research*, *Conditioned Reflex* and *Neurological Research*). He chaired the anatomy department at UCLA for 10 years and was a founding member of the Brain Research Institute of which he was director for 11 years. He has been president of the American Association of Anatomists, the Association of Anatomy Chairmen, and the Pavlovian Society of North America. Over a glorious career marked by dedication, scientific excellence, service, and a love of learning, Clemente has received 31 other

*continued on page 23*

## Baljit Singh wins prestigious Canadian education fellowship

*Baljit Singh*, professor of veterinary medicine at the Western College of Veterinary Medicine, University of Saskatchewan, has received a 3M National



*Baljit Singh*

Teaching Fellowship in recognition of teaching excellence and educational leadership by teacher-scholars across Canada. The Society for Teaching and Learning in Higher Education, in collaboration with 3M Canada, awards up to 10 Fellowships each year in a broad range of academic disciplines; since 1986,

only 238 3M Fellows have been named. They work individually and collaboratively to enhance teaching and learning at their own institutions and through larger collaborative initiatives supported by the Society.

In an article in Canada’s *Maclean’s* magazine announcing the awards, Singh, former president of the American Association of Veterinary Anatomists and a member of AAA’s Educational Affairs Committee, acknowledges that he failed his first anatomy course because “I did not like it—I did not like the subject, I did not like the way it was being taught.” That experience became the impetus for finding ways to actively engage students in the learning process and the basis for winning the 3M Fellowship.

## Steven Sugrue named senior associate dean for research affairs

*Stephen P. Sugrue* has been named senior associate dean for research affairs at the University of Florida College of Medicine. Sugrue,

who has chaired the Department of Anatomy and Cell Biology since 1996, has also served as associate director of basic research for the UF Shands Cancer Center. In his new position, he will develop an administrative structure to leverage the many facets of research at the College of



*Stephen P. Sugrue*

Medicine and encourage collaborations throughout the University and Florida’s biotechnology activities.

*continued on page 13*



## Public Policy

### Focus shifts to FY2011 and beyond as FY2010 NIH budget debate begins

Although much of the sound and some of the fury surrounding the \$10.4 billion in stimulus funding that NIH received under the American Recovery & Reinvestment Act (ARRA) has died down, there is certainly more to come as researchers nationwide await word on the thousands of grant proposals submitted and advocacy groups ask “What next?”

As has become the norm, most of the U.S. government—including NIH—began the 2009 fiscal year last October on a continuing resolution (CR) that kept the government running through March 6. One election and one more CR later, President Obama approved the bulk of the FY2009 budget on March 11, bringing NIH funding up 3.2% over FY 2008, somewhat under the estimated Biomedical Research and Development Price Index (BRDPI) of 3.8%.

Then along came ARRA, including Sen. Arlen Specter’s (then R-PA, now D-PA) addition of \$10.4 billion to the NIH bottom line, spread across FY2009 and FY2010. The stimulus funding was a classic case of “good news/bad news” or “be careful what you wish for.” While reluctant to oppose such a sizable sum, biomedical interest groups recognize the difficulties that could arise when the stimulus funding ends and more researchers than ever find themselves without grants.

After much negotiation with other biomedical interest groups, FASEB decided to seek a 7% NIH funding increase for FY2010, using the FY2009 Omnibus funding of \$30.4 billion as the base. Thus, FASEB was seeking about \$2.1 billion in additional funding for FY2010, which would bring the NIH base to \$32.5 billion, about 3.2% higher than BRDPI. In addition, NIH would still have about \$5 billion in stimulus funding.

The Obama budget for FY2010 would put NIH funding at just under \$31 billion, well short of the FASEB request. Expressing significant concern about “the sustainability of the biomedical research enterprise,” FASEB President Richard Marchase thanked the president and Congress for their investment in medical research, but noted the importance of maintaining jobs and innovations beyond FY2011, when the stimulus

## Fischman Honored for Service to AAA and Anatomy Discipline

AAA’s 2009 A. J. Ladman AAA/Wiley Exemplary Service Award was presented to Donald A. Fischman, M.D., professor emeritus of cell and developmental biology, Weill Medical College of Cornell University, New York on April 21 during the Society’s Annual Meeting. He held the Harvey Klein Professor of Biomedical Sciences endowed chair and was the chair of the department from 1977 to 1999.

The Ladman Award is AAA’s highest honor recognizing unique and meritorious contributions to, and achievements

in, services to the anatomical sciences and AAA. Fischman was nominated for this award by David Bader, a former postdoctoral fellow. Fischman is the second AAA member to receive both the Ladman Award



Donald Fischman & Kathy Svoboda

and the Henry Gray/Lippincott Williams & Wilkins Scientific Achievement Award, which he won in 1999. He was also in the inaugural class of AAA Fellows in 2007.

Fischman began his academic career at Kenyon College, Ohio, graduating *magna cum laude*, and then moved to New York to study at Cornell University Medical College, completing his M.D. in 1961. While working on his M.D., he was Elizabeth D. Hay’s first student. He used light and electron microscopy to study limb regeneration and published his first paper in 1961.

After medical school, Fischman spent several years learning radioisotope techniques and electron microscopy at the Oak Ridge National Laboratory and the Strangeways Research Laboratories. He returned to Cornell for a short appointment as an instructor, then moved on to the Zoology and Anatomy Department at the University of Chicago as an assistant professor, where he was promoted to associate professor in 1971, while also being the associate dean for curriculum. During his tenure at the University of Chicago, he took a leave of absence to serve in the military as a captain in the U.S. Army Medical Corps, Armed Forces Institute of Pathology.

After a sabbatical leave in Biochemistry and Biophysics at UCSF, Fischman returned to New York to assume the chairmanship of the Department of Anatomy and Cell Biology, State University of New York, Downstate Medical Center (1977-1982). He moved to Cornell Medical College in 1982 as the Harvey Klein Professor and Chair until 1999. During this same time, he served Cornell as dean of the Graduate School of Medical Sciences and associate dean of research.

For almost 40 years, Fischman's research has been focused on skeletal and cardiac muscle development. He has made many important contributions to the fields of anatomy and cell biology through his studies on muscle development, structure, and function, as well as his training of graduate students. His extensive investigations have provided important new insights into the development, structure, and function of muscle tissues and have been published in more than 150 papers in widely recognized journals, including *The Anatomical Record* and *Developmental Dynamics*. Although Fischman is emeritus, he continues to publish papers, including a recent review of Elizabeth D. Hay's contributions to understanding cell-matrix interactions in *Developmental Dynamics*.

Fischman joined AAA as a student in 1960, and has served on numerous committees and as a member of the Board of Directors and president (1993-94). Fischman has also been involved in AAA's publications, serving on the editorial boards of *The Anatomical Record* and *Developmental Dynamics*. He notes that AAA has connected him to others in the field and has assisted in recruitment of postdoctoral fellows. Furthermore, his connection to AAA was instrumental in helping him develop the anatomy departments at SUNY Downstate and Cornell while he was chairman at both institutions.

Fischman has an international reputation as an exemplary scientist and has been recognized by other scholarly societies with elected positions and many awards, including an honorary D.Sc. from Kenyon College in 1985.

Kathy Svoboda chaired the A. J. Ladman AAA/Wiley Exemplary Service Award Committee, which also included Mary Hendrix and Robert Tomanek. Wiley-Blackwell provides support for this award. ❖

*Adapted from a longer article prepared by Kathy Svoboda.*

money runs out. Addressing this concern, Health and Human Services Secretary Kathleen Sebelius has acknowledged the value of investing in research and said "we certainly need to begin working on what happens in 2011 and 2012."

### **NIH issues Challenge Grants and faces challenge of giving away \$10.4 billion**

With more than \$10 billion in extra stimulus funding to dole out over two years, NIH officials have been scrambling since February, first to decide which funding mechanisms to use and then to gear up to handle the onslaught of grant applications.

Of the total funding, \$8.2 billion for research will be divided nearly equally between FY2009 and FY2010. Of this amount, \$5.7 billion will support 13,211 research project grants and 3,983 administrative supplements; most of the remaining \$2.5 billion will go to research centers, research career awards (K series), and training.

According to NIH, the bulk of the research funding will be used to expand the pay line for "highly meritorious applications" applications not funded in FY2008. Smaller amounts have been set aside for a variety of other purposes, including:

- Competitive Revisions;
- Administrative Supplements;
- Challenge Grants targeted at specific health and science problems;
- Grand Opportunity (GO) Grants to support high impact ideas that require significant resources for a discrete period of time;
- New Faculty recruitment assistance;
- Summer Research Experiences for Students and Science Educators; and
- Signature Initiatives, potentially transformative approaches to major challenges in biomedical research.

If grant reviewers were counted among the new jobs created by the American Recovery & Reinvestment Act of 2009 (ARRA), then the economic stimulus program would be deemed a success. According to a statement released by the NIH Center for Scientific Review (CSR) on May 12, they received 20,000 Challenge Grant applications, more than double the number received in a typical review round. Citing what they termed "unprecedented numbers," CSR says they usually have 8,000 reviewers cover 16,000 applications in each of

*continued on page 9*



AAA has combined its three long-standing awards for junior researchers—Bensley, Herrick & Mossman—with the AAA Morphological Sciences Award to create a cluster of Young Investigator Awards to be featured in an exciting Young Investigator Award Symposium at the AAA Annual Meeting.

**Your role:** Nominate an investigator who has made important contributions to biomedical science through research in cell/molecular biology, developmental biology, comparative neuroanatomy, or the morphological sciences. Candidates should be within 10 years of their highest earned degree at the time of nomination. Neither nominators nor nominees need be AAA members.

**Our role:** Select the best candidates (based on the subject areas detailed below) and shower them with fame, glory, an honorarium & the opportunity to shine at the next AAA Annual Meeting.

# AAA Young Investigator Awards

**R.R. BENSLEY AWARD IN CELL BIOLOGY**—This award, first given in 1979, recognizes a cell biologist who has made a distinguished contribution to the advancement of anatomy through discovery, ingenuity, and publications in the field of cell biology.

**C.J. HERRICK AWARD IN NEUROANATOMY**—Established in 1962, this award recognizes investigators who have made important contributions to the field of comparative neuroanatomy, broadly defined, and have demonstrated remarkable promise of future accomplishments.

**H.W. MOSSMAN DEVELOPMENTAL BIOLOGIST AWARD**—This award was established in 2001 to recognize investigators in the early stages of their careers who have made important contributions to the field of developmental biology, as broadly defined, and have demonstrated remarkable promise of future accomplishments.

**AAA MORPHOLOGICAL SCIENCES AWARD**—This award was established in 2008 to recognize investigators in the early stages of their careers who have made important contributions to biomedical science through research in the morphological sciences, as broadly defined, and have demonstrated remarkable promise of future accomplishments.

AAA Young Investigator Award recipients will present a lecture in the Young Investigator Award Symposium at the AAA Annual Meeting following their selection and will receive:

- A plaque
- A \$1,000 honorarium
- Travel reimbursement
- Two years free membership in the American Association of Anatomists (and two years free membership for winning non-member nominators)
- Two years free registration at the AAA Annual Meeting/EB meeting, including the year of the award

Nomination deadline: **August 15<sup>th</sup>**



**For full details and a nomination form** go to: [www.anatomy.org](http://www.anatomy.org) or e-mail: [exec@anatomy.org](mailto:exec@anatomy.org)  
It is not required that each award be made annually.



# Median Salary for Anatomy Faculty Finally Tops \$100K

The median salary for anatomy faculty with a Ph.D. or other doctoral degree has finally topped \$100,000, reaching \$102,000 in 2007-2008, up from \$98,000 the prior academic year, according to the latest AAMC salary survey. This 3.6% increase was slightly higher than last year's 3.2% rise, but was the third smallest increase among basic science departments – molecular biology salaries rose 2.3%, also reaching \$102,000, and biomedical informatics was up 2.8% to \$110,000. Highest salaries went to those in biomedical informatics, genetics, and physiology, all at \$110,000.

For the same period, median salaries for M.Ds in anatomy departments remained steady at \$88,000, still far below those in other basic science departments; biochemistry, the next closest, is at \$105,000 and genetics is on top at \$148,000.

Looking at salaries for specific faculty levels, the survey found that the median salary for anatomy department chairs with a doctoral degree was \$207,000 (up another 7.2% from \$193,000). Median salaries for professors and associate professors were up from \$129,000 to \$135,000 and \$92,000 to \$95,000, respectively. Assistant professors were up from \$75,000, to \$78,000, while instructor salaries jumped by 13.7% from \$51,000 to \$58,000.

The full *AAMC Report on Medical School Faculty Salaries 2007-2008* is online for members of the American Association of Medical Colleges and can be purchased via the AAMC website at <[www.aamc.org/publications](http://www.aamc.org/publications)>. Fiscal year 2008 data were submitted by 127 of the 129 accredited medical schools in the United States that were administered the 2008 Faculty Salary Survey, and cover all sources of compensation: fixed/base salary, medical practice supplement, bonus/incentive pay, and uncontrolled outside earnings. The publication reports total compensation statistics for six faculty ranks in 79 departments/specialties. Contact AAA for a copy of the tables referred to for the above data. ❖

## What's New with You?

- Gotten an award?
- Received an honorary degree?
- Started a new venture?
- Been honored in any way?

**Tell us about it!**  
[exec@anatomy.org](mailto:exec@anatomy.org)



## Public Policy *continued from page 7*

three yearly rounds. For the current round of stimulus-related applications, they expect more than 23,000 reviewers to assess about 36,000 applications.

CSR Director Toni Scarpa noted that “scientists in the U.S. and abroad have signed on” to assist in the process. “The international help is particularly gratifying,” he said, “because it shows the value and respect that scientists around the globe have for NIH peer review.”

While CSR claims to be managing the review challenge, some are skeptical that one component of the NIH infrastructure—namely Grants.gov—can handle the onslaught of applications. NIH recently extended grant applications by a day due to submission difficulties. In a March 16 letter, the American Association of Medical Colleges expressed concern about “major service and operational deficiencies in the program” and called on the Office of Management and Budget to “ensure that adequate resources are allocated to solve the short- and long-term operational problems.”

The detailed NIH ARRA implementation plan is available at <[www.hhs.gov/recovery/reports/plans/scientific\\_research.pdf](http://www.hhs.gov/recovery/reports/plans/scientific_research.pdf)>. For up-to-date information on NIH & ARRA, go to <<http://grants.nih.gov/recovery/>>.

## Obama lifts hESC restrictions; final guidelines due early July

Responding to President Obama's lifting of restrictions on the federal funding of human embryonic stem cell (hESC) research, NIH has issued draft guidelines for conducting such research. At press time, the 30-day comment period was coming to a close and NIH was expected to issue final guidelines on July 7.

In a public conference call, Acting NIH Director Raynard Kington explained that the guidelines set out a series of informed consent procedures under which hESC might be derived, as well as some types of research that would be prohibited. Lines derived from surplus IVF embryos created for reproductive purposes, provided they meet the informed consent criteria, would be eligible for funding, while lines derived through somatic cell nuclear transfer (SCNT), parthenogenesis, or deliberately by IVF for research purposes would not be eligible. Experiments ineligible for funding include hESC or iPS cells being placed in

*continued on next page*



## Public Policy continued from previous page

non-human primate blastocysts or transgenic animals in which stem cells may be present in the germ line.

Responding to questions about why NIH is not allowing funding for deliberately created or SCNT-derived embryos, Kington stated that while it is clear there is “broad public support” for federal funding of surplus embryo-derived hESC lines, there is no such evidence for these other categories. He pointed out that such research could be funded privately and that many of the existing hESC lines, derived from private funds will be eligible for funding under the new guidelines. Also, he noted that NIH plans to regularly review the guidelines, based on changing science and public opinion.

The draft NIH guidelines are available at <<http://stemcells.nih.gov/policy/2009draft.htm>>.

## IOM report aims to strengthen conflict of interest policies

A new report from the Institute of Medicine (IOM) on *Conflict of Interest in Medical Research, Education, and Practice* examines the issue from all angles—research, clinical care, medical training, and continuing education—and recommends voluntary and regulatory measures to improve disclosure of financial ties between the medical community and industry, limit company payments and gifts, and remove industry influence from medical education and the development of practice guidelines.

All academic medical centers, journals, professional societies, and other entities engaged in health research, education, clinical care, and development of practice guidelines should establish or strengthen conflict-of-interest policies, the report says.

Noting substantial variations in institutions’ conflict-of-interest policies and shortcomings in physicians’ and researchers’ adherence to policy requirements, the IOM proposes that the format for disclosure and categories of relationships be standardized to help institutions judge the risk that a relationship poses and to ease the burden for individuals who must report information to multiple organizations with different policies.

Among its other recommendations, the IOM report calls for:

- Creating a national program for reporting company payments;

## Anatomy Book Shelf

### ATLAS OF ANATOMY LATIN NOMENCLATURE EDITION

*A.M. Gilroy, B.R. MacPherson, L.M. Ross, M. Schuenke, E. Schulte and U. Schumacher, Thieme Medical Publishers, 2009, 656 pp, 100 tables, 2200 illustrations, hardcover, \$129.95*

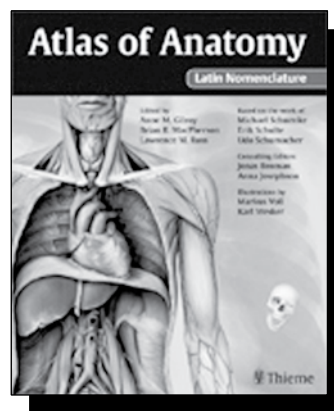
The shelves in student bookstores are crowded with a plethora of human anatomy atlases. Most students are directed to choose those works that have become classics in the field. Is there room or a need for another human anatomy atlas? Based upon the more than 2,000 exquisite illustrations that strike the right balance between detail and clarity, I would say this new atlas will earn itself a place on the shelf. The first-year medical student will benefit from not being overwhelmed with excessive minutiae.

In terms of organization, this atlas focuses on regional anatomy as taught in graduate programs rather than the systems approach used in undergraduate studies.

Interestingly, the authors present each body region from deep to superficial. Each region begins with the bony structures, followed by the musculature. Neurovascular structures are then delineated along with specific organs. Relevant surface anatomy closes out each section to assist the student in recognizing those anatomical structures just under the skin. The sections on the Upper Limb, Lower Limb, and Head & Neck also include topography illustrations that help the student see all the structures in context to each other.

Other features that help to make this atlas stand out are the numerous tables filled with concise but useful information and the clinical boxes that provide relevant medical conditions directly related to the anatomy just exposed. Furthermore, purchase of this atlas includes access to the *Winkingskull.com* online study aid that includes additional illustrations, quizzing, and diagnostic scans.

This new *Atlas of Anatomy Latin Nomenclature* edition is a companion to the anglicized *Atlas of Anatomy* that these same editors published in 2008. The only difference between the two atlases is the labeling of structures in the original Latin in this edition. Many students in an introductory human anatomy course might balk at the additional financial cost of this version and the necessity of defining anatomical terms from another language. That



said, the primary audience for this atlas over the authors' companion work would most likely be international students and those academics who prefer the purity of the original Latin labels.

*Mark Jaffe, DPM, MHSA, Associate Professor,  
Farquhar College of Arts and Sciences,  
Nova Southeastern University*

## CLINICAL NEUROANATOMY

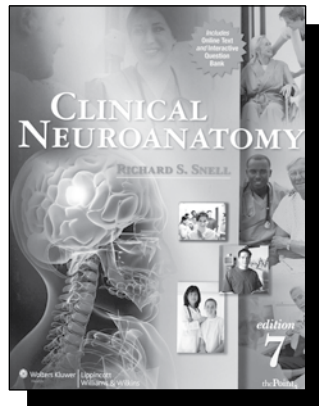
*Richard S. Snell, Wolters Kluwer/Lippincott and Wilkins,  
2010, 7<sup>th</sup> edition 542 pp + index, \$67.95*

*Clinical Anatomy* is a compact volume arranged by chapters beginning with introductory material on the organization of the nervous system, the neurobiology of neurons, nerve fibers, receptors and muscle function, proceeding through the spinal cord, the regions of the brain, and functional systems, and ending with a chapter on the development of the nervous system. Important words and concepts are indicated by heavy bolding, which certainly is clear, but does make the text seem a little busy. The text is supported with copious illustrations that, while not particularly artistic, are also clear. A major strength of the text is that each chapter ends with several clinical solving problems and review questions with answers and explanations.

In contrast to many other neuroanatomy texts, *Clinical Neuroanatomy* has a single author with no contributors other than a few mentioned in the acknowledgements. The neuroanatomy texts I am most acquainted with have several authors and sometimes several editors, which is expected considering the complex nature of the subject. This text is described by the author as containing the basic neuroanatomical facts necessary for the practice of medicine with factual material strictly limited to that which is clinically important and thus useful to residents as a quick reference to essential facts. The title, however, might lead one to think it could be a text for use in a clinical neuroanatomy course in medical school. These two purposes are not necessarily compatible.

As a test of its utility, I used the text as a reference while revising my lectures in two neuroscience courses in which I participate. I discovered a number of omissions that led me to question the book's usefulness as the sole text for a medical school neuroanatomy or neuroscience course. I could find no description of the vestibular fibers

*continued on page 23*



- Restricting participation of researchers with conflicts of interest in research with human participants;
- Reforming the financing system for continuing medical education;
- Restricting industry funding and conflicts in clinical practice guideline development.

The study was sponsored by the National Institutes of Health, Robert Wood Johnson Foundation, Greenwall Foundation, ABIM Foundation, Burroughs Wellcome Fund, and Josiah Macy Jr. Foundation. An executive summary of the report is available at <[www.iom.edu/CMS/3740/47464/65721.aspx](http://www.iom.edu/CMS/3740/47464/65721.aspx)>.

Addressing the issue of scientific integrity as it relates to actions of the federal government, President Obama told the heads of executive departments and agencies in a March 9 memo that “The public must be able to trust the science and scientific process informing public policy decisions.”

Toward that end, he mandated that, within 120 days, “each agency should have appropriate rules and procedures to ensure the integrity of the scientific process within the agency; and, when scientific or technological information is considered in policy decisions, the information should be subject to well-established scientific processes, including peer review where appropriate, and each agency should appropriately and accurately reflect that information in complying with and applying relevant statutory standards”

### NIH offers reviewer guidance on how to deal with peer review process

The NIH Office of Extramural Research has posted a new Web page with Guidelines for Reviewers, available from the Peer Review Policies & Practices page ([http://grants.nih.gov/grants/peer/reviewer\\_guidelines.htm](http://grants.nih.gov/grants/peer/reviewer_guidelines.htm)). These various guidelines, while intended for reviewers, are also informative for applicants. Among the materials available are chair and reviewer “orientations” describing what to expect throughout the peer review process, instructions for using the new scoring system, and guidance for evaluating research utilizing human subjects, vertebrate animals, and embryonic stem cells.

NIH has also produced two videos to orient the community to the changes to the peer review system: *Overview of Peer Review Enhancements* ([http://enhancing-peer-review.nih.gov/video\\_overview.html](http://enhancing-peer-review.nih.gov/video_overview.html)) and *What Reviewers Need to Know Now* ([http://enhancing-peer-review.nih.gov/reviewer\\_video.html](http://enhancing-peer-review.nih.gov/reviewer_video.html))

## NEW AAA STUDENT & POSTDOCTORAL MEMBERS (141 accepted April 2009)

<b>Evangelos Antzoulatos</b> Massachusetts Institute of Technology	<b>Symone San Miguel</b> Baylor College of Dentistry	<b>Sarah Beech</b> University of Western Ontario	<b>Jonathan Chong</b> University of California San Francisco	<b>Javier Goldberg</b> Museo de Ciencias Naturales, Universidad Nacional de Salta
<b>Anita Austin</b> Vanderbilt University Medical Center	<b>Jaime Sanchez</b> University of South Florida	<b>Joyce Belcher</b> Temple University School of Medicine	<b>Casey Crisp</b> Palmer College of Chiropractic	<b>Shauna Grady</b> Midwestern University
<b>Jiri Brabec</b> First Faculty of Medicine	<b>Ryan Splittgerber</b> Vanderbilt University School of Medicine	<b>Lauren Bennett</b> Loma Linda University	<b>Christine Day</b> Northern Illinois University	<b>Michael Gregg</b> SUNY Downstate Medical Center College of Medicine
<b>JoSette Broiles</b> Oklahoma University -Health Sciences Center	<b>Heather Ward</b> University of New Mexico	<b>Jonathan Bensley</b> Monash University	<b>Marc de Asis</b> University of British Columbia	<b>Jeremy Gregory</b> Mayo Clinic College of Medicine
<b>Shoujun Chen</b> University of South Florida	<b>Junping Xin</b> Loyola University Chicago	<b>Katie Billard</b> University of Western Ontario	<b>Janaina Dernowsek</b> University of Sao Paulo, Brazil	<b>Gabriella Grisotti</b> SUNY Downstate Medical Center
<b>Gabrielle Curinga</b> University of Kentucky	<b>Qing-Shan Xue</b> University of Florida	<b>Charles Billington</b> University of Minnesota	<b>Jennifer Doyle</b> York University	<b>Courtney Guenther</b> University of Wisconsin-Madison
<b>Keith Fargo</b> Loyola University Chicago	<b>Anastasiia Aleksandrova</b> University of Kansas Medical Center	<b>Christopher Camp</b> Mayo Clinic College of Medicine	<b>Kellie Duench</b> Mount Saint Vincent University	<b>Hillary Hager</b> Vanderbilt University
<b>Chunlei Gao</b> SUNY - Upstate Medical University	<b>Cara Alexander</b> Mayo Clinic College of Medicine	<b>Burcu Carlon</b> Northern Illinois University	<b>Megan Dufton</b> Dalhousie University	<b>Melissa Haulcomb</b> Loyola University Chicago
<b>Jill Glausier</b> University of Pittsburgh	<b>Capri Andrews</b> University of Central Oklahoma	<b>Wanakee Carr</b> University of Iowa	<b>Sara Edsall</b> Mount Saint Vincent University	<b>Heather Hawker</b> University of Utah
<b>Nicole Herring</b> Vanderbilt University	<b>Stavros Atsas</b> University of Louisville	<b>Yasmin Carter</b> University of Manitoba	<b>Gabrielle Finn</b> Durham University	<b>Fenglei He</b> Tulane University
<b>Nicolai Konow</b> Johns Hopkins Medical University	<b>Tiffany Aversa</b> Philadelphia College of Osteopathic Medicine	<b>Daniel Charubhumi</b> SUNY Downstate Medical Center	<b>Brooke Flammang</b> Harvard University	<b>Matthew Holzmann</b> CASE Western Reserve University
<b>Michael Lane</b> University of Florida	<b>Sivasai Balivada</b> Kansas State University	<b>Laura Chen</b> Mayo Clinic College of Medicine	<b>David Frumberg</b> SUNY Downstate Medical Center	<b>Simon Hong</b> SUNY Downstate Medical Center
<b>Wenhua Liu</b> Cornell University	<b>Taylor Behars</b> Loyola University	<b>Robstein Chidavaenzi</b> University of Illinois at Chicago	<b>Janina Fuller</b> Louisiana State University	<b>Robin Hopkins</b> University of Western Ontario
<b>Stephen Mason</b> Indiana University	<b>Michael Beckman</b> SUNY Downstate College of Medicine	<b>Madeleine Chollet</b> Johns Hopkins School of Medicine		
<b>Sara Patterson</b> University of Florida				

*continued on page 43*

# Class of 2009 AAA Fellows Honored

The third class of Fellows of the American Association of Anatomists were inducted at the April 21 Annual Awards Banquet in New Orleans by AAA President David Burr, who presented each new Fellow with a certificate and lapel pin.

New Fellows for 2009 include:

- Allan Basbaum, University of California—San Francisco
- Richard Drake, Cleveland Clinic Lerner College of Medicine
- John Fallon, University of Wisconsin
- Gary Schoenwolf, University of Utah
- Kathy Svoboda, Baylor College of Dentistry
- Robert Tomanek, University of Iowa
- A. Wayne Vogl, University of British Columbia



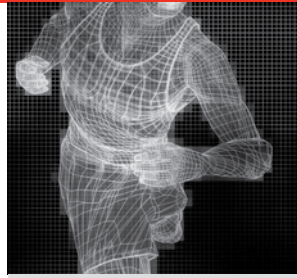
*John Fallon, Gary Schoenwolf, Robert Tomanek, Kathy Svoboda, A. Wayne Vogl & Richard Drake*

The rank of Fellow was established to honor distinguished members who have demonstrated excellence in science and in their overall contributions to the anatomical sciences. At any given time, no more than 10% of all eligible AAA members may be at the Fellow rank.

This year's Fellows Selection Committee was chaired by Joseph Besharse and also included Bruce Carlson, Donald Fischman, Marion Gordon, and Birgit Satir. ❖

## Who Else Has What It Takes?

To find a full listing of all AAA Fellows, go to <[www.anatomy.org](http://www.anatomy.org)> and click on "Awards-Grants." If you know someone else who should be on the list, then it's up to you to submit a nomination. It's easy to do online! Deadline: December 1st.



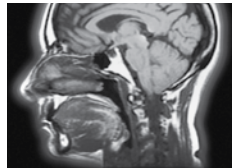
## News & Notes

### GAO sting operation reveals weaknesses in IRB process

Institutional review boards (IRBs) are responsible for reviewing and monitoring human subjects research and the adequacy of IRBs is the responsibility of the Department of Health and Human Services (HHS). A late March report from the Government Accountability Office (GAO) questions whether either of these responsibilities are being carried out appropriately.

GAO assessed three aspects of the IRB system: "(1) the process for establishing an IRB, (2) the process through which researchers wishing to apply for federal funding assure HHS their human subjects research activities follow ethical principles and federal regulations, and (3) the process that medical research companies follow to get approval for conducting research on human subjects."

In an undercover "sting" operation, GAO created a bogus IRB that was able to give a real medical research company approval to join ongoing human trials involving invasive surgery. GAO also got approval



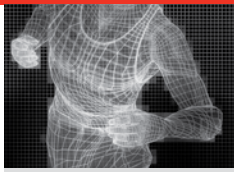
## Members in the News

*continued from page 5*

### Mount Holyoke honorary degree for Clare Waterman-Storer

*Clare Waterman-Storer*, now chief of the Laboratory of Cell and Tissue Morphodynamics at the National Institute of Health's National Heart, Lung and Blood Institute and the 2006 recipient of AAA's R.R. Bensley Award in Cell Biology, recently received an honorary degree from Mount Holyoke College, her alma mater.

Waterman-Storer, who won an NIH Director's Pioneer Award in 2005, also received the 2007 Sackler International Prize in Biophysics from Tel Aviv University, a prestigious prize awarded to young scientists who have made outstanding contributions to their fields.



## News & Notes *continued from previous page*

from an actual IRB to test a fictitious medical device on human subjects, although the IRB did not verify any of the fake—and apparently risky—specifications provided.

The report concludes that “The IRB system is vulnerable to unethical manipulation, which elevates the risk that experimental products are approved for human subject tests without full and appropriate review.” Additional details are available at <[www.gao.gov/products/GAO-09-448T](http://www.gao.gov/products/GAO-09-448T)>.

### **On Being a Scientist updated to meet 21<sup>st</sup> century situations**

The third edition of *On Being a Scientist*, recently published by the National Academies Press, describes the ethical foundations of scientific practices and some of the personal and professional issues that researchers encounter in their work. Reflecting changes since the 1995 version, the book includes several hypothetical scenarios, offering guidance in thinking about the issues that are posed.

Although the publication is aimed mainly at graduate students and beginning researchers, it offers lessons that apply throughout the scientific career, covering such topics as the treatment of data, advising and mentoring, mistakes and negligence, authorship and the allocation of credit, and sharing research results.

*On Being a Scientist* can be read online or purchased at <<http://books.nap.ed>>.

### **Report proposes principles for dealing with fully digital world**

While the piles of paper on your desk may belie this statement, the Interagency Working Group on Digital Data of the National Science and Technology Council’s (NSTC) Committee on Science maintains that, “Empowered by an array of new digital technologies, science in the 21st century will be conducted in a fully digital world.”

To meet the challenges of such a world, the group, with representatives from 22 federal agencies, has adopted a set of guiding principles and a series of recommendations for achieving “a digital scientific data universe in which data creation, collection, documentation, analysis, preservation, and dissemination can be appropriately, reliably, and readily managed.”

## FASEB Expands Advocacy Via Public Campaign & Social Media

by Carrie D. Wolinetz

**F**ASEB is taking our advocacy for NIH outside of the Beltway and bringing our message straight to the American public. A new effort to support sustainable increase for NIH funding was launched on April 22 by a coalition of universities, teaching hospitals, patient groups, and scientific organizations. The Research Means Hope campaign, of which FASEB is a founding member, will use print, radio, and online advertising, as well as electronic and social media, to raise public awareness of the critical need for sustained, real growth in federal funding for medical research. “The lack of sustainable NIH funding threatens to affect an entire generation of young researchers, as the difficulty in obtaining grants drives our best and brightest scientists to seek opportunities outside of the lab. We can’t afford that loss of talent in our search for medical breakthroughs,” stated FASEB President Richard Marchase

Treatment for Alzheimer's —  
Cure for diabetes —  
Cure for breast cancer —  
Protection against cervical cancer —

**Medical research is the beginning of hope.** And today its promise has never been greater. But despite the considerable progress that's been made in new treatments and therapies, too many South Carolinians still suffer from heart disease, asthma, depression, Parkinson's and other incurable diseases. We can change this — through significant, annual increases in federal funding for medical research. It's one of the best investments we can make in our future.

Tell your members of Congress that you support significant, annual increases in medical research funding. Go to [ResearchMeansHope.org](http://ResearchMeansHope.org) to send your message today.

**MORE FUNDING TODAY. MORE MIRACLES TOMORROW.**

A message from patients and the physicians and researchers of America's medical schools, teaching hospitals, universities, research companies and organizations.  
ResearchMeansHope.org

at the launch of the campaign. Other founding members include the Association of American Medical Colleges, the Association of American Universities, Johns Hopkins, and the Association of Public and Land-grant Universities.

This exciting new project, which is being pilot tested in California and South Carolina, provides opportunities for the public and scientists to let members of Congress know the importance of medical research funded by NIH. It is the culmination of more than a year of public opinion research to examine which messages in support of medical research work best. The two initial pilot regions were chosen based on the affordability of the media markets and their representation in Congress by members who are important decision makers on NIH funding. If the campaign is successful, it may be expanded nationwide. FASEB encourages all of our societies' scientists to spread the word in their own communities about this effort. To view the campaign materials or to get involved, please visit <[www.researchmeanshope.org/](http://www.researchmeanshope.org/)>.

Meanwhile, FASEB is expanding our own reach through use of social media by launching pages on Twitter and Facebook. "We all know that the potential power of reaching new and larger audiences with social media is tremendous," said Marchase. "FASEB's advocacy goal has always been to convey the critical importance of biomedical research to the health and well-being of our nation. These are exciting new tools to carry that message." FASEB also hopes that social media will provide more opportunities for scientists and engineers to stay in touch and get involved with science policy issues and advocacy. The Federation wants to ensure that scientists have a variety of resources to keep up to date on science policy news and to express their views to policymakers and the public on issues important to biomedical research.

To that end, FASEB has also updated its popular, state-specific slide presentations titled, "Breakthroughs in Bioscience: From NIH Funded Basic Research to Improved Health," with the most recent NIH funding information ([http://opa.faseb.org/pages/Publications/NIH\\_PPT.htm](http://opa.faseb.org/pages/Publications/NIH_PPT.htm)). The customizable slides are a useful way for researchers to let policymakers or members of their community know about the important medical breakthroughs funded by NIH and are a great resource for Members of Congress, their staff, or the media and the public to learn about federally-funded, life-saving medical research in their own state.

To stay on top of public policy issues affecting your career, follow FASEB on Twitter at <<http://twitter.com/FASEBopa>>.

*Carrie D. Wolinetz, Ph.D., is Director of Scientific Affairs and Public Relations in the FASEB Office of Public Affairs; this article will also appear in the June issue of ASBMB Today.*

The group recommends that:

- A National Science and Technology Council (NSTC) Subcommittee for digital scientific data preservation, access, and interoperability be created;
- Appropriate departments and agencies lay the foundations for agency digital scientific data policy and make the policy publicly available; and
- Agencies promote a data management planning process for projects that generate preservation data.

*Harnessing the Power of Digital Data for Science and Society* is available online at <[www.nitrd.gov/About/Harnessing\\_Power\\_Web.pdf](http://www.nitrd.gov/About/Harnessing_Power_Web.pdf)>.

### **William Talman to serve as FASEB president, 2010-2011**

William T. Talman has been chosen as the next FASEB president elect and will serve FASEB as president for one year beginning in July 2010. Talman, a professor of neurology and neuroscience at the University of Iowa, is also vice chair for basic research in neurology and chief of the Neurology Service at the VA Medical Center in Iowa City. He received his M.D. at the University of Virginia, did his residency in internal medicine at Case Western Reserve University and in neurology at Cornell University Medical College, and did his postdoctoral training in Neurobiology at Cornell University Medical College, where he served on faculty before moving to the University of Iowa in 1983.



*William Talman*

Talman's current research probes mechanisms underlying cardiac damage in the presence of lesions in the central nervous system and mechanisms through which the brain may be protected from ischemia and infarction. In addition to being an active scientist, Talman is a neurologist who specializes in autonomic dysfunction. He has been recognized for the past eight years as one of the Best Doctors in America.



#### *Eligibility*

- Applicant must have been an AAA member for one year preceding the application date.
- Applicant or host sponsor must be a permanent resident of US or Canada; Fellowships can be used in any country.
- Applicant should be working on research encompassing any aspect of biology relevant to the anatomical sciences. Approaches may include (but are not limited to) cellular, molecular, genetic or histological techniques, and/or emphasize development, evolution, morphology, or human health.

#### *Criteria*

- Applicant's track record
- Quality of sponsor laboratory
- Importance of research project

#### *Terms and Conditions*

- Fellowships are expected to cover partial salary support, with the remainder coming from other sources. Indirect costs are not included. A no-cost extension may be requested.
- At the end of the Fellowship period, each recipient must provide AAA with a written report of work accomplished. This report must be received within three months following the end of the Fellowship period.
- Each recipient must attend the annual AAA Meeting to present his/her work. AAA will pay registration and travel expenses, up to \$1,000.

## *AAA Postdoctoral Fellowships*

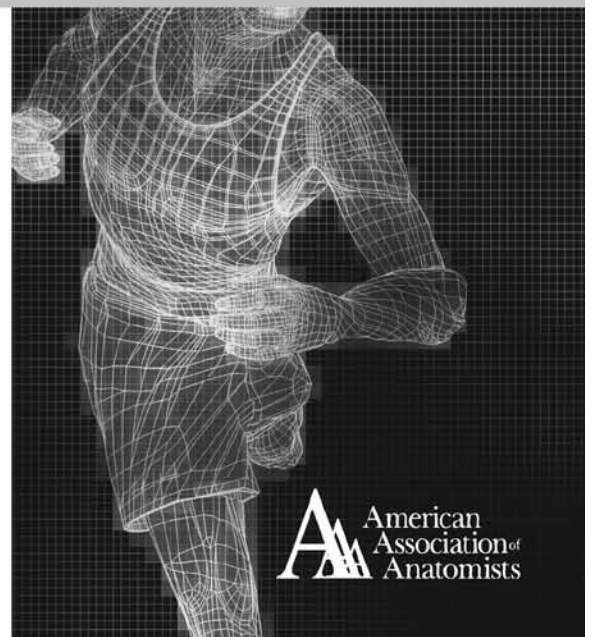
How does \$20,000 sound? The AAA Postdoctoral Fellowship offers salary support to AAA members who are postdoctoral fellows working in any aspect of biology relevant to the anatomical sciences.

AAA will provide up to three \$20,000 Fellowships, plus travel support and complimentary registration to the next appropriate AAA Annual Meeting. The laboratory in which the postdoc works must supplement this stipend with funds to equal or exceed the NIH standard for postdoctoral fellows and must make some provision for health insurance.

Deadline: **October 1**

Fellowships begin: **January 15**

For full award details & application, go to: [www.anatomy.org](http://www.anatomy.org)  
or e-mail us at: [exec@anatomy.org](mailto:exec@anatomy.org)



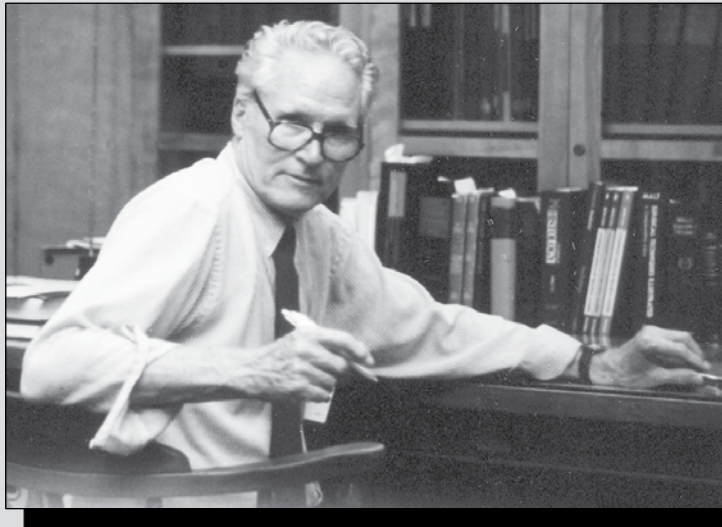
**AAA** American  
Association  
of  
Anatomists



# In Memoriam

## G. E. (Erik) Erikson, 1920-2009

Erik Erikson died on January 15, 2009, in Norton, Massachusetts. He was born George Emil Erikson on May 3, 1920, in Palmer, Massachusetts, one of eight children. He served as historian and archivist for the American Association of Anatomists for 27 years from 1972-1999. During this time, he visited nearly every anatomy department in the United States and Canada on his own dollar and the generosity of his hosts. In this position, he frequently asked members for biographical information, including copies of their CVs, and was also AAA's Annual Meeting photographer, chronicling AAA's history in the late 20th century. If an AAA member was preparing a paper on some aspect of the association's history, Erikson was always willing to search his files for an appropriate picture. He was dedicated to the teaching, history, and promotion of the anatomical sciences. AAA recognized his value and services by awarding him the AAA/Wiley A.J. Ladman Exemplary Service Award in 1999.



Erikson was a professor of medical sciences at the Medical School of Brown University from 1965-1990. His academic career began in 1941 when he graduated from Massachusetts State College (now the University of Massachusetts). He went to Harvard as a teaching fellow in 1942 and remained on the academic staff at Harvard until 1965. Erikson also taught surgical anatomy at Rhode Island and Massachusetts General Hospitals and had a course in Anatomy for Artists at the Rhode Island School of Design. After retiring in 1990, he complemented his career by founding and heading the Erikson Biographical Institute.

Erikson's wide-ranging interests included history—especially of science and anatomy—languages, travel, and art. He integrated these interests in the presentations that he gave to his classes, at scientific meetings, and to groups of interested people in his communities, making his presentations exciting and memorable.

During his career, Erikson wrote biographical sketches on a number of scientists who were notables in their field. He was especially pleased with his published biographical sketch of the great paleontologist Alfred S. Romer. While Erikson was at Harvard, Romer was also there as Professor of Zoology (1934-65). Knowing Erikson's enthusiasm for history and science as broadly defined, one can only imagine the conversations they may have had.

Erikson believed that learning should be motivated by interest and not by the quest of credentials. He also felt that it should be interdisciplinary across related areas of medicine and science and that physicians should be trained to be knowledgeable of the whole body.

He is survived by his wife of 59 years, Suzanne (Henderson) Erikson, and four children: Ann Febiger, David, John and Tom Erikson; and a brother, Walter Erikson; seven grandchildren and a great granddaughter. A memorial gathering is being planned for the spring; additional details are available through his son David at <david.erikson@comcast.net>. Donations in his memory may be made to Doctors Without Borders.

*Prepared by David Erikson, with additions by Charles Slonecker and Duane Haines.*



## Animals in Research

### FBR launches public awareness campaign on YouTube

The Foundation for Biomedical Research (FBR) has launched a series of 60-second television spots on YouTube as part of their new “ResearchSaves” forum through which people can share their experiences with disease and their opinions of animal research. The first TV spot, Jen’s story, has had nearly 17,000 views on YouTube and is playing every day in a market test city on the NBC affiliate and several strategic cable TV channels.

“I am not an actress dressed up in costume,” Jen says. “I am a scientist, a biomedical researcher. I am working hard to find treatments and cures for breast cancer. I am somebody’s daughter, a sister, a wife, somebody’s best friend. I am, for five years now, a breast cancer survivor.”

Explaining that most cures have happened as a direct result of medical research that uses animals to simulate human conditions, the ResearchSaves forum asks people to share their stories via comments and videos, noting if animal research has saved or improved their life and what new cures they are hoping for.

To enhance this public awareness campaign, FBR has asked researchers to circulate information about the forum and YouTube spots to friends and colleagues. Additional information is available at <[www.fbresearch.org](http://www.fbresearch.org)> and <[www.researchsaves.org](http://www.researchsaves.org)>.

### Kington deplores terrorist acts against biomedical researchers

Responding to the latest outbreak of violence against scientists engaged in animal research, Acting NIH Director Raynard Kington issued a “Statement Deploring Terrorism Against Researchers” in late April, affirming that animals used in federally-funded research benefit both human and animal health.

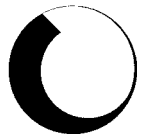
Kington explained that “all animals used in federally-funded research are protected by laws, regulations, and policies to ensure they are used in the smallest numbers possible and with the greatest commitment to their comfort and welfare.” He also noted that “Federally-supported scientists are accountable, from the time they first plan their research to the time the research is

### Assistant/Associate Professor of Anatomy

Kansas City University of Medicine and Biosciences seeks candidates for the position of Assistant or Associate Professor of Anatomy. The successful candidate must have a Ph.D. in anatomy or related discipline, and experience teaching human gross anatomy. Duties will include teaching in selected sections of clinically-oriented human gross anatomy, participating in the dissection lab, and teaching some lectures in histology or embryology. The successful applicant may also elect to participate in teaching within graduate programs in the College of Biosciences or mentor Anatomy Fellows in research. Successful applicants will be expected to maintain ongoing, productive scholarly activity. History of or potential for successful extramural funding is desirable. For additional information, contact Robert E. Stephens, Ph.D., Professor & Chair, Anatomy, 1-800-234-4847, ext. 2244 or 816-283-2244, [rstephens@kcumb.edu](mailto:rstephens@kcumb.edu).

KCUMB, a growing institution with an emerging emphasis on research, recently completed a 46,000 sq ft building for bioscience research. The College of Osteopathic Medicine is Missouri’s largest medical school and strives to hire outstanding faculty & staff to provide an exemplary medical education for approx. 1,000 osteopathic medical and biosciences graduate students. Excellent pay is complemented with an exceptional benefits package. Located in the Northeast historic district of Kansas City, MO, near downtown and collaborating institutions, KCUMB is one of eight original key stakeholder institutions in the Kansas City Area Life Sciences Institute: <[www.kclifesciences.org](http://www.kclifesciences.org)>

To apply, send a letter of interest for Job #08-39, *curriculum vitae*, a statement regarding scholarly activity, teaching goals, and philosophies, and contact information for 3 references to: Nicole Torgerson, Recruiter, Human Resources, 1750 Independence Ave., Kansas City, MO 64106-1453, 800-234-4847, ext. 2229 or 816-283-2229; or e-mail [employment@kcumb.edu](mailto:employment@kcumb.edu) (Word or PDF format only, please), or fax 816-283-2285. Pre-employment drug screen and background check required. EOE. [www.kcumb.edu](http://www.kcumb.edu). Tobacco free environment.



**KANSAS CITY  
UNIVERSITY**  
MEDICINE & BIOSCIENCES

## Spotlight on Education

AAA’s AnatomyLink  
Your year-round teaching resource!

Education & Teaching Tools • [www.anatomy.org](http://www.anatomy.org)



# New Mentoring Program Matches Member Expertise With AAA Member Needs

by Carlin Bokal

**A**AA launched its new mentoring program at the Annual Meeting/EB 2009 in New Orleans. The program is designed to assist student and postdoc members with their transition into the field of anatomy and help them meet their professional development and networking goals with the guidance of more seasoned professionals.

As anatomy departments continue to disappear, outside mentoring is more necessary than ever. Add to that the fact that the quality of mentoring programs may vary between institutions and it becomes evident that additional mentoring resources are needed. To fill this need, AAA created an informal, flexible mentoring program.

Mentors are AAA Fellows and members of the AAA Advisory Committee for Young Anatomists Alumni Association (A<sup>6</sup>). Student and postdoc members can self-select a mentor from the list of volunteers. The pair can then work together to determine the scope of the relationship based on the mentoree's current needs. Some mentor/mentoree pairs may choose to have only one contact to address a specific issue, while others may choose to have an ongoing relationship. Mentorees may also have more than one mentor, with each addressing a specific need.

To learn more about the AAA mentoring program, go to our online Career Center at <[www.anatomy.org/Resources/career\\_center.htm](http://www.anatomy.org/Resources/career_center.htm)>. If you are a student or postdoc member interested in selecting a mentor, contact Carlin Bokal at <[cbokal@anatomy.org](mailto:cbokal@anatomy.org)>. ❖

completed, to protect the welfare of animals in their research. “

Describing terrorist acts against biomedical researchers as “unconscionable,” Kington said that “Terrorism is not expression of opinion nor point of view—it is a violation of law.” Apart from the immediate destruction of life and property, such tactics create fear that results in “irretrievable time...lost in finding as yet undiscovered treatments and cures.”

## UK guide urges researchers to proactively communicate with public

*A Researcher's Guide to Communications* offers some concrete advice on how scientists can openly and proactively communicate their work to the public. According to Understanding Animal Research, the British organization that produced this guide, “The antivivisectionists have been setting the agenda for too long” and are not going away anytime soon.

Rather than keeping their heads down to avoid attracting attention, the group advises, it is time for researchers to preempt communications and make it easier for the public to find out about their research, rather than more difficult.

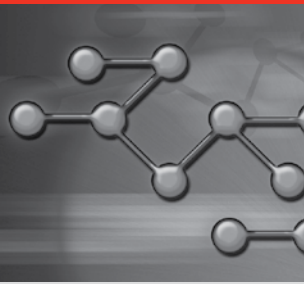
Emphasizing the importance of “making friends before you need them,” the publication provides a step-by-step guide to developing your message and finding an audience among colleagues, opinion formers, research funders, organizations, government, industry, and the public.

The guide is available as a PDF at <[www.understandinganimalresearch.org.uk](http://www.understandinganimalresearch.org.uk)>.

# Take a Stand for Science



**Support  
Evolution  
Education**



## Hotlinks

Here are some of the new resources you can get to through *AnatomyLink* ([www.anatomy.org](http://www.anatomy.org)). If you've found a site that you'd like to share with colleagues, just go to "Resource Links" and click on "Send it to us."

### <http://www.aamc.org/mededportal>

MedEdPORTAL is a free medical and dental publication service that promotes access to high-quality, peer-reviewed educational teaching and assessment resources online. While MedEdPORTAL 2.0, launched in April, may look familiar, the back-end of the system has undergone dramatic improvements. The Web site is

View *continued from page 2*

Professional Development in February. Several important recommendations arose from a well planned task force meeting organized by Carlin and you will hear more details over the coming months. These endeavors will be guided by a new Professional Development Committee, chaired by Kimberly Topp, that will work alongside AAA's Program Committee and Educational Affairs Committee to develop programs and services to improve your AAA membership experience.

The traditional stable environment that a faculty member could count on over the course of his/her career doesn't exist anymore for many of us. For years, we have been losing anatomy departments and the established structural base for our members. Ironically, this trend continues despite the unique importance of the anatomical sciences in biomedical education, and at a time when interest in the anatomical sciences is rapidly escalating and beginning to be taught as a basic science (along with biology, chemistry, and physics) at the high school level. Thus, we have enthusiastic "anatomy students" across all levels of education these days who are looking for a home.

AAA, with its rich history of representing the anatomical sciences in research and education, can both gain much and offer much by responding appropriately to match this changing landscape. Essentially, AAA would like to be *your* Anatomy Department. Please let me know ([exec@anatomy.org](mailto:exec@anatomy.org)) what AAA can offer to enhance your career in the anatomical sciences. ❖

Kathryn J. Jones  
AAA President

now fully integrated with a powerful content and digital asset management system to host resources online. The new site makes it easier to download most resources and also features a robust search engine that allows you to search for published resources through a greater number of metrics. In addition, MedEdPORTAL now collects a variety of end-user data that can be used by authors to demonstrate the particular impact and use of their published materials.

### <http://lane.stanford.edu/bassett/index.html>

The Bassett Collection of Stereoscopic Images of Human Anatomy is the product of a 17-year project in which David Lee Bassett and William B. Gruber, inventor of the Viewmaster system of stereoscopic imagery, collaborated on creating three-dimensional photographic images of human anatomy using innovations in dissection pioneered by Bassett. Three artists developed detailed line drawings based on the photographs. A 24-volume *Stereoscopic Atlas of Human Anatomy*, completed in 1962, includes 1,547 photographic images and accompanying drawings. The images in this online collection are derived from the Atlas project.

### <http://www.molecularmovies.com/showcase/index.html>

This Web portal contains links to a variety of cell and molecular animations. Topics cover 21 areas from Adhesion/Extracellular Matrix to Viruses. The site also includes tutorials and lectures to guide you in using a variety of software packages to create your own 3D models and animations.

### [http://www.bio-medicine.org/?q=about\\_index.html](http://www.bio-medicine.org/?q=about_index.html)

Bio-medicine touts itself as one of the Internet's leading online organizations and Web portals devoted to biology and medicine. The free service brings you breaking news about the latest discoveries and hottest research projects in biology and medicine.

### <http://www.aamc.org/students/considering/research/start.htm>

This site provides information to students considering a career in medical research. It discusses a Ph.D. in Biomedical Sciences and the MD/Ph.D. route, including tips for applying, general information on education and training, and career paths afforded by each option.



## RFA's & RFPs

Check AAA's Web site ([www.anatomy.org](http://www.anatomy.org)) for weekly updates on research grants, fellowships, and other funding opportunities. Just go to "Awards/Grants" and click on "RFPs/RFAs."

### NIH and the American Recovery & Reinvestment Act of 2009

<http://www.nih.gov/recovery/>

### Guidelines for NIH Grant Reviewers

The NIH Office of Extramural Research has posted a new Web page with Guidelines for Reviewers, which are also informative for grant applicants. <[http://grants.nih.gov/grants/peer/reviewer\\_guidelines.htm](http://grants.nih.gov/grants/peer/reviewer_guidelines.htm)>

### FY 2009 NIH Directors Bridge Awards

Provides continued but limited bridge funding for meritorious investigators who just miss the funding cutoff and have minimal support from other sources. The continued funding will permit the PI additional time to strengthen a resubmission application. <<http://grants.nih.gov/grants/guide/notice-files/NOT-OD-09-068.html>>

### NIH Small Research Grant Program (Parent R03)

Supports small research projects that can be carried out in a short period of time with limited resources, including pilot and feasibility studies; secondary analysis of existing data; small, self-contained research projects; development of research methodology; and development of new research technology. <<http://grants.nih.gov/grants/guide/pa-files/PA-09-163.html>>

### NIH Exploratory/Developmental Research Grant Program (Parent R21)

To encourage exploratory and developmental research projects by providing support for the early and conceptual stages of these projects. Studies may involve considerable risk, but may lead to a breakthrough in a particular area, or to the development of novel techniques, agents, methodologies, models, or applications that could have a major impact on a field

of biomedical, behavioral, or clinical research. <<http://grants.nih.gov/grants/guide/pa-files/PA-09-164.html>>

### Renal Function and Chronic Kidney Disease in Aging (R01)

NIA and NIDDK invite applications that propose basic, clinical, and translational research on chronic kidney disease (CKD) and its consequences in aging and in older persons. See also related R21. <http://grants.nih.gov/grants/guide/pa-files/PA-09-165.html>

### In Vivo Cellular and Molecular Imaging Centers (ICMICs) (P50)

Five-year grants to support interdisciplinary scientific teams conducting cutting-edge cancer molecular imaging research. Letters of intent due September 28, 2009, 2010, 2011; applications due October 28, 2009, 2010, 2011. <<http://grants.nih.gov/grants/guide/pa-files/PAR-09-157.html>>

### NHLBI Career Transition Award (K22)

To provide highly qualified postdoctoral fellows an opportunity to receive mentored research experience in the NHLBI Division of Intramural Research and then to provide them with bridge funding to facilitate the transition of their research programs as new investigators at extramural institutions. <<http://grants.nih.gov/grants/guide/pa-files/PAR-09-102.html>>

### Career Enhancement Award for Stem Cell Research (K18)

To encourage investigators to obtain the training and career development they need to appropriately use stem cells in their research. Human embryonic stem cells (hESC) have only recently become available, and most investigators are not prepared to handle, maintain, or properly study hESCs. Likewise, the potential of human adult or cord blood, and even animal, stem cells for understanding, treating, and curing human disease is great. Opening date: May 12; standard application deadlines. <<http://grants.nih.gov/grants/guide/pa-files/PA-09-110.html>>

## NEW AAA REGULAR MEMBERS (84 accepted April 2009)

**Abayomi Afolabi**  
American University of  
Antigua

**Mohamed Al-Shabrawey**  
Medical College of  
Georgia

**Victoria Ballard**  
GlaxoSmithKline

**Mark Baxter**  
Oxford University

**Andrew Bergemann**  
Mount Sinai School of  
Medicine

**Fred Berry**  
University of Alberta

**Kriti Bhalla**

**Sat Bhattacharya**  
Memorial Sloan-  
Kettering Cancer Center/  
Harlem Chi

**Heather Billings**  
West Virginia University

**Carol Britson**  
University of Mississippi

**Bruce Buttler**  
Canadian University  
College

**Craig Byron**  
Mercer University

**Valeria Carrillo  
Mendoza**  
Centro De  
Rehabilitacion Infantil  
Teleton

**Joseph Cheatwood**  
Southern Illinois  
University School of  
Medicine

**Amit Choudhury**  
The University of Iowa

**Eileen Chusid**  
New York College of  
Podiatric Medicine/eq

**Maria Cole**  
Kansas City University of  
Medicine & Biosciences

**Anthony DiLandro**  
New York College of  
Podiatric Medicine

**Peter Dodson**  
University of  
Pennsylvania School of  
Veterinary Medicine

**Michael Doyle**  
Iomas Research LLC

**Gregg Duester**  
Burnham Institute for  
Medical Research

**Sharif Ellozy**  
Mount Sinai School of  
Medicine

**Jill Feinstein**  
Richland Community  
College

**Greg Fitch**  
Avila University

**Corina-Daniela Frandes**  
Western University Vasile  
Goldis Arad

**Samuel Franklin**  
University of Kentucky  
College of Medicine

**Dorothy Frenz**  
Albert Einstein College  
of Medicine

**Sharon Gerecht**  
Johns Hopkins  
University

**Haviva Goldman**  
Drexel University  
College of Medicine

**Jorge Gonzalez**  
Sanford-Brown Institute

**Gary Heisermann**  
Salem State College

**Lori Hensley**  
Ouachita Baptist  
University

**Casey Holliday**  
Marshall University

**Luisa Iruela-Arispe**  
University of California,  
Los Angeles

**Steve Kasprisin**  
Joliet Junior College

**Rajiv Kumar**  
Brij Hormone Lab

**Leila Laitman**  
Visiting Nurse Service of  
New York

**Laura Leiphon**  
University of North  
Dakota

**Susan Lerner**  
Mount Sinai School of  
Medicine

**Karen Lyons**  
University of California,  
Los Angeles

**Charles Marshall**  
University of Kentucky

**Kurt McBurney**  
University of Victoria

**David Mitchell**  
SUNY Health Science  
Center

**Maria Moschella**  
New York College of  
Podiatric Medicine

**Alberto Musto**  
LSU Health Sciences  
Center

**Renu Nagpal**  
All India Institute of  
Medical Sciences

**Barbara O'Kane**  
University of Nebraska  
Medical Center

**Ganesh Pai**  
Damodar Clinic

**Virginia Pascoe**  
Mt. San Antonio College

**Alice Phillips**  
Nucleus Medical Art

**Lucky Pianwi**  
Takblossz, LLC

**Jeffrey Plochocki**  
Midwestern University

**Claire Porter**

**Hanumanth Raj**  
V.P. Chest Insitute/  
University of Delhi

**Deepthynadh  
Reghunadhan**  
American University of  
Antigua, St. Johns

**Holly Ressetar**  
West Virginia University

**April Richardson**  
University of Kentucky

**Alfred Rosenberger**  
Brooklyn College

**Frank Ruhli**  
University of Zurich

**Farid Saleh**  
Kuwait University  
Medical School

**Rama Samruddhi**

**Jean Sanger**  
SUNY Upstate Medical  
University

**Theodore Sarphie**  
LSU Health Sciences  
Center

**Jayc Sedlmayr**  
LSU Health Sciences  
Center

**Mohamad Sharawey**  
Medical College of  
Georgia

**Kedambady Shetty**  
University of West Indies

**Laurel Stone**  
Invitrogen

**Kelli Sullivan**  
University of Michigan

**Lori Summers**  
Medicine Hat College

**Donald Sussman**  
Eastern Virginia Medical  
School

**Andrea Taylor**  
Duke University School  
of Medicine

**MariaTeresa Tersigni-Tarrant**  
Philadelphia College of  
Osteopathic Medicine  
- Georgia Campus

**Daniel Topping**  
Washington State  
University

**Beth Townsend**  
Midwestern University

**Ricardo Trevino-Gonzalez**  
Tecnologico De  
Monterrey

**Thomas Van De Water**  
University of Miami  
Miller School of  
Medicine

**Wilson Veras**  
Universidad Central Del  
Caribe

**Susan Warren**  
University of Mississippi  
Medical Center

**Jacqueline Webb**  
University of Rhode  
Island

**Susanne Wish-Baratz**  
Case Western Reserve  
University

**Lawrence Witmer**  
Ohio University College  
of Osteopathic Medicine

**Donald Wong**  
Indiana University  
School of Medicine

**Heather Yule**  
University of British  
Columbia

**Evan Zamir**  
Georgia Institute of  
Technology

## NEW AAA STUDENT & POSTDOCTORAL MEMBERS (continued from page 43)

**Tamara Stock**  
University of Western  
Ontario

**Eyuel Terefe**  
University of Central  
Oklahoma

**Cassandra Uchida**  
York University

**Shahnoor Ullah**  
University of Western  
Ontario

**Marcus Van Aarsen**  
University of Western  
Ontario

**Guillaume Voghel**  
Montreal Heart Institute

**Aaron Weiss**  
Mount Sinai School of  
Medicine

**Jeffrey White**  
LSU Health Sciences  
Center - New Orleans

**Michael Woods**  
University of Western  
Ontario

**David Yang**  
Mount Sinai School of  
Medicine

**Jennifer Yang**  
California Institute of  
Technology

**Harold Yim**  
University of Western  
Ontario

**J'Nelle Young**  
University of British  
Columbia

**Derek Yuan**  
Mount Sinai School of  
Medicine

**Uriel Zapata**  
Baylor College of  
Dentistry

### Anatomy Education *continued from page 5*

awards, including AAA's Henry Gray/Lippincott Williams & Wilkins Scientific Achievement Award in 1993. This makes him the first person to receive both AAA's top education and top scientific honors.

The Henry Gray/Elsevier Distinguished Educator Award, provided by Elsevier, publisher of *Gray's Anatomy for Students*, is AAA's highest education award, recognizing excellence in human anatomy education in the anatomical sciences at the medical/dental, graduate, or undergraduate level of teaching. This year's Henry Gray/Elsevier Distinguished Educator Award Committee was chaired by Suzette Chopin; other members were Scott Lozanoff and Anna Lysakowski. ❖

*Adapted from a longer article prepared by Suzette Chopin.*

### Book Shelf *continued from page 11*

usually called the medial vestibulospinal tract or sometimes included in the medial longitudinal fasciculus. The fibers usually described as the lateral vestibulospinal tract are simply referred to as the vestibulospinal tract. Figure 11-9 illustrating the cutaneous territories of the divisions of the trigeminal nerve implies that the ophthalmic nerve innervates the skin of the lower eyelid and most of the nose and there is no description in the text to correct the impression. Figure 11-24 illustrating lesions of the optic pathways show no quadrantanopsias, nor are they described in the text. Considering the compactness of the text and these omissions, which were noted with little effort, I suggest that this volume is best suited as a review text for boards or a quick reference with caveats in the areas mentioned. ❖

*Bruce L. Manion, Ph.D.  
Professor and Chair, Department of Basic Biomedical Sciences,  
Scholl College of Podiatric Medicine  
Rosalind Franklin University of Medicine and Science*

P  
H  
O  
T  
O  
  
A  
L  
B  
U  
M



AAA Program Co-chair Lynne Opperman congratulates button winner and former Program Co-chair Emmy Gordon for her winning slogan: *Anatomy Academy: School of Fine Parts.*



Some of the more than 100 Student/Postdoc Travel Award recipients pose for a Banquet photo.



Christian Paxton explains his research to ACYA poster judges.



Young Faculty Travel Award recipients Ondrej Nanka, Yoke-Chen Chang, Linda May, Lorinda Lynn & Tamara Franz-Odendaal



Kathy Jones accepts her presidential gavel from outgoing AAA President David Burr.

## AAA's Annual Meeting Dream Team

### Annual Meeting Program Committee

Lynne Opperman & Judith Venuti, co-chairs  
 Eduard I. Dedkov \* Valerie DeLeon \* Martine Dunnwald \* Darrell Evans  
 Charles Little \* Jessica Mong \* Stephen Moorman

### Educational Affairs Committee

David Bolender, chair  
 James Augustine \* James Brokaw \* Robert DePhilip \* Camille DiLullo \* Carol A. Nichols  
 Noelle Granger \* Kirk M. McHugh \* Jennifer McBride \* Rebecca Fisher \* Robert Spears

### AAA Staff

Carlin Bokal \* Melissa Kraft \* Andrea Pendleton \* Brenda Valladares \* Rachel Yablonowitz





AAA officers and past presidents. Seated left to right: Robert Yates (1999-2001), President Elect Kathryn Jones, President David Bur & President Emeritus Kathy Svoboda. Standing left to right: Bruce Carlson (1997-1999), Donald Fischman (1993-1994), Gary Schoenwolf (1996-1997) & John Fallon (2001-2003).



A special thank-you to outgoing Board members Ann Zumwalt, Carol Gregorio & Kathy Svoboda for their years of service.



Basmajian Award winner Samuel Márquez accepts his award from Robert Hinton, who chaired the award committee. Márquez also won this year's Young Anatomist's Publication Award.



AAA Postdoctoral Fellowship recipient Maria Serrat accepts award from Paulette Bernd. Serrat's award also came with a check for \$20,000.



AAA staff: Melissa Kraft, Carlin Bokal, Rachel Yablonowitz, Andrea Pendleton & Brenda Valladares



It was a busy week at the AAA exhibit booth, including "Meet the Author" sessions, book give-aways & free tee-shirts for all current & new members.

## Gearhart Focuses on How Much We Don't Know About Stem Cells

by Gina Schatteman & Martine Dunnwald

John Gearhart, James W. Effron University Professor and director of the Institute for Regenerative Medicine at the University of Pennsylvania, delivered the 2009 keynote address at the AAA Annual Meeting, focusing on *Regenerative Medicine: Learning to Instruct Our Own Cells*.

Reviewing the current state of stem cell biology from adult to inducible pluripotent to embryonic stem cells, Gearhart pointed out that we still know relatively little about stem cells. In fact, we are in the basic science phase of trying to understand how the cells are controlled and function.

Gearhart talked about the role of stem cells in regenerative medicine and cautioned that creating differentiated cells is a far cry from generating

an organ. He also explained that, in order to use stem cells in regenerative medicine, we first must learn to expand them, find efficient ways to differentiate them, and develop methods to verify their phenotypes.

He also cautioned that, although stem cells are involved in the homeostasis of the tissue, they may not be involved in the repair or regeneration of the tissue. In most grafting experiments, very few cells integrate into recipient tissues. Instead, the cells secrete factors that recruit endogenous cells. Further, Gearhart noted that most grafting experiments have not been done under realistic conditions and many have been done with immature cells leaving large gaps in our understanding.

Do inducible pluripotent stem (iPS) cells mean the end to somatic cell nuclear transfer and embryonic stem cells (ESCs)? Perhaps, but Gearhart reminded the audience that there are many issues with iPS cells, not the least of which is the problem of viral integration and how closely iPS cells resemble ESC remains to be seen. Still, newer methods using small molecules are being developed and hold promise.

Gearhart emphasized that there is a lot of data in many species from both *in vitro* and *in vivo* studies and that findings often appear to be contradictory. Perhaps, he



John Gearhart

## X-linked Gene Affects Enteric Neural Crest Migration

by Jane Yu and Richard A. Schneider

The enteric nervous system (ENS) is an intricate autonomous network of neurons and glial cells that runs along the length of the gastrointestinal tract. Throughout the life of an individual, the ENS supports motility, secretion, and absorption within the gut. During embryogenesis, much of the ENS is derived from vagal neural crest cells, which emigrate out of the caudal hindbrain. Vagal neural crest cells migrate along the gut in a proximal to distal fashion. However, if they fail to colonize the gut all the way to the anus, intestinal swelling occurs adjacent to the region lacking enteric neurons, creating a megacolon. Megacolon manifests in humans with Hirschsprung's disease, occurs congenitally in about 1:5000 live births, and is four times more common in males than females. Yet, the precise molecular and cellular underpinnings for this devastating condition remain unclear.

In his 2009 AAA C.J. Herrick Award Lecture in Neuroanatomy entitled *Enteric Neural Crest Cell*

### Stem Cells *continued*

suggested, we need to take a step back from our drive to look for the next great discovery and begin to synthesize and make sense of existing data. For example, we have yet to understand the variability within and between stem cell populations and among different species. We do not fully understand the stem cell 'niche.' Differentiated cells are more reversible than we previously thought, but how these differentiated cells relate to stem cells and normal physiological processes is unclear. Are these cells truly plastic or merely unstable?

Gearhart also urged scientists to engage and instruct the public, giving them a more realistic sense of the promise and limitations of stem cells. He warned that we should not try to move stem cells too quickly into the clinic, noting the recent case of a boy in Russia who developed a brain tumor after stem cell therapy. Finally, he closed with a caution to the scientific community that we be more realistic ourselves and manage our own expectations.

Gina Schatteman, Ph.D.,

Dept. of Integrative Physiology, University of Iowa

Martine Dunnwald, PharmD, Ph.D.,

Dept. of Pediatrics, The University of Iowa

*Migration*, presented as part of the Young Investigator Awards Symposium at the AAA Annual Meeting/EB 2009 in New Orleans, Richard Anderson detailed with much clarity and sophisticated imaging techniques, his contributions over the past six years toward understanding the dynamics of enteric neural crest cell migration, as well as the functions of key molecules during ENS development. His work, which was conducted at the University of

Melbourne, entails a combination of *in vivo* and *in vitro* approaches most vividly illustrated through time-lapse microscopy.

In particular, Anderson has focused on cell adhesion

and guidance molecules that affect enteric neural crest cell migration, and is currently studying the role of the L1CAM gene in Hirschsprung's disease. L1CAM, which is X-linked, encodes for the transmembrane adhesion protein, L1, and has been identified as one of several susceptibility genes for Hirschsprung's. By performing a series of elegant organ culture experiments, Anderson has shown that enteric neural crest cells express L1 as they migrate through the gut. When L1 is inhibited with a blocking antibody, neural crest cell migration is severely delayed. Curiously, in L1CAM null mutant mice, despite the disruption to neural crest cell migration, the entire gut is eventually colonized. Only when the L1CAM mutation is combined with a heterozygous mutation in another Hirschsprung's susceptibility gene such as Sox10 does severe aganglionosis occur. This has led Anderson to propose that L1CAM functions as a modifier gene requiring other mutations to produce a deleterious effect.

Overall, Anderson has made valuable contributions toward understanding the etiology of gastrointestinal diseases by establishing that molecules involved in cell-cell adhesion are essential for the migration of enteric neural crest. Moreover, he has been able to demonstrate that an X-linked gene implicated in Hirschsprung's disease specifically alters the migratory ability of enteric neural crest. Thus, his work has direct clinical significance, broad relevance to developmental biology, and is highly worthy of this year's C.J. Herrick Award.



Richard Anderson

Jane Yu and Richard A. Schneider,  
University of California at San Francisco

## AAA & Guest Societies Co-sponsor Stem Cell Mini-meeting at EB

by Martine Dunnwald

Stem cells were at the forefront at the AAA Annual Meeting at EB 2009 with about 30 talks presented in the context of a Stem Cell Mini-meeting, co-sponsored by AAA and its three guest societies—ASGBI, HCS and NAVBO.

Stem cells are undifferentiated cells with two main characteristics: they need to self-renew in order to maintain the pool of stem cells constant, and they give rise to all the cells of the tissue they are coming from. The two broad types of mammalian stem cells are the embryonic stem cells, which are isolated from the inner cell mass of blastocysts, and adult stem cells that are found in adult tissues.

Nicholas Zavazava (Univ. of Iowa) chaired a session on the function and immunity of embryonic stem cell-derived hematopoietic cells. Investigators discussed the transcriptional regulation of embryonic stem cells, their development during adulthood, how they can be induced into blood cells, and their potential immunosuppressive function.

Stem cells not only maintain the homeostasis over the lifetime of an organism, but are also part of a developmental program and interact with their environment. Very elegantly, Evan Snyder (Burnham Institute for Medical Research) presented work from his laboratory using embryonic bodies (embryonic stem cells left to differentiate *in vitro*) to understand the interactions between neuronal and vascular precursors as they develop. His findings reveal that these two cell types follow each other with interesting developmental differences. As tissue repair can be viewed as reactivation of embryogenesis, it needs to happen in a coordinated fashion. This means that cells need to talk to each other and establish contact. To illustrate this important point, he showed that neuronal stem cells injected into cerebellum deficient mice did not become cerebellum cells (or Purkinje cells), but “kissed” the few remaining cells, turned on Connexin 43 and rescued the phenotype. However, when the cell-cell contacts were blocked, no rescue was observed.

Darwin Prockop (Texas A&M Health Sciences Center), one of the pioneers in mesenchymal stem cells (MSC), presented two sessions on the biology of these cells and their potential therapeutic applications. Although extensive research is currently done on these cells, scientists have much more to learn to fully characterize them, and also

continued on page 34

# Hepatic Microvascular System Significant In Health & Disease

by John F. Fallon

**R**obert S. McCuskey, professor emeritus of cell biology and anatomy, pediatrics, and physiology, emeritus department head of cell biology and anatomy (1986-2006), University of Arizona, and AAA president emeritus (2003-2005) presented the Henry Gray/Lippincott Williams and Wilkins Scientific Achievement Award Lecture on *The Hepatic Microvascular System in Health and Disease*.

McCuskey has studied the hepatic microvasculature for more than 48 years and is internationally recognized for the development and use of high resolution *in vivo* microscopic imaging of the liver and other organs in anesthetized animals to study the microcirculation in health and disease. His lecture initially reviewed the dynamic morphology of the hepatic microvascular system, which includes all vessels in the liver with a diameter less than 300  $\mu\text{m}$  and various morphological sites within these vessels that regulate the distribution of blood flow. The latter include the

various segments of the afferent portal venules and hepatic arterioles, the sinusoids, and central and hepatic venules.

Liver sinusoids are unique exchange vessels lined by fenestrated endothelial cells (SEC), which lack a basal lamina. The SEC have important endocytotic and immune functions and are a source of vasoactive mediators. Interspersed with the SEC are the phagocytic Kupffer cells (KC) that are a source of vasoactive substances, as well as mediators for host defense and hepatic injury. Completing the sinusoidal anatomy are the extraluminal stellate cells, which are contractile pericytes containing fat droplets that store Vitamin A, produce collagen when activated, and are an additional source of mediators that affect SEC and KC function, as well as the microcirculation. Stellate cells and SEC play a major role in regulating the diameters of sinusoids and the distribution of




Robert McCuskey

blood flow in individual sinusoids, lobules, or segments of lobules called hepatic microvascular subunits.

McCuskey then focused on the response of the hepatic microvascular system to toxicants including endotoxin, alcohol, acetaminophen, and pyrrolizidine alkaloids. The SEC are a sensitive and early target for hepatic injury. There are two types of responses of the hepatic microcirculation to toxicants: (1) an inflammatory response involving paracrine activation of SEC by mediators released from adjacent KC following stimulation by toxicants such as alcohol and endotoxin, leading to the upregulation of adhesion molecules and the subsequent adhesion of leukocytes to the SEC, as well as swelling of the SEC, both of which restrict sinusoidal blood flow; and (2) direct injury of the SEC by toxicants such as acetaminophen resulting in loss of the ability of these cells to endocytose ligands together with the loss of fenestrae, and formation of gaps between SEC, permitting penetration of the sinusoidal lining by blood cells into the Space of Disse. Subsequently, the sinusoid may collapse or disintegrate reducing or blocking blood flow, which concomitantly is diminished or lost. Alcoholic bingeing exacerbates this response, resulting in therapeutic doses of acetaminophen eliciting massive hepatic injury.

Taken together, these studies demonstrate that hepatic microvascular injury and dysfunction contribute to the time course, magnitude, and progression of subsequent or concomitant parenchymal injury in the liver.

John F. Fallon, Ph.D., Dept. of Anatomy, School of Medicine and Public Health, University of Wisconsin-Madison



**Eligibility**  
AAA members in the following categories may apply for the scholarship:

- Graduate students in a mentored program
- Postdoctoral fellows
- Junior faculty members up to assistant professor

**Criteria**  
The Award Committee will evaluate applications on the basis of:

- Scholarship: Degree to which the application demonstrates innovation in anatomy instruction and evaluation of anatomy curricula
- Benefits/impact of project on local, regional and national anatomy education
- Methodology: clear, feasible methods consistent with goals/objectives
- Evaluation: Plan to measure desired outcomes and project success

**Application**  
Apply online at [www.anatomy.org](http://www.anatomy.org) by October 15.

**Prize**

- \$5,000 stipend to support research
- A complimentary registration and full travel support to attend the Annual Meeting/EB

**Additional Obligations**  
The winner will be expected to:

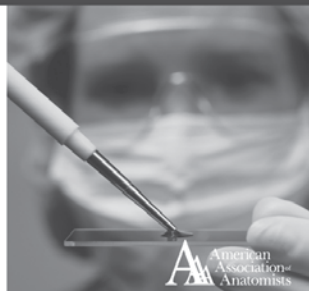
- Disseminate proven innovations in appropriate journals and/or at national or international medical education presentations
- Submit a poster or conduct an oral presentation at the AAA Annual Meeting

## Lippincott Williams & Wilkins / American Association of Anatomists Education Research Scholarship

The American Association of Anatomists and Lippincott Williams & Wilkins have joined together to recognize excellence in scholarship of upcoming generations of anatomy educators.

The LWW/AAA Education Research Scholarship competition is expected to foster innovative projects that hold promise as models for the resolution of important issues and problems in anatomical education and represent new and creative approaches to teaching and evaluating innovative anatomy curricula.

For more information visit [www.anatomy.org](http://www.anatomy.org) or email [exec@anatomy.org](mailto:exec@anatomy.org).



# Understanding Cilia Provides Insights into PKD and Blindness

by Peter Satir

A “Eureka moment” is a rare occurrence in scientific research, leading to a spurt in understanding. As described at his 2009 Bensley Award lecture, presented as part of the Young Investigator Awards Symposium at the AAA Annual Meeting/EB 2009 in New Orleans, Gregory Pazour’s “Eureka moment” came when he saw a scanning electron micrograph of kidney tubule epithelium from a Tg737 mouse developed at Oak Ridge National Laboratory as a model for autosomal recessive polycystic kidney disease.

The puzzle was that the mouse mutation was in the mammalian orthologue of a mutation in a protein, IFT88, that Pazour was studying in the green alga *Chlamydomonas*, which was essential for the generation of cilia in the alga. What Pazour saw was that the single cilia on each kidney tubule cell, easily seen in wild type mice, were very short or missing in the Tg737 mouse. At that moment, the ciliary hypothesis of polycystic kidney disease was born.

As Pazour explained, kidney cell cilia, called primary cilia, had long been known, as had similar non-motile 9+0 primary cilia on other mammalian cells, but they were often assumed to be vestigial artifacts, despite the fact that the outer segments of photoreceptors of the eye were modified primary cilia and many sensilla of invertebrates were also cilia-based.

When he saw the Tg737 cell images, Pazour and his colleagues George Witman, Douglas Cole, and Joel Rosenbaum realized that normal primary cilia must somehow prevent the development of a cystic kidney—that is, that they also were likely to function as sensory organelles. This was confirmed when it was demonstrated that the polycystins, responsible for autosomal dominant polycystic disease, normally localized primarily in the cilium. When they did not, cystic kidneys again developed.

Pazour said that another consequence of his “Eureka moment” was the realization that the process by which cilia are built, called “intraflagellar transport” or IFT, was evolutionarily conserved. In cells as divergent as *Chlamydomonas* and kidney, for both 9+2 motile cilia and primary cilia, multiple IFT proteins form complexes and move along the cilium, building it from the tip and then returning to the cell. Moreover, polycystic kidney disease is not the only pathology associated with the failure of normal IFT – cilia all over the body are affected, including the photoreceptor cilia, leading to retinal degeneration and

blindness. Primary and motile cilia malfunction has serious consequences for human health.

Pazour then discussed the mechanism by which malfunction of the kidney cell primary cilium could lead to cystic disease. He presented two hypotheses: (1) that the cilium operates as a flow sensor, whereby mechanical displacement causes  $Ca^{2+}$  to enter the cell, which in turn regulates gene expression to prevent cyst development or (2) that the cilium controls Wnt signaling pathways, which



Gregory Pazour

regulate cell proliferation and the plane of cell division, so-called planar cell polarity (PCP). With the cilium present, the Wnt pathways would be properly active so that spindle alignment would be regulated and longitudinal,

causing tubule elongation; in its absence, the division rate would increase and spindle alignment would be unregulated, even horizontal, leading to a diameter increase and cyst formation.

To test the second hypothesis, Pazour is using a Cre-lox system of tissue-specific inducible knockout of a second IFT protein, IFT20, in the collecting duct of adult mice. Knockout of IFT20 rapidly leads to cells lacking cilia and to the development of a cystic kidney. He found that the rate of cell proliferation was increased compared to controls and that there was significant randomization of the mitotic spindle. Pazour concluded that the primary cilium was involved in Wnt signaling along two branches, one a branch of the canonical pathway inhibited by the presence of the cilium, involving the destruction of  $\beta$  catenin and initiation of proliferation, and one involving the PCP pathway, which defines the spatial orientation of the spindle and cell organelles in ways still not completely understood.

Attendees of Gregory Pazour’s Bensley lecture learned that the primary cilium, far from being unimportant, is deeply embedded in signaling processes critical to human development and health.

Peter Satir, Ph.D., Dept. of Anatomy and Structural Biology,  
Albert Einstein College of Medicine

## Molecular Mechanisms Maintaining Nervous System Architecture

by Keith N. Fargo

The establishment of appropriate nervous system structure has been a major focus of developmental neurobiologists for more than a century. More recently, it has been recognized that, once established, the elaborate structure of the nervous system also needs to be maintained. Thanks to the pioneering work of Oliver Hobert, winner of AAA's 2009 H.W. Mossman Award in Developmental Biology, the processes that govern the maintenance of nervous system structure are beginning to be unraveled. Hobert discussed some of this work in his acceptance address presented as part of the Young Investigator Awards Symposium at the AAA Annual Meeting/EB 2009 in New Orleans.

Hobert performed his undergraduate work at the University of Bayreuth (Germany) and earned his Ph.D. at the Max Planck Institute for Biochemistry. He then worked as a postdoctoral researcher at Harvard Medical School/Massachusetts General Hospital and is now a Howard Hughes Medical Institute Investigator and Associate Professor of Biochemistry and Molecular Biophysics at Columbia University College of Physicians and Surgeons.

Hobert's work is aimed at explaining how organisms maintain appropriate nervous system architecture in the face of the twin challenges of growth and movement, both of which can perturb normal structure. To answer these questions, he studies the proteins that are responsible for maintaining the positions of axons and cell bodies in *C. elegans*. Hobert and colleagues have discovered a group of proteins that appear to be responsible for this maintenance.

In organisms lacking these proteins, the axons of the ventral nerve cords commonly "flip" over to the contralateral side of the body, and the cell bodies are also displaced. However, when a paralysis-inducing drug is also administered, the flips and displacements do not occur, leading Hobert to conclude that these proteins prevent disruption of nervous system architecture that can be caused by normal movement.



Oliver Hobert

## Old Techniques Bring New Understanding of Skeletal Disease

by David Burr

In the era of molecular biology and genetically-modified animals, the use of morphological techniques to elucidate key aspects of disease pathogenesis and treatment can seem like a step back into the last century. Matthew Allen dispelled this notion in the first AAA Morphological Sciences Award Lecture on *Bisphosphonates and Bone: Understanding Biological Mechanisms using Morphological Techniques*, presented as part of the Young Investigator Awards Symposium at the AAA Annual Meeting/EB 2009 in New Orleans. He elegantly demonstrated how several different morphological techniques can be used to understand the pathological progression of skeletal disease, and also to assess the potentially negative side effects of bisphosphonate treatment for osteoporosis and for cancer metastasis to bone.

Allen began by showing how en bloc staining, together with both brightfield and fluorescence microscopy, is used to assess the presence and accumulation of bone microdamage, a side effect of long-term anti-resorptive treatments for osteoporosis. Although these treatments can delay or prevent

---

### Molecular Mechanisms *continued*

In addition, these proteins are *not* expressed during initial axon patterning, and knockout animals are able to establish normal axon and cell body placement early in development. Thus, it appears that these proteins are responsible specifically for the maintenance of normal architecture rather than its establishment.

It turns out that this family of proteins is characterized by each member having two Ig domains. Because of this, Hobert initially wanted to name the group Two Ig domains. However, when he discovered that the name was already taken, Hobert—who also speaks German—decided upon the nomenclature zig proteins, for Zwei Ig domains (*zwei* is German for "two").

Some of the zig proteins have also been found in humans. They have mostly been studied in the immune system, but it is known that they are expressed in the nervous system as well. This is an exciting development that opens up a whole new vista of research into the maintenance of nervous system architecture.

Keith N. Fargo, Ph.D., Edward Hines, Jr. VA Hospital,  
Research & Development Service

bone fracture, they also prevent the repair of naturally occurring microcracks in bone, and can be associated secondarily with increased fragility of the bone tissue.

In his experiments, Allen also used fluorochromes that bind to calcium to histologically measure the changes in bone formation rates that accompany these treatments. The initial goal of his studies was to examine changes to bone tissue consequent to treatments for osteoporosis. However, because of the high doses and long treatment period, he was also able to examine bone matrix necrosis and osteocyte death that occurs following long periods of treatment.

High doses of bisphosphonates are often used in patients with multiple myeloma, breast cancer, and other forms of cancer both to prevent metastases to the skeleton and to prevent the loss of bone that accompanies these cancers.



Matthew Allen & Robert Klein, chair of the Young Investigator Awards Committee.

– such as extractions – sometimes do not heal in these patients, leaving regions of exposed bone. By modulating the intensity of the basic fuchsin stain, Allen was able to visualize areas of bony necrosis in dogs that had been treated with bisphosphonates, and distinguish them from regions of healthy bone. The boundary between healthy and necrotic bone was especially striking when he examined these stained sections using confocal microscopy. In these cases, necrotic bone did not show any of the extensive canalicular connections that would normally be observed.

In the human condition, sequestra are sometimes formed in the necrotic region. Using  $\mu$ CT based morphological methods, Allen was able to show that a sequestrum that had formed in one of the treated dogs was morphologically similar to a sequestrum that had been removed from a patient with ONJ, providing support for his canine model of ONJ. He has established that an anatomist's reliance on understanding the morphological basis of disease is critical to our understanding of its pathogenesis.

David Burr, Ph.D., Dept. of Anatomy and Cell Biology,  
Indiana University School of Medicine

## Growth Factor Control Allows ECM to Act as “Banking System”

by Rich Pierce

The elastic fibers of blood vessels, the lung, skin, and other tissues give these tissues a resiliency that is critical for their functions. First recognized as structural proteins, it is now clear that many glycoproteins present in the microfibrillar component of elastic fibers also have important roles in regulating growth factor signaling and in directing morphogenesis. By controlling the storage and release of growth factors, the elastic extracellular matrix can act as a “banking system,” selectively stimulating tissue formation or renovation.

Speakers in *The Anatomical Record*-sponsored symposium on *Elastic Fiber Molecules in Growth Factor Signaling* highlighted recent discoveries about roles of microfibrillar proteins in signaling and cellular migration important for tissue development and remodeling. These included two talks on disparate roles of different fibulins—one on fibrillin-2-controlled signaling, and one on a complementary role for MAGP1, or microfibril-associated glycoprotein 1.

Scott Argraves (Medical Univ. of South Carolina, Charleston) reported that fibulin-1 is required for proper neural crest cell migration in the developing mouse embryo. In the absence of fibulin-1, abnormalities in neural crest cell migration and survival result in defective morphogenesis of the pharyngeal glands, bones of the skull, blood vessels of the head, aortic arch arteries, and the cardiac outflow tract. These defects are attributed to aberrant Fgf8 signaling through the Map kinase pathway.

Hiromi Yanigasawa (Univ. of Texas Southwestern) generated a “knock-in” mouse with the RGD, integrin-binding site of fibulin-5 replaced by RGE. These studies demonstrated that integrin binding to fibulin-5 is not essential for elastic fiber formation, but revealed an unexpected role for fibulin-5. In the absence of fibulin-5 integrin binding, fibronectin-mediated signaling leading to generation of reactive oxygen species (ROS) and metalloproteinase activation was markedly enhanced.

Gerhard Sengle (Shriners Hospital for Children, Portland) described studies showing that fibrillin-2 (FBN2) controls the amount of sequestered versus active bone morphogenetic protein (BMP) available to differentiating muscle. In FBN2-null mice there is delayed skeletal muscle differentiation that leads to forelimb contractures. *In vitro* studies of skeletal muscle differentiation confirm that FBN2 controls whether BMP is sequestered or released into the medium.

continued on page 34

## Cardiovascular System and Aging: New Clues to an Old Puzzle

by Eduard I. Dedkov

Advanced age is linked with an increased incidence of cardiovascular diseases, which are the leading causes of disability and mortality in industrialized countries. Since the world population is progressively aging, the cardiovascular disease epidemic is only expected to worsen in the coming years. To address this problem, a considerable number of past and present studies have focused on prevention and treatment of age-related diseases. Unfortunately, to date, little attention has been devoted to a better understanding of age-associated changes in organ structure and function. However, it has become increasingly evident that until we acquire a comprehensive understanding of why age by itself is a potent risk factor for cardiovascular diseases, we will not be successful in fighting these diseases.

Speakers at the Ellison Medical Foundation-supported symposium on *Cardiovascular System & Aging* highlighted the existence of intimate links between the age-associated alterations in the cardiovascular system and the increased risk of cardiovascular diseases with advanced age.

Hui-Ying Lim (Burnham Institute for Medical Research) described her experiments that used *Drosophila* easily-shocked (eas) mutants to study the role of phosphatidylethanolamine (PE) homeostasis in cardiac functional aging. She demonstrated that a defect in PE homeostasis of eas mutants leads to excessive activity of the sterol regulatory element binding protein pathway, resulting in prolonged induction of the downstream lipid synthesis genes. The increased production and accumulation of lipids in cardiac myocytes created a state of lipotoxicity that could accelerate the aging process of the heart and cause the age-dependent decline in cardiac function.

Douglas Seals (Univ. of Colorado) outlined his laboratory's work demonstrating that vascular aging leads to an impairment in endothelium-dependent dilation via an oxidative stress-associated reduction in nitric oxide bioavailability and the development of vascular inflammation. He particularly emphasized that habitual physical exercise can reduce age-associated oxidative stress and, thereby, restore compromised vascular endothelial function in older individuals.

Marcello Rota (Harvard Medical School) summarized his studies on aging of cardiac progenitor cells (CPC) demonstrating that the IGF-1 (insulin growth factor)/IGF-1-receptor and the HGF (hepatocyte growth factor)/c-met

## More is Not Always Better In Fibroblast Growth Factor Signaling

by Christian N. Paxton

Suzi Mansour (Univ. of Utah) began the *Developmental Dynamics - sponsored session on FGF Signaling in Development, Disease & Repair* with an overview of FGF-signaling, pointing out the importance of dose-sensitivity to FGF throughout development. She then proceeded with her presentation on early inner ear development and her work to define FGF-signaling in otic induction.

Using conditional double knock-out models, Mansour has teased out the tissue specific sources of *Fgfs* 3, 8, and 10 in the mouse. Microarray studies comparing cranial ectoderm from double knock-outs with control tissue at the stage of otic induction have identified potential downstream targets of FGF-signaling that may play a role in induction

---

### Cardiovascular System *continued*

systems—which both promote proliferation, survival, and migration—are down-regulated in CPCs from old animals, whereas the angiotensin II/AT1-receptor system—involved in cellular senescence, growth arrest, and apoptotic cell death—is up-regulated in these cells. Importantly, he was able to demonstrate that treatment of old hearts with IGF-1 and HGF promoted growth and migration of CPCs to the region of myocardial damage, partly restoring cardiac function and improving survival.

In the final talk of the symposium, Mingyi Wang (National Institute on Aging) described his work on the effect of aging on arterial wall restructuring. He demonstrated that increased angiotensin II signaling cascade within the arterial wall, involving the up-regulation of monocyte chemoattractant protein-1, matrix metalloproteinase type II, calpain-1, and transforming growth factor *beta*-1, plays an essential role in central arterial aging.

Taken together, these talks provided a new insight into the research studies committed to unravel the specific mechanisms that underlie the links between cardiac and vascular age-associated alterations and an increased risk of cardiovascular diseases with aging.

Eduard I. Dedkov, M.D., Ph.D.,  
Department of Biomedical Sciences,  
New York College of Osteopathic Medicine / NYIT



of the inner ear. Mansour found a number of the genes in the arrays with defined roles in later stages of otogenesis and it will be interesting to see if they are required for the earlier inductive process, as well.

Xin Sun (Univ. of Wisconsin) discussed the role of FGF signaling controlling limb bud size. Her presentation focused on a *Shh-Grem1-Fgf4/8* feedback loop. Prolonged expression of any of these genes results in increased limb bud size, so signal termination is critical for proper limb bud formation. In dissecting out this regulatory system, Sun found that in addition to a positive feedback loop from *Shh* to *Grem1* to *Fgf4* and back to *Shh*, *Grem1* is also upstream of *Fgf8*, which negatively regulates *Grem1*.

Sun has proposed a model for limb outgrowth. At first, low concentrations of FGFs act through the *Shh* positive feedback loop to activate *Grem1* expression and outgrowth of the limb bud. As GREM1 accumulates and stimulates *Fgf* expression, the increased concentrations of FGF8 act in the negative feedback loop to inhibit *Grem1*, resulting in the subsequent termination of limb bud development.

Xin Zhang (Indiana Univ.) addressed downstream FGF-signaling in *Drosophila* eye formation: specifically the role of *Shp2* in FGF-induced retinal development. Using conditional retinal knock-outs of *Shp2*, Zhang demonstrated that timing of *Shp2* expression is critical in retinal formation. Early depletion of *Shp2* led to defective retinal development, whereas the retina was unaffected by late depletion. Zhang concluded that *Shp2* therefore played an important role in retinal progenitor cell fate, but is not required for terminal retinal differentiation. Since *Shp2* is an important member of the MAP kinase pathway, Zhang demonstrated that activation of the pathway, via over-expression of RAS, could rescue *Shp2* mutants.

Mohammed Hajihosseini (Univ. of East Anglia) focused on the roles of FGF receptors in cranial suture development. Hajihosseini discussed an *Fgfr1* mutation that results in a “sticky” receptor that prolongs ligand-receptor interaction, causing Pfeiffer Syndrome. He pointed out that increased copies of the mutation exacerbate the phenotype, indicating an FGF dose-response in suture formation. Switching to a mouse model of Apert syndrome, in which knock-out of *Fgfr2-IIIc* leads to inappropriate production of mesenchymal *Fgfr2-IIIb*, Hajihosseini presented some fascinating experiments demonstrating that a reduction of *Fgf10* could rescue the craniosynostosis phenotypes of the Apert model. Surprisingly, he also found that reduction of *Fgf10* in the Apert background caused cleft palate and blind colon. This result again demonstrates the importance of appropriate FGF concentrations during development.

*Christian N. Paxton, MS, Ph.D.*

*Dept. of Neurobiology and Anatomy, University of Utah*

## Imaging Technology Sheds New Light on Old Anatomy

*by Kathleen Muldoon*

Recent advances in imaging technology have allowed researchers to look at anatomical structure and function in new and exciting ways. At this year’s annual meeting, AAA’s Advisory Committee for Young Anatomists (ACYA) co-sponsored a symposium on *New Perspectives on Old Anatomy*, with the aim of providing an overview of these methods and their potential use.

Jonathan Wisco (UCLA) opened the symposium with an overview of the methodological basics of diffusion tensor imaging (DTI), a radiographic method for assessing and quantifying white matter fiber tract integrity in the human brain. He emphasized that anatomists play an important role in providing expert validation of DTI methodology in its clinical applications, such as in studies of normal aging and Alzheimer’s disease.

Kevin Bickart (Boston Univ.) and colleagues used functional magnetic resonance imaging (fMRI) to identify brain regions that mediate the effect of perceived control on emotional experience. In their study, participants were exposed to negative stimuli in the form of frightening pictures. Participants who believed they controlled the duration of their exposure to the images showed decreased functional activity in the emotional centers (amygdalae), but increased activity in the dorsal cingulofrontal brain network. These findings suggest cognitive control of emotional response, and have broader implications for the functional basis and treatment of traumatic disorders, including post-traumatic stress disorder.

Valerie DeLeon (Johns Hopkins Univ.) and colleagues used microCT imaging in a novel method to visualize developing cranial primordia. In applying this technique to mouse models affected with premature fusion of multiple cranial sutures, they demonstrated that facial dysmorphology arises prior to any bony fusion of the sutures. Using this new imaging technique to better understand the mechanisms of malformation will lead to improved clinical treatment of craniofacial disorders, including Crouzon syndrome.

Baljit Singh (Univ. of Saskatchewan) closed the symposium with a discussion of recent advances in the imaging of the lung. Because of its complex cellular, gross morphologic, and physiological architecture, lung tissue has been notoriously difficult to image. Advanced techniques in ultrastructural and intravital imaging systems have

*continued on page 36*

# Anatomical Education: Teach What's Useful, Not Just What's Correct

by Richard Drake

**D**uane Haines, Professor and Chair of Anatomy, University of Mississippi Medical Center, presented the Henry Gray/Elsevier Distinguished Educator Award Plenary Lecture on *The Changing Landscape of Anatomical Education: One Opinion on How We Might Increase the Value of Our Stock*. He stressed the importance of teaching students useful information, not just correct information.

Haines began with a story to illustrate that learning anatomy is important in the context of its future use.

Years ago, Orlando Andy, former neurosurgery chair at the University of Mississippi Medical Center, asked him: "What is A1?" As it turned out, Haines was unfamiliar with the term and proceeded to explore its meaning. What he discovered was that this term was descriptive of a portion of the anterior cerebral artery and was commonly used in the clinics, as were other similar designations. This simple point made him realize that neuroanatomy/neuroscience should be taught in a format that is useful in, relevant to, and integrated with the clinical experience.



Duane Haines

Haines suggested several questions to answer before developing instructional goals:

- Is the information correct and useful?
- Is the information at the appropriate level?
- Is the information relevant to present and future needs (both immediate and long term)?
- Is the information in a context that is interesting to the recipient?

He maintained that the point-of-view that "I am not a clinician, why should I be expected to teach clinical information?" is not appropriate and that, as anatomists, we should use clinical terms and concepts to their full benefit and impact, teach in a format that resembles clinical reality, and stress relevance.

Using a variety of examples, Haines emphasized that anatomy educators should present sections of the brain in the same orientation as a clinician would view corresponding CT or MRI images. In this way, we are not

only presenting correct information, but also presenting it in a format that will benefit the student in their future studies in the field of medicine.

When one takes this approach, Haines noted, students have a sense of preparedness and are more self-confident when they enter the clinics, faculty interacting with the students during 3<sup>rd</sup> year clinical rotations feel the students are more adequately prepared, and anatomy faculty find that the students are more engaged in their learning.

*Richard Drake, Ph.D., Director of Anatomy,  
Cleveland Clinic Lerner College of Medicine*

## Growth Factors *continued from page 31*

In the final talk of the symposium, the author, an *Anatomical Record* Associate Editor, described binding of BMPs and members of the TGF-*beta* family of growth factors by MAGP1. MAGP1-null mice have phenotypes that contrast sharply with fibrillin-null "Marfan's syndrome" mice. MAGP may antagonize or balance the signaling roles of fibrillins 1 and 2 in elastic fiber tissues by competing for binding of TGF-*beta* and BMP family growth factors to the microfibrillar network.

Collectively, these talks highlighted the complex and often complementary roles of elastic fiber components in regulating the storage, activation, and release of growth factors during tissue development and remodeling.

*Rich Pierce, Ph.D., Department of Internal Medicine,  
Washington University*

## Stem Cell Mini-meeting *continued from page 27*

to come to an agreement on the definition of the MSC population. This is critical when these cells are used *in vivo*. Indeed, their successful use in animal models is hard to understand, in part because the cells are too heterogeneous.

Are stem cells really necessary to provide efficient repair? Work done with keratinocytes presented by Elizabeth James (Univ. of Brighton) clearly demonstrated that a mixture of epidermal cells could save the life of burn patients with no need to particularly isolate the stem cells.

So, are stem cells the key to regenerative medicine? They are part of the story, but not the entire story.

*Martine Dunnwald, PharmD, Ph.D.,  
Dept. of Pediatrics, The University of Iowa*

## Anatomy Master Class: Lowdown on the Lower Respiratory System

by David Bolender

**H**ealthy cells depend on adequate exchange of vital gases, and the components of the lower respiratory system, the larynx, the trachea, and the lungs are important links in the pathway mediating gas exchange.

Michael Benjamin (Cardiff Univ., Wales) opened our 2009 Master Class by reviewing the histology of the lower respiratory organs. Throughout his review, he described teaching strategies he uses when presenting this material to first and second year medical students. Benjamin advised that the inclusion of clinical and functional examples in lecture enhances the relevance of the material to clinical medicine and that the laboratory experience be designed to support the key points addressed in the lectures. He also gave several examples of Web-based exercises that reinforce what is discussed in class.

After giving an overview of lung development, Tim LeCras (Cincinnati Children's Hospital) emphasized that in humans and rodents, alveolar formation occurs predominantly after birth by a process called alveolarization. Interference with this process can result in long-term health problems such as asthma and chronic obstructive pulmonary disease. Lung remodeling seems to play an important role in these conditions. LeCras described work from his lab showing that elevated EGFR signaling in the lungs of a transgenic mouse model can disrupt lung morphogenesis leading to fibrosis and remodeling. The results are affected by the developmental stage and availability or duration of gene expression. The studies have led to formation of a model for the role of EGF signaling in lung remodeling.

Alan Jobe (Cincinnati Children's Hospital) explained the effects of prematurity on alveolarization. Unfortunately, the current clinical interventions used with these infants interfere with lung development. Fibrosis again appears to be the primary agent that alters lung development and repair resulting in chronic bronchopulmonary dysplasia. Jobe also commented on data from rodent models that suggest that, contrary to current thinking, new alveoli can form in adult lungs. If fibrosis can be inhibited, injury resulting in emphysema or from acute respiratory distress syndrome can be resolved.

The session ended with an overview of the anatomy of these organs by John Morris (Oxford Univ.). Morris also placed his discussion in the context of good teaching

*continued on next page*

## Where's the Border? Limbic System Anatomy & Function

by Jennifer McBride

**“L**imbic” from the Latin *limbus* meaning a “border” or “belt” is a radically simplified name for an immensely complex system of neuroanatomical structures. In this year's Refresher Course, speakers discussed the intricacies of this system from an anatomical and historical perspective, emphasizing its clinical relevance in several common neuropsychiatric disorders and illustrating a modeling system used to aid in understanding how the underlying structures are interconnected.

James Walker (Purdue Univ.) began with a presentation on the anatomical structures and pathways traditionally included in the limbic system. As he cited several textbooks, reference books, and primary literature, it quickly became apparent why the limbic system remains anomalous in the eyes of our students! No two sources seem to agree on which structures to include in the system, if such a system even exists. After a collective review of these resources, Walker presented a synopsis of commonly included structures, pathways, and anatomical terms used to describe the limbic system.

James Culberson (West Virginia Univ. Health Sciences Center) followed with an historical account of how all this confusion developed and offered suggestions for classroom instruction. With contributions from Hippocrates, Darwin, Broca, and MacLean, the definition, anatomical landmarks, and function of the limbic system progressively developed into a multifaceted system. While disentangling this system was overwhelming, the significance of its function continued to be apparent in clinical practice and experimental lesioning studies. Culberson suggested that in order to condense this information into a meaningful learning experience for students, instructors need to have a comprehensive understanding of their curriculum, student audience, and the timeframe in which they have to teach.

With his medical student audience in mind, John Greene (Univ. College Cork) described a neuroanatomy modeling system he developed that allows students to visualize nuclear and cortical structures of the limbic system and other regions of the brain. In this model, serial sections of the nervous system are represented on plastic plates that can be stacked and manipulated by the students. In addition to seeing the three-dimensional representation of limbic structures, students are also able to physically build the pathways associated with the limbic system using wires and plastic pieces (nuclei).

*continued on next page*

**Master Class** *continued from previous page*

principles. He tries always to begin with function, then emphasizes those aspects of structure necessary to explain the mechanisms involved. In addition, he recommends, teaching of structure must anticipate how students will see the anatomy in clinical practice. This is often accomplished by linking the gross anatomy with dynamic medical imaging techniques or living anatomy. Morris advocates delivering the relevant anatomy in a multi-stage approach—what is needed and when it is needed—starting in year one and continuing through the course and into postgraduate continuing medical education.

This session was co-sponsored by AAA and the Anatomical Society of Great Britain and Ireland, with financial support from *The Anatomical Record*.

*David Bolender, Ph.D., Medical College of Wisconsin*

**Limbic System** *continued from previous page*

Jayaraman Rao (Ochsner Foundation Clinic) closed the session with a look at three major neuropsychiatric disorders that are associated with damage to limbic system structures. During his clinical case discussions of patients with amnesia, suicidal depression, and obsessive compulsive disorder, Jayaraman highlighted several advances in imaging technology that has allowed for better discrimination of neuroanatomical structures and/or lesions of these structures. The enhanced visualization offered by these technological innovations has introduced and improved treatment regimens available to patients, such as deep brain stimulation (DBS).

*Jennifer McBride, Ph.D.  
Cleveland Clinic Lerner College of Medicine*

**Imaging** *continued from page 33*

provided ways to quantify changes in the living lung, with applications to the diagnosis of pulmonary disease.

The symposium wrapped up with a discussion of the light shed on “old” anatomy by new imaging modalities. These techniques allow anatomists to ask questions previously unanswerable by traditional methods and provide direct applications in clinical settings. Audience participants left this forum with exciting new ways to look at old anatomy!

*Kathleen Muldoon, Ph.D.  
Department of Anatomy, Dartmouth Medical School,  
Department of Anthropology, Dartmouth College*

# Anatomy Education: A New Look for An Old Friend

*by Richard Drake*

AAA's 2009 Education Plenary symposium provided attendees with an opportunity to hear about different approaches used to teach anatomy in a world of changing curriculums. Three presenters, Richard Drake (Cleveland Clinic Lerner College of Medicine of CWRU), Darrell Evans (Brighton and Sussex Medical School), and Jeffrey Laitman (Mount Sinai School of Medicine), discussed their experiences with curricular change.

In the first presentation, *We Can't Teach Everything: Less Can Be More*, Drake suggested that curriculum reform should be viewed as an opportunity, not a curse. During this process, a course director can ask some key questions to evaluate the approach and make modifications that better fit the educational philosophy/curricular design at their institution. Such questions might include: Are lectures still the best approach? Can we modify the laboratory to make it more efficient? Is it possible to get time in later years to reinforce anatomy? What level of anatomy understanding does a medical student need to be adequately prepared for 3<sup>rd</sup> year clinical rotations? Drake reviewed the modifications they have made in anatomy education to fit the unique curriculum at his institution.

In his presentation *Anatomy Leading the Competition – Variety is the Spice of Life*, Evans discussed how establishing Brighton and Sussex Medical School provided an excellent opportunity to revisit the way anatomy is taught. His program features system-based modules in the first two years, with anatomy integrated into clinical practice modules that run simultaneously. Students work in teams performing dissections with faculty guidance and innovative dissecting guides. Additionally, faculty have designed more useful presentation slides for lectures and use ‘home-made’ models, street theatre, and audience response systems to provide students with an interactive learning environment.

New communication activities have been introduced in the curriculum in which students write lay statements, design patient-focused information leaflets, and give mock-media interviews to enhance their skills. Students also return to anatomy in later years during specialist rotations. Evans noted that student feedback and performance has shown this varied approach to anatomy is providing an effective experience for their students.

In *Dancing with the Devil? Teaming with Deans to take Anatomy to a Bold New Future*, Laitman discussed his

*continued on next page*

# Education Workshop: A “Fresh” Approach To Teaching Anatomy

by H. Wayne Lambert & Noelle A. Granger

A medical school must train not only its medical students, but also its residents and physicians, via life-long learning practices. The symposium *Using Fresh Tissue to Teach Anatomy* demonstrated how several schools are using fresh tissue to teach clinically-oriented anatomy, basic and advanced surgical skills, and new or complicated surgical procedures to achieve this goal.

Robert Acland, director of the University of Louisville Fresh Tissue Laboratory, compared the different methods of preserving fresh cadaveric tissue and discussed how light embalming maximizes the use of bodies for the relearning of anatomy with fresh tissue, for rehearsing the use of new surgical tools or techniques, and for anatomical research. This facility has produced many top level research papers and enabled Acland to produce his acclaimed *DVD Atlas of Human Anatomy* series.

Terry Regnier, director of Anatomical Services at the Mayo Clinic, described the logistics of setting up an effective fresh tissue dissection facility. He stressed flexibility in the initial setup, highlighting the installation

of equipment on wheels and appropriate adapters for any surgical instrumentation, to increase the laboratory's use and adaptability. Regnier also discussed meeting state regulations for procurement, preservation, storage, and disposal of specimens. At Mayo, cadavers are frozen, rather than lightly embalmed, and then sectioned. Only the body part or tissue of interest is thawed, in a gradual process. Because of increased interest in fresh tissue use at Mayo, they had to double their freezer capacity.

James Johnson explained that Wake Forest University School of Medicine abandoned a traditional medical gross anatomy course in 2003 and established an Anatomical Resource Clinical Training Center (ARCTC), a multidisciplinary laboratory learning environment. Within the ARCTC, medical students receive both CT and MRI data from the cadaver they dissect and have access to a Surgical Anatomy Virtual Operating Room. Fresh tissue has energized the use of these facilities, and many practicing physicians enter the training center to teach medical students and enhance their own clinical skills. Johnson estimated that active participants in the ARCTC are now 80% clinical faculty, compared to only 5% previously.

Richard Whitworth described the Center for Advanced Practice at the Louisiana State University Health Sciences Center. This 10,000-square feet facility has many amenities, including simulation classrooms and an operating room, 17 laparoscopy stations, and 32 demonstration stations for fresh tissue dissections. Even with these state-of-the-art facilities, Whitworth emphasized that schools must run an effective body donor program and manage increased pathogen risk through testing specimens for HIV and hepatitis.

Fresh tissue laboratories benefit medical education, patient care, and research. In return, speakers reported increased funding for clinical research and improved recruitment of medical students, residents, and faculty. This symposium, supported by AAA and the American Association of Clinical Anatomists, may stimulate other schools to seek a fresh approach to the life-long learning of anatomy.

*H. Wayne Lambert, Ph.D., Dept. of Neurobiology  
and Anatomy, West Virginia University  
Noelle A. Granger, Ph.D., Dept. of Cell and  
Developmental Biology, UNC-Chapel Hill*

---

## Anatomy Education *continued from previous page*

school's new approach to anatomy education that teams anatomists with surgeons, radiologists, and deans in an integrated approach to learning. They not only emphasize anatomical concepts and facts, but also stress principles of professional behavior, integrity, communication skills, and functioning as a member of a team.

One exciting innovation is a unique approach to laboratory practicals. Mount Sinai has introduced table conferences (announced the day they occur) in which each member of the group receives the same grade. Additional assessments introduced into the course include exams taken on- or off-site in an online format under an honor code system and individual assessments in the areas of knowledge and preparation, dissection involvement, and team work. Laitman concluded with a suggestion that curriculum revision and reform should not be done in a silo. It's important to bring everyone to the table, he emphasized.

*Richard Drake, Ph.D.,  
Cleveland Clinic Lerner College of Medicine*

## Innovations I: Looking at New Ways To Learn Anatomy

by Carol Nichols

Each year, the AAA Annual Meeting at EB features two teaching innovations sessions. The first at EB 2009 featured speakers from nine different institutions who presented their work on a range of educational topics related to anatomy education and assessment.

Rebecca Luffler (Boston Univ.), the 2008 Lippincott Williams Wilkins/AAA Education Research Scholarship winner, opened the session with a presentation of her work looking at the efficacy of incorporating cadaver CTs in learning spatial relationships in anatomy. Visual spatial ability was assessed using a mental rotations test (MRT) that was given at the beginning and end of the course.

Lloyd Sherman (Mt. Sinai School of Medicine) and Samuel Márquez (SUNY Downstate Medical Center) discussed dyad pedagogy as a learning method in the gross anatomy laboratory. Students were randomly assigned to dyads and completed a series of learning activities. Each student in a dyad earned the same grade on the activities. Students learned creative problem solving, collaboration, and communication skills with this method.

Lawrence Rizzolo (Yale Univ.) presented data related to the educational benefits of shortened case-based anatomy courses for medical and physician associate students. These short courses use clinical cases to teach functional anatomy. Long-term recall of anatomy was improved in both groups of students who took these courses compared to those who took classically taught anatomy courses.

Patrick Gannon (Touro Univ. College of Medicine) gave a thought provoking talk about moving beyond “cadaver as first patient” as a means to help assuage the anxiety that may come when students are exposed to their cadaver for the first time. He suggested having students become familiar with surface anatomy and phenomena using themselves, their peers, and simulation models prior to their first exposure to cadavers.

Geoffrey Guttman (The Commonwealth Medical College) and Cristian Stefan (Touro Univ. College of Medicine) spoke about the unique opportunities and challenges associated with designing and implementing clinically relevant, learner-centered neuroscience curricula in new medical schools. They stressed the importance of integration through the curriculum continuum.

Diana Rhodes (Kirkville College of Osteopathic Medicine) presented data from her study evaluating the benefits of introducing evidence-based medicine group exercises to students taking medical gross anatomy. The

## Innovations II: Digital Technology in Anatomical Education

by James J. Brokaw

The second 2009 AAA teaching innovations session focused on the use of digital technology in anatomical education, and included eight speakers who employ novel computer simulations in the classroom. In an era of decreasing lecture/lab time, and increased reliance on student self-study, these simulations can supplement the more traditional educational methods to enhance learning outcomes.

Yang Ding, the first of six speakers from the University of Western Ontario (UWO), described a virtual reality technology (realXtend software) that enables students (as avatars) to freely interact with anatomical structures in a 3D world.

Valerie O’Loughlin (Indiana Univ.) related her experiences using virtual microscopy in an undergraduate human anatomy course. She found that students who used the computer-based system performed better on lab exams than students from previous semesters who used optical microscopes. Student satisfaction also increased.

Robin Hopkins (UWO) presented data about the effectiveness of a 3D stereoscopic model of the head and

*continued on next page*

---

### Innovations I *continued*

exercises increased student discussions related to clinical abnormalities seen in their cadavers and had a positive effect on student views of the importance of anatomy to clinical medicine.

Gabrielle Finn (Durham Univ.) spoke about body painting as a novel and fun way to learn anatomy. Students who participated in body painting exercises also learned surface anatomy, body awareness, and empathy for undressing and being examined. The use of bold paint colors assisted in anatomy recall as well.

Finally, Ramon Brown (Morehouse School of Medicine) demonstrated an innovative, interactive electronic program to help students learn cross sectional anatomy. The program, developed with Lawrence Wineski and others, offers a flexible, self-directed learning tool that allows students to study and quiz themselves using both cross sections and comparable radiographic images.

*Carol Nichols, Ph.D., Dept. of Cellular Biology  
and Anatomy, Medical College of Georgia*

Innovations II *continued from previous page*

neck. Students were randomized into three groups to learn the muscles of mastication: those using a gross dissection alone, those using the 3D model alone, and those using both learning aids. Interestingly, the students performed equally well on a multiple-choice test, regardless of how they learned the material.

Michael Midgley (UWO) continued with the 3D modeling theme and presented a comparison between two different segmentation and rendering software packages: Amira and OsiriX. Models of the upper limb were created from cryosection images obtained from the Visible Human Project (Amira) or from cross-sectional CT and MRI scans (OsiriX). Both programs yielded highly detailed 3D models that can be manipulated in virtual space.

Harold Yim (Univ. of Western Ontario) demonstrated how adding another dimension (time) to a 3D model of the heart produced an anatomically correct 4D model that rhythmically contracts with time. This interactive model allows the addition/removal of different anatomical parts and alterations in model opacity to view inner chambers.

Aimee Sergovich (UWO) showed how the complexity of the female pelvis and its contents were rendered into a 3D stereoscopic model from cryosection images obtained from the Visible Human Project. The model can be manipulated in virtual space and anatomical parts added/deleted to reveal relationships.

The final UWO presenter was Christina Lew, who showed a 3D stereoscopic model of the cerebral ventricular system derived from MRI scans. The model can be manipulated by adding/deleting components and by taking slices to reveal inner structures. Video animation can be used to visualize CSF flow through the system.

Jiri Brabec (Charles Univ.) wound up the session with a demonstration of a multimedia program for learning the CNS pathways, which incorporates images, videos, animations, and quizzes.

Many of these presentations will soon be available as part of AAA's Education & Teaching Tools Web site at <[www.anatomy.org](http://www.anatomy.org)>.

*James J. Brokaw, Ph.D., M.P.H., Dept. of Anatomy and Cell Biology, Indiana University School of Medicine*

## Cinema in Classroom Facilitates Learning About Disease, Ethics

*by R. Ranney Mize*

**A**n AAA education symposium on the *Use of Cinema in the Classroom* focused on how Hollywood movies teach students, faculty, and the general public about a variety of issues facing the professions of medicine and biomedical science, including knowledge about specific diseases and issues related to graduate and post-doctorate training and scientific ethics.

Bruce Fuchs, NIH Director of Science Education, described the NIH Science in the Cinema series, an educational summer film festival designed to better inform the public about science and illness. The program, now in its 16<sup>th</sup> year, has screened full versions of movies such as *Miss Ever's Boys* to dramatize the ethics of syphilis research and *Panic in the Streets* to illustrate the response to a potential epidemic of bubonic plague. A guest medical expert discusses the scientific implications of the films after they are screened. Fuchs showed data indicating the popularity of the program.

Beth Fischer (Univ. of Pittsburgh Survival Skills and Ethics Program) then presented methods that program uses to train students in effective teaching and interviewing

techniques using movie clips. Highlights included a clip from *The Mirror Has Two Faces* about effective methods of teaching and a segment from *Erin Brockovitch* illustrating what *not* to do in a job interview.

Using several segments from the movie *And the Band Played On*, Michael Zigmond (Univ. of Pittsburgh, Dept. of Neurology) stimulated an interactive discussion with the audience about scientific ethics by using film clips related to the AIDS epidemic. One showed a confrontational governmental meeting held in an attempt to restrict distribution of potentially contaminated blood, illustrating why the meeting failed to result in a solution. Other segments showed the fierce and sometimes unethical competition between American and French scientists racing to identify the virus causing the disease.

The author discussed the use of movies to demonstrate brain diseases to medical and allied health students, including the films *Hilary and Jackie* (multiple sclerosis), *Coming Home* (paralysis), *Iris* (Alzheimer's), and *Sylvia* (depression). He emphasized the value of using commercial films to convey the impact of specific diseases upon the patient, family, and society. Film clips effectively dramatized symptoms of both paralysis and MS.

*R. Ranney Mize, Ph.D., Julius H. Mullins Professor and Director of Graduate Studies, Dept. of Cell Biology and Anatomy; Professor, Neuroscience Center of Excellence, Louisiana State University Health Sciences Center*

## Student, Postdoc Entries Once Again Make Things Tough for ACYA Judges

AA's Advisory Committee for Young Anatomists (ACYA) had to hustle this year as they judged an ever growing group of student and postdoctoral platform and poster entries to decide on this year's award winners.

ACYA judges were Chandrashekar Charavaryamath, Anna Cunningham, Valerie DeLeon, Christine Eckel, Kenneth "Bo" Foreman, Lorinda Lynn, Linda May, Kathleen Muldoon, Jason Organ, Barb Puder, and Brent Thompson. ACYA Chair Jason Organ presented the awards. Details on next year's student/postdoctoral award nomination process will appear in the September *AAA Newsletter*, on AnatomyLink ([www.anatomy.org](http://www.anatomy.org)), and in the online *EB 2010 Call for Abstracts*.

### Langman Graduate Student Platform Presentation Award



Jason Organ with Langman runner-up & winner, Rebecca Lufler & Jeffrey White.

Finalists selected from among those graduate or medical/dental/vet students submitting Annual Meeting abstracts were judged at a special platform

session. The winner receives a \$500 prize; two runners-up receive \$150 each.

- **Jeffrey White**, winner (Louisiana State Univ. Health Sciences Center) – "Wilms Tumor 1 (WT1) and Foxc2 are Required for Podocyte Development in *Xenopus*"
- **Christopher Camp**, runner-up (Mayo Medical School, College of Medicine) – "Comparative Efficacy of Group

versus Individual Feedback Regarding Medical Student Professionalism in Gross Anatomy"

- **Rebecca Lufler**, runner-up (Boston Univ. School of Medicine) – "Incorporating Radiology into Medical Gross Anatomy: A Study of its Efficacy in Learning Spatial Relationships"

### AAA Postdoctoral Fellow Slide Presentation Award



Gabrielle Curinga, Jaime Sanchez & Josette Broiles

Finalists selected from among those postdoctoral fellows or medical residents/interns submitting Annual Meeting abstracts were judged at a special platform session. The winner receives a \$500 prize; two runners-up receive \$150 each.

- **Gabrielle Curinga**, winner (Univ. of Kentucky) – "Chase-ing Regeneration: Engineering Chondroitinase for Mammalian Expression"
- **Josette Broiles**, runner-up (Univ. of Oklahoma - Health Sciences Center) – "Mechanoregulated Expression of Smooth Muscle Alpha-actin in Myofibroblasts is Mediated by Actin Dynamics and Myocardin Related Transcription Factor-A Localization"
- **Jaime Sanchez**, runner-up (Univ. of South Florida) – "Surgical Anatomy of the Male Pelvis: A 3D Model Based on the Visible Human Project®"

### Postdoctoral Fellow Poster Presentation Award

The postdoctoral fellow or medical resident/intern winning this award receives a \$400 prize.

- **James Windelborn** (Univ. of Wisconsin) – "Growth Factor and Cytokine Regulation in Ventral Cervical Spinal Cord Following C2 Hemisection in Rats"

## STUDENT/POSTDOC TRAVEL AWARD WINNERS • STUDENT/POSTDOC TRAVEL AWARD WINNERS

Congratulations to our Student/Postdoc Travel Award winners. These travel grants are given to student/postdoctoral members presenting a paper or poster at the AAA Annual Meeting. Go to [www.anatomy.org](http://www.anatomy.org) for details on how to apply for EB 2010 Travel Awards of \$350 for renewing members and \$250 for new members.

**Anastasiia Aleksandrova** (Univ. of Kansas Medical Center) **Cara Alexander** (Mayo Clinic College of Medicine) **Capri Andrews** (Univ. of Central Oklahoma) **Stavros Atsas** (Univ. of Louisville) **Tiffany Aversa** (PCOM) **Taylor Behrns** (Loyola Univ.) **Michael Beckman** (SUNY Downstate College of Medicine) **Sarah Beech** (The Univ. of Western

Ontario) **Katie Billard** (The Univ. of Western Ontario) **Jiri Brabec** (First Faculty of Medicine) **JoSette Broiles** (OU-Health Sciences Center) **Christopher Camp** (Mayo Clinic College of Medicine) **Burcu Carlon** (Northern Illinois Univ.) **Wanakee Carr** (Univ. of Iowa) **Daniel Charubumi** (SUNY Downstate Medical Center) **Laura Chen**

(Mayo Clinic College of Medicine) **Robstein Chidavaenzi** (Univ. of Illinois at Chicago) **Madeleine Chollet** (Johns Hopkins School of Medicine) **Jonathan Chong** (Univ. of California San Francisco) **Beverly Crider** (Univ. of Oklahoma, Health Sciences Center) **Gabrielle Curinga** (Univ. of Kentucky) **Marc de Asis** (UBC) **Janaina**



## Graduate Student Poster Presentation Award

The graduate or medical/dental/vet student winning this award receives a \$400 prize.

- **Michael Woods** (The Univ. of Western Ontario) – “Exploring the Anti-diabetic Effect of Duodenojejunal Bypass: A novel Mouse Model”



*Michael Woods, Capri Andrews, Madeleine Chollet & James Windelborn*

## Student/Postdoctoral Research Education Award

The graduate or medical/dental/vet student winning this award receives a \$400 prize.

- **Madeleine Chollet** (Johns Hopkins Univ. School of Medicine) – “Student Laboratory Presentations as a Learning Tool in Anatomy Education”

## Undergraduate Student Poster Presentation Award

The undergraduate student winning this award receives a \$400 prize.

- **Capri Andrews** (Univ. of Central Oklahoma) – “Inhibition of Ras-expressing Keratinocytes by De-epidermized Dermis”

## Thanks, Thanks, Thanks!!

AAA thanks those who supported the sessions and awards at the AAA Annual Meeting/EB 2009:

### Gold Sponsors (\$3500+)

- Ellison Foundation
- Elsevier, Inc.
- Lippincott Williams & Wilkins
- Wiley-Liss

### Silver Sponsors (\$1000-\$3499)

- American Association of Clinical Anatomists (AACA)
- The Anatomical Record
- Carl Zeiss MicroImaging, Inc.
- JEOL USA Inc./AACBNC
- LSU Health Sciences Center
- Scott & White Memorial Hospital
- Texas A&M Health Science Center, Office of the Vice President for Research and Graduate Studies
- Texas A&M Health Science Center, College of Medicine

### Bronze Sponsors (<\$1000)

- Tulane University, Department of Biomedical Engineering
- Keith Moore

## Save These Dates!

### Future AAA Annual Meetings/EB

<b>A</b> pril 24-28, 2010	Anaheim
<b>A</b> pril 9-13, 2011	Washington, D.C.
<b>A</b> pril 21-25, 2012	San Diego

## STUDENT/POSTDOC TRAVEL AWARD WINNERS • STUDENT/POSTDOC TRAVEL AWARD WINNERS

**Dernowsek** (Faculty of Medicine of Ribeirão Preto) **Srinivasan Dinesh Kumar** (National Univ. of Singapore) **Yang Ding** (Univ. of Western Ontario) **Jennifer Doyle** (York Univ.) **Megan Dufton** (Dalhousie Univ.) **Sara Edsall** (Mount Saint Vincent Univ.) **Carrie Elzie** (Vanderbilt Univ.) **Jennifer Feenstra** (Loma Linda

Univ.) **Gabrielle Finn** (Durham Univ.) **Christina Freisinger** (Univ. of Iowa) **David Frumberg** (SUNY Downstate Med Center) **Eric Gee** (York Univ.) **Shauna Grady** (Midwestern Univ.) **Sarah Greene** (Boston Univ. School of Medicine) **Michael Gregg** (SUNY Downstate Medical Center) **Jeremy Gregory** (Mayo Clinic

College of Medicine) **Gabriella Grisotti** (SUNY Downstate Medical Center) **Courtney Guenther** (Univ. of Wisconsin-Madison) **Melissa Haulcomb** (Loyola Univ. Chicago) **Simon Hong** (SUNY Downstate Medical Center) **Robin Hopkins** (The Univ. of Western Ontario) **Thomas Hynd** (Univ. of Hawaii) **Lisa Kirkpatrick** (Univ. of

Saskatchewan) **Tracy Kivell** (Duke Univ.) **Lindsey Koper** (Northern Illinois Univ.) **Oxana Korj** (UBC) **Tatyana Krieger** (New York College of Osteopathic Medicine) **Michael Lane** (Univ. of Florida) **Michelle Lazarus** (Vanderbilt Univ.) **Rosanna Lee** (SUNY Downstate Medical Center) **Jeff Leiter** (Univ. of Manitoba) **Lai**

# Education Roundtable: Communicating Anatomy Outside the Classroom

by David Bolender

Large crowds at traveling body exhibits suggest there is a considerable public curiosity about human anatomy. Most health science students are easily convinced of the relevance of anatomy to health care delivery. Yet, whether we teach it to students, investigate it to reveal the secrets of its complexity, or both, how well we communicate to others about anatomy affects their understanding. After a time of gathering and table talk among participants at AAA's Education Breakfast Roundtables, Darrell Evans (Brighton Sussex Medical School, UK), a member of the Anatomical Society of Great Britain and Ireland, gave a brief presentation on communicating anatomy with a view toward stimulating general discussion.

Change in the way information is accessed and used requires us to rethink how effectively we communicate. Increased success might include finding the correct blend of tried and tested methods combined with newer forms of information delivery. Evans described a few of the activities he uses with students to enhance their communication skills, such as designing Web sites, creating articles or information leaflets that explain medical conditions for a lay audience, and conducting media interviews. As anatomical educators and scientists, we must be willing to explore new opportunities to communicate anatomy to a widening audience.

A lively discussion began with examples of community outreach projects for students and teachers, some of which were funded by AAA Educational Outreach Grants. This led to the question of how to find support for these activities. Suggestions ranged from letting student interest and enthusiasm drive this to obtaining outside funding for the event.

The discussion then turned to donor recognition ceremonies. Bernard Moxham (Cardiff Univ., Wales) shared some of the activities he uses to enhance student

appreciation of the dissection experience. These include writing a poem about the experience from the donor point of view and writing short stories or essays that may be used in the donor appreciation ceremony.

Elsevier provided generous support for AAA's annual Education Breakfast Roundtable.

David Bolender, Ph.D., Dept. of Cell Biology,  
Medical College of Wisconsin



**Anatomical Sciences  
Education**  
**Call for Manuscripts**  
[www.ASEjournal.com](http://www.ASEjournal.com)

ASE is AAA's new academic journal, published in cooperation with the American Association of Clinical Anatomists and the Human Anatomy & Physiology Society.

ASE offers an international forum for the exchange of ideas, opinions, innovations, and research on topics related to education in the anatomical sciences of gross anatomy, embryology, histology and neuroscience, including:

- Descriptive articles
- Relevant reviews
- Research reports
- Viewpoints & commentaries

**For all levels of anatomical sciences  
education**

- Undergraduate
- Graduate
- Post-Graduate
- Medical – Allopathic
- Medical – Osteopathic
- Dental

**ASE is at your service**

ASE is committed to maintaining AAA's reputation for fast, fair and friendly peer review, with a rapid turn around time of approximately four weeks from manuscript submission to initial editorial decision.

**Co-Editors:** Richard L. Drake, Ph.D.  
Wojciech Pawlina, M.D.

STUDENT/POSTDOC TRAVEL AWARD WINNERS • STUDENT/POSTDOC TRAVEL AWARD WINNERS

**Yee Leung** (Wayne State Univ.)  
**Christina Lew** (Christina Lew) **Ann Lin** (Simon Fraser Univ.) **Wenhua Liu** (Cornell Univ.) **Yingheng Liu** (Sanford Research - Univ. of South Dakota) **Jie Liu** (Wake Forest Univ.) **David Lo** (Univ. of North Dakota) **Xin Long** (Indiana Univ. School of Medicine) **Rebecca Lufler** (Boston Univ. School of

Medicine) **Rachael Maciasz** (SUNY Downstate Medical Center) **Murali Mallela** (Reg. College of Vet. Med., Virginia Tech) **Nichole Mesnard** (Loyola Univ. Chicago) **Michael Midgley** (The Univ. of Western Ontario) **Ngan Nguyen** (The Univ. of Western Ontario) **Andrew Notebaert** (Univ. of Iowa) **Chelsea Obourn** (SUNY Downstate College

of Medicine) **Ferdinand Osuagwu** (David Geffen School of Medicine at UCLA) **Anthony Pagano** (Mount Sinai School of Medicine) **Tiffany Palmer** (Univ. of Central Oklahoma) **Christian Paxton** (Univ. of Utah) **Bill Pearson** (Boston Univ. School of Medicine) **Ashley Perkins** (Midwestern Univ.) **Joanne Peterson** (Univ.

of Central Oklahoma) **Colin Prenskey** (Mount Sinai School of Medicine) **Naema Qureshi** (SUNY Downstate Medical Center) **Charys Raynor** (The Univ. of Western Ontario) **George Risinger** (OUHSC) **Terrence Ritzman** (Arizona State Univ.) **Tyson Ruetz** (Simon Fraser Univ.) **Symone San Miguel** (Baylor College of Dentistry)

## NEW AAA STUDENT & POSTDOCTORAL MEMBERS

(continued from page 12)

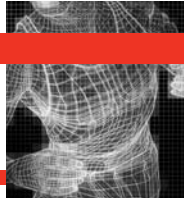
<b>Sarah Jacobs</b> Mayo Clinic College of Medicine	<b>Rosanna Lee</b> SUNY Downstate Medical Center	<b>Rachael Maciasz</b> SUNY Downstate Medical Center	<b>Bill Pearson</b> Boston University School of Medicine	<b>Tyson Ruetz</b> Simon Fraser University
<b>Clayton Jordan</b> Westminster College	<b>Joseph Lehner</b> Philadelphia College of Osteopathic Medicine	<b>Monica McCarthy</b> Loma Linda School of Medicine	<b>Ashley Perkins</b> Midwestern University	<b>Jeffrey Schachar</b> SUNY Downstate Medical Center
<b>Aruna Katoch</b> Desh Bhagat Group of Institutes	<b>Lai Yee Leung</b> Wayne State University	<b>Stephen McCullough</b> Mount Sinai School of Medicine	<b>Joanne Peterson</b> University of Central Oklahoma	<b>David Schneberger</b> Western College of Veterinary Medicine
<b>Kris Kawamoto</b> University of Hawaii	<b>Christina Lew</b> University of Western Ontario	<b>Michael Midgley</b> University of Western Ontario	<b>Colin Prenskey</b> Mount Sinai School of Medicine	<b>Dennis Schulz</b> San Francisco State University
<b>Klodiana Kolomitro</b> OISE/University of Toronto	<b>Ann Lin</b> Simon Fraser University	<b>Meghan Moran</b> NEOUCOM College of Medicine	<b>Naema Qureshi</b> SUNY Downstate Medical Center	<b>Tamar Segev</b> Midwestern University
<b>Elias Kontogiorgos</b> Baylor College of Dentistry	<b>Joshua Little</b> Saint Louise University	<b>Candice Myers</b> St. George's University	<b>Keyla Ramos-Pratts</b> UPR Medical Sciences Campus	<b>Aimee Sergovich</b> The University of Western Ontario
<b>Lindsey Koper</b> Northern Illinois University	<b>Yingheng Liu</b> Sanford Research - University of South Dakota	<b>Allison Newell</b> Appalachian State University	<b>Charys Raynor</b> University of Western Ontario	<b>Eric Shikatani</b> York University
<b>Oxana Korj</b> University of British Columbia	<b>Jie Liu</b> Wake Forest University	<b>Chelsea Obourn</b> SUNY Downstate College of Medicine	<b>Matta Reddy</b> Temple University	<b>Kelly Sinak</b> Purdue University
<b>Tatyana Krieger</b> New York College of Osteopathic Medicine	<b>David Lo</b> University of North Dakota	<b>Daniel O'Neill</b> Indiana University School of Medicine	<b>Terrence Ritzman</b> Arizona State University	<b>Kyle Smith</b> Creighton University
<b>Benjamin Laitman</b> University of Pennsylvania	<b>Xin Long</b> Indiana University School of Medicine	<b>Tiffany Palmer</b> University of Central Oklahoma	<b>Joanna Rossi</b> McGill University	<b>Francis Smith</b> University of California San Francisco
<b>Ann Lam</b> University of Saskatchewan	<b>Daryn Lu</b> University of Central Oklahoma	<b>Danielle Paolillo</b> A.T. Still University	<b>Danielle Royer</b> Stony Brook University	<b>Samatha Sripada</b> National Institute of Virology
			<b>Jon Rueckemann</b> Boston University School of Medicine	<b>Jennifer Stanley</b> Purdue University

*continued on page 23*

### STUDENT/POSTDOC TRAVEL AWARD WINNERS • STUDENT/POSTDOC TRAVEL AWARD WINNERS

<b>Jaime Sanchez</b> (Univ. of South Florida) <b>Jeffrey Schachar</b> (SUNY Downstate Medical Center) <b>David Schneberger</b> (Western College of Veterinary Medicine) <b>Patricia Schneider</b> (Univ. of Iowa) <b>Tamar Segev</b> (Midwestern Univ.) <b>Aimee Sergovich</b> (The Univ. of Western Ontario) <b>Maria Serrano</b> (Baylor College of Dentistry) <b>Maria Serrat</b>	(Cornell Univ.) <b>Eric Shikatani</b> (York Univ.) <b>Sarabjeet Singh</b> (Univ. of Saskatchewan) <b>Heather Smith</b> (Univ. of Arizona-Phoenix) <b>Francis Smith</b> (Univ. of California San Francisco) <b>Kyle Smith</b> (Creighton Univ.) <b>Joshua Stefanik</b> (Boston Univ. School of Medicine) <b>Tamara Stock</b> (The Univ. of Western Ontario) <b>Adam Sylvester</b> (Johns Hopkins Univ. School of Medicine) <b>Andre Tavares</b> (Univ. of Arizona) <b>Eyuel Terefe</b> (Univ. of Central Oklahoma) <b>Brent Thompson</b> (Vanderbilt Univ.) <b>Cassandra Uchida</b> (York Univ.) <b>Shahnoor Ullah</b> (The Univ. of Western Ontario) <b>Georgina Voegele</b> (Johns Hopkins Univ. School of Medicine) <b>Florin Vranceanu</b> (Univ. of Illinois at Chicago) <b>Jeffrey</b>	<b>White</b> (LSUHSC - New Orleans) <b>James Windelborn</b> (Univ. of Wisconsin) <b>Michael Woods</b> (The Univ. of Western Ontario) <b>Harold Yim</b> (The Univ. of Western Ontario) <b>J'Nelle Young</b> (Univ. of British Columbia) <b>Christopher Zahm</b> (Univ. of Wisconsin-Madison) <b>Uriel Zapata</b> (Baylor College of Dentistry)
--	---	---

AMERICAN ASSOCIATION OF  
**ANATOMISTS**  
**News**



CONSTITUENT SOCIETY OF FASEB

American Association of Anatomists  
9650 Rockville Pike  
Bethesda, MD 20814-3998

NON-PROFIT ORG  
U.S. POSTAGE  
**PAID**  
BETHESDA, MD  
PERMIT NO. 7004

Give someone's career a major boost – see page 8



At Maryville University, high school students and their teachers reach for the STARS (Students and Teachers Anatomical Research Series).

## AAA's Outreach Grant Program

AAA's Outreach Grant Program provides funding for workshops, symposia, and meetings organized by AAA members, either as stand-alone activities or under the umbrella of other national or international societies. Supported activities may either be educational—such as anatomy workshops for high school students—or scientific.

**AAA Education Outreach Grant**—AAA offers grants for education programs designed to enhance teaching skills or interest educators and students at all academic levels in anatomy as a discipline.

**AAA/Wiley Research Meetings Outreach Grant**—Funding is available to support non-AAA workshops, symposia, or meetings organized by AAA members.

**AAA/Wiley Three-Year Research Meetings Outreach Grant**—AAA may select one meeting each year as deserving of ongoing support over a three-year period.

**Deadline: August 1**

For full details and to download an application, please visit [www.anatomy.org](http://www.anatomy.org) or email [exec@anatomy.org](mailto:exec@anatomy.org).

**Eligibility**

- Only AAA members are eligible to apply for a grant.
- No individual or project will be funded two years in a row for an Education Outreach Grant or regular Research Meetings Outreach Grant.
- Members submitting separate proposals for the same meeting will be asked to consolidate their requests.

**Criteria**

- Visibility and scientific impact
- Quality of participants
- Potential value to AAA
- Visibility of AAA support

**Application Process**

- Your two-page proposal should provide project details, goals, budget, and expected audience.

