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## The MCAT is Coming, the MCAT is Coming!

Dee Silverthorn (University of Texas at Austin), Steven T. Case (University of Mississippi Medical Center), Rebecca Rice (Association of American Medical Colleges), and Henry Sondheimer (Association of American Medical Colleges)

The pending arrival of the fifth iteration of the Medical College Admission test (MCAT) in April 2015 has caused nearly as much consternation as did the arrival of British forces in Boston in April 1775. Premedical students are faced with the dilemma of whether to hurry up and take the current version, sometimes before they have completed all the appropriate coursework, or take a chance on the new test. Advisors are trying to determine what to tell students about additional coursework that might be needed for the new sections. And medical school admissions committees are wondering how to compare scores from the current version to the new scoring system.

In an effort to dispel some of the anxiety, the APS Teaching Section sponsored a symposium on *MCAT 2015: Are We Ready?* at Experimental Biology 2014 in San Diego, CA. This article is a summary of the presentations in the symposium, along with links to resources for advisors, faculty, and students from the Association of American Medical Colleges (AAMC). The information was taken from the speakers' Powerpoint slides and is presented here with their permission.

### MCAT 2015: What Has Changed?

The first presenter was Rebecca Rice, Manager of MCAT<sup>2015</sup> Outreach and Communication at the AAMC, speaking on what has changed in the new MCAT. Rice began by pointing out that the current version of the exam was launched in 1991 and that, since then, the competencies needed to be a good physician have evolved. The 21-member MR5 Committee worked for several years gathering information from many sources, including 2,700 medical school and baccalaureate faculty, medical students, and residents. They also considered the recommendations in three reports:

- 1) *Scientific Foundations for Future Physicians* (<https://members.aamc.org/eweb/upload/Scientific%20Foundations%20for%20Future%20Physicians%20Report2%202009.pdf>)
- 2) *Behavioral and Social Sciences Foundations for Future Physicians* (<https://members.aamc.org/eweb/upload/Behavioral%20and%20Social%20Science%20Foundations%20for%20Future%20PhysiciansSecond.pdf>)
- 3) *Roadmap to Diversity: Integrating Holistic Review Practices into Medical School Admission Processes* (<https://members.aamc.org/eweb/upload/Roadmap%20to%20Diversity%20Integrating%20Holistic%20Review.pdf>)

Continued on page 253

### A Matter of Opinion

## America's Got Talent

Granted, I am dating myself when I make reference to Ted Mack and *The Original Amateur Hour*, but it is clear that America has been enamored with talent shows for well over 60 years. Although I may have started with *The Original Amateur Hour*, I have since migrated to *American Idol*, *Dancing with the Stars*, and other reality talent shows. Is it time for APS to start its own talent show?

It is well known that many scientists have musical talents, performing in chamber orchestras, singing in choirs, and playing in rock bands. Even the NIH Director, Francis Collins, has demonstrated musical talents with his guitar, promoting science and funding for NIH. But could APS

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# Business Meeting Minutes

## American Physiological Society 167th Business Meeting

Time: 5:45 PM, Tuesday, April 29, 2014

Place: San Diego, CA

### I. Call to Order

The meeting was called to order at 5:45 PM by President Kim E. Barrett, who welcomed the members to the 167th Business Meeting of the American Physiological Society.

### II. Election of Officers

President Barrett announced the results of the election. The new President-elect is Patricia E. Molina, Louisiana State University (April 30, 2014 to April 26, 2017). The three newly elected Councillors are Barbara Alexander, University of Mississippi Medical Center; Rudy Ortiz, University of California, Merced; and Bill Yates, University of Pittsburgh (April 30, 2014 to April 26, 2017). The newly elected Councillors will serve a three-year term. All newly elected officers will assume office at the close of EB2014.

### III. Membership

#### A. Summary of the Membership Status

President-Elect David Pollock reported on the status of Society membership. As of March 15, 2014, the current membership of the Society is 11,312, of which 8,231 are regular members, 22 are honorary members, 1,046 are emeritus members, 88 are affiliate members, 1,646 are graduate student members, and 279 are undergraduate student members. He also indicated that women make up

27% of the membership, and 26% of our members reside outside of the U.S. He also encouraged the membership to participate in the "Be Counted" campaign. This campaign encourages all APS members to go the APS website and complete their member profile, including information on gender, racial and ethnic group, and interest area ([www.the-aps.org/beaccounted](http://www.the-aps.org/beaccounted)).

#### B. Deaths Reported Since the Last Meeting

A list of the names of those members whose deaths had been reported since the 2013 Business Meeting was displayed. Pollock asked the membership to stand and to observe a moment of silence in tribute to their deceased colleagues.

### IV. State of the Society

President Barrett addressed the membership and spoke on the state of the Society.

#### A. Expenses and Revenue

Barrett said that the Society is financially sound, with the current revenue at \$19,587,500 and expenses totaling \$19,055,000. The majority of the revenue is generated by the Publications Department, whereas Meetings/Membership, Education, and the reserves account for the majority of the remaining revenue. The revenue funds a number of initiatives that Barrett discussed during the remainder of her presentation.

#### B. APS Initiatives

**1. Publications.** Barrett said that APS and The Physiology Society (TPS) are publishing an open-access journal entitled *Physiological Reports*, which launched in March 2013. Since the launch, 223 articles have been published, with an average time to first decision of 12.7 days and a 73% acceptance rate.

Barrett said that all of the journals are doing well. For the 14 published journals, 6,700 manuscripts were



APS President Kim Barrett presents the Ray G. Daggs Award to Gerald F. Dibona



Trainee Advisory Committee Chair Jennifer Sasser and APS President Kim Barrett present Karen Sweazea the Dale J. Benos Early Career Professional Service Award



received, and 3,250 were published. The time to first decision has been reduced to 19 days. There are three new editors beginning their terms on July 1, 2014. They include Jo Adams (*AJP-Cell*) and Bill Yates (*JN*), and Irv Zucker (*AJP-Heart*), who officially starts on January 1, 2015, although he is also currently serving as the interim editor as a result of Bill Stanley's untimely death.

Barrett introduced *APSelect*, which is a timely collection that highlights the highest-quality research papers accepted each month by the 10 APS research journals. These articles are recommended by the editors, and the final selection is made by the Selection Committee. They can be viewed at <http://apselect.physiology.org>.

**2. Meeting Program.** Barrett reported that APS would be holding two conferences in 2014: The APS Institute on Teaching and Learning scheduled for June 23-27 in Bar Harbor, ME, and the APS Intersociety Meeting:

Comparative Approaches to Grand Challenges in Physiology scheduled for October 5-8 in San Diego, CA. She also reminded attendees that next year's Experimental Biology meeting will be held in Boston, MA from March 28 to April 1, 2015.

**3. Education Programs.** Barrett said that the APS Education programs help to promote excellence in science teaching and learning, and help to train future physiologists. The Education Department is responsible for managing many of the awards that are provided by the APS and provides resources for K-12 education, undergraduates, graduates/professionals, continuing education, and minority scientists.

Barrett reported that the Education Department has developed a new Professional Skills Training (PST) course in Publication Ethics. This is a collaboration between the Education and the Publications Departments and is funded by NSF. The Education Department is also launching a Leadership Academy to develop the next generation of Society leaders and to help our members succeed in their own careers. The APS Archive of Teaching Resources has new partners, new community tools, and a new name: Life Science Teaching Resource Community. An additional new Professional Skills Training course on Effective Teaching will be launched shortly, and several ongoing Professional Skills Training courses are now available online, with some eligible for graduate credit.

Barrett encouraged all members to plan now for Phun Week 2014, which will be held November 3-7, 2014 ([www.PhUnWeek.org](http://www.PhUnWeek.org)).

**4. Science Policy.** Barrett said that the Executive Cabinet, members of Council, and the Science Policy Committee visit the Hill and NIH often to discuss federal funding for biological research, publications access, peer review, humane use of



Ryuji Ueno and APS President Kim Barrett present Declan F. McCole with the S&R Foundation Ryuji Ueno Award



APS President Kim Barrett presents Brian Graham with the Giles F. Filley Memorial Award



APS President Kim Barrett presents Donna L. Cioffi with the Giles F. Filley Memorial Award



APS President Kim Barrett presents the Lazaro J. Mandel Young Investigator Award to Oleh M. Pochynyuk



APS President Kim Barrett presents the Shih-Chun Wang Young Investigator Award to Christopher L. Mendias



APS President Kim Barrett presents the Arthur C. Guyton Young Investigator Award to Richard D. Wainford



APS President Kim Barrett and Ryan Lindquist of DSI present the Dean Franklin Young Award to Colin N. Young

animals in research, and build ties with funding agencies such as NIH and NSF. They have had more than 60 meetings on Capitol Hill and with NIH officials in the past year.

The Science Policy Committee has established the Early Career Advocacy Fellowship. This fellowship engages early career investigators in advocacy activities and provides skills to become long-term advocates for scientific research. The Committee has also developed *SP-News*, a monthly e-mail bulletin of advocacy-oriented information for APS members. The Chapter Advocacy Outreach Program sponsors speakers to discuss research funding and animal issues at Chapter meetings. The Committee has also produced "Peer Review 101," a practical guide to becoming involved in the peer review process.

**5. International Outreach.** Barrett said that the APS Leadership has been invited to participate in several international meetings, including the Physiological Society of Japan, Tokyo, Japan, March 2013; Covian Symposium, Ribeiro Preto, Brazil, May 2013; IUPS, Birmingham, UK, July 2013; Sociedade Brasileira de Fisiologia (SBFis), Ribeirao Preto, September 2013; and a Physiological Society symposium, Dublin, Ireland, December 2013. APS will be presenting a workshop on Writing and Reviewing (PST) in Sao Paulo, Brazil in July 2014. APS is getting ready to participate in the Pan-American Congress, Iguassu Falls, Brazil in August 2014, and discussions are ongoing regarding a possible joint meeting with the Physiological Society to be held in Dublin, Ireland in 2016.

### C. Final Comments

Barrett said that APS launched a new national Twitter handle – @APSPHysiology – and she encouraged the membership to follow it. She also reminded the Business Meeting attendees to come to the APS Nobel Prize in Physiology or Medicine Lecture presented by Bruce Beutler and to join their colleagues at the Closing Party on Wednesday, April 30 at 6:30 PM. Barrett also reported that the Society had made more than 400 awards in 2014, totaling more than \$1.2 million. She reminded everyone that this was a significant member benefit.

### V. Awards and Presentations

#### A. Ray G. Daggs Award

Ray G. Daggs was the APS Executive Secretary-Treasurer between 1956 and 1972. In tribute to his devotion to the Society, the Ray G. Daggs Award was established and is given annually to a physiologist for distinguished service to the Society and to the discipline of physiology. The 2014 Daggs Awardee is Gerald F. DiBona.

DiBona received his AB degree from Harvard University and his MD from Tufts University School of Medicine. He joined the faculty at the University of Iowa College Of Medicine in 1969 as an assistant professor of internal medicine and remained at that institution his entire career. DiBona reached the rank of professor of internal medicine in 1979, and in 1997 was also appointed as professor of physiology and biophysics. In 2004, he became professor emeritus.

DiBona has had a distinguished research career focused primarily on neural regulation of renal function and

is an acknowledged leader in this area. DiBona's impact is reflected by his impressive record of 285 peer-reviewed publications.

DiBona has been recognized by the scientific community with numerous awards and honors. Among his awards from the APS is the Robert W. Berliner Award for Excellence in Renal Physiology from the Renal Section, the Ernest H. Starling Distinguished Lectureship from the Water & Electrolyte Homeostasis Section, and our society's highest honor, the Walter B. Cannon Memorial Lectureship. DiBona has been a very active member of APS since joining the society in 1971. He has served as a councilor and program representative for the Water & Electrolyte Homeostasis Section, a member of the Publications Committee, and Chair of the Committee on Committees. DiBona was elected to the APS Council in 1995 and subsequently served as president from 2000 to 2001.

#### **B. Orr E. Reynolds Award**

The Orr Reynolds Award, established in 1985 in honor of our second executive secretary-treasurer, recognizes the best historical article published by an APS member. The 2014 awardee is Adrian Morrison, University of Pennsylvania, for his article entitled "Coming to Grips With a 'New' State of Consciousness: The Study of Rapid-Eye Movement Sleep in the 1960s."

#### **C. Dale Benos Early Career Professional Service Award**

The Early Career Professional Service Award honors an APS member who is judged to have made outstanding contributions to the physiology community and furthering its broader goals.

This award was established to recognize the late Dale Benos, the Society's 79th President, Chair of Physiology at the University of Alabama, Birmingham, and a distinguished physiologist. The award recognizes Dale's dedication and commitment to excellence in the training and mentoring of young physiologists and colleagues. APS is pleased to recognize Karen Sweazea, Arizona State University, as the 2014 Awardee.



APS President Kim Barrett and Wes Colgan of ADI present the ADInstruments Macknight Early Career Innovative Educator Award to Aaron Bunker



APS President Kim Barrett presents the Arthur C. Guyton Educator of the Year Award to Herb Janssen

#### **D. S&R Foundation Ryuji Ueno Award for Ion Channels or Barrier Function Research**

The S&R Foundation Ryuji Ueno Award for Ion Channels or Barrier Function Research was established in 2007 by the American Physiology Society through the generous support of Ryuji Ueno and Sachiko Kuno and the S&R Foundation. Ueno and Kuno are founders of Sucampo Pharmaceuticals and S&R Foundation, both in Bethesda, MD. This award recognizes an APS member who has demonstrated outstanding research promise. The award is given annually to an early career physiologist demonstrating outstanding promise in ion channel or epithelial barrier function research. The award of \$30,000 is designated for the awardee's research program. APS is pleased to recognize this year's awardee, Declan F. McCole, University of California, Riverside. Barrett stated McCole was also a former trainee, so she was especially pleased to have the opportunity to present the award to him, although she was not involved in his selection.

#### **E. Giles F. Filley Memorial Awards**

As a result of a bequest from the family of Giles F. Filley, a memorial fund was established to recognize excellence in research in respiratory physiology and medicine. Two annual awards of \$12,000 are made to a junior faculty member (at an academic rank no higher than assistant professor). APS is pleased to recognize this year's awardees, Brian Graham, University of Colorado, Denver, and Donna L. Cioffi, University of South Alabama.

#### **F. Lazaro J. Mandel Young Investigator Award**

As a result of a bequest from the wife of Lazaro J. Mandel, a memorial fund was established to recognize excellence in epithelial or renal physiology. An award is



made to a junior faculty member who has demonstrated outstanding research promise. The award is \$4,000 and is designated for use in the awardee's research program. This year's awardee is Oleh M. Pochynyuk, University of Texas Health Sciences Center-Houston.

#### **G. Shih-Chun Wang Young Investigator Award**

As a result of a bequest from the wife of Shih-Chun Wang, a memorial fund was established to recognize excellence in physiology. An annual award is made to a junior faculty member who has demonstrated outstanding research promise. The award of \$4,000 is designated for the use in the awardee's research program. APS is pleased to recognize this year's awardee, Christopher L. Mendias, University of Michigan.

#### **H. Arthur C. Guyton Young Investigator Award**

The Arthur C. Guyton Award Fund was established in 1993 to recognize the contributions of Guyton and his interests in feedback, modeling, and integrative physiology. The awards are made to an independent, junior investigator pursuing research that uses integrative approaches to the study of physiological function and explores the role of feedback regulation in physiological function. The award is for \$15,000 and is designated for use in the awardee's research program. This year's awardee is Richard D. Wainford, Boston University School of Medicine.

#### **I. Dean Franklin Young Investigator**

The Dean Franklin Young Investigator Award was established by Data Sciences International (DSI) to recognize Franklin's role in developing instrumentation to monitor physiological function in conscious animals and humans. The award recognizes a postdoctoral

scientist or junior faculty member who is pursuing in vivo physiological research and is in the process of establishing an independent laboratory. The award recipient receives a travel award of \$1,500 to attend the annual Experimental Biology meeting to present his/her work and a DSI instrumentation starter kit valued at approximately \$20,000. Ryan Lindquist, DSI, joined Barrett on stage to recognize this year's awardee, Colin N. Young, Cornell University.

#### **J. ADI Macknight Early Career Innovative Educator Award**

The ADInstruments Macknight Early Career Innovative Educator Award is named in honor of Anthony Macknight, an APS member since 1978 and founder of ADInstruments. The award honors an APS member who incorporates innovative teaching techniques and technology resources to engage undergraduates in physiology education. The awardee receives a \$1,500 travel award to attend the EB meeting and an institutional grant providing the award recipient's institution with a PowerLab LabTutor Physiology Teaching Bundle or equivalent. This year, the Society is pleased to recognize Aaron Bunker, Morningside College, as the ADInstruments Macknight Early Career Innovative Educator Awardee. Wes Colgan of ADI joined Barrett to present the award.

#### **K. Arthur C. Guyton Teacher of the Year Award**

The Arthur C. Guyton Physiology Teacher of the Year Award is selected by the Teaching Section and is supported by Elsevier. This award recognizes a full-time faculty member who has demonstrated excellence in classroom teaching, commitment to the improvement of physiology



APS President Kim Barrett presents the Annual Reviews Award for Scientific Reviewing to Mordecai P. Blaustein



APS President Kim Barrett presents the Fleur Strand Professional Opportunity Award to Victoria Kay



APS President Kim Barrett presents the Presidential Recognition Plaque to Susan M. Barman, APS Past President

teaching, and contributions to physiology education at the local community, national, or international levels. This year, the recipient of the Guyton Educator of the Year Award is Herb Janssen. Janssen is currently a professor in the Department of Medical Education, Paul L. Foster School of Medicine, Texas Tech University, and teaches physiology courses for undergraduate, graduate, and medical students. Janssen consistently works to improve the educational outcomes of border youth and has initiated programs to bring physiology labs to high schools throughout rural West Texas. APS is pleased to present Herb Janssen with the 2014 Arthur C. Guyton Educator of the Year Award.

#### **L. Annual Reviews Award for Scientific Reviewing**

The Annual Reviews Award for Scientific Reviewing is given for excellence in providing systematic, periodic examinations of scholarly advances, and provoking discussion that will lead to new research activity.



APS President Kim Barrett and Physiologists in Industry Committee Chair Eugene Shek present the Novel Disease Model Awards to Suttira Intapad (postdoctoral awardee) and Ellen Gillis (predoctoral awardee)



APS President Kim Barrett and Peter Horvath present the Steven M. Horvath Professional Opportunity Awards to Denise Cornelius and Kristine DeLeon-Pennell

The award recognizes an APS member who has helped to provide an enhanced understanding of physiology through their review articles. The recipient receives an award of \$2,000 and travel to attend the EB meeting. APS is pleased to recognize this year's awardee, Mordecai P. Blaustein, University of Maryland School of Medicine.

#### **M. Novel Disease Model Awards**

The Novel Disease Model Awards were established in 1999 and are given to a graduate student and to a postdoctoral fellow submitting the best abstracts describing novel disease models. This award is sponsored by the Physiologists in Industry Committee and by Beijing Novo Nordisk Pharmaceuticals Science and Technology Co., Ltd. Eugene Shek, Physiologists in Industry Committee Chair, joined Barrett on stage to present the awards. The recipient of this year's postdoctoral award is Suttira Intapad, University of Mississippi Medical Center; and the recipient of this year's predoctoral award is Ellen Gillis, University of Mississippi Medical Center.

#### **N. Caroline tum Suden/Frances Hellebrandt Professional Opportunity Awards**

The recipients of the Caroline tum Suden awards are selected by the Women in Physiology Committee, chaired by Angela Grippo. This year's 36 awards were made possible by the bequests of Caroline tum Suden and Frances Hellebrandt, who were long-time members of the Society. Awards are open to graduate students or postdoctoral fellows, who receive a \$500 check and paid registration.

#### **O. Fleur L. Strand Professional Opportunity Awards**

The Fleur L. Strand Award was established to recognize the achievements of a graduate student or postdoctoral fellow, enabling the recipient to attend the EB meeting. It is awarded to the top-ranked applicant of the tum Suden/Hellebrandt Awards. The award is named in honor of the late Fleur Strand, formerly Professor Emerita, New York University. Strand was the first to show that stress-evoked hormone such as ACTH can have a direct effect on peripheral systems, independent of the adrenal gland. The award is open to a physiologist working in any area of research. The awardee receives \$1,000 and complimentary registration for the EB meeting. APS is pleased to recognize this year's awardee, Victoria Kay, University of North Texas Health Science Center.





APS Section Advisory Committee. *Front:* David Poole, Martha E. O'Donnell, Siribhinya Benyajati, Ann M. Schreihof, Joshua C. Anthony, Sean D. Stocker. *Back:* Declan F. McCole, Wolfgang M. Kuebler, Harold D. Schultz, Barbara E. Goodman, Heddwen Brooks, Jennifer S. Pollock, Merry Lindsey

#### **P. Steven M. Horvath Professional Opportunity Awards**

The Steven M. Horvath Award is given to the top two applications from minority candidates. This award is a reflection of Horvath's long-term commitment to the training of minority physiologists. These awards are made possible by a bequest of the family of Steven M. Horvath. The son of Steven Horvath, Peter Horvath, joined Barrett to recognize this year's awardees, Kristine DeLeon-Pennell, University of Mississippi Medical Center, and Denise Cornelius, University of Mississippi Medical Center.

#### **Q. International Early Career Physiologist Travel Awards**

The International Early Career Physiologist Travel Award program was established in 2008 to assist with travel expenses for international early career physiologists who are attending the APS Annual Meeting at EB to present their work. This year's awardees are Mohammed Abdulla, University College Cork, Ireland; Rushita Bagchi, University of Manitoba, Canada; T. Scott Bowen, Leipzig University-Heart Center, Germany; Surapong Chatpun, Prince of Songkla University, Thailand; Rodrigo Del Rio, Alemana-Universidad del Desarrollo, Chile; Silke Haerteis, Erlangen-Nürnberg, Germany; Kate Herum, University Hospital and University of Oslo, Norway; Birgitte McDonald, Aarhus University, Denmark; Jolyane Meloche, Laval University, Canada; Lauro Vianna, Federal University, Brazil; Tao Xing, Florey Institute of Neuroscience and Mental Health, Australia; Georgios Kararigas, Charite University Hospital, Germany.

#### **R. Recognition of Outgoing Section Chairs**

Heddwen Brooks, Chair of the Renal Section, Wolfgang Kuebler, Chair of the Respiration Section, Barbara Goodman, Chair of the Teaching of Physiology Section, and Joshua Anthony, Chair of the Endocrinology and Metabolism Section, completed their terms at the close of the EB14 meeting. Barrett thanked them for their service to their sections and to APS, and presented them with certificates of service.

#### **S. Recognition of Outgoing Committee Chairs**

Susan Barman, Chair of the Honors Committee, Hannah V. Carey, Chair of the Daggs Award Committee, Brian Mackenzie, Chair of the International Physiology Committee, Ronald Lynch, Chair of the Joint Program Committee, Kelly R. Pitts, Chair of the Physiologists in Industry Committee, Dexter L. Lee, Chair of the Porter Physiology Development & Minority Affairs Committee, Christine Maric-Bilkan, Chair of the Awards Committee, Jane F. Reckelhoff, Chair of the Committee on Committees, and Gerald A. Meininger, Chair of the Conference Committee, completed their terms at the close of the EB14 meeting. Barrett thanked them for their service to their respective committees and to APS.

#### **T. Recognition of Outgoing Councillors**

Councillors Dennis Brown, Patricia Molina, and Jane Reckelhoff completed their terms at the close of the EB14 meeting. Barrett thanked them for their service to the Society.

#### **U. Recognition of Past President Sue Barman**

Barrett asked the membership to join her in offering a special thank you to our outgoing Past President, Sue Barman, for her hard work and dedication to APS over the past three years. Barman has shown extraordinary devotion to the APS and has been passionate about her role as President. During her tenure, we have implemented new programs, launched new journals, forged stronger ties with our colleagues in other countries, and redoubled our efforts to support the next generation of physiologists. Barman has always been focused on mentoring, and Barrett noted that she continued that role as a mentor when she moved into the role of President. Barman has amazing energy, an indefatigable spirit, and an extraordinary work ethic. Barrett was certain that

APS will continue to call on Barman for her wise counsel and abundant enthusiasm in many other roles. Barrett also commented that she is personally very fortunate to be able to count her as a friend as well as a colleague.

Sue Barman said: "I want to thank the membership for giving me the opportunity to serve as its President. The last three years have been an awesome experience. There are a lot of young folks here who received awards at this meeting. I want to encourage you to be active in this Society that gives back to its members. With the exception of maybe a year since the 1990s I have been involved either on a section steering committee or an APS committee as a member or as a chair. I have met so many wonderful folks, including Kim, who have become my friends. When I got elected President, it was like a dream come true. I want to thank the members of the Executive Cabinet, including Kim and David, but also Joey Granger and Peter Wagner in the previous two years, for being such a great team to work with. I also want to thank Marty Frank for his friendship. And a special thanks to the APS staff, many of whom Kim referred to in her talk. We are so lucky that the APS has such a dedicated and talented staff that makes our life easy. But you should all know that the things we do are not just the ideas of the leadership. We listen to you, the members, to learn what you want and need and help make that happen."

## VI. Conclusion

Barrett summed up her experience as President as follows: "It was really a marvelous honor to serve the Society as President for the past year and to see some new initiatives move forward. It was especially meaningful to serve as the fifth female President and to have been able to call on the wise counsel of three of my female predecessors, who remain active in the Society: Barbara Horwitz, Hannah Carey, and, of course, Sue Barman. I have also benefitted greatly from the support of President-Elect David Pollock, Executive Director Marty Frank, and the outstandingly talented group of individuals who comprise the APS staff. I'm grateful for the support of my colleagues at UC San Diego and my supremely efficient Executive Assistant, Glenda Wheeler. I've also been very



APS Council. *Front:* Rudy Ortiz, Kevin Kregel, Ann Schreihof, Susan Barman, Kim Barrett, David Pollock, Bill Yates, Hannah Carey, Patricia Molina. *Back:* Marilyn Merker, William Talman, Marshall Montrose, John Chatham, Dennis Brown, Jeff Sands, Pamela Carmines, Barbara Alexander, Michael Wyss, Robert Hester, M. Harold Laughlin, Hershel Raff

much touched by the many members who have shared with me their thoughts about the Society and its mission, including the Council, Sections, and Committees. Finally, I truly appreciate my bandmates in GI Distress and the unfailing support of my wonderful husband, Peter Pierce. Without Peter's love and assistance, nothing I do outside our home would be possible."

## VII. Passing of the Gavel

Barrett then passed the gavel to David Pollock, University of Alabama at Birmingham, incoming President of the American Physiological Society. Pollock, upon accepting the gavel, said: "I would like to thank Dr. Barrett for the outstanding job she has done this past year in leading our society. She is highly respected among her peers and has demonstrated a clear vision for the kind of society we can be. She has made important steps towards solidifying APS as a world leader in representing the membership and the scientific community at large. I look forward to her continued support on the Executive Cabinet."

## VIII. New Business

No new business.

There being no new business, the meeting was adjourned at 6:47 PM, April 29, 2014. ●

*David Pollock*  
President-Elect

# APS News

## APS AAMC CFAS Report

Mike Levitzky



Michael Levitzky

The Council of Faculty and Academic Societies (CFAS) is one of the three councils of the Association of American Medical Colleges (AAMC). The other two are the Council of Deans (COD), which comprises the deans of all medical schools in the United States and Canada, and the Council of Teaching Hospitals (COTH), which is composed of representatives of ~400 major teaching hospitals

and health systems, including 64 Veterans Affairs medical centers. CFAS represents academic faculty of AAMC institutions, and its purpose is to provide a strong faculty voice within the AAMC. One goal of CFAS is to include faculty representatives from all member AAMC medical schools and from its member academic societies.

CFAS evolved from the Council of Academic Societies (CAS), which was established in 1967 to be the voice of the faculty in the AAMC. Approximately 90 dues-paying academic medical societies constituted the CAS, with ~20 representing basic science disciplines, most of the rest clinical disciplines, and a few interdisciplinary (e.g., IAMSE). Each member society could designate two participants. Physiology had representatives from the APS and from the ACDP for many years. Gabby Navar was involved in several CAS leadership roles. In 2011, CAS discussed ways to improve communication between medical school faculty and the AAMC administration. Those involved in the discussion noted that the CAS was not truly representative of medical school faculties. Representatives of the academic societies were mainly department chairs and senior faculty; many medical schools were not represented. There was little diversity among the representatives. After discussion at several meetings (CAS/CFAS meets twice a year: in the spring and at the annual AAMC meeting in the fall), a major change was proposed. In addition to the current academic society members of the CAS, each AAMC member medical school would be invited to nominate two faculty

representatives, one senior and one junior, to join the renamed CFAS. Academic societies were encouraged to appoint more junior members. Approximately 75% of AAMC medical schools have appointed representatives; almost all of the constituent academic societies maintained their memberships. CFAS representatives elect a 15-member administrative board to lead the council's activities. The CFAS chair and chair-elect are ex officio members of the AAMC Board of Directors.

This effectively tripled the CAS membership and theoretically diluted APS input. However, I was elected to the new CFAS Administrative Board at approximately the same time. (Gary Sieck is the other APS appointee; R. Clinton Webb and Marshall Montrose are the ACDP appointees.) Irv Zucker is the University of Nebraska's senior faculty representative, Jerry Breslin is USF's junior faculty appointee, and Adi Haramati is on the Administrative Board, representing IAMSE. There may be a few more APS members. As of last November, of the 319 total representatives, 190 are men and 129 are women (40%); 163 are professors, 70 are associate professors, and 75 are assistant professors; 222 are MDs, 75 are PhDs, and 16 are MD-PhDs; and 92 are chairs, 13 are vice-chairs, and 44 are directors.

The CFAS Administrative Board established standing CFAS committees for communications, evaluation, nominations, engagement, and meeting programs; and task forces or working groups for advocacy, basic science, faculty identity and value, mission alignment, faculty values, value propositions, and work-life balance. (There is considerable overlap among the task forces and working groups, and I expect some consolidation.) The committees, task forces, and working groups are composed of some members of the Administrative Board and volunteers from the CFAS membership.

I was asked to chair the Basic Science Task Force. It was charged by the Administrative Board to "work with the AAMC Chief Scientific Officer (Ann Bonham) to provide opportunities for basic science faculty (in both basic science and clinical departments) to discuss issues of



concern. Such issues may include the impact of research and other funding trends on faculty vitality and their mission activities; defining, evaluating and promoting the value of fundamental research to the public, policy makers, and other members of the academic community; training and sustaining the research and basic science educator workforces of the future; and other issues. . . ." I organized two conference calls and collected a list of issues from the task force members, including: NIH funding; early, mid-, and late-career basic science faculty development and mentoring; new teaching methods and curricula; teaching loads, basic science department organization in medical schools; loss of identity of basic science disciplines; loss of faculty; aging faculty; tenure; graduate students; MD-PhD programs; and educating BS faculty as to what the AAMC does and can do for them.

After much discussion at the CFAS meeting, the group decided to focus on the following 5 topics.

### **1. Definition of basic science faculty and concerns of basic science faculty**

*Definition:* Include anyone who self-identifies as a basic scientist: MDs or MD-PhDs in basic science departments or doing basic science research; PhDs in clinical departments.

*Concerns:* Research funding, academic advancement, promotion and tenure, job security.

### **2. The value added to medical schools by basic science**

*Education.* Undergraduate, graduate, and continuing medical education; graduate student education, research mentoring for clinical faculty.

*Research.* Discovery, scholarly work, enhancement of institution's reputation, funding for research, enhancement of fund-raising and philanthropic donations, fostering research in clinical departments, patent development, technology transfer, and better therapy for patients.

*Service to school, university, and community.* Mentor junior faculty in basic science and clinical departments; inform the public to assist them to make better health decisions; and drive the economy. Research leads to employment (technicians, postdoctoral fellows, etc.), equipment purchase and development, products, patents, and biotechnology.

### **3. Current challenges to the scientific enterprise**

*Funding.* Flat NIH budget, low likelihood of success in grant applications, increased average age of those receiving first R01. Less institutional support of research, bridge funding, etc. (Academic health science center administrators say that even NIH funding, including indirect costs, *loses* money. Every grant dollar costs institutions an average of an additional 30 cents.)

*Graduate student education.* Fewer excellent applicants; less institutional support for stipends, tuition waivers, MD/PhD programs; uncertain career pathways and likelihood of multiple extended postdoctoral fellowships after completion of degree; less likelihood of obtaining a tenure track position in the future.

### **4. What are successful financial models for fostering basic research and basic science faculty?**

*Models.* traditional departments, consolidated departments, centers dedicated to specific research areas, traditional departments and centers. Basic scientists in clinical departments: support of basic scientist salaries and research by clinical departments, pharmaceutical and medical equipment companies.

Increasing importance of research collaboration within and between departments and even between institutions; increasing research collaborations between basic scientists and clinical scientists.

### **5. How can we educate administrators, politicians, and the public of the consequences of reducing the presence of basic science at medical schools, especially the long-term consequences on public health and discovery?**

Importance of advocating for basic science education, basic medical research support, etc.

Must work harder to inform: national, state, and local elected officials; administrators and clinicians in our own institutions; and the public

These will be the main areas the task force will focus on in the near future. ●

## CFAS Basic Science Task Force

(\*Attended meeting; \*\*joined group at meeting)

### Chair

#### Michael G. Levitzky, PhD\*

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## Calamari and Science: Dinner on the Marina with a Nobel Laureate

### APS Trainees Take Bruce Beutler Out for Dinner

In the midst of the tumultuous period during one's scientific training, there are only a few moments of inspiration in a trainee's experience that will stick with them throughout the rest of their careers. Needless to say, having a conversation over dinner with 2011 Nobel Laureate in Physiology or Medicine Bruce Beutler was easily one of those moments.

Following his extremely modest and encompassing lecture at Experimental Biology, we had the distinct pleasure of taking Beutler out to dinner. Predictably, we felt it was imperative that we know each detail and critical highlight of his research, because this was assumingly going to be the topic of discussion over dinner. However, and much to our surprise, Beutler was more interested in discussing our research interests. Furthermore, Beutler wanted more than the research summary formality – he wanted to *learn*.

If it were possible to characterize someone's passion for science as being both micro- and macrocosmic in nature, that would artfully articulate how Beutler views scientific exploration. Although the big question is important, the molecular components and nuances of the related physiology are equally as fascinating. Beutler challenged us to think of a broader approach to the question to efficiently extract more answers from that single question. Briefly, what will be our approach to design high-throughput learning? This seems to remain a foreign concept to many of us during our finely focused studies, and it is refreshing to be reminded to take a step back to look at the bigger picture.

Indeed, in today's environment of science, it seems we are too busy with being busy that we often forget to take a moment to stop, listen, and experience to true art of discovery, which is the essence of science. Beutler reminded us how important this was to bring about the creative mind, and how it is the art of discussion that brings science to life. Throughout our dinner, he challenged us to take risks in our careers, to think outside



From left to right: Karen Edelblum, Bruce Beutler, Christopher Banek, and Jessica Bradley

the box, and to not be afraid of failure. Indeed, with all of the challenges trainees and young faculty are currently facing in science, it is refreshing and encouraging to see prominent researchers such as Beutler be excited to be scientists. Moreover, whenever we face doubts in our career, he urged us to remember that every time we get that new piece of data there is a brief moment in discovery where we are the only ones in the entire universe who know the answer to that question, and that we get to choose how to share that knowledge with the world.

This incredible and rare opportunity was graciously provided by the American Physiological Society and clearly demonstrates the Society's focus on fostering the professional development of its trainees. From us all, we thank the APS, the organizers, and, most importantly, Bruce Beutler for this unforgettable experience. We will cherish this memory for time to come.

*Karen L. Edelblum (University of Chicago), Jessica Bradley (Louisiana State University), Christopher Banek (University of Oregon) ●*



# Publications

## 2013 Impact Factors Released for APS Journals

Thomson Reuters has released its 2014 Science Edition of the *Journal Citation Reports*, which gives journal impact factors and rankings of ~8,000 science journals. The 2013 impact factors of the journals of the APS, along with a comparison of the past 3 years, are given in the table below. The table also shows the rank of APS journals in the physiology category, as well as each journal's cited half-life.

The 2014 *Journal Citation Reports* includes an update to the Five-Year Impact Factor and *Eigenfactor*<sup>TM</sup> Metrics in JCR Web. *Eigenfactor*<sup>TM</sup> Metrics use citing journal data from the entire JCR file. The *Eigenfactor*<sup>TM</sup> score and the Article Influence<sup>TM</sup> score are calculated based on the citations received over a 5-year period.

Journal	Thomson Reuters Impact Factor Data							<i>Eigenfactor</i> <sup>TM</sup> Metrics	
	2010	2011	2012	2013	5-Year Impact Factor	2013 Cited Half-Life	2013 Rank Among Physiology Journals	2012 <i>Eigenfactor</i> <sup>TM</sup> Score	2012 Article Influence <sup>TM</sup> Score
<i>Physiological Reviews</i>	28.417	26.866	30.174	29.041	35.456	9.8	1	0.04169	13.843
<i>Physiology</i>	7.657	7.953	6.750	5.645	8.387	5.7	4	0.00888	3.317
<i>AJP-Endo</i>	4.686	4.746	4.514	4.088	5.037	7.6	10	0.03949	1.660
<i>AJP-Lung</i>	4.137	3.662	3.523	4.041	4.338	7.7	11	0.02121	1.165
<i>AJP-Heart</i>	3.880	3.708	3.629	4.012	4.046	8.5	12	0.05312	1.282
<i>AJP-GI</i>	3.522	3.431	3.649	3.737	3.853	7.6	15	0.02816	1.236
<i>AJP-Cell</i>	3.817	3.536	3.711	3.674	3.952	7.9	17	0.03312	1.318
<i>AJP-Regu</i>	3.284	3.336	3.284	3.529	3.502	8.9	19	0.03480	1.112
<i>Journal of Applied Physiology</i>	4.232	3.753	3.484	3.434	4.193	>10.0	20	0.04724	1.296
<i>AJP-Renal</i>	3.792	3.682	3.612	3.300	3.753	7.4	22	0.03303	1.165
<i>Journal of Neurophysiology</i>	3.114	3.316	3.301	3.041	3.446	>10.0	26	0.06897	1.407
<i>Physiological Genomics</i>	3.368	2.735	2.806	2.812	3.019	6.7	29	0.01008	1.016
<i>Advances</i>	1.382	1.547	1.217	1.237	1.389	7.1	68	0.00131	0.364

## APS Journals and the ORCID Initiative

The APS Journals program is now participating in the ORCID Registry (<http://www.the-aps.org/mm/Publications/Info-For-Authors/Composition#orcid>). Authors submitting manuscripts to APS journals will now have the option to attach their ORCID identifier to their author profile in the APS Manuscript Submission system, or register for one if they are a new participant. This ORCID identifier will be included in the article metadata, if published, which may facilitate broad-reaching linkages of many pieces of an author's work across multiple databases (such as Pubmed, PMC, and others).

ORCID is “an open, non-profit, community-based effort to create a permanent registry of unique researcher identifiers and a transparent method of linking research activities and outputs to these identifiers.”

Please see the ORCID website (<http://orcid.org/>) for more information and to register for an ORCID identifier. ●



# Education

## Joyner Receives Schmidt-Nielsen Distinguished Mentor and Scientist Award at EB 2014

The APS Women in Physiology Committee hosted a lecture and reception at Experimental Biology 2014 to honor Michael J. Joyner, Mayo Clinic, who was selected as the 11th recipient of the Bodil M. Schmidt-Nielsen Distinguished Mentor and Scientist Award.

Over 100 colleagues, trainees, and EB awardees gathered to celebrate and hear Joyner's award lecture entitled, "Mentoring Through Teamwork: Lessons Learned." The talk will be published in a future issue of *The Physiologist* and posted on the APS Mentoring Forum website (<http://www.the-aps.org/career>). Erica Wehrwein (Michigan State University), who coordinated the nomination of Joyner for the award, was present to introduce him. Angela Grippo, Chair of the Women in Physiology Committee, gave the award presentation introduction, and David Pollock, incoming President of the APS, and Kim Barrett, President of the APS and the 2012 award recipient, gave the award to Joyner.

Joyner is the Frank R. and Shari Caywood Professor of Anesthesiology at the Mayo Clinic, where he served as Deputy Director and Associate Dean for Research from 2005 to 2010. Since the late 1990s, he has played major leadership roles at Mayo, was named a distinguished investigator in 2010, and was presented the prestigious APS Walter B. Cannon Award in 2013.

Joyner's lab has been continuously funded by NIH since the early 1990s. He has had major editorial duties with both the *Journal of Physiology London* and the *Journal of*



The Joyner "Family" at the 2014 Schmidt-Nielsen Award Lecture and Reception

*Applied Physiology.* Joyner has participated in numerous peer-review panels for various funding agencies. His former fellows have established successful independent research laboratories at top institutions in the U.S., Canada, Europe, and Japan.

Joyner's research interests focus on cardiovascular control in conscious humans. He is especially interested in the interaction between local vasodilator signals, sympathetic vasoconstriction, and the regulation of arterial pressure. He is also a recognized expert on athletic performance and the physiology of world records.

Joyner's deep understanding of topics in physiology combined with a wonderful interactive nature makes him a top-tier educator and mentor. His talents in the classroom and at the podium carry over into more informal venues.

He was an Excellence in Teaching nominee (Mayo Clinic, Department of Physiology), Teacher of the Year Nominee (Mayo Grad School Physiology/Biophysics), and winner of the Teacher of the Year award for the Danish Cardiovascular Foundation.

APS members are encouraged to nominate members for the 2015 Bodil Schmidt-Nielsen Award. For more information, see the APS website (<http://www.the-aps.org/education/schmidtnielsen>) or contact Brooke Bruthers, APS Senior Program Manager, Diversity Programs at [education@the-aps.org](mailto:education@the-aps.org). The application deadline is September 15, 2014. ●



Angela Grippo, Chair of the Women in Physiology Committee, Michael Joyner, 2014 Schmidt-Nielsen Awardee, and David Pollock, President-elect



2014 Nominator Erica Wehrwein and Awardee Michael Joyner



## Bunker Receives Fourth ADInstruments Macknight Early Career Innovative Educator Award



Aaron Bunker,  
Morningside College,  
2014 ADInstruments  
Macknight Early Career  
Innovative Educator  
Awardee

Aaron Bunker from the Department of Biology-Chemistry at Morningside College (Sioux City, IA) received the fourth annual ADInstruments Macknight Early Career Innovative Educator Award. Bunker was selected based on the laboratory activity he developed entitled, "Laboratory Group Research Project" to use in conjunction with his General Physiology class.

This award honors an early career APS member who demonstrates the greatest potential for incorporating innovative teaching techniques and effectively utilizing technology resources in engaging undergraduate students in physiology education. It is sponsored by ADInstruments in honor of its co-founder, Tony Macknight.

The APS Education Committee chaired by J. Michael Wyss (University of Alabama, Birmingham) selected Bunker from the pool of applicants. He was chosen based on a 2- to 3-page description of a laboratory experiment or activity that exemplifies innovative use of technology in physiology education, an explanation of how this activity/technique can be integrated in the curriculum to best benefit students, a CV, and a letter of recommendation from his department chair or administrator.

Bunker received a \$1,500 Travel Award to attend Experimental Biology, a certificate of recognition, and an Institutional Grant providing Morningside College with a PowerLab PTB 4152 LabTutor Physiology Teaching Bundle or its equivalent.

Bunker received the ADInstruments Macknight Early Career Innovative Educator Award at the Experimental Biology meeting. ●

## Inspire the Next Generation of Physiologists

**Physiology Understanding Week (PhUn Week) is November 3-7, 2014**



**Start Planning your Event Now! Deadline: October 1<sup>st</sup>**

- The theme for PhUn Week is Exercise & Health.
- APS provides resources to support and plan your event.
- APS Members and teachers partner NOW for preliminary planning before the school year begins!
- Online submission request form for PhUn Week Event planners is now open.



[www.PhUnWeek.org](http://www.PhUnWeek.org)

## Sweazea Receives Dale J. Benos Early Career Professional Service Award



Karen Sweazea, 2014 Benos Early Career Professional Service Awardee

Karen Sweazea, assistant professor in the School of Life Sciences, Arizona State University, was selected as the 2014 Dale J. Benos Early Career Professional Service Awardee. Sweazea was selected based on her remarkable level of professional service, outreach, and mentoring/teaching activities with students at the graduate/professional, undergraduate, and K-12 levels, as well as with members of her community. She has been

nominated for or won awards for both her mentoring and her research throughout her career to date.

**Professional service.** Sweazea's professional service has been at all levels: graduate, undergraduate, and K-12. She served as a member of the APS Trainee Advisory Committee and trainee representative to the Comparative and Evolutionary Physiology (CEP) Section Steering Committee as well as to the Communications Committee of APS (2006-2009). Following that, she became a member of the Communications Committee (2010-2012), and contributed and edited content for the [www.physiologyinfo.org](http://www.physiologyinfo.org) consumer website. Currently, she is serving as treasurer for both the Arizona Chapter of the Association for Women in Science (AWIS-AZ) (since 2011) and the CEP Section of the APS (since 2010). She also is a current advisory board member for K-12 research fellowships through the APS Education Office (since 2012). She continuously serves as a judge for numerous K-12 and undergraduate research presentations and competitions on behalf of the APS, as well as for a myriad of other scientific organizations to which she belongs. For her universities, she has served on many committees (and was chair of many) as a graduate student, postdoctoral fellow, and now as a faculty member.

**Outreach.** Sweazea's outreach activities have encompassed all levels as well. At ASU, she has served as a volunteer for the Commission on the Status of Women Professional Development Conference and on the Organizing Committee for the ASU Forward to Professorship Conference for STEM career development

for the AWIS chapter. At the APS CEP Intersociety meeting in 2010, she presented a seminar on career options, and at the 2014 meeting she will be co-chairing a workshop on Teaching Physiology.

Since 2010, Sweazea has served as an Obama Scholars Mentor for underprivileged freshman at ASU and has been a mentor for the online mentoring program, MentorNet, in addition to her activities with undergraduate students in the classroom and laboratory. Recently, she was the faculty leader responsible for developing and implementing a series of five unique workshops to teach middle school students about digestive physiology and nutrition. She has developed and implemented a physiology understanding (PhUn) week event for second graders, a summer workshop on neurophysiology for high school seniors, and volunteered at the Arizona Science and Engineering Fair, along with many other local high school and undergraduate outreach activities.

For outreach to the general public, she writes weekly content for a national blog on current physiology research topics since 2010. She has presented a seminar on diabetes for the American Hellenic Educational Progressive Association and given many guest lectures/seminars to the general public at events such as the Women in Science and The Imagination Project.

**Mentoring/teaching.** Sweazea has mentored undergraduates, masters, and PhD students, serving not only as advisor but on thesis/dissertation committees as well. Her graduate and undergraduate students have received both national and institutional research grants. Student success in her laboratory was highlighted in a recent article (<http://bit.ly/1iqEL58>). She routinely takes undergraduate students to scientific meetings locally and nationally, where they receive awards for their work. She continues to volunteer to create new courses of interest to undergraduates who want to learn more about research and physiology in general.

Sweazea accepted the 2014 Dale J. Benos Early Career Professional Service Award at the Experimental Biology meeting. ●

## 2014 APS Minority Travel Fellows Attend Experimental Biology in San Diego



2014 Travel Fellows at the EB 2014 Minority Travel Fellows Luncheon

The APS regularly awards travel fellowships for underrepresented minority scientists and students to attend APS scientific meetings with funds provided by APS. These fellowships provide funds for reimbursement of registration, transportation, meals, and lodging expenses for travel to a meeting location. Thirty-one Fellows attended the APS's annual meeting, Experimental Biology (EB), in San Diego from April 26 to 30, 2014.

Fellows in the Minority Travel program not only receive financial support to attend these meetings, but are also provided professional guidance through pairings with APS members who serve as "meeting mentors" to the Fellows for the duration of the conference. Thanks to the time and expertise offered by mentor volunteers, Fellows are able to expand their network of professional colleagues.

During EB, several events were offered as part of the Minority Travel program, including an orientation and reception on Saturday afternoon, a networking breakfast on Monday, and a luncheon on Wednesday. All events were very well attended by Fellows, meeting mentors, Porter Physiology Development and Minority Affairs Committee members, members of the APS leadership including APS President Kim Barrett, APS President-Elect David Pollock, Past President Sue Barman, and Executive Director Marty Frank. During the networking breakfast on Monday, students and meeting mentors had the opportunity to interact with one another again

Discussion Topic	Discussion Leader
Perfecting Your CV	Eric Lazartigues, LSU Health Sciences Center
Finding Grant Opportunities	Heidy Contreras, Univ. of La Verne Patricia Molina, LSU Health Sciences Center
Interviewing Skills	Rolando J. J. Ramirez, Univ. of Akron
Tips On Writing and Defending a Dissertation	Dexter Lee, Howard Univ.
Mentor Selection	Corey Reynolds, Baylor College of Medicine Alice Villalobos, Texas A&M University
Networking	Keisa Mathis and Barbara Alexander, Univ. of Mississippi Medical Center
Graduate School vs. Medical School	Peter Mittwede, Univ. of Mississippi Medical Center
Choosing a Graduate or Medical School	Mike Ryan, Univ. of Mississippi Medical Center
Talk to a Clinical Researcher	Kedra Wallace, Univ. of Mississippi Medical Center Michael Joyner, Mayo Clinic



to exchange contact information, provide career-related answers or advice, and introduce students to other possible mentors in their particular research areas and/or geographical areas. This year, the early morning networking breakfast program included roundtable discussion topics, with discussion leaders.

Travel Fellows were also given handouts on each topic provided by the APS LifeSciTRC, formerly known as the APS Archive of Teaching Resources. The breakfast was very well attended and productive.



Minority Travel Fellow Luncheon  
Keynote Speaker Dexter Lee

The Wednesday luncheon consistently provides another opportunity for students and mentors to solidify their interaction and discuss or clarify concepts learned and acquired during the meeting. The highlight of the luncheon was the keynote address given by Dexter Lee, Director of Graduate Studies and

associate professor in the Department of Physiology and Biophysics at the Howard University College of Medicine. Lee's talk, "From Minority Travel Fellow to Associate Professor and All of the Steps In Between," highlighted his career path and the importance of continuing to network with Minority Travel Fellows and APS members along the way. His talk provided a personal perspective on what he has learned along the way. Lee's presentation will be available online later this summer at [www.the-aps.org/diversity](http://www.the-aps.org/diversity).

The APS's Minority Travel Fellowship awards are open to graduate students, postdoctoral students, and early career faculty (within 5 years of earning a PhD) from groups underrepresented in science (i.e., underrepresented racial/ethnic minorities and persons with disabilities). Applicants must be attending U.S. institutions and conducting research within the 50 states and U.S. territories. The specific intent of this award is to increase participation of underrepresented pre- and postdoctoral students in the physiological sciences. For more information, contact Brooke Bruthers, Senior Program Manager, Diversity Programs, in the APS Education Office at 301-634-7132 or [education@the-aps.org](mailto:education@the-aps.org). ●



## Meetings and Conferences

### APS Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology

October 5-8, 2014 • San Diego, California

### Experimental Biology 2015

March 28-April 1, 2015 • Boston, Massachusetts

### APS Conference: 14<sup>th</sup> International Conference on Endothelin: Pathophysiology and Therapeutics

September 2-5, 2015 • Savannah, Georgia

[the-aps.org/mm/Conferences](http://the-aps.org/mm/Conferences)

## Graduate Students and Postdoctoral Fellows Receive tum Suden/Hellebrandt Professional Opportunity Awards



2014 tum Suden, Strand, and Horvath Awardees at EB 2014 with Angela Grippo, Chair, WIPC

Graduate students and postdoctoral fellows who were first authors on an abstract submitted to Experimental Biology 2014 were eligible to apply for the Caroline tum Suden/Frances A. Hellebrandt Professional Opportunity Award. A fund established to honor the memory of Steven M. Horvath and Fleur L. Strand, distinguished APS members, to provide support for the top two underrepresented minority awardees and top-ranked awardee, respectively.

The APS Women in Physiology Committee, chaired by Angela Grippo at Northern Illinois University, selected 39 awardees from a pool of 145 applicants. Applicants were required to be APS members (either student or regular) at the time of application and could not have won the award previously as a graduate student (if currently a graduate student) or as a postdoctoral fellow (if currently a postdoctoral fellow). Applicants were chosen based on the quality and novelty of their abstracts, and letters written by the candidates describing their career goals, research, and why they were particularly deserving of the award. Each awardee received \$500, a certificate of recognition, and complimentary advanced registration for the EB 2014 meeting; the Fleur Strand Awardee receives \$1,000.

Awards were presented during the APS Business Meeting to:

Awardee	Institution
Tahisha Buck	Univ. of Oregon
Eileen Chang	Univ. of Florida College of Medicine
Yi-Chun Chen	Indiana Univ. School of Medicine
John Clemmer	Univ. of Mississippi Medical Center
Denise Cornelius*	Univ. of Mississippi Medical Center
Kristine DeLeon-Pennell*	Univ. of Mississippi Medical Center
Joseph Duke	Univ. of Oregon
Jessica Faulkner	Univ. of Mississippi Medical Center
Scott Ferguson	Kansas State Univ.
Amy Firth	The Salk Institute for Biological Studies
Alexandra Garvin	Pennsylvania State Univ.
Sarah Greising	Mayo Clinic
Paul Grimm	Univ. of Maryland School of Medicine
Jonathan Gumucio	Univ. of Michigan
Karla Haack	Univ. of Nebraska Medical Center
John Harrell	Univ. of Wisconsin Madison
Brett Heimlich	Georgia Health Sciences Univ.
Dao Ho	Georgia Regents Univ.
Anne-Cecile Huby	Georgia Health Sciences Univ.
Heather Huntsman	Univ. of Illinois Urbana-Champaign



Victoria Kay*	Univ. of North Texas Health Science Center
Christine Klemens	Univ. of Pittsburgh School of Medicine
Kristin Lewis	Ohio State Univ.
Jacqueline Limberg	Mayo Clinic
Roxana Loperena	Vanderbilt Univ.
Levi Maston	Univ. of New Mexico
Julie McLean	Univ. of Kentucky
Charles Norton	Univ. of New Mexico
Danielle Plomaritas	Univ. of New Mexico
Paula Poh	Univ. of Illinois at Urbana-Champaign
Joshua Sheak	Univ. of New Mexico
Joshua Speed	Georgia Regents Univ.
Theodora Szasz	Georgia Regents Univ.
Vince Tedjasaputra	Univ. of Alberta
Ashlee Tipton	Georgia Regents Univ.
Kathryn Walsh	Boston Univ. School of Medicine
Jing Wu	Vanderbilt Univ.
Liang Xiao	Vanderbilt Univ.
Daniel Xing	Latrobe Regional Hospital

\*The Fleur Strand Award was presented to Victoria Kay for having the highest ranked application. The Steven Horvath Awards were presented to Denise Cornelius and Kristine DeLeon-Pennell. Please see *American Physiological Society 167th Business Meeting* (p. 195) for photographs of the Strand and Horvath awardees.

For information about applying for the 2015 Caroline tum Suden/Frances Hellebrandt Professional Opportunity Awards, visit <http://www.the-aps.org/tumsudenstudent> (graduate student applicants) or <http://www.the-aps.org/tumsudenpostdoc> (postdoctoral fellow applicants); or contact Brooke Bruthers, APS Senior Program Manager, Diversity Programs at [education@the-aps.org](mailto:education@the-aps.org). The application deadline for the 2015 awards is November 6, 2014 (<https://www.the-aps.org/awardapps>). ●

## APS Supports Local and Regional Science Fairs



**Would you like to be a science fair judge at your local school and present an APS award?**



Each year the APS sponsors awards at local and regional science fairs on a first come, first serve basis. The APS awardee receives an APS t-shirt, pin, and a Certificate of Achievement for the best physiology-related project. The student's teacher receives a copy of the APS book, *Women Life Scientists: Past, Present, and Future* and an APS teacher resource packet. Any APS member who participates as a judge in a local or regional science fair at an elementary, middle, or high school is eligible to apply and receive APS support for one award per year.

To request an award package, visit the APS Science Fair website or contact Kristine Vowels ([kvowels@the-aps.org](mailto:kvowels@the-aps.org)) at the APS Education Office.

**[the-aps.org/education/sciencefair](http://the-aps.org/education/sciencefair)**



## MD or DO Students Receive Second Excellence in Professional Student Research Travel Awards



2014 Excellence in Professional Student Research Travel awardees (from left to right: Jonathan O'Donnell, David Thompson, Milad El Hajj, Huy Le, Geneva Wahl)

MD or DO students who were first authors on an abstract submitted to Experimental Biology 2014 in San Diego, CA were eligible to apply for the Excellence in Professional Student Research Travel Awards.

The APS Career Opportunities in Physiology Committee chaired by Kathy Ryan, from U.S. Army Institute of Surgical Research, selected six awardees from the applicants. Awardees were chosen based on the quality of their abstract; a one-page letter discussing their role in the research, the significance of the research, and their career plans; and a recommendation letter from their research advisor.

The awardees received a certificate of recognition, \$1,800 travel allowance, and complimentary advanced registration for the EB 2014 meeting. They also received a meeting mentor who was a professional in their field of research for the EB meeting.

Five of the students received their awards and met with their meeting mentors at an orientation session at EB. Career Opportunities in Physiology Committee Chair

Ryan and members TanYa Gwathmey (Wake Forest School of Medicine) and Eileen Chang (University of Florida) spoke to the students about APS, translational research opportunities, and navigating the EB meeting.

The 2014 Excellence in Professional Student Research Travel Awardees are:

Student	Meeting Mentor
Milad El Hajj LSU Health New Orleans	David G. Harrison Vanderbilt Univ.
Huy Le Georgia Regents Univ.	Michael J. Joyner Mayo Clinic
Johathan O'Donnell Univ. of Newcastle	Rolando E. Rumbault Baylor College of Medicine
David Sigmon Tulane Univ.	Pedro A. Jose Univ. of Maryland
David Thompson Tulane Univ.	William T. Talman Univ. of Iowa
Geneva Wahl Medical College of Wisconsin	Jeff M. Sands Emory Univ.

## Novel Disease Model Awards Granted to Graduate Student and Postdoctoral Fellow



Ellen Gillis



Suttira Intapad

Predoctoral students and postdoctoral fellows who were first authors on an abstract submitted to Experimental Biology 2014 in San Diego, CA were eligible to apply for the Novel Disease Model Awards.

The APS Physiologists in Industry Committee chaired by Kelly Pitts, from Corgenix Medical Corporation, selected a predoctoral and a postdoctoral awardee from the applicants. Awardees were chosen based on the novelty of the model and the potential utility of the system for future research related to a disease process.

The predoctoral awardee received \$500, a certificate of recognition, and complimentary advanced registration for the EB 2014 meeting. The postdoctoral awardee received \$800, a certificate of recognition, and complimentary advanced registration for the EB 2014 meeting. Beginning in 2014, the Novel Disease Model Awards were sponsored by Novo-Nordisk.

The Predoctoral Awardee was Ellen Gillis, University of Mississippi Medical Center, for her abstract entitled "The Dahl S Rat on Normal Salt Diet is a Spontaneous Model of Preeclampsia."

The Postdoctoral Awardee was Suttira Intapad, University of Mississippi Medical Center, for her abstract entitled "A New Model of Intra Uterine Growth Restriction (IUGR) Induced by Reduced Uterine Perfusion in the Mouse Programs Hypertension in the IUGR Mouse Offspring."

Awards were presented at EB during the APS Business Meeting. APS congratulates these awardees. ●

<http://apsselect.physiology.org>

# APSselect

A new article collection website from the APS

**Introducing APSselect**  
 A new website from which you can access the "best of the best" articles from the APS journals. APSselect highlights articles from the more than 250 papers published each month by the Society's 10 research journals. Articles are selected by an editorial team that includes editors and members of the Publications Committee. You can access the APSselect collection all in one place at <http://apsselect.physiology.org>.

**About the New Website**  
 The editorial team carefully selects the top articles published each month across all 10 APS research journals that highlight, promote, and rapidly disseminate our very best original research. This collection provides:

- Outstanding scientific discoveries published by our Society each month.
- Timely, convenient, and concise "one-stop shopping" mechanism to broadly transmit our exceptional work.
- Easy access from the APS homepage ([www.the-aps.org](http://www.the-aps.org)).

APSselect is an ideal mechanism to enable a broader mission: to promote excellence of the physiological discipline to biomedical researchers in other fields.



<http://apsselect.physiology.org>



<http://apsselect.physiology.org>

## Undergraduate Summer Research Fellows Attend EB

The 2013 Fellows from four of APS's undergraduate summer research programs attended the 2014 Experimental Biology meeting held in San Diego, CA to report on their research findings from last summer.

Six of the eight Integrative Organismal Systems Physiology (IOSP) Fellows attended the EB meeting. Of those, five submitted a first-author abstract to the meeting.

Fourteen of the 18 Short-Term Research Education Program to Increase Diversity in Health-Related Research (STRIDE) Fellows attended the EB meeting. Of those attending, all submitted a first-author abstract, and one student submitted two abstracts. One additional student who could not attend submitted an abstract.

Twenty-two of the 24 Undergraduate Summer Research Fellows (UGSRFs) attended the meeting. Twenty of the UGSRFs were first authors on abstracts submitted to the meeting.

Five of the six Undergraduate Research Excellence Fellows (UGREFs) attended the meeting. Five Fellows submitted a first-author abstract.



2013 IOSP Fellows (others not pictured)

Kim E. Barrett (APS President), Susan Barman (APS Past President), and Patricia Molina (APS President-elect for 2014-2015) congratulated the Fellows on their scientific research efforts and presented them with certificates for completing their fellowship.

All undergraduates in physiology who had first-author posters were invited to a special Undergraduate Orientation Session. The Fellows were joined by the David S. Bruce Outstanding Undergraduate Abstract Awardees, in addition to ~30 other undergraduates

for the session. Kathy Ryan, Chair of the Career Opportunities in Physiology Committee, welcomed the undergraduates and introduced the Fellows from all programs. Lila LaGrange, member of the Education Committee, introduced the Bruce Abstract Awardees and reminded the undergraduates about the special Undergraduate Poster Session on Sunday. Cassandra Williams, member of the Trainee Advisory Committee, gave a presentation on attending a scientific meeting and how to get the most out of being there, both in terms of science and career talks, as well as social activities. Tom Pressley, member of the Career Opportunities in Physiology



2013 UGSRFs (others not pictured)

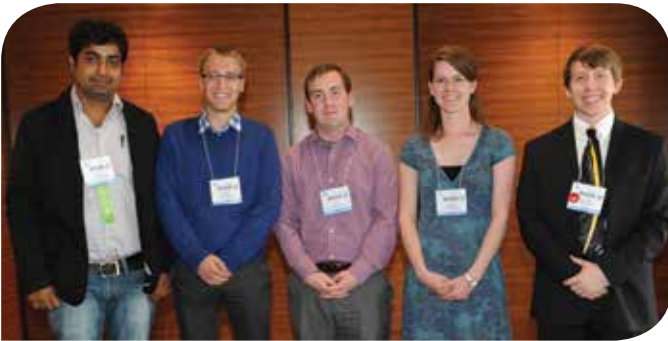




2013 STRIDE Fellows (others not pictured)

On Monday morning, the IOSP and STRIDE Fellows attended the Minority Travel Fellow Networking Breakfast to meet graduate students, postdoctoral fellows, and early career faculty from diverse backgrounds. Networking tables with topics such as “choosing a graduate school or medical school,” “networking,” and “mentor selection” were organized to facilitate discussion.

Overall, the Fellows saw the EB meeting as being a very positive learning experience and appreciated the opportunity to come and present their research.



2013 UGREFs (others not pictured)

The IOSP and STRIDE undergraduate programs are supported by APS and NIH NHLBI Grant 1R25 HL-115473-01. The UGSRF and UGREF programs are supported by APS.

For more information about these programs, contact Melinda Lowy, Senior Program Manager, Higher Education Programs, or Brooke Bruthers, Senior Program Manager, Diversity Programs, at [education@the-aps.org](mailto:education@the-aps.org). ●

Committee, gave a talk on poster presentations and hints for making that a positive experience. Members of the Career Opportunities in Physiology and Trainee Advisory Committees attended the session and sat among the undergraduates to offer their own advice.

On Sunday, the Fellows participated in the APS Undergraduate Poster Session and presented their posters to APS members, in addition to their regularly scheduled scientific session.



UG orientation

## Undergraduate Students Receive David S. Bruce Awards for Excellence in Undergraduate Research

Undergraduate students who were first authors on an abstract submitted to Experimental Biology 2014 in San Diego, CA were eligible to apply for the David S. Bruce Awards. The Bruce Awards include two awards: the Outstanding Undergraduate Abstract Award and the Excellence in Undergraduate Research Awards.

The APS Education Committee, chaired by J. Michael Wyss, University of Alabama, Birmingham, selected 30 Outstanding Undergraduate Abstract Awardees from a pool of 88 applicants. Awardees were chosen based on the quality and novelty of their abstracts and letters written by the candidates describing their career goals, research, and why they were particularly deserving of the award. The 30 Outstanding Abstract Awardees were:

**Mun Y. Aw**, Univ. of Arizona (lab of Thomas L. Pannabecker, Univ. of Arizona Coll. Med.)

**Iara M. Backes**, Univ. of Florida (lab of Deborah A. Scheuer, Univ. of Florida)

**Michael F. Catanzaro**, Univ. of Pittsburgh (lab of Bill J. Yates, Univ. of Pittsburgh)

**Frederick Dong**, Cornell Univ. (lab of Robin L. Davisson, Cornell Univ.)

**David Ferland**, Michigan State Univ. (lab of Stephanie W. Watts, Michigan State Univ.)

**Rebecca Frazier**, Susquehanna Univ. (lab of Erin M. Keen-Rhinehart, Susquehanna Univ.)

**Eileen R. Gonzalez**, California State Univ., Los Angeles (lab of Katrina G. Yamazaki, California State Univ., Los Angeles)

**Julie A. Horwath**, Cornell University (lab of Robin L. Davisson, Cornell Univ.)

**Sarah M. Johnson**, Univ. of Oregon (lab of Jeffrey S. Gilbert, Univ. of Oregon)



2014 Bruce Outstanding Undergraduate Abstract Awardees

**Aaron M. Kleinertz**, Univ. of Wisconsin-Madison (lab of Melissa L. Bates, Univ. of Wisconsin-Madison)

**Michael Korn**, Kalamazoo College (lab of Christopher L. Mendias, Univ. of Michigan)

**Sarah M. Kruse**, Univ. of Wisconsin, La Crosse (lab of Jill N. Barnes, Mayo Clinic)

**Maxwell T. Laws**, Wayne State Univ. (lab of Patrick J. Mueller, Wayne State Univ.)

**Debby Lee**, Univ. of California, Merced (lab of Rudy M. Ortiz, Univ. of California, Merced)

**Jacob Mack**, Univ. of California, Davis (lab of Barbara A. Horwitz, Univ. of California, Davis)

**Kevin J. Malins**, Univ. of California, Davis (lab of John M. Horowitz, Univ. of California, Davis)

**Alexandra Mikhailova**, Univ. of California, Davis (lab of Barbara A. Horwitz, Univ. of California, Davis)

**Katelynn Ondek**, Susquehanna Univ. (lab of Erin M. Keen-Rhinehart, Susquehanna Univ.)

**Jonathan W. Opacich**, Univ. of Minnesota (lab of Jean F. Regal, Univ. of Minnesota)

**Jenna M. Peterson**, Univ. of Minnesota (lab of Jean F. Regal, Univ. of Minnesota)

**Katherine M. Poinsette**, Kenyon College (lab of Ann M. Stowe, Univ. of Texas Southwestern)

**Mary Savarese**, Elon Univ. (lab of Jennifer K. Uno, Elon Univ.)

**Taylor T. Shuster**, Univ. of Wisconsin-Madison (lab of Marlowe W. Eldridge, Univ. of Wisconsin-Madison)

**Michael P. Skolka**, Messiah Coll. (lab of R. Alberto Travagli, Pennsylvania State University College of Medicine)

**Alissa L. Small**, Univ. of Wisconsin-Madison (lab of Jyoti J. Watters, Univ. of Wisconsin-Madison)

**Ericka M. Tank**, Univ. of Iowa (lab of Gary L. Pierce, Univ. of Iowa)

**Jenna Tosto**, William Paterson Univ. of New Jersey (lab of Jorge M. Serrador, Veteran Affairs/Rutgers Biomedical and Health Sciences)

**Breanna M. Trisko**, Univ. of California, San Diego (lab of Ellen C. Breen, Univ. of California, San Diego)

**Benjamin J. Weidemann**, Univ. of Iowa (lab of Justin L. Grobe, Univ. of Iowa)

**Julia York**, Univ. of British Columbia (lab of William K. Milsom, Univ. of British Columbia)

Awardees receive \$100, 2 years of APS undergraduate membership, and a certificate of recognition.

These students were then eligible for the Bruce Excellence in Undergraduate Research Awards. They were required to make oral presentations of their posters to a subcommittee of Education Committee members and other APS members. Of these, 14 research awardees were selected based on their knowledge of their research project. Each awardee received \$400 and a certificate of recognition. Again this year, funds were received and earmarked to award an additional \$350 to the top research awardee. This year, APS was pleased to receive support for the Bruce Awards again from Dr. Isis and APS Members John M. Horowitz, Barbara A. Horwitz, Ida J. Llewellyn-Smith, and J. Michael Wyss. Awards were presented by President Kim E. Barrett during the special APS Undergraduate Poster Session. The awardees were:

**Frederick Dong**, Cornell Univ. (lab of Robin L. Davisson, Cornell Univ.)

**David Ferland**, Michigan State Univ. (lab of Stephanie W. Watts, Michigan State Univ.)

**Rebecca Frazier**, Susquehanna Univ. (lab of Erin M. Keen-Rhinehart, Susquehanna Univ.)

**Julie A. Horwath**, Cornell University (lab of Robin L. Davisson, Cornell Univ.)

**Sarah M. Kruse**, Univ. of Wisconsin, La Crosse (lab of Jill N. Barnes, Mayo Clinic)



**Maxwell T. Laws**, Wayne State Univ. (lab of Patrick J. Mueller, Wayne State Univ.)

**Jacob Mack**, Univ. of California, Davis (lab of Barbara A. Horwitz, Univ. of California, Davis)

**Alexandra Mikhailova**, Univ. of California, Davis (lab of Barbara A. Horwitz, Univ. of California, Davis)

**Jenna M. Peterson**, Univ. of Minnesota (lab of Jean F. Regal, Univ. of Minnesota)

**Mary Savarese**, Elon Univ. (lab of Jennifer K. Uno, Elon Univ.)

**Michael P. Skolka**, Messiah Coll. (lab of R. Alberto Travagli, Pennsylvania State University College of Medicine)

**Ericka M. Tank**, Univ. of Iowa (lab of Gary L. Pierce, Univ. of Iowa)

**Jenna Tosto**, William Paterson Univ. of New Jersey (lab of Jorge M. Serrador, Veteran Affairs / Rutgers Biomedical and Health Sciences)

**Julia York**, Univ. of British Columbia (lab of William K. Milsom, Univ. of British Columbia)

**David Ferland**, Michigan State Univ., was named the top Bruce Excellence in Undergraduate Research awardee.

APS congratulates all these students on the quality of their research and presentations.

The awards are named in honor of APS member David S. Bruce (1939-2000), who served as Chair of the APS Teaching Section and was a professor of physiology at Wheaton College from 1978 to 2000. Bruce was a dedicated physiology educator who had a particular interest in engaging undergraduate students in scientific research. Bruce not only encouraged and supported his students in participating in research, but he also regularly brought undergraduate students to the Experimental Biology meeting, often to present their research findings. ●



2014 Bruce Excellence in Undergraduate Research Awardees

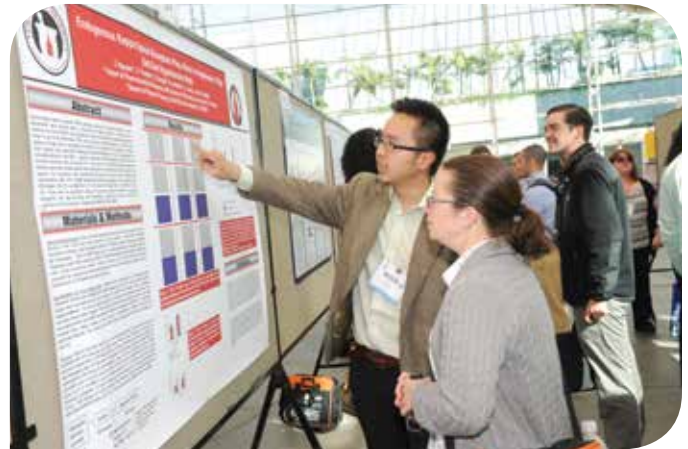
## Undergraduate Research Highlighted at Special EB Session

EB 2014 provided the setting for the 11th annual APS Undergraduate Poster Session. This special session highlights the contributions of undergraduate students to physiology research. Students present their poster at both their regularly scheduled poster session and the special Undergraduate Poster Session. This year, it was held again on Sunday afternoon and culminated with the presentation of the David S. Bruce Excellence in Undergraduate Research Awards and the awards for the third APS Video Contest: APS Presents: . . . Phantastic Physiology Voyage: "Function Follows Form."



UG poster session students

Of the 195 undergraduate first authors invited to present at the APS Undergraduate Poster Session, a record-number 167 accepted the invitation and took advantage of the opportunity to display their poster and present it to interested scientists and guests. In addition, APS was joined for a fourth year by undergraduate students from the American Association of Anatomists (AAA). A record-number 31 anatomy undergraduate presenters were there as well to participate in the session along with AAA society members. Approximately 200 APS and AAA members and guests were in attendance at the session, with many comments heard as to the high quality of research being presented by the students. The students and their research were highlighted again this year in a special printed program distributed during the session (available at [the-aps.org/ugposter](http://the-aps.org/ugposter)).



UG poster session students

The session not only provided all these undergraduate students with an opportunity to highlight their research but also to meet faculty from many graduate schools and medical schools to discuss their future plans. This is the eighth year that graduate departments were invited to sponsor the session and display promotional materials for their departments to those undergraduates considering graduate school. The departments and students arrived 30 minutes before the session to allow the students to spend time with the departments without having to leave their posters. The following 12 schools or programs participated:

University of Alabama at Birmingham, Graduate and Biomedical Science (PhD) and Medical Scientist (MD / PhD) Training Programs

University of California, Davis, Molecular, Cellular, and Integrative Physiology Graduate Group

University of Florida, Department of Physiology & Functional Genomics

Howard University College of Medicine, Department of Physiology & Biophysics

Mayo Clinic College of Medicine, Biomedical Engineering and Physiology Graduate Program



Medical College of Wisconsin, Department of Physiology

Meharry Medical College, Physiology Program

Michigan State University, Department of Physiology

University of Missouri, Department of Biomedical Sciences

Saint Louis University, Graduate Program in the Biomedical Sciences

Tulane University Health Sciences Center, Physiology, Biomedical Sciences Graduate Program and the Bioinnovations Graduate Program

Virginia Commonwealth University School of Medicine, Department of Physiology and Biophysics

The departments received a list of undergraduate presenters who indicated they were interested in being contacted about attending graduate school.

APS looks forward to hosting APS Undergraduate Poster Sessions at future Experimental Biology meetings and encourages undergraduate students doing research in physiology to submit abstracts for EB, apply for the David Bruce award, and attend the poster session in 2015.

Departments who are interested in sponsoring the 2015 Undergraduate Poster Session and displaying materials for their departments are encouraged to contact the APS Education Office ([education@the-aps.org](mailto:education@the-aps.org)). ●



Departments and programs discuss their graduate offerings with undergraduate students

# APS Members!

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A monthly bulletin for APS members about science policy issues of concern to physiologists with an *emphasis on advocacy opportunities*

Email [SciencePolicy@the-aps.org](mailto:SciencePolicy@the-aps.org) to sign up!





## San Jose State University Undergraduates Win Fourth Video Contest

Peter Luu, Laura Philbin, Lubaina Elahi, and David Tatarakis of San Jose State University are the recipients of the APS Presents . . . Phantastic Physiology Voyage 2014: “Function Follows Form” Video Contest First Place Award. Their video was entitled “Avian Surgery!”

Derek Burkhardt, Marc Stanieich, and Joshua Linnane from the University of New Hampshire won the Viewers’ Choice Award for the contest for their video entitled “Goose Bumps.”

The video contest encourages undergraduate and graduate students to creatively connect with physiology and engages them with the broader public through a short video contest. These videos would creatively demonstrate and/or explore a specific physiological function in 5 minutes or less. Videos can be staged as a short play, commercial, news broadcast, talk show, music video, documentary, etc.

The APS Career Opportunities in Physiology Committee chaired by Kathy Ryan (from U.S. Army Institute of Surgical Research) selected the award-winning video from the applicants. The winning video was chosen based on originality, creativity, and quality of the video; whether the video explained the scientific principle at issue clearly and accurately; whether the video made physiology more interesting and relevant; and overall impact.

Finalist videos were then advertised on the APS website and Facebook pages to encourage members and guests to review and vote for their favorite on YouTube. Voting



Peter Luu (1st place awardee), accepting on behalf of the team from San Jose State University, and President Kim E. Barrett

was closed during the EB meeting, and the Viewers’ Choice Award was given based on the total number of YouTube views.

The award-winning video team received \$750 and certificates of recognition. For the Viewer’s Choice Award, the winning team received \$250 and certificates of recognition.

Awards were presented during the Undergraduate Poster Session held during EB. ●

## High School Students and Science Teachers Explore Physiology at EB 2014

This year's 2014 APS Physiology Workshop for Teachers and Students saw a significant increase in the number of area high school teachers and their students, with over 120 in attendance for the daylong event. The workshop was held on April 28, and also included representatives for ADInstruments, Education Committee members, APS members, and the 2013 Frontiers Research Teachers. Students' feedback commented on RK Rao, tour guide, being the best part of their experience. RK Rao, Education Committee member, was committee lead for the day and, according to students' comments, was one of the best parts of their experience as their lunchtime tour guide.

Students engaged in demos of lab equipment used in teaching and research laboratories with interactive demonstrations by APS members, K-12 Outreach Fellows, and representatives from ADInstruments. The keynote talk, "Rattlesnakes, Hummingbirds and Antelopes: Biological Insights From Nature's Extremes," was given by APS member Stan Lindstedt, Professor of Physiology, School of Medicine, University of Arizona and Regents' Professor of Biology, Northern Arizona University, Flagstaff, AZ. His talk was followed by an interactive career panel that included Lindstedt, Raisa Loucil-Alicea, and Abigail Ruiz-Rivera, Ponce School of Medicine and Health Services, Puerto Rico. The panel was moderated by 2013 Lead Mentor Instructor Robert Manriquez. Fifteen APS members served as tour



High School students from around the San Diego area enjoy demonstrations by ADInstruments during the Teacher Student Workshop at EB 2014

guides during lunchtime visits to the exhibit hall, where they took teachers and students through the exhibits and posters and shared a box lunch while discussing physiology careers.

The afternoon student session was led by Education Committee members Carissa Krane and Peter Mittwede, along with Frontiers Mentor instructors Robert Manriquez and Monica Erwin. Students used the "Junkyard Digestion" activity on modeling the digestive system with common household items. The teachers and APS teacher fellows were led by mentor teacher Tonya Smith in an exploration of the *Next Generation Science Standards Science and Engineering Practices*.

The students commented that one of the best parts of the event was meeting physiologists one-on-one during the lunch hour tour to the exhibit hall and scientific posters. In addition to the APS, donations for door prizes and resources were provided by ADInstruments, AAAS, and the Howard Hughes Medical Institute. The APS Education Committee plans to continue the workshop program for high school students and teachers at EB 2015 in Boston, MA. ●



The Career Panel (left to right: Robert Manriquez, Abigail Ruiz-Rivera, Raisa Loucil-Alicea, and Stan Lindstedt) takes questions from area high school students and teachers

## 2013 Frontiers in Physiology Teachers Complete Fellowship



2013 Frontiers Mentor Instructors (left to right) Monica Erwin, Robert Maniquez, and Tonya Smith enjoy meeting at the Frontiers Award Luncheon

Frontiers in Physiology Research Teacher Fellows completed their fellowship year in April with their attendance at EB2014 in San Diego. Seventeen middle and high school teachers from across the nation began

this course in April of 2013 and progressed through the online professional development lessons for 9 months. The Frontiers in Physiology Program was made available with a NCRR Science Education Partnership Award (SEPA) grant and generous support from APS. Teachers participated in reading, sharing of resources, experimental design, poster sessions, discussion boards, lesson development, peer reviews, production of Bench-to-Bedside Primers, and pre- and post-fellowship content surveys and physiology tests. Lead Mentor Instructor Robert Manriquez (2005) was assisted by Mentor Instructor Tonya Smith (2005) and Monica Erwin (2008) in leading the online forum of modeling inquiry methods for use in the classroom. Overall, teachers from nine states completed this rigorous professional development course, learning not only about physiology but about the best ways to help their students learn science via the scientific method.

The teachers completing the program include:

Teacher	Research Host
Rebecca Burns, Sherwood Githens Middle School, Durham, NC	Mildred Pointer, North Carolina Central, Durham, NC
Rachelle Carnes, Century High School, Hillsboro, OR	Virginia Brooks, Oregon Health Sciences, Portland
Matthew Carter, Riverdale High School, Fresno, CA	Rudy Ortiz, UC Merced, Merced, CA
Ginger Donnelly, Fontana Unified School District-JHHS, Fontana, CA	Lawrence Longo, Loma Linda University, Loma Linda, CA
Steve Farmer, Mt. Vernon High School, Mt. Vernon, OH	Loren Wold, The Research Institute at Nationwide Children's Hospital/The Ohio State Univ., Columbus, OH
Lorenita Holloway, Compton High School, Compton, CA	Nina Bradley, Univ. of Southern CA, Los Angeles, CA
Lauren Luongo, Milton Hershey School, Hershey, PA	Leonard Jefferson, Penn State College of Medicine, Hershey, PA
Patricia Moser, Clarksburg High School, Clarksburg, MD	Margery Anderson, Walter Reed Medical, Silver Springs, MD
Andrew Nelson, San Diego Unified School District, San Diego, CA	Thomas Herzig, U.S. Navy Health Science Center, San Diego, CA
*Elizabeth Pitts, Fort Worth ISD, Ft. Worth, TX	Dana Garcia, Texas State Univ. of San Marcos, San Marcos, TX
Takisha Reece, Sandy Spring Friends School, Sandy Spring, MD	Steven Farber, Carnegie Institution for Science, Baltimore, MD
*Christina Sabato, Pike High School, Indianapolis, IN	Steve Miller, IU School of Medicine, Indianapolis, IN
Tamica Stubbs, Phillip O Berry Academy of Technology High School, Charlotte, NC	Inna Sokolova, UNCC, Charlotte, NC
Gema Suarez, Anaheim High School, Anaheim, CA	Sean Wilson, Loma Linda Univ. School of Med., Loma Linda, CA
*Temy Taylor, Diamond Ranch High School, Pomona, CA	Bradley Andersen, Western University of Health Sciences, Pomona, CA



## Learning How to Share the PhUn at the EB 2014 Physiology Understanding Week Training Session

Twenty-seven poster presenters described strategies for outreach and hands-on physiology-related activities across primary, elementary, middle, and high school levels at the Physiology Understanding (PhUn) Week Training Session at EB 2014. The session is the sharing of best practices and grassroots outreach efforts by APS members who participate in the APS annual Physiology Understanding Week (PhUn Week) outreach program each fall ([www.PhUnWeek.org](http://www.PhUnWeek.org)). In addition to classroom activities, topics included working with a teacher, recruiting and training of a volunteer team, and organizing special community events. APS Education Committee member Kim Huey organized and opened the poster session. Approximately 120 attendees flowed through the 90-minute open poster session. The continental breakfast session was co-sponsored by the APS and ADInstruments, Inc. ●



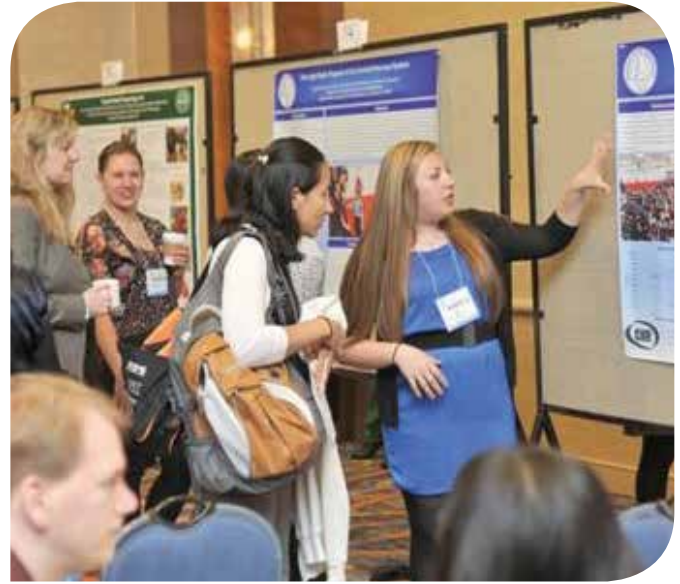
The group from the University of Mississippi Medical Center proudly pose with their PhUn Week poster

### PhUn Week Training Session Poster Titles and Lead Authors

I can hear heart sounds too, how about you? Introducing Pre-Kindergarteners to Heart Sounds with Homemade Stethoscopes—an Intersection of Science and Art	Jessica Taylor
Presenting Physiology to Students of Various Ages and Stages	Keisa W. Mathis
Introducing Fourth-Graders to Physiology Through Hands-on Activities: Special Focus on the Cardiovascular, Respiratory and Special Senses Systems	Jessica Taylor
Elementary School PhUn Week Activities: Learning and Experiencing the Function of the Heart	Kim Henige
Introducing Renal Physiology to 5th Graders	Carmen De Miguel
A PhUn Week Activity: From Fun to Impact	Alvaro Gurovich
The Effects of Exercise on Heart Rate and Blood Pressure Were Tested by Second Graders	Patricia Halpin
Student Lead PhUn Week: Challenges and Successes	Edward Merritt
Exploring the Nervous System in Elementary School: How do we Know What we Sense?	Christine Schnackenberg
Lessons Learned: Improving a Large-Scale PhUN Week Event at a Science Center	Erica Wehrwein
Kidney, Heart and Lung PhUn at the Mississippi Children's Museum	Michael Ryan
From the Classroom to the Community: A Day of Learning and PhUn	William Colburn



Marangelie Criado-Marrero discusses her PhUn Week event with 2013 Frontiers Teacher, Patricia Moser



Indiana State undergraduates share their excitement for PhUn Week activities with PhUn Week Training attendees

Teaching Heart Electrical Function to Second Grade Students in a Rural Area	Emily Barrett
The Light Bulb: Signals of the Central Nervous System	Shannon Hamilton
Fourth Grade Physiology Fun in Eugene, Oregon	Karen Wiedenfeld Needham
Using an Interactive Demonstration of the Mammalian Diving Reflex to Teach Cardiovascular Physiology to Elementary Students	Bryan Becker
Having PHUN at Phillip O Berry Academy of Technology: Promoting a Healthy Understanding of the Irreplaceable Nexus of Physiology Careers and Classroom Content	Tamica Stubbs
Having PhUn While Teaching Special Senses to Elementary School Students	Helena Carvalho
Physiology Understanding (PhUn) Week: The Five P's of Working With a K-12 Educator	Jessica Ibarra
Physiology as a Future Career Option for Puerto Rican Students During Physiology Understanding Week 2013	Jocelyn Rivera
Hands-on Activities for Teaching Physiology at Middle School	Marangelie Criado-Marrero
Hands-on Activity to Teach High School Students How Caffeine and Exercise Affect Blood Pressure & Heart Rate	Susan Barman
Lessons in Cardio-Respiratory Physiology and Healthy Living	Carmel McNicholas-Bevensee
Kinesiology: Movin' Muscles & Minds	Jessica Kutz
Inspiring High School Anatomy Students to See "How Muscle Force Can Move You!"	Lorenita Holloway
Interactive Activities Designed to Teach Respiratory Physiology to Elementary School Students	Alicia Schiller
Have a Healthy Heart: Interactive Activities for Elementary School Students	Jessica Dominguez Rieg

## Five APS Undergraduate Research Hosts Honored



Van Doze



Carissa M. Krane



Gregory L. Stahl



Steven Swoap



J. David Symons

APS is pleased to honor five undergraduate research hosts who have had five or more students from APS undergraduate summer research programs in their labs.

**Van Doze** from the Department of Pharmacology/Physiology/Therapeutics at the University of North Dakota School of Medicine has had six students in two APS programs since 2006: Explorations in Biomedicine and Undergraduate Summer Research Fellowship (UGSRF).

**Carissa M. Krane** from the Department of Biology at the University of Dayton has had five UGSRFs in her lab from 2002 to present.

**Gregory L. Stahl** from the Complement and Endothelial Dysfunction Program, Department of Anesthesiology, Perioperative and Pain Medicine at Brigham & Women's Hospital/Harvard Medical School has had six students in the UGSRF program since 2003.

**Steven Swoap** from the Department of Biology at Williams College has had six students in the UGSRF program, beginning in 2001, the inaugural year for that program.

**J. David Symons** from the College of Health, Division of Endocrinology/Metabolism at the University of Utah School of Medicine has had six students in three APS programs since 2005: UGSRF, Undergraduate Research Excellence Fellowship (UGREF), and Short-Term Research Education Program to Increase Diversity in Health-Related Research (STRIDE) Fellowship (supported by NIH NHLBI Grant 1 R25 HL-115473-01).

The APS undergraduate summer research programs would not have been successful without the dedication of these five individuals and many other APS members who have been willing to open their labs and serve as research hosts to undergraduate students. APS expresses its gratitude for their support and training of the next generation of physiologists.

For more information on any of the five current APS undergraduate summer research programs [UGSRF, UGREF, STRIDE, Integrative Organismal Systems Physiology (IOSP) Fellowship, and Short-Term Research Experience for Underrepresented Persons (STEP-UP) Fellowship], please see the website [the-aps.org/summerresearch](http://the-aps.org/summerresearch) or contact Melinda Lowy, Senior Programs Manager, Higher Education ([education@the-aps.org](mailto:education@the-aps.org)). ●



## APS Sponsors Speaker and Holds Workshops at the 28th Annual HAPS Conference



APS sponsored guest speaker Ann Schreihofner, University of North Texas Health Science Center at Fort Worth

In a continued collaboration with the Human Anatomy and Physiology Society (HAPS), APS sponsored a speaker and exhibited at the 28th Annual HAPS Conference held May 24-29, 2014 in Jacksonville, FL. This year's chosen speaker was Ann Schreihofner from the University of North Texas Health Science Center at Fort Worth. Schreihofner spoke of her research and its application to sleep apnea in her talk, "Cardio-respiratory Integration by the

Caudal Ventrolateral Medulla: Insights From Acute and Chronic Intermittent Hypoxia." Resources related to her talk can be found in the Life Science Teaching Resource Community (LifeSciTRC): <http://www.lifescitrc.org/collection.cfm?collectionID=3073>.

For the first time, APS also held two workshops for HAPS attendees, led by Margaret Shain (APS Program Manager, K-12 Education Programs) and Miranda Byse (APS Program Manager, LifeSciTRC and PST). A workshop for high school anatomy and physiology educators highlighted using materials produced by APS Frontiers in Physiology program participants to address the new Next Generation Science Standards (NGSS). A second workshop for undergraduate anatomy and physiology educators focused on using APS materials from the LifeSciTRC to implement the core competencies from *Vision and Change in Undergraduate Biology Education*. Resources from the undergraduate workshop can be found at <http://www.lifescitrc.org/collection.cfm?collectionID=3089>.

The 2015 HAPS Annual Conference will be held May 23-28 in San Antonio, Texas. APS President-Elect Patricia Molina, Louisiana State University Health Sciences Center, will serve as the APS-sponsored speaker. ●





# Save the Date...ET-14

APS Conference: 14<sup>th</sup> International Conference on Endothelin: Pathophysiology and Therapeutics  
September 2-5, 2015 • Savannah, Georgia

## APS Presents Awards to Outstanding High School Students at the Intel International Science and Engineering Fair

For volunteer APS judges, the prestigious Intel International Science and Engineering Fair (ISEF) was an opportunity to meet some of the brightest young minds in the world. The Intel ISEF held this year in Los Angeles, California from May 11 to 16, 2014, is the world's largest international pre-college science competition where more than 1,700 students presented their own independent research and competed for over \$5 million in scholarships and cash prizes.

Students were eligible to compete at the ISEF after winning a top prize from one of the more than 450 affiliate fairs held in 70 countries, regions, and territories. For the 22nd year, the APS presented special awards for the most outstanding projects in the physiological sciences in the form of cash prizes, certificates, t-shirts, and 1-year subscriptions to APS publications. This year's APS judging team included Lila LaGrange (University of the Incarnate Word), Johana Vallejo-Elias (Midwestern University), Kim Henige (California State University, Northridge), Erica Dale (University of California, Los Angeles), and Oliver Losón (California Institute of Technology). The APS judging team evaluated 75 projects based on students' abstracts and selected 22 candidates to interview at their posters. After 2 days of judging, the following students were selected to receive APS Awards for excellence in physiological research.

- The first place APS award (\$1,500) was presented to Divya Koyyalagunta from Clear Lake High School (Houston, Texas) for her project entitled "Role of Somatostatin Interneurons in Alzheimer's Disease."
- The second place APS award (\$1,000) was presented to Sanjana Rane from DuPont Manual High School (Louisville, Kentucky) for her project entitled "Effects



Education Committee members Lila LaGrange and Johana Vallejo-Elias pose with the APS awardees at this year's ISEF awards ceremony

of the Environmental Pollutant Acrylic Aldehyde on Renal Fibrosis."

- The third place APS award (\$500) was presented to Garrett Elijah McGrady from DuPont Manual High School (Louisville, KY) for his project entitled "Age and Glaucoma Induced Changes in Retinal Ganglion Cell Function."
- The APS Exceptional Science Award (\$500) was presented to Giuseppe Dall'Agnese from Liceo Scientifico E. Vendramini (Pordenone, Italy) for his project entitled "p38 in Muscle Differentiation."

*Lila P. LaGrange, University of the Incarnate Word  
Johana Vallejo-Elias, Midwestern University  
APS Education Committee. ●*

# Science Policy

## APS Voices Support for Lab Animal Transport

The threat to air transportation of research animals in the U.S. and elsewhere in the world poses a risk to medical research. Laboratory animals play a crucial role in efforts to cure diseases that affect both humans and other animals. Air transport ensures that animals are available when and where they are needed. Moreover, rapid shipment by air is less stressful for the animals.

The stakes are high. Lack of access to research animals would affect research on cancer, diabetes, heart disease, Parkinson's, HIV/AIDS, and a host of other conditions. Specialized animal models play a crucial role in helping researchers understand the causes, symptoms, and potential treatments for these diseases.

The inherent difficulty of shipping animals as cargo combined with persistent pressure from animal activist and extremist groups has caused many companies to cease transporting research animals. In 2012, UPS and FedEx yielded to pressure from People for the Ethical Treatment of Animals (PETA): UPS stopped transporting all mammalian species, including non-human primates, whereas FedEx implemented a stringent review process for animal shipments. United Airlines halted non-human primate shipments in 2013 after PETA orchestrated demonstrations at its offices around the world and flooded the company with over 130,000 e-mail complaints. This left Air France as the sole commercial airline still shipping non-human primates into the U.S. However, PETA supporters continue to bombard Air France with harassing e-mails, phone calls, and Facebook postings, which caused one shipment of monkeys scheduled for delivery into the U.S. to be cancelled.

The situation in the United Kingdom is a warning about what could happen here. Animal rights groups in the U.K. have pressured nearly all air, sea, and ground

carriers into refusing shipments of research animals – even mice and rats. This means that scientists who want to study genetically modified mice have to set up their own breeding colonies, an expensive and lengthy process.

This summer, animal rights groups are conducting a campaign against Delta Airlines because of its ties to Air France. Protests are scheduled to take place at Delta's airport facilities, cargo offices, and even the homes of Delta board members and executives. Airline companies have little tolerance for public pressure in the face of the other challenges involved in transporting research animals. Given that the transport of live animals requires special handling and that this type of transport represents only a tiny portion of an airline's business, it makes sense that they would withdraw unless they see a compelling reason to continue. But there is a compelling reason to continue: these animals are essential to research that will save lives.

On June 30, the APS Council adopted a statement of support for companies that provide air transportation of research animals in the face of growing pressure by anti-research groups. The statement said, in part:

Air transportation is essential so scientists can work with animal models that otherwise would not be available for life-saving research. Moreover, it is the most humane transportation option for the animals themselves. The APS calls therefore upon regulators, research sponsors, and transporters to take steps to ensure that air transportation of animals can continue.

To view the complete APS statement, go to [the-aps.org/AnimalTransport](http://the-aps.org/AnimalTransport). ●



# Membership

## New Regular Members

**\*transferred from student membership**

**Antonis Armoundas**

Massachusetts General Hosp.,  
Charlestown, MA

**Massimo Attanasio**

UT Southwestern Med. Ctr., Dallas, TX

**Wyeth Bair**

Univ. of Washington, Seattle, WA

**Valentina Alexandrovna Baronenko**

Ural Federal Univ., Ekaterinburg,  
Russian Federation

**Miriam Ben Hamo**

Princeton Univ., Princeton, NJ

**Candice Lauren Bywater**

Univ. of Melbourne,  
Brisbane, Australia

**Robin Bertrant Candau**

UMR 866, Montpellier, France

**Kunal Chaudhary**

Univ. of Missouri, Columbia, MO

**Sandra Chinapen**

San Juan Bautista Sch. of Med.,  
Caguas, Puerto Rico

**Marcelo Augusto Christoffolete**

Univ. Federa, Sao Paulo, Brazil

**Joan M. Cook-Mills**

Northwestern Univ. Feinberg Sch.  
of Med., Chicago, IL

**David Thomas Corr**

Rensselaer Polytechnic Inst., Troy, NY

**Peter Corridon**

Australian Coll. of Kuwait,  
Indianapolis, IN

**Randy Thomas Cowling**

UCSD, La Jolla, CA

**Paul M. Craig**

Univ. of Waterloo, Ottawa, Canada

**Geoffrey F. Dilly**

Cal State Channel Islands,  
Santa Barbara, CA

**Brent Doiron**

Univ. of Pittsburgh, Pittsburgh, PA

**Patrick James Drew**

Penn State Univ., University Park, PA

**Sally L. Dunwoodie**

Victor Chang Cardiac Res. Inst.,  
Sydney, Australia

**Scott Edwards**

LSU Hlth. Sci. Ctr. New Orleans,  
New Orleans, LA

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Orlu, Nigeria

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The Netherlands

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**William Faubion**

Mayo Clinic, Rochester, MN

**Paul A. Faure**

McMaster Univ., Hamilton, Canada

**Xiuyan Feng**

Emory Univ., Atlanta, GA

**Annette Dam Fialla**

Odense Univ. Hosp.,  
Odense SV, Denmark

**Ryan Fiddler**

Texas A&M Univ.-Kingsville,  
Kingsville, TX

**Arturo Figueroa**

Florida State Univ., Tallahassee, FL

**Per Flodby**

USC, Los Angeles, CA

**Yasuo Furukawa**

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Higashi-Hiroshima, Japan

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**Ayan Ghoshal**

Vanderbilt Univ. Med. Ctr.,  
Nashville, TN

**Joshua A. Goldberg**

Hebrew Univ. of Jerusalem,  
Jerusalem, Israel

**Pedro Miguel Guerreiro**

CCMAR-Center of Marine Sci.,  
Fargo, Portugal

**Deborah L. Gumucio**

Univ. of Michigan, Ann Arbor, MI

**Sarah Anne Hamilton**

Shenandoah Univ., Winchester, VA

**Bryan Robert Helm**

North Dakota State Univ., Fargo, ND

**Lucrecia Anzueto Hernandez**

Univ. Francisco Marroquin,  
Guatemala City, Guatemala

**Simon Andrew Hirota**

Univ. of Calgary, Calgary, Canada

**Song Hong**

Louisiana St. Univ., Hlth. Sci. Ctr.,  
New Orleans, LA

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Mayo Clinic, Rochester, MN

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Johns Hopkins Univ., Baltimore, MD

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Planegg-Martinsried, Germany

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Sherbrooke, Canada

**Li Li**  
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Hong Kong

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Ridgefield, WA

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**Matthew Eric Loewen**  
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Saskatoon, Canada

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**Michael Frisk**

Univ. of Oslo, Oslo, Norway

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**Shannon Rena Jimmie**  
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**Fanta Kalle**  
Univ. of Delaware, Middletown, DE

**Gurjit Kaur**  
Millsaps College, Clinton, MS

**Jenessa Hannah Kerr**  
McGill Univ., Montreal, Canada

**Sally Kim**  
Rutgers Univ., Secaucus, NJ

**Sarah Frances Macrorie**  
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**Javier Martinez Cabanero**  
Univ. of Castile-La Mancha,  
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**Camilo Andres Mejia**  
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**Billy Joe Mullinax**  
Presbyterian College, Honea Path, SC

**An Nguyen**  
Virginia Tech, Falls Church, VA

**Laura Grace Nicholson**  
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**Oluwatobiloba Adebisi Osikoya**  
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**Jenna Peterson**  
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Cornell Univ., Rochester, MN

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**Sierra Nichole Quinn**  
Georgia Regents Univ., Augusta, GA

**Alayna Joshallynn Robinson**  
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**Emanuel Russom**  
Morehouse College, Silver Spring, MD

**Anthony Sainz**  
Univ. of Utah, Sandy, UT

**Kelara Samuel**  
Univ. of Florida, Fleming Island, FL

**Kelly Ann Schwanebeck**  
Univ. of Florida, Gainesville, FL

**Folasade Adaora Sofela**  
Harvard, Bowie, MD

**Erica Irene Steele**  
Rochester Inst. of Tech.,  
Flemington, NJ

**Juliana Sucharov-Costa**  
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Superior, CO

**Phi T. Trac**  
Emory Univ. Emory Children's Ctr.,  
Atlanta, GA

**Susan Voong**  
Univ. of Iowa, Iowa City, IA

**Rachelle Loise Walter**  
Univ. of Colorado, Longmont, CO

**Sharday Tierria Young**  
Mississippi State Univ., Ridgeland, MS

### New Affiliate Members

**Chunsun Dai**  
Nanjing Med. Univ., Nanjing, China

**Camila Hirotzu**  
Univ. Federal De Sao Paulo,  
Sao Paulo, Brazil

**Sri Kasturirangan**  
Univ. of Wisconsin, Madison, WI

**Rogério Lachtermacher**  
BR Consultoria Medica,  
Rio de Janeiro, Brazil

**Luis Enrique Macias Bustes**  
Minsa, Callao-Lima, Peru

**Efrain Patino Mandujano**  
Univ. Xochicalco, Tijuana, Mexico

**Abdelhak Mansouri**  
ETH Zurich, Schwerzenbach,  
Switzerland

**Jennifer Ellen Mertz**  
Central Michigan Univ.,  
Mount Pleasant, MI

**John James Mooney**  
Beth Israel Deaconess Med. Ctr.,  
Boston, MA

**Lucas Mendes Penchel**  
Cruzeiro, Belo Horizonte, Brazil

**Cesar Augusto Torres Dos Santos**  
Flexnutri, Jundiai-Sao Paulo, Brazil

### Recently Deceased Member

**Basil I. Hirschowitz**  
Birmingham, AL

## Current Calls for Papers

### Physiological Genomics

- Epigenetics and Epigenomics
- Mitochondrial Metabolism
- NextGen Sequencing  
Technology-Based Dissection of  
Physiological Systems

### Journal of Neurophysiology

- Neurobiology of Deep Brain  
Stimulation  
(Submission deadline:  
March 1, 2015)
- Decision Making: Neural  
Mechanisms  
(Submission deadline:  
March 1, 2015)
- Correlating Neuronal Activity  
and Neural Imaging  
(Submission deadline:  
March 1, 2015)

### Advances in Physiology Education

Teaching and Learning of  
Professional Ethics

### American Journal of Physiology – Cell Physiology

- Omic and Systems  
Biology Approaches in  
Neurodegenerative Diseases  
(Submission deadline:  
December 31, 2014)
- STIM and Orai Proteins in  
Calcium Signaling  
(Submission deadline:  
December 31, 2014)
- Cellular Mechanisms of Tissue  
Fibrosis  
(Submission deadline:  
December 31, 2014)

- Stem Cell Physiology and  
Pathophysiology  
(Submission deadline:  
December 31, 2014)
- Physical Biology of Cancer  
(Submission deadline:  
December 31, 2014)
- Endoplasmic Reticulum Stress  
(Submission deadline:  
December 31, 2014)

### American Journal of Physiology – Endocrinology and Metabolism

- Islet Biology  
(Submission deadline:  
December 31, 2014)
- Novel Aspect of Adipocyte  
Biology  
(Submission deadline:  
December 31, 2014)

- CNS Control of Metabolism  
(Submission deadline: December 31, 2014)
- Endocrine and Metabolic Dysfunction during Aging and Senescence  
(Submission deadline: December 31, 2014)
- Metabolic Control by Inflammation and Immunity  
(Submission deadline: December 31, 2014)
- Mitochondrial Dynamics and Oxidative Stress in Disease  
(Submission deadline: December 31, 2014)

#### **American Journal of Physiology – Gastrointestinal and Liver Physiology**

- Physiology and GI Cancer
- Intestinal Stem Cells in GI Physiology and Disease
- Innovative and Emerging Technologies in GI Physiology and Disease

#### **American Journal of Physiology – Heart and Circulatory Physiology**

- Cardiovascular Consequences of Obesity and Type 2 Diabetes  
(Submission deadline: September 15, 2014)
- Autophagy in the Cardiovascular System  
(Submission deadline: September 15, 2014)

- Cardiac Regeneration and Repair: Mechanisms and Therapy  
(Submission deadline: January 15, 2015)
- Impact of Sympathoexcitation on Cardiovascular Function in Humans  
(Submission deadline: January 15, 2015)

#### **American Journal of Physiology – Lung Cellular and Molecular Physiology**

- Sex Differences in the Respiratory System
- Translational Research in Acute Lung Injury and Pulmonary Fibrosis
- Biomarkers in Lung Diseases: From Pathogenesis to Prediction to New Therapies
- Real-Time Visualization of Lung Function: From Micro to Macro  
(Submission deadline: January 1, 2015)
- Bioengineering the Lung: Molecules, Materials, Matrix, Morphology, and Mechanics
- Nanoparticles and the Lung: Friend or Foe?  
(Submission deadline: March 1, 2016)

#### **American Journal of Physiology – Regulatory, Integrative and Comparative Physiology**

- Central Control of Fluid and Electrolyte Homeostasis  
(Submission deadline: December 31, 2014)
- Central Control of Cardiovascular Function  
(Submission deadline: January 31, 2015)
- Oxygen as a Regulator of Biological Systems  
(Submission deadline: April 30, 2015)

#### **American Journal of Physiology – Renal Physiology**

- Renal Hypoxia  
(Submission deadline: December 31, 2014)
- Sex and Gender Differences in Renal Physiology  
(Submission deadline: December 31, 2014)
- Developmental Origins of Health and Disease  
(Submission deadline: December 31, 2014)
- Lower Urinary Tract Symptoms  
(Submission deadline: December 31, 2014)

For a complete list of current Calls for Papers, visit the APS homepage and click on the tab for Calls for Papers.



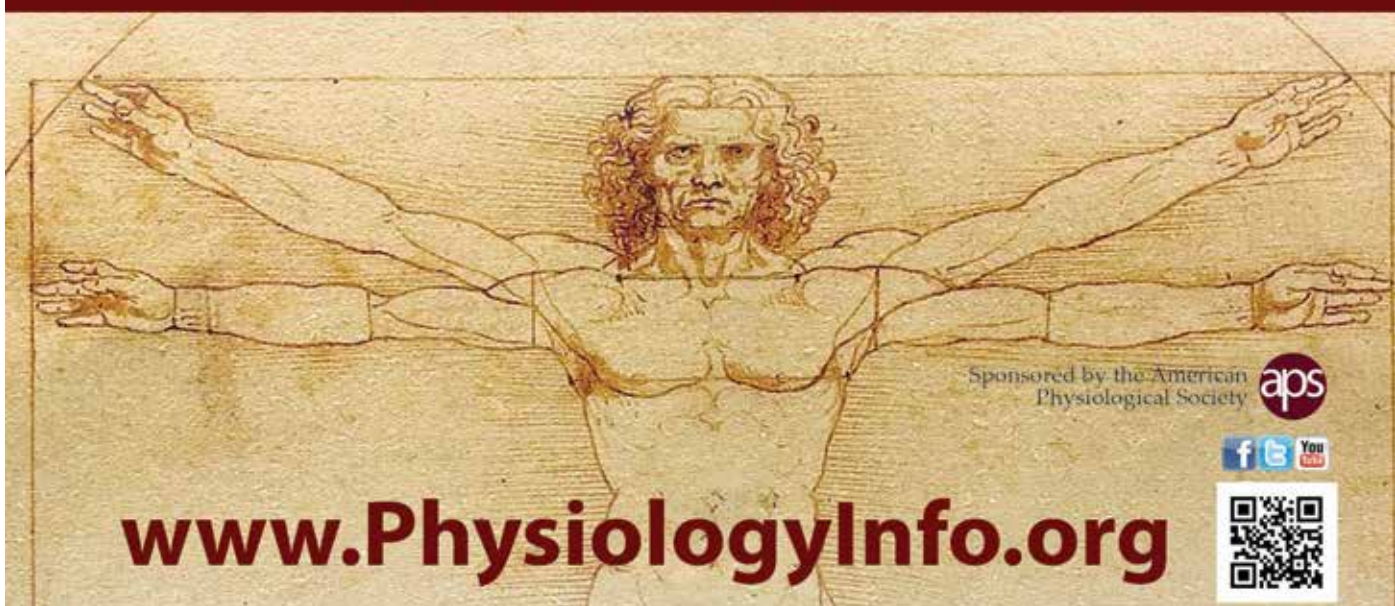
# People and Places


## Raichle Awarded Kavli Prize in Neuroscience

APS member Marcus E. Raichle, Washington University School of Medicine, was one of three persons selected for the Kavli Prize in Neuroscience 2014 Laureate "for the discovery of specialized brain networks for memory and cognition." The Kavli Prize in Neuroscience, consisting of \$ 1,000,000 prize money, a scroll, and a gold medal, was established to recognize outstanding scientific research, honor highly creative scientists, promote public understanding of scientists and their work, and foster international cooperation among scientists.





Raichle has received many honors, including election to the Institute of Medicine (1991) and the National Academy of Sciences (1996). More recently, he has received the Bristol-Myers Squibb Award for Distinguished Achievement in Neuroscience Research, the Grawemeyer Award for Psychology, and the Perl-UNC Neuroscience Prize. ●



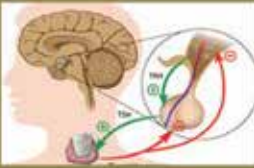





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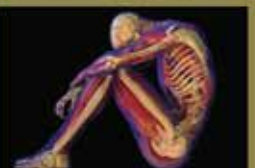









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# Mentoring Forum

## Career Opportunities for Graduates with Professional Master's vs. PhD Degrees

Patricia A. Gwirtz

University of North Texas Health Science Center, Fort Worth, Texas



Patricia A. Gwirtz

Students have several important decisions to make when considering whether to pursue an advanced degree. Graduate education requires a major commitment of time, money, rigorous course work, and, many times, a research project. In making this decision, the student must take an inventory of their passion and career goals.

Students must decide what kind of job they want to have, where they want to work, and how much money they want to earn. They must decide on what their career goal is and how earning a graduate degree will help them in reaching that goal. There are careers that do require an advanced degree (e.g., physician, physician assistant, professor, research scientist, veterinarian, dentist, etc.), but there are other careers that offer job opportunities for those who have earned an undergraduate degree. Students must then decide whether to apply to a master's (academic or professional) or a PhD degree program and, finally, where to go to graduate school.

### Master's Degree vs. PhD Degree

#### Master's Degrees

Master's degree programs allow students to obtain an education in a specialized field of study. Most of these degree programs take about 1-2 years of study. Master's degrees can be professional or academic. Professional degrees include a diverse range of study, such as business administration, mathematics, biotechnology, and clinical research management. These professional degrees are designed such that the graduate can obtain employment or advance within a specific field. On the other hand, academic degrees, such as a master's of science degree, are more designed to allow for intellectual growth of the student and many times are a prerequisite for doctoral work within a given field. Most academic master's

degrees take 1-3 years to complete. Master's degrees tend to be more career-oriented. Students in master's degree programs receive little to no financial support.

**Benefits of a master's degree.** A benefit of pursuing a master's degree is that it takes less time and money to earn than a doctoral degree, and it will still set the student apart from others who only have a bachelor's degree. A master's degree may be the perfect choice for individuals who have been working in a particular career for several years and now want to gain new knowledge that will help them qualify for advancement within their field. The specialized master's degree will also be of benefit to those who want to learn something new in order to go in a different career direction or actually change careers. It is possible to find teaching positions with a master's degree at junior or community colleges, some 4-year colleges, and K-12 schools. However, there are fields in which an individual with a master's degree simply cannot qualify. For example, for those who want to become professors or research scientists, a PhD degree is usually required.

#### PhD Degrees

The doctor of philosophy degree (PhD) is considered the highest possible earned academic degree. The major focus of the PhD degree programs is advancing knowledge through original research in a given academic field. Thus PhD programs are more research oriented because they prepare students for research-oriented careers. These programs provide extensive expertise in a specialized field (e.g., biochemistry, cancer, physiology, immunology, etc.) and usually train the student to pursue a life in academia as a professor or a research investigator, either in research institutes or industry. PhD degrees in the field of physiology average 5-7 years to complete. PhD programs often offer full scholarships and a living stipend. With some fields, students can pursue a master's degree and later pursue a PhD degree. Sometimes, students who originally pursue a PhD degree will transfer programs and graduate after earning

a master's degree if they find the academic lifestyle is not what they want to do for a career. A PhD degree is also useful in finding careers other than academia. Many industries and businesses hire qualified people who have demonstrated intelligence, perseverance, and the ability to learn.

### **Graduate School**

Graduate school takes commitment and hard work, much more than undergraduate school. Some students who found undergraduate school easy and were able to do well by studying just before an exam quickly find that graduate school is much more competitive and requires a greater commitment in terms of time, work, study, critical thinking, and problem solving. One of the aspects of obtaining a PhD degree that is enticing to students is the idea of creating knowledge. PhD degrees require students to conduct original research that contributes new information to the field of study.

However, there is a big difference between college and graduate school in that students focus on their major field and subject areas that most interest them. Thus a majority of graduate students enjoy what they are doing, since it involves an area in which they are very interested.

## **Professional Science Master's Degree**

### **Background**

About 15 years ago, the Alfred P. Sloan Foundation funded the first group of professional science master's (PSM) degree programs at research institutions (3). A PSM degree will allow students to obtain advanced training in science while also developing valuable skills required in the workplace (3). Students who earn PSM degrees are prepared for many interesting careers in business, industry, government, and nonprofit organizations. PSM degree programs were originally developed to create new career pathways and fill a demand for scientists with professional and management skills. Since then, the number of PSM programs has grown and now includes a large number of scientific fields, from biotechnology to nanoscale physics (3, 4).

### **Program Content**

PSM programs usually take 1-2 years of academic training and include a professional or capstone component, such as an internship, or "cross-training" in workplace skills, such as industry, research facilities, business, communications, and regulatory affairs. PSM programs emphasize the following skills: technical

and/or scientific, project management, research and development, leadership training, and writing and communication. Most programs require a final project or team experience. Internships in a business or public sector enterprise are usually required for all PSM programs and are an important part of the program because the internship experience is considered job experience by employers and is a strong consideration in hiring the student. These professional programs and the internships are usually designed in collaboration with employers to train the students for professional career opportunities. The internships provide the student with "real world" experience (3, 4).

### **Program Graduates**

The Council of Graduate Schools estimates that ~5,000 students have now earned a PSM degree. In 2012, there were 5,804 students enrolled in a PSM program in U.S. institutions (1, 2). The major fields of study were computer/information sciences, biotechnology, environmental sciences, natural resources, mathematics and statistics, and other sciences. Surveys have been conducted documenting where these students are employed, how easily they find employment and in what kinds of positions, how easily they are promoted relative to their colleagues with traditional degrees, how their salaries compare with peers who have MBAs, PhDs, or other advanced degrees, and was the degree worth the considerable investment. Most of the students enrolled in a PSM program to acquire specific skills and knowledge; to increase their opportunities for promotion, advancement, and/or salary; and to learn more about something in which they were particularly interested. Many students in these programs wish to facilitate a job or career change or to use the degree as a stepping stone for more advanced education (i.e., a PhD degree) (1, 2).

### **Program Results**

Although the national data are sparse, the available evidence indicates that PSM graduates were very satisfied with their program, are finding jobs, and are usually well paid. Over two-thirds of graduates who were surveyed by the Council of Graduate Schools in 2012 reported earning more than \$50,000 annually (salary range of \$50,000-100,000 or more); one-third earned less than \$50,000. PSM degree programs are definitely filling a need in the workforce (1, 2). Employers in industry, the nonprofit sector, and government are looking for employees with advanced training in science, mathematics, and professional



skills. Thus most graduates are finding jobs and have job offers that pay well by the time they graduate or soon afterward. It is no longer true that serious professionals must obtain a PhD. Many graduates from a PSM program demonstrate the potential for growth and satisfaction with the degree (1, 2).

### **Our Experiences with Professional Master's Degree Programs**

Four PSM degree programs were developed at the University of North Texas Health Science Center at Fort Worth (UNTHSC) in the year 2000: Biotechnology, Clinical Research Management, Forensic Genetics, and Medical Science.

#### **Biotechnology PSM Program**

The Biotechnology Program was designed to train individuals for careers in industry and research by providing the tools and experience needed for highly technical positions offered in emerging biotechnology companies, life science organizations, and research institutions. This 2-year program focuses on providing students a broad-based view of the biomedical sciences and an in-depth knowledge of laboratory management, industry practice, ethical issues, and laboratory skills necessary to prepare students for a career in the biotechnology and life science industry. As part of the Biotechnology Program, all students complete a 2-semester Internship Practicum in biotechnology and use this experience to write a detailed Internship Practicum Report or thesis. Over 22 students have graduated from this PSM program and have been offered jobs immediately on graduation. Our graduates have taken a number of different jobs, including laboratory technician, sales and marketing, research and development, and quality control.

#### **Clinical Research PSM Program**

Clinical Research involves the testing and determination of safety and efficacy of new, unapproved products, such as pharmaceuticals, devices, and biologics in human subjects. Well trained clinical research professionals are in high demand. They are key personnel involved in the conduct of clinical trials that, in turn, are pivotal in new product approval. This PSM program provides our students a strong foundation for a career in a field that the Association for Clinical Research Professionals confirms will provide "plenty of job opportunities for the foreseeable future." Students get a broad-based view of the biomedical sciences and in-depth knowledge of U.S. Federal (FDA) and international (ICH) regulations

and guidelines governing the conduct of clinical trials and the protection of human rights. A unique 2-semester internship practicum under the supervision and mentoring of highly qualified clinical research professionals provides valuable on-the-job experience. Our many partners who mentor for the internship are committed to providing an outstanding experience for our students. The internship also qualifies as experience toward certification as a clinical research coordinator. The degree is completed in 18 months. Graduates from the Clinical Research Management program go on to fill beginning positions as a clinical research associate (industry or clinical research organization position) or clinical research coordinator (research site position). Over 100 students have graduated from this program since it began. Seventy percent obtained jobs in clinical research as coordinators or associates, or in regulatory affairs. Most of the time, the internship site was so pleased with the student who was placed with them that they hired the student on completion of the program. Twenty percent of our graduates go on to medical, dental, or physician assistant (PA) school (with the intent of conducting clinical trials in the future), and others have decided to pursue PhD degrees.

#### **Forensic Genetics PSM Program**

The PSM degree in forensic genetics is a 2-year program that emphasizes the application of current methods and technologies to human identification. It offers a focused learning experience in forensic science, with an emphasis on hands-on training in current and future DNA technologies. The program was designed to meet the educational and training requirements for a position as a forensic DNA analyst and provide the ability to ultimately qualify as a technical leader as outlined in the National Quality Assurance Standards for Forensic DNA Testing Laboratories adopted by the Federal Bureau of Investigation (FBI). On completion of their coursework, students complete a moot court exercise that serves as an oral qualifying exam. Students then work on a hypothesis-driven research project, and write and defend a thesis. Our graduates have gone on to work in crime labs, medical examiners offices, police departments, the FBI, law, and academia. Graduates also find that the program was helpful in building a foundation to pursue further studies at the PhD level.

#### **Medical Sciences PSM Program**

The PSM program in medical sciences was designed to provide opportunities to those students who would like

to enhance their credentials for entry into and prepare for the rigors of medical, dental, or PA school. This program is designed to enhance their skills before they apply or reapply to a professional school. We offer a very strong, challenging biomedical sciences curriculum in the environment of a health science center. The average time to complete the program is 12 months (mid-May through mid-May). Our Medical Science program has proven to be very successful in preparing students for the rigors of a medical/dental/PA school curriculum by allowing these students to develop the skills and confidence necessary to compete. This program has been extremely successful in meeting its goal of helping students matriculate into medical, dental, or PA school. Data indicate that 70% of the medical science students who apply to medical/dental/PA school are accepted and do extremely well in school, not just because of their enhanced background in the biomedical sciences but because they now have the necessary skills to be successful. The students who do not go on to medical school find that they would rather pursue a different career, such as research (e.g., clinical research, biomedical science research) or teaching.

## Summary

Professional science master's degree programs are an appealing option to those who want to pursue a professional career and/or seek advancement in their career that does not necessarily require the more advanced PhD degree. These programs are designed to meet a workforce need for professionals and can

be completed within 2 years. The student learns the professional skills to be successful in their chosen field, and data indicate a great deal of satisfaction by graduates from these programs. In contrast, those who wish to have a career goal in academia or research usually will pursue a PhD degree. Table 1 shows the important similarities and differences a student should consider when deciding whether to pursue a PSM or Ph.D. degree.

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4. Tobias S. *Professional master's education* (Online). *ASBMB Today* (Aug 2010). [http://www.asbmb.org/asbmtoday/asbmtoday\\_article.aspx?id=8758](http://www.asbmb.org/asbmtoday/asbmtoday_article.aspx?id=8758). ●

**Table 1. Similarities and differences: professional master's degree vs. PhD degree**

	Professional Master's Degree	PhD Degree
<b>Time to completion</b>	1-3 years, depending on the program	5-7 years
<b>Cost</b>	Tuition, fees, books, etc.; loss of money not working	Tuition, fees, books, etc.; loss of money not working, but PhD may yield higher salary on completion
<b>Scholarships, stipends</b>	Usually none available	Usually available; more financial aid available
<b>Emphasis</b>	Career oriented	Research oriented
<b>Commitment</b>	Takes hard work and focus	Takes hard work and focus; must have a true passion for your field of research and enjoy your studies
<b>Internship</b>	Usually yes, to provide hands-on experience	Original research project leading to dissertation and publications
<b>Job opportunities</b>	Career oriented; move into research management, regulatory affairs; private sector and government jobs; master's degree helps with changing direction in your job, job advancement, obtaining raises	Research-oriented career; competitive; academic positions usually require several years of postdoctoral training; academia tends to be major career focus, requiring grant funding, publications for advancement; create knowledge

# News from Distinguished Physiologists

## Letter to Ken Baldwin

**Esmail Koushanpour** writes: "I have been a member of the American Physiological Society since 1969. As a retired, octogenarian physiologist, I would like to thank APS for their offer to me to talk about what I have been doing since my retirement.

"My 80th birthday marked 15 years since my 'official' retirement in 1999, after working for 36 years in the Department of Physiology at Northwestern University Medical School (now called the Feinberg School of Medicine). While working at Northwestern, I taught physiology and did research on renal hypertension. Outside of work, I participated in some weekend social service projects. After retirement, I continued my interest in physiology and medical education, but I had more time to pursue my interest in social service and to travel.

"I still attend FASEB conventions sometimes. Also, in 2008, I spent a month on the lovely island of Saint Marten, where I taught renal physiology as a visiting professor at the American University of the Caribbean. Currently, I am working on the 3rd edition of my textbook on renal physiology, which is under contract to be published by Springer Publishing Company.

"My work in social service essentially became a second career. In particular, I have been involved with interfaith dialogue and social justice programs. I have been active in an organization called United Power for Action and Justice, a coalition of faith and social groups, and in an organization called ICIRR, the Illinois Coalition for Immigrant and Refugee Rights. This led to me being appointed to the Board of the Gilead Outreach and Referral Center of Chicago. Gilead helped develop and gain state funding for KidCare, a low-cost healthcare program, part of the 2003 All Kids Program in Illinois, which provided comprehensive and affordable health insurance. In 2005, I was appointed by the State of Illinois to the New Americans Immigrant Policy Council, which was comprised of a task force of 15 Illinois business, faith, labor, community, and philanthropic leaders. Work on developing models for immigration policy in Illinois has been supported by the MacArthur Foundation and the Carnegie Corporation of New York.

"As part of the International Rotary campaign for the eradication of polio, and as a member of Northbrook Rotary Club, I served as co-Chair of their local fundraising efforts for this campaign. I also served on the Board of the Northbrook YMCA for a couple of years, and I have served, and continue to serve, on the Board of ICODA, the International Center on Deafness and the Arts.

"I was elected as Vice-Chair of the Council of Islamic Organizations of Greater Chicago (2003-2004), and I served as Chair of their Catholic-Muslim Dialogue Committee. I was Executive Director of a mosque that I used to attend, where I organized many interfaith activities, including holding a mosque open house and hosting the annual Northbrook Community Thanksgiving Celebration, which is always sponsored by the Northbrook Clergy Association and held at different locations each year.

"It has been my privilege to receive several awards for building bridges between Islam and other faiths, including the 2004 Interfaith Award from the Glenview Community Church and The Richard H. Driehaus Foundation Faith in Community Award In 2002. I received an honorary Doctor of Humane Letters honoris causa (D.H.L.) degree in 2008 from the Graduate Theological Foundation (GTF) in South Bend, Indiana, where I have an appointment as Advisor to the Foundation on Islamic Affairs and Distinguished Service Professor in American Muslim Relations. I have been affiliated with GTF for several years. That institution is affiliated with Notre Dame and Oxford University.

"I have participated in some interfaith events connected with the Raven Foundation, a group committed to peace. They emphasize applying the mimetic theory in listening to different points of view, and they sponsor many educational programs that examine the nature of human behavior, including programs about literature, religion, history, psychology, and peacemaking. One of the Raven "flock" interfaith dialogue programs that I participated in is available online, and we also published an article related to interfaith dialogue in a Christian publication.



"I have appeared on television a few times; once in an Oprah Winfrey program, once as part of a fundraising drive for the victims of the earthquake in Bam, Iran (my native country), and once in a half hour interview on a local Northbrook television station, which also is available online through the Northbrook Library. I have been a co-speaker on a National Radio Program (NPR) about intra-faith Sunni-Shia relations.

"Although I am not an ordained religious leader, I was invited to attend the First Congress for Peace, organized by Hommes de Parole (a French organization). I had the pleasure to participate in this ground-breaking event, which was attended by international religious leaders, including 100 leading Imams and Rabbis from around the world. This meeting was held in Brussels, Belgium in 2005 and was sponsored by the King of Belgium and the King of Morocco.

"I have enjoyed traveling and taking adult education classes through the local community college and through an organization called Common Ground in Deerfield, IL. Through Common Ground, along with others in that group, I attended a conference on Nonviolent

Conflict Resolution that was held at Fatih University near Istanbul, Turkey. We then traveled to some other locations in Turkey, including Konya and Cappadocia.

"In fact, since retirement, I have been fortunate to be able to do a lot of traveling, meeting new friends and renewing acquaintances with old friends from my college and working days. I traveled around Spain with a tour group, I revisited Paris, France, and I made a longer return visit to beautiful Heidelberg, Germany, where I spent a very productive sabbatical in the past (1984). Closer to home, I have traveled around Mexico and to many states throughout the U.S., including a tour to visit the homes of former American Presidents, a trip to visit the United States Air Force Academy, and an autumn tour of spectacular sights in the New England states.

"My advice for soon-to-be retirees is to stay active in retirement and enjoy your new-found freedom to follow your own schedule with regard to work, hobbies, and travel. Best regards to all my former colleagues and professional friends. I hope that you will enjoy your retirement when that time comes." ●

## Letter to Ken Baldwin

**John Anderson** writes: "Thanks for extending your kind note on behalf of senior physiologists. Over the years, my research has become more oriented to the field of bone and calcium metabolism as impacted by nutrition, so my publications have been in nonphysiology journals. APS has been a superb academic society, and I retain great respect for the broad discipline that has merged, at least in part, with biochemistry in recent decades. Please keep up the good efforts." ●

## Letter to Terry Dwyer

**Albert L. Hyman** writes: "I am writing to tell you that I'm still involved in research on the pulmonary circulation on my 90th birthday. We have recently had a paper published in the *American Journal of Physiology-Heart and Circulatory Physiology* listed on PubMed. My co-authors have dedicated this paper to me on the occasion of my 90th birthday. I have been involved in research for more than 50 years at Tulane University School of Medicine and still get great satisfaction doing research and working on papers for publication. I've have had a great time working in medicine and research and look back with great satisfaction at the research done in collaboration with Lewis Ignarro that was part of his Nobel Prize in physiology or medicine in 1998. I would also tell you that I was a close friend of Andrew Schally, who was a Nobel laureate in 1977. I am happy to report that I am doing well in my 90th year and look forward to staying involved in research in the future." ●

# Books Received

## Celebrating Life: An Appreciation of Animals in Verse and Prose

Donald C. Jackson

*CreateSpace Independent Publishing Platform,*  
October, 2013, 88 p., \$20.00  
ISBN 1492349291

In this delightful book, comparative physiologist Donald Jackson shares his appreciation of animals with unique physiological traits in a very interesting and unique format. The book is about animals, their problems, and their solutions to survive individual environmental challenges. The book covers 20 different animals: 19 vertebrates and 1 invertebrate. Each animal is presented with a beautiful color photograph of the animal in natural habitat, followed by a 12-line verse (an "ode to the animal"), then a short essay. The verse and the prose highlight the lifestyle of the animal in its unique extreme (hostile) environment and the approaches (anatomical, behavioral, and physiological) it uses to survive.

The book covers diverse animals, which include eight mammals, three birds, two reptiles, three amphibians, three fishes, and one worm. The order of the presentation of animals is not organized in any specific sequence, nor is it particularly related to habitat. The author just alternates different examples of mammals, birds, reptiles, and fish throughout the book to illustrate strategies that have emerged to solve the problems the animals encounter. The selected animals are those that live successfully in an environment that places insurmountable obstacles to survival (low oxygen supply, extreme temperatures, limited energy resources, water scarcity), e.g., the camel, the hummingbird, the wood frog, and the ice fish. Some animals possess special anatomical and physiological traits that allow them to perform remarkably in their daily life, e.g., the giraffe, the cheetah, the python. These animals are usually discussed and taught in comparative physiology texts

and courses. At least three of the animals were studied by the author himself (the turtle, the kangaroo rat, and the toadfish). Since there are many more animals that could be presented in similar context, a second volume might be in the works.

This book is clearly written for general readers and is delightfully readable. The book is as interesting for what it tells us about diversity of adaptive responses to environmental challenges in the animal kingdom as it is for its poetic literary read. The format of the book (photographs, poems, short essays) makes it appealing to all ages and backgrounds. Younger children could peruse as a picture book of animals; the majority of the high-resolution photographs were provided by many comparative physiologists working on the animals. The essays contain basic physiological concepts appropriate for high-school students and older. Even though this is not a textbook (no references are provided), it provides an understanding of life's adaptations to many of the major environmental stresses and an insight into general principles of physiology. Jackson's book offers a new tool for teaching physiological principles: using poetry to teach science is innovative. The book could be used as a starting point for senior students to do more in-depth research into the adaptive mechanisms. The author himself uses this book to teach seminar courses to college students. This book will be a great addition to any household coffee table as well as to libraries of physiologists.

Don Jackson is the author of another comparative physiology book *Life in a Shell: A Physiologist's View of a Turtle*. He is a professor emeritus at Brown University. ●

*Siribhinya Benyajati*

*University of Oklahoma Health Sciences Center*

## The Extreme Life of the Sea

**Stephen R. Palumbri and Anthony R. Palumbri**  
*Princeton, NJ: Princeton Univ. Press, 2014, 225 p.,*  
 \$27.95  
 ISBN: 978-0-691-14956-1

Stephen Palumbri is a Professor of Biology and Director of the Hopkins Marine Station at Stanford University. His son Anthony is a science writer and novelist. Together, they describe the amazing diversity of ocean life in this new book written for either lay or scientific audiences. Although I am not a marine biologist, I found this book incredibly difficult to put down. Aside from obvious interest in the unique adaptations of animals living in the ocean, the colorful analogies and descriptions are delightful to read and aid in visualizing the ocean as the authors see it. In fact, I have to agree with the authors that anglerfish are “spectacularly ugly animals.”

The book transports the reader through evolutionary time, from the deepest depths of the ocean to the shallowest waters, while highlighting how environmental and physiological pressures shape the evolution of species. It begins with a description of how the diversity of ocean life we recognize today may have evolved from an “explosive arms race that did not destroy life but diversified it” through the development of more sophisticated defenses and predation tools and tactics. I found it interesting to learn that sharks are thought to be the first to develop teeth 418 million years ago and today are “among the strongest natural structures on Earth.” What is more amazing is that these seemingly ancient animals continue to adapt.

Although *The Extreme Life of the Sea* is a delight for anyone to read, it is especially fascinating for someone

interested in comparative physiology. The authors take the reader on a magnificent journey that includes species uniquely adapted for living under pressure with very little oxygen and light in the deep ocean, animals adapted to living in shallow waters with the added danger of land predators, some of the longest-lived animals on Earth, heat and cold-adapted animals, the diversity of animals that devour whale carcasses, and animals with unique reproductive strategies from hermaphrodites to male pregnancies. As we have seen numerous times, understanding these unique adaptations may inspire novel therapies or technologies. Take, for example, the development of glue that holds up under wet conditions inspired by the substance blue mussels (*Mytilus edulis*) secrete to adhere to wet rocks (doi:10.1002/anie.200352759), microbial-resistant surfaces and medical devices inspired by the microbial-resistant nature of shark skin (<https://sharklet.com/>), or novel painkillers developed from sea snail venom ([http://nihrecord.nih.gov/newsletters/2005/03\\_01\\_2005/story03.htm](http://nihrecord.nih.gov/newsletters/2005/03_01_2005/story03.htm)). As described in this book, we are only just beginning to understand the diversity of life and adaptations in the world's oceans.

In the final chapter, the authors discuss the effects of climate change on marine biology and ways in which we may begin to restore the normal pH balance and temperature of the world's oceans. This book certainly lives up to its title and purpose of showing “how marine life thrives against the odds.” One can only hope that marine life continues to find ways to successfully adapt with the ever-changing climate. ●

Karen L. Sweazea  
 Arizona State University, Tempe, AZ



# Positions Available

**Postdoctoral Position:** A 3-year NSF-funded postdoctoral position is available in the laboratory of William Karasov at University of Wisconsin-Madison to study molecular mechanisms of dietary modulation of intestinal enzymes in birds and small mammals. The production of digestive enzymes may increase with availability of substrate in the diet, and we seek to advance knowledge about underlying mechanisms of digestive enzyme flexibility. PhD in biological sciences is required, and relevant experience in biochemical (e.g., enzyme assays, cell fractionation) and molecular methods (e.g., qPCR, DNA-protein interaction study assays, immunohistochemistry) and animal handling is highly desirable. Knowledge of Spanish and willingness to travel internationally is also useful. Position available September 2014 or thereafter. Application procedure: 1) Send letter as e-mail ([wkarasov@wisc.edu](mailto:wkarasov@wisc.edu)) that includes your experience relevant to this position. 2) Attach to the e-mail your curriculum vitae, including names and e-mail addresses of 3 references; the file name should include your name. Additional information about the laboratory is on the website (<http://forestandwildlifecology.wisc.edu/karasov-william-current-faculty-profile>).

**Postdoctoral Research Associate I Position:** A postdoctoral research associate I position is available in the lab of E. Fiona Bailey within the Physiology Department at the University of Arizona, Tucson, AZ. The successful candidate will work on NIDCD-NIH-funded research projects that investigate the neuromuscular control of upper airway muscles in respiratory and voluntary movements. The research involves the study of skilled movements of human motor output entailing precise neural control to achieve a desired acoustic output/target. Using tungsten microelectrodes and whole muscle fine-wire electromyography, the candidate will identify and characterize single motor unit and whole muscle EMG activities as a function of volitional (motor cortex) and respiratory (CPG)-driven behaviors. The candidate will also be responsible for developing appropriate visual tracking stimuli and for conducting associated analysis. Salary is commensurate with experience and qualifications. Minimal qualifications: doctoral degree in neuroscience, physiology, biomedical, or engineering related field; demonstrated excellence in written and spoken English. Preferred qualifications: background in digital signal processing and

computational skills; understanding of motor systems physiology and/or electrophysiology; experience in statistical analyses; ability to work independently, be highly motivated, and conduct the project with minimal supervision. Interested applicants should contact: [ebailey@u.arizona.edu](mailto:ebailey@u.arizona.edu); The University of Arizona, Department of Physiology, College of Medicine, 1713 E. University Blvd., P.O. Box 210093, Tucson, AZ 85721-0093; phone: 520 626-8299; fax: 520 621-8170.

**Assistant, Associate, or Full Professor Position:** The California Northstate University College of Medicine invites applications for an assistant, associate, or full professor position in physiology in the Department of Medical Education. Candidates whose expertise and responsibilities center on medical student education as well as the scholarly analysis and improvement of teaching methods are encouraged to apply. Candidates should have a PhD and/or MD, postdoctoral research experience, and a good publication record; demonstration of an ability to maintain an independent research program is desired. Candidates in all areas of physiology will be considered. Candidates will also be expected to contribute to the department's teaching mission and to mentor medical students. Applications received by August 15, 2014 will be assured of consideration. Applicants must submit the following materials: CV and cover letter; statement of current and proposed teaching philosophy (not to exceed 2 pages); statement summarizing past experience, leadership, and/or contributions in fostering equity and diversity (or potential to make contributions in the field); 3-5 references. All inquiries should be directed to [hr@cnucom.org](mailto:hr@cnucom.org); California Northstate University College of Medicine, 9700 West Taron Drive, Elk Grove, CA 95757. The California Northstate University College of Medicine is an equal-opportunity institution dedicated to building a broadly diverse and inclusive faculty and staff. U.S. citizenship or permanent residence status is required.

**Postdoctoral Researcher:** A postdoctoral research position in physiological genomics is available within the Department of Pharmacology & Experimental Therapeutics at Louisiana State University Health Sciences Center, New Orleans, LA. The position is available to investigate the molecular and physiological roles of angiotensin converting enzyme type 2 (ACE2) in the regulation of cardiovascular

function in vivo and in vitro. Our laboratory ([http://www.medschool.lsuhs.edu/pharmacology/lab\\_lazartigues\\_index.aspx](http://www.medschool.lsuhs.edu/pharmacology/lab_lazartigues_index.aspx)) takes a multidisciplinary approach to investigate autonomic nervous function and to determine the cellular and molecular mechanisms of ACE2 in normal and transgenic mice overexpressing components of the renin-angiotensin system, and their effects on blood pressure regulation. Among these approaches are: cardiovascular and neurophysiological techniques (mouse telemetry, cardiovascular function assessment, central microinjections, microdialysis), gene therapy tools including but not limited to siRNA and viral transfection, molecular and recombinant DNA methodology, immuno-histochemistry and biochemical methods (e.g. *Circ Res* 113: 1087-1096, 2013. PMID:24014829). Qualified applicants will have

recently acquired a doctoral degree in neurosciences or related field and have a strong background in animal physiology and molecular pharmacology, and knowledge of brain circuitry relative to the autonomic nervous system. Additional expertise in molecular/cellular biology is a plus. The Louisiana State University Health Sciences Center ([www.medschool.lsuhs.edu](http://www.medschool.lsuhs.edu)) is a state-of-the-art facility with well equipped imaging and molecular core facilities. A competitive salary, based on NIH guidelines, is available to successful applicants. Applicants should send their resume (e-mail preferably) and the names of 3 references to: Eric Lazartigues, PhD, Associate Professor of Pharmacology and Neurosciences, Louisiana State University Health Sciences Center, 1901 Perdido St., New Orleans, LA 70112; e-mail: [elazar@lsuhsc.edu](mailto:elazar@lsuhsc.edu). ●



APS Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology  
San Diego, CA • October 5-8, 2014

Please join us for the 2014 APS Intersociety Meeting. The theme of the meeting will be "Comparative Approaches to Grand Challenges in Physiology." Comparative physiology takes advantage of the diverse evolutionary histories and ecological settings of animals. By definition, comparative physiology is broad, spanning a variety of animal taxa occurring in diverse environmental settings, and studied at many levels of biological organization (from molecular physiology to physiological ecology). This breadth allows comparative physiology to (a) understand basic physiological processes and (b) identify novel mechanisms used by animals to solve specific physiological challenges.

This meeting will draw comparative and evolutionary physiologists from around the world to present and discuss recent advances in animal physiology. The three and a half day meeting will feature 15 symposia, 2 plenary lectures, 2 workshops, and multiple sessions for contributed abstracts as oral or poster presentations. This meeting will include the 2014 Scholander Award competition for young comparative physiologists, plus other trainee awards and activities.



[the-aps.org/comparative](http://the-aps.org/comparative)

# Meetings & Congresses

## 2014

September 1-5

**76th Harden Conference: Total Transcription**, Hinxxton, Cambridge, UK. Information: internet: <http://www.wellcome.ac.uk/conferences>

September 2-6

**Society of General Physiologists 68th Annual Symposium, "Sensory Transduction,"** Marine Biological Laboratory, Woods Hole, MA. Information: Emily Liman and Miriam Goodman, Organizers; internet: <http://www.sgpweb.org/symposium2014.html#papers>; e-mail: [sgp@mbi.edu](mailto:sgp@mbi.edu)

September 5-6

**4th Annual North American Artery Meeting: Arterial Stiffness: If You Don't Measure It, You Can't Manage It**, Chicago, IL. Information: internet: <http://naartery.org/Events>

September 7-11

**11th International Symposium on Resistance Arteries (ISRA 2014): From Molecular Machinery to Clinical Challenges**, Banff, Alberta, Canada. Information: Suzanne Brett Welsh; tel.: 011 403.836.5631; e-mail: [info@isra2014.org](mailto:info@isra2014.org); internet: <http://www.isra2014.org>

September 9-12

**Virtual Physiological Human Conference 2014**, Trondheim, Norway. Information: internet: <http://www.ntnu.edu/vph2014>

September 10-12

**Obesity – A Physiological Perspective**, Newcastle United, UK. Information: internet: <http://physoc.org/non-society-meetings>

September 18-19

**8th Neurodegenerative Conditions Research & Development Conference**, San Francisco, CA. Information: internet: <https://www.gtcbio.com/conferences/neurodegenerative-conditions-research-and-development-overview>

October 5-8

**2014 APS Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology**, San Diego, CA. Information: internet: <http://www.the-aps.org/mm/Conferences/APS-Conferences/2014-Conferences/Comparative>

November 5-8

**25th International Symposium on the Autonomic Nervous System**, Rio Grande, Puerto Rico. Information: Anita Zeller, AAS Executive Secretary, American Autonomic Society, 18915 Inca Ave., Lakeville, MN 55044; tel.: 952-469-5837; fax: 952-469-8424; e-mail: [zeller.anita@mayo.edu](mailto:zeller.anita@mayo.edu); internet: <http://www.americanautonomicsociety.org>

November 14-16

**IOF Regionals 5th Asia-Pacific Osteoporosis Meeting**, Taipei, Chinese Taipei. Information: internet: <http://www.iofbonehealth.org/taipei-2014>

December 14-16

**ICI 2014 Meeting**, Tel Aviv, Israel. Information: internet: <http://www.iofbonehealth.org/taipei-2014>

## 2015

March 18-22

**AD/PD 2015**, Nice, France. Information: internet: <http://www2.kenes.com/adpd/Pages/Home.aspx>

March 28 to April 1

**2015 Experimental Biology**, Boston, MA.

August 3-7

**14th International Congress on Amino Acids, Peptides and Proteins**, Sao Paulo, Brazil. Information: Professor Gert Lubec, c/o Medical University of Vienna, Wahringer Gurtel 18, A-1090 Vienna, Austria; e-mail: [icapp@meduniwien.ac.at](mailto:icapp@meduniwien.ac.at); internet: <http://www.meduniwien.ac.at/icaap>

September 2-5

**APS Conference: 14th International Conference on Endothelin: Pathophysiology and Therapeutics**, Savannah, GA. Information: internet: <http://www.endothelins.com/Conferences/ET-14/>. ●



## Continued from page 193: America's Got Talent

really expect to get its members to perform in front of their colleagues? During the recent meeting of the APS Council and Committee chairs, we put that question to a test.

Thanks to the generosity of Ryuji Ueno and Sachiko Kuno, benefactors of several Society awards, they made Evermay (<http://evermayestate.org/>), the S&R Foundation's home in Georgetown available for dinner and performance. The Society had last used the home in 2012 to celebrate our 125th anniversary with a performance of *Body Notes* by APS member Hector Rasgado-Flores. *Body Notes* was written by Hector for the 2005 IUPS Congress and performed by the San Diego Chamber Orchestra at Copley Symphony Hall.

This year's performance was different! We needed a musical compliment to the location. We identified an ex officio member of Council who trained at the Manhattan School of Music and majored in music at Union College to be the lead performer. Hershel Raff performed on a concert grand piano and an acoustic guitar playing jazz and contemporary music. But who would accompany Hershel in song? We did not have to turn to the "Three Tenors." Instead, we could draw upon the unique vocal skills of the "Three Presidents": Past-President Kim Barrett, who sings with *GI Distress*, President David Pollock, and President-elect Patricia Molina Hershel. It proved to be an amazing evening of music and song, and their contributions were captured on video and posted to the APS Facebook page (<https://www.facebook.com/AmericanPhysiologicalSociety>). I invite you to watch the videos and enjoy the performances. Just like the talent shows of today and bygone years, I invite you to demonstrate your enthusiasm for their performances by "liking" the one's you like best. It was clear from the evening that not only does America Got Talent, but The American Physiological Society's Got Talent as well.

While talent is not a criterion for APS membership, although some have suggested that we include a talent contest when selecting candidates for president, APS used to more rigorously assess an individual's expertise and contributions when considering them for membership. Then, just like a talent contest, the membership at the APS Business Meeting voted on their eligibility. Such measures have gone out of favor as the Society has become more inclusive, but the earlier



With our hosts at Evermay. Left to right: Ryuji Ueno, Sachiko Kuno, Patricia Molina, Kim Barrett, David Pollock, Martin Frank

exclusive nature of membership did contribute to my membership story.

In 1976, while an Assistant Professor of Physiology at George Washington University School of Medicine, Richard Kenney, the department chair, encouraged me to apply for regular membership in the American Physiological Society. My application was accepted, but not for regular membership, only associate membership. It was not until the April 1985 meeting, the meeting at which I was introduced to the Business Meeting attendees as the new Executive Director (actually Executive Secretary-Treasurer, the earlier title), that I was accepted for regular membership.

As we have become more inclusive, there have been suggestions that the Society implement a new membership category, one that recognizes the contributions of our members to the discipline and to the Society. The potential to do so became a reality when Robert Brock, Membership Committee Chair, presented the Committee's report to Council during the summer meeting. The Membership Committee proposed that the APS initiate a Fellows Program that would not only acknowledge an individual's noteworthy scientific and professional accomplishments but also their outstanding leadership and service to the Society. The Council responded favorably to the proposal and has asked the Membership Committee to review the proposed criteria and to determine how best to select candidates for selection. Implementation of the program is probably a year away. The goal is to identify those individuals who have contributed significantly to the Society and to the discipline and create a cadre of Fellows that can be turned to for assistance and advice in the future. Do you think you have the talent to be an APS Fellow? If so, you may be selected to be a Fellow of the American Physiological Society. If so, you will be able to call yourself a FAPS and append the initials to your name! ●

Martin Frank

## Continued from page 193: The MCAT is Coming

The new exam is intended to be more conceptually focused. It

- emphasizes educational outcomes by asking examinees to apply what they've learned
- increases emphasis on scientific and critical reasoning skills
- asks examinees to think like scientists by bringing together concepts in the natural and social sciences, reasoning about research designs and results, interpreting data, including statistical analysis, and drawing conclusions.

The content and approach are organized around competencies from the expert panel reports. As with the previous exam, the content focuses on concepts that are taught in introductory college classes in biology, general chemistry, organic chemistry, and physics. The major addition on the scientific content side is concepts from introductory courses in biochemistry. A new section with concepts from introductory psychology and sociology has been added to underscore the role that behavioral and sociocultural factors play in health and illness.

The revised test will be organized into four sections rather than the current three, and the test itself will be longer: 7 hours, with breaks between each section. The four sections include:

- 1) Biological and Biochemical Foundations of Living Systems
- 2) Chemical and Physical Foundations of Biological Systems
- 3) Psychological, Social, and Biological Foundations of Behavior
- 4) Critical Analysis and Reasoning Skills (similar to the current Verbal Reasoning section), with paragraphs on topics from the humanities

The writing sample section is no longer being administered. Scientific inquiry and reasoning skills will be tested in all of the first three sections.

Physiology is Foundational Concept 3, "Complex systems of tissues and organs sense the internal and external

environments of multicellular organisms, and through integrated functioning, maintain a stable internal environment within an ever-changing external environment," and will comprise 25% of the Biological and Biochemical Foundations section.

Links to detailed descriptions of what is covered in each section can be found at <https://www.aamc.org/students/services/343550/mcat2015.html>.

The scoring scheme was embargoed at the time of the symposium but has since been released and is described at <https://www.aamc.org/students/applying/mcat/mcat2015/admins/scores/>. Each section will be scored from 118 to 132, with a midpoint score of 125 (Figure 1). Total scores will range from 472 to 528, with a midpoint of 500. Test takers will also be given percentile rankings.

The AAMC has developed numerous resources for advisors, students, and medical school admission committees that can be accessed at <https://www.aamc.org/mcat2015/admins>.

- Faculty and administrators can sign up for the quarterly Q-UPP e-Newsletters and webinars by going to <https://www.aamc.org/students/applying/mcat/mcat2015/admins/newsletter/>

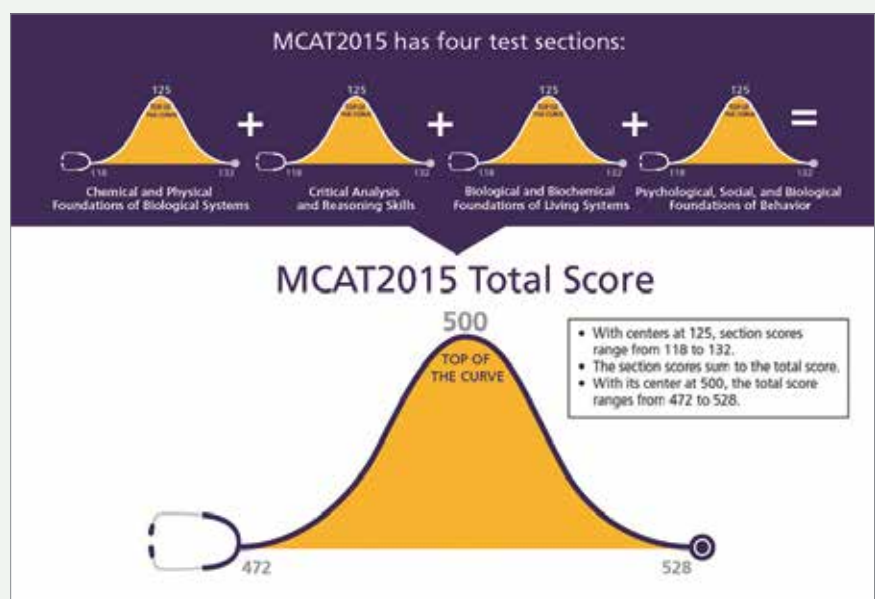


Figure 1. Scoring for MCAT 2015 (from American Association of Medical Colleges; <https://www.aamc.org/students/download/378384/data/mcat2015scoregraphic.jpg>)

- Other resources for faculty include a new *Official Guide to the MCAT Exam*, a *What's on the MCAT2015 Exam?* interactive tool, and a sociology and psychology textbook resource list (<https://www.aamc.org/students/services/343550/mcat2015.html>)
- A new interactive course-mapping tool allows advisors to match the content and skills from the new MCAT to a student's courses (<https://www.aamc.org/students/applying/mcat/mcat2015/admsn/resources/313190/thecourse-mappingtoolforthemcat2015exam.html>)
- Additional teaching materials that support the new MCAT content can also be found in the Pre-health Collection within MedEdPORTAL's iCollaborative (<https://www.mededportal.org/icollaborative/about/initiatives/prehealth/>); users must register for a free AAMC account to gain access to MedEdPortal

The 2015 testing policies and calendar were released in late June 2014, and a full-length sample test will be available in September 2014.

For students, AAMC is partnering with the Khan Academy and Robert Wood Johnson Foundation to create video tutorials designed to help prepare for the MCAT<sup>2015</sup> exam. There are currently 250 videos and 350 questions, and by fall 2014 there will be 500 videos and 1,000 questions (<https://www.khanacademy.org/test-prep/mcat>).

### Reassessing Medical School Prerequisites

The next presentation was from Henry Sondheimer, Senior Director of Medical Education Projects for the AAMC, speaking on "The changing landscape of medical school prerequisites." He opened with several quotes underscoring the fact that admission to medical school is not strictly about academic credentials, and he compared the current prerequisites to an old-fashioned telephone still being used in a world of smart phones.

Sondheimer pointed out that multiple factors are converging to make it timely for medical schools to reexamine their full admissions process (Figure 2). Healthcare needs and the structure of the American healthcare system are changing. Residency and undergraduate medical programs are placing increasing emphasis on competency-based education and assessment, and these changes need to be integrated with the move to more concepts-based teaching in undergraduate premedical education. The AAMC's Holistic Review initiative, with its emphasis on admitting a diverse student body, encourages admissions

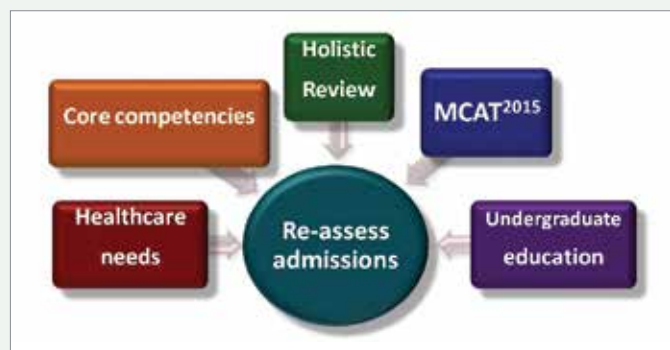


Figure 2. From American Association of Medical Colleges

committees to consider candidates' attributes and experiences in addition to academic qualifications. And finally, the MCAT is changing, as previously described.

The AAMC has created an Admissions Initiative (<https://www.aamc.org/initiatives/admissionsinitiative/>) to support medical schools as they implement holistic and competency-based admissions. The situation is complicated because the call for revising admissions requirements often overlaps with changing curricula in the medical schools. Admissions committees need to be clear about what they want their admission requirements to do, and they should make sure there is alignment between their curriculum and the admissions requirements.

The AAMC surveyed the admissions requirements of the 141 schools that grant MD degrees and found they fit into six broad categories:

- 80% still have traditional course requirements (6 courses and a specified sequence of biology and chemistry)
- 9% have course recommendations rather than requirements
- 5% have minimal prerequisites (5 or fewer courses)
- 2% have competency-based admissions, with defined knowledge, skills, and behaviors that applicants must demonstrate they have acquired
- 1% require terminal courses, such as biochemistry or cell biology, with no specified prerequisites
- 3% use hybrid systems or are in the process of making the transition from one system to another

The change in admissions requirements from traditional courses to one of the alternate models is still in its infancy, but change is taking place.

The next two speakers talked about how their institutions have implemented new policies and programs in response to the call for universities and medical schools



to broaden the medical school admission requirements from a set series of courses to a more flexible model.

### Changing Medical School Admissions: The Mississippi Experience

Steven T. Case, Associate Dean for Admissions and Professor of Biochemistry at the University of Mississippi School of Medicine, presented the story of how his school moved from traditional prerequisites to a hybrid admissions requirement model. The process began within the medical school, but one of the first steps was to engage external stakeholders from the major undergraduate institutions that are the “feeder” schools for the medical school (three public universities and two liberal arts colleges). Provosts, deans, department chairs, faculty, and premedical advisors from the undergraduate institutions were introduced to the changes to the MCAT and to the idea of moving to competency-based admissions.

One immediate concern was whether the changes would require the development of new courses. To demonstrate that the change could be met without new courses, the schools mapped the entering medical competencies presented in the *Scientific Foundations for Future Physicians* (SFFP) report against their existing courses. The results showed that all the competencies could be met by the existing course inventory and that all schools had more than one path for acquiring the competencies.

An unexpected bonus was that some of the schools then reexamined how they are educating pre-health students. University of Mississippi is developing a “Population Health” course, and it may be expanded to an interdepartmental, multi-semester track that would cover natural and behavioral sciences and associated diseases prevalent in Mississippi. Millsaps College is already using a competency-based curriculum, and they now have a \$1.4 million Howard Hughes Medical Institute grant to develop a series of courses that afford students the opportunity to acquire the SFFP competencies regardless of major.

Discussions at the medical school engaged a wide range of stakeholders beyond the Admissions Committee, including the Dean and Vice Dean of the School of Medicine, the Deans’ Council, the Admissions Task Force (ATF), the Curriculum Committee, and course directors and the residency program directors. After considering the reasons for change and different options, the ATF and Admissions Committee supported a flexible plan whereby applicants select the option by

which they want to be evaluated for admission: terminal courses, entering student competencies (documented with course-competency maps), or novel curricula/course tracks. The decision met with support from both internal and external stakeholders, and the new criteria go into effect summer 2014.

### Broadening Student Competencies: The Bachelor of Science and Arts Degree

The final speaker was Dee U. Silverthorn, who introduced a new bachelor of science and arts (BSA) degree program at the University of Texas at Austin. Although not designed exclusively for pre-health profession students, the BSA degree in the College of Natural Sciences will allow students to acquire a solid understanding of core science while simultaneously exploring disciplines such as public policy, medicine, anthropology, the arts, psychology, business, or communications. The hallmark of the BSA degree is that students must complete a 15-hour minor or 18- to 24-hour certificate in a field outside of science and engineering.

Currently, students who wish to major in biology have two options: a bachelor of science (BS) degree or a bachelor of arts (BA). These degrees both require 24 hours of upper division biology classes (about eight courses) in addition to a required three-course sequence of introductory biology and genetics. The new BSA only requires 12 hours of upper division biology, plus an additional 6 hours that may come from any science discipline. The BSA requires one semester of calculus plus one of statistics instead of one (BA) or two (BS) semesters of calculus, and it does not require chemistry beyond the introductory level. It also has more flexibility in the requirements for classes in the humanities, social sciences, languages, and arts.

One of the most appealing aspects of the BSA to students is the opportunity to study for a minor or certificate in a topic outside of science. Examples of certificates include:

- **Business foundations.** Finance, accounting, marketing, management, business law
- **Business and public policy**
- **Pre-health professions.** Classes in public health, cultural competency, healthcare policy, human and societal development, nutrition, and health
- **History and philosophy of science**
- **Communications in science**

Students can select the BSA degree for the first time in fall 2014, and already a number of students have decided to switch from other majors or tracks. ●

# How The Works For You

The American Physiological Society (APS) is a nonprofit devoted to fostering education, scientific research, and dissemination of information in the physiological sciences. The Society was founded in 1887 with 28 members. APS now has more than 11,000 members worldwide.

Discover how you can get involved with the **APS' award-winning programs and services**, including career resources, extensive awards programs, exciting education programs, diverse membership, exceptional scientific meetings, prestigious publications, and innovative advocacy resources. [www.the-aps.org](http://www.the-aps.org)



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careers



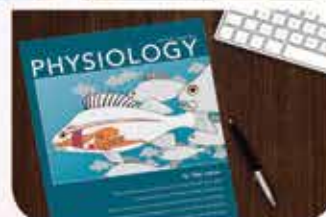
education



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- Benefit from K-12, undergraduate, graduate/professional, & continuing education programs
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- Engage in the diversity programs



## MEETINGS—Join us for the 2014 and 2015 Meetings and Conferences

- Attend the Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology, October 5-8, 2014 in San Diego, California
- Plan for Experimental Biology 2015, March 28-April 1, in Boston, Massachusetts
- Attend the 2015 APS Conference: 14<sup>th</sup> International Conference on Endothelin: Pathophysiology and Therapeutics, September 2-5, 2015 in Savannah, Georgia
- Sponsor a meeting



## MEMBERSHIP—Undergraduate student membership is \$10 and Graduate membership is \$15!

- Jump start or develop your career & join the APS
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