



THE Pharmacologist

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Percy Lavon Julian

29



Black Heritage USA

THE EXTRAORDINARY PERCY JULIAN

INSIDE

2019 Annual Meeting

WCP 2018 Meeting
in Review

Interview with Dr.
Namandjé N. Bumpus



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Message from The President

Dear Friends, Colleagues, Members of ASPET,

It's a pleasure and an honor to write for the first time as president of ASPET. I would be remiss if I did not first thank John Schuetz for his outstanding service as president this past year, and likewise the outgoing past-president, David Sibley, for his three years of dynamic leadership. Their guidance and example will stand me in excellent stead for the year ahead.

This has been a momentous year for ASPET. We've made great strides in the implementation of our strategic plan (<https://www.aspet.org/aspet/about-us/2017-strategic-plan>), and we've moved to a beautiful new headquarters in Rockville, Maryland. For a minimal increase in annual costs, we've moved into a more efficient, custom-designed space with upgraded communications and better facilities for conferences and team meetings. With our sister EB societies, we've solidified the future of our annual meeting. ASPET was the lead society at EB 2018, at which we moved significantly toward our strategic goal of reimagining the meeting experience, including the introduction of the datablitz sessions for young scientists. Staff were successful in obtaining a Burroughs-Wellcome Career Guidance for Trainees grant, which is critical for supporting the highly successful *ASPET Mentoring Network* and helping to make it sustainable. All of this has entailed a tremendous effort on the part of our executive officer, Judy Siuciak, and the outstanding ASPET staff, and I thank them on the behalf of the leadership team and all our members.

Returning to the subject of the EB meeting, please mark your calendars for April 6-9 for the 2019 meeting in Orlando, FL. Working with the other EB societies, we continue to reimagine the meeting experience for our members. Responding to member feedback, the meeting has been shortened to 4 days, ending on Tuesday. In addition, a 10:00 am – noon time slot has been carved out for the poster sessions, during which there will be no competing distractions such as oral sessions, awards presentations, or indeed lunch. Thus, our trainees should have the full attention of the conferees and a more rewarding experience in presenting their research.

I'm also excited to announce that EB 2019 will host the first joint ASPET-APS (American Physiological Society) Presidential Symposium series, which will focus on "The Microbiome in Physiology and Pharmacology." The series consists of three symposia held from 8:30 am – 10:00 am on Sunday, Monday, and Tuesday of the meeting, as well as a jointly sponsored microbiome workshop on Saturday afternoon. APS President Jeff Sands and I are enthusiastic not only about the scientific content of the series, but also about the possibility for future joint ventures of the two societies and hopefully with other EB societies. Also at EB, look forward to a proposed change in the bylaws to allow graduate student members and affiliate members to vote.

Implementation of our strategic plan is ongoing. Important activities to be initiated this year include formation of a Global Partnerships Task Force and implementation of a review of the Society's governance. Although governance reviews are a regular activity in many societies and organizations in order to ensure that they function efficiently and to the best of their capabilities, this has not been done recently by ASPET.

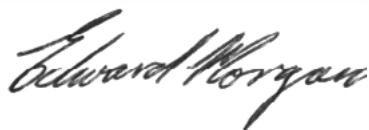
Another part of our strategic plan was to institute a fellows program to recognize our outstanding members for their contributions to science and to ASPET, and we're pleased to announce plans to implement this in the coming year. Council has approved funding for our community engagement platform, and under the able stewardship of Suzie Thompson, ASPET Marketing Director, we will begin to implement it in 2019. This is a

private online community that will be seamlessly integrated into our website and will for the first time allow members of ASPET to connect, converse, learn, share, and collaborate online. It will transform the way our members interact and greatly increase the value of your ASPET membership. Exciting times ahead!

Finally, I would like to take a moment to address diversity and inclusion at ASPET. Diversity in science has been one of my major priorities for many years, not least because there is a body of literature showing that diversity contributes to innovation and productivity in the scientific workplace. It is gratifying to see so much diversity among our young and early career ASPET members, and we must make sure that we are mindful of diversity and inclusion in all of our ASPET activities. The Program Committee has worked hard to achieve diversity in ASPET symposia and likewise we have good diversity on our Society-wide and divisional committees.

We need to be vigilant in maintaining diversity in these areas while working to ensure that deserving scientists who are women and/or members of underrepresented groups are nominated for ASPET awards. For that reason I urge those of us with meritorious colleagues who are female or from underrepresented groups to nominate them for an ASPET award this year and in the future.

Warm regards,

A handwritten signature in black ink that reads "Eddie Morgan". The signature is written in a cursive, flowing style.

Eddie Morgan, PhD
ASPET President



2019 Annual Meeting



Preliminary Program

Plan to attend the ASPET Annual Meeting at Experimental Biology, April 6-9, 2019 in Orlando, Florida! Join 1600 scientists passionate about pharmacology as ASPET intersects with over 10,000 other experimental biologists in physiology, biochemistry, molecular biology, pathology, and anatomy.

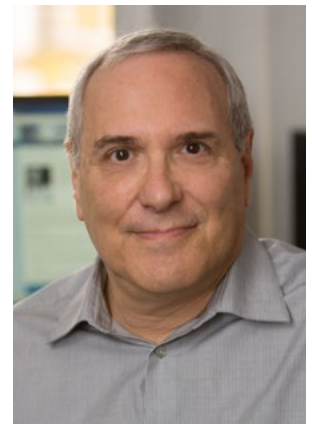
In early January we'll announce lectures by the preeminent winners of the John J. Abel Award in Pharmacology and the Reynold Spector Award in Clinical Pharmacology.



Mary Vore, PhD



Joseph A. Beavo, Jr., PhD



Paul A. Insel, MD

Keynotes

The 2019 **Norman Weiner Lecture** will be presented by Dr. Mary Vore, emerita professor at the University of Kentucky, College of Medicine. Her lecture is titled *Cancer Chemotherapy, Oxidative Stress and ATP-Dependent Efflux Transporters*.

The 2019 **Julius Axelrod Award in Pharmacology Lecture** will be presented by Dr. Joe Beavo, emeritus professor at the University of Washington, titled *Cyclic AMP Coordination of Signaling Pathways: What Does Phosphoproteomic Analysis with PDE Inhibitors Suggest?*

Dr. Beavo will also chair the Axelrod symposium titled *Phosphoproteomic Analysis of G Protein-Coupled Pathways* with talks by Drs. Mark von Zastrow, Manuela Zaccolo, Kjetil Tasken, and Mark Knepper.

Dr. Paul Insel, the Distinguished Professor of Pharmacology and Medicine at the University of California, San Diego, was our 2017 recipient of the **David Lehr Research Award**. He will discuss his work on *GPCRs as Novel Therapeutics in Pancreatic Cancer* as this two-year award term comes to a close.

Symposium Highlights

For the full ASPET program with session descriptions, speaker names, and talk titles, visit www.aspet.org/eb2019-program-TPharmFall

Over **23** sessions for scientists interested in **behavioral pharmacology**, including:



- *Maximizing the Therapeutic Value of Psychedelics: Recent Preclinical Studies*
- *Pharmacology of Taste: From Receptors to Behavior*
- *What Does Sex Have to Do With It? Implications for Pharmacotherapy*
- **More sessions at**
<https://bit.ly/2CO5qL4>

Over **28** sessions for scientists interested in **drug discovery and development**, including:



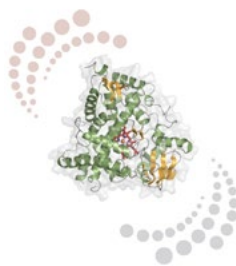
- *An Apel(-in) a Day Keeps Cardiovascular Disorders at Bay?*
- *Pharmacology Repurposed: Novel Uses for Current Therapies*
- **More sessions at**
<https://bit.ly/2x79Re8>

Over **10** sessions for scientists interested in **cancer pharmacology**, including:



- *Companion Animals in the Cancer Therapeutic Development Pipeline*
- *Drugging DNA Damage Response & Repair: A Layered Therapeutic Approach for Cancer Treatment*
- *New Strategies for Augmenting Immune Checkpoint Blockade in Cancer Therapy*
- **More sessions at**
<https://bit.ly/2Qjowv>

Over **21** sessions for scientists interested in **drug metabolism and disposition**, including:



- *Natural Product-Drug Interactions: Complex Mechanisms and Public Health Impact*
- *ncRNAs in Drug Metabolism & the Translation of Gene Silencing Technology into Therapeutics*
- *Strategies to Assess Drug-drug Interactions When Developing Fixed Dose Combinations*
- **More sessions at**
<https://bit.ly/2CNoPvK>

Over **29** sessions for scientists interested in **cardiovascular pharmacology**, including:



- *ACE2/Angiotensin-(1-7)/Mas Receptor Axis: Look How Far We've Come!*
- *Cardiovascular Signaling via the G Protein-Coupled Estrogen Receptor*
- *Targeting Adipose Inflammation in Diabetic Vascular Complications*
- **More sessions at**
<https://bit.ly/2x5rUlw>

Over **21** sessions for scientists interested in **molecular pharmacology**, including:



- *G protein- β -arrestin Interplay: Molecular and Therapeutic Implications*
- *Leveraging Novel Insights into Allosteric Modulator Pharmacology for CNS Disorders*
- *New Opportunities in Targeting WNT Signaling*
- *New Roles and Mechanisms of RGS Proteins in Physiology and Disease*
- **More sessions at**
<https://bit.ly/2CMFwaw>

Over **15** sessions for scientists interested in **neuropharmacology**, including:



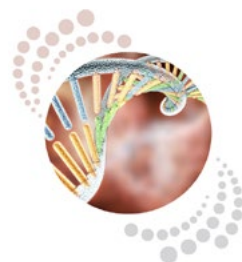
- *Addressing the Opioid Epidemic Through Science and Policy*
- *Bridging the Translational Gap in Ischemic Stroke Research*
- *Functional Output of Sexual Dimorphism of Neuroimmune Cells*
- *Novel Neuropeptides that Regulate Motivational and Reward-Related Behaviors*
- **More sessions at**
<https://bit.ly/2N5x0IC>

Over **19** sessions for scientists interested in **pharmacology education**, including:



- *Balancing Content, Critical Thinking, and Creativity in Graduate Education*
- *Surviving an Existential Threat - Creating a Niche for Basic Science Educators*
- *Teaching Blitz*
- *Teaching Institute: Pharmacology Education ADME: Audience, Design, Modality and Experimentation*
- **More sessions at**
<https://bit.ly/2N8Jkrx>

Over **16** sessions for scientists interested in **toxicology**, including:



- *Enteric Drug Metabolism and Drug-drug Interactions*
- *Genetic Polymorphisms in Drug Metabolizing Enzymes*
- *Mechanisms of Drug-induced Liver Injury: From Bedside to Bench and Back*
- **More sessions at**
<https://bit.ly/2NB3dXE>

Over **15** sessions for scientists interested in **translational and clinical pharmacology**, including:



- *New Paradigms for Targeting Adenosine Receptors: Basic and Translational Applications*
- *Virtual Pharmacology and Experimental Therapeutics: Near or Distant?*
- **More sessions at**
<https://bit.ly/2x7mN3v>

In collaboration with the **Chinese Pharmacological Society (CNPHARS)**:



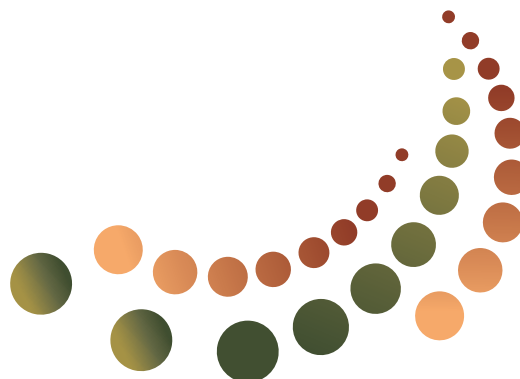
- *Pharmacological Studies on the Drugs of Anti-neurodegenerative Diseases*

In collaboration with the **American Physiological Society (APS)**, our presidents, Drs. Edward Morgan and Jeffrey Sands, will present 3 presidential symposia on the **microbiome**:

- Presidents' Symposium I: Gut Microbiome and Metabolic Disorders
- Presidents' Symposium II: Gut Microbiota: A Chemical Factory
- Presidents' Symposium III: Microbiota in Action: The Gut and Beyond
- Presidents' Symposium Workshop: Microbiome Research: What You Need to Know

Presented by the editors of the ASPET journals:

- Journals Workshop: An Interactive Guide to Publishing, Reviewing, and Ethics Issues



Explore the full ASPET program at www.aspet.org/eb2019-TPharmFall

Explore the full EB program at www.experimentalbiology.org

Stay Up-To-Date on Annual Meeting News

Visit the ASPET website at www.aspet.org/eb2019-program-TPharmFall to access full information on the meeting program, abstracts, speakers, special events, and sponsorship opportunities. Be sure to bookmark the website and visit often as content is updated frequently.

Insider tip: You can filter your sessions of interest by division – just click on the division name!

Submit your abstract
by **November 14, 2018**

<https://bit.ly/2Mo4kVX>

Call for Pharmacology Abstracts

We encourage submission of abstracts to ASPET topic categories in all areas of pharmacology detailing your latest work. By submitting your abstract, you will:

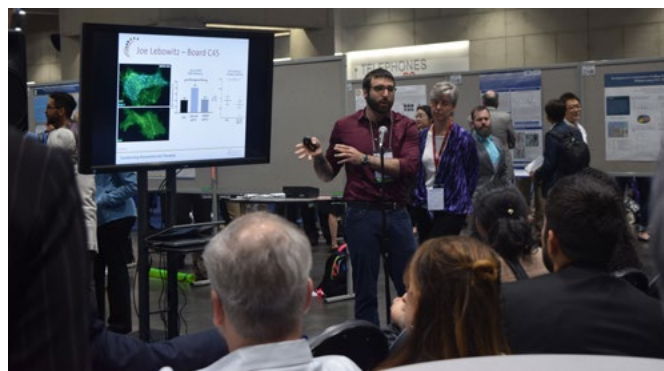
- Receive feedback on your work
- Be recognized for your recent scientific advances
- Be visible to spur those conversations about collaboration
- Have opportunities to win travel and poster awards (students and postdocs)

Submit an abstract of your work by November 14, 2018.

ASPET Abstract Topic Categories

ASPET is specifically seeking abstracts in the following research areas:

- Cancer Pharmacology
- Cardiovascular Pharmacology
- Cellular and Molecular Pharmacology
- Central Nervous System Pharmacology
- Drug Discovery and Development
- Drug Metabolism and Disposition
- Pharmacogenomics and Translational Pharmacology
- Pharmacology Education
- Toxicology
- Pharmacology – Microbiome
- Pharmacology – Other



Don't find your specialty listed? Search all pharmacology-related topics <https://bit.ly/2Mo4kVX> or EB topic categories www.experimentalbiology.org

Networking at EB

In addition to interacting during the Q&A at symposia and during poster sessions, these are other ways ASPET helps you connect:

- The ASPET member lounge for free wifi, coffee, and introductions
- Evening mixers for scientists at all career levels within your specialty (i.e. division)
- ASPET meet-up spot within the EB welcome reception
- Trainee events hosted by divisions
- Division annual meetings where you can meet division executive leadership and learn how you can get more involved
- Dance party exclusively for students, postdocs, and other young scientists
- Interact at the popular ASPET Student-Postdoc Poster Competition. Additional opportunities available to apply to present a poster or to volunteer to be a judge. Visit: <https://www.aspet.org/aspnet/meetings-awards/aspnet-awards/aspnet-poster-awards>.
- Wear your ASPET pride – visit the ASPET booth to purchase logo apparel to be more easily found

Opportunities for Young Scientists

Undergraduates, post-baccalaureate students, graduate students, and postdoctoral scientists are encouraged to submit their abstract and attend EB. In addition to hearing the latest science, presenting their work, and networking, the following opportunities are also available:

ASPET Poster Competition

Application Deadline: Thursday, November 15, 2018, 8:00 pm ET

Poster awards are offered for outstanding poster presentations by ASPET student and postdoc members.

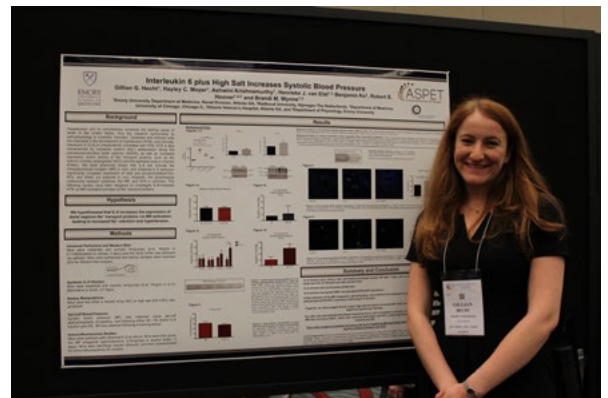
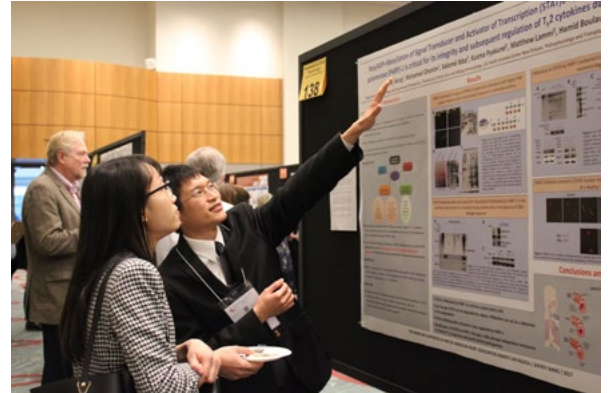
Step 1: **Submit your abstract** to EB in an ASPET topic category by November 14

Step 2: Complete your **ASPET competition application** by November 15

Selected finalists will be announced in January. Presentations will take place at the ASPET Student-Postdoc Poster Competition on Sunday, April 7, 2019 in Orlando, Florida where winners will be selected.

For more information and to apply for the ASPET Poster Competition, please visit:

<https://www.aspet.org/aspet/meetings-awards/aspet-awards/aspet-poster-awards>



Competitors at the 2018 Student/Postdoc Poster Competition

“The poster competition at ASPET is a great way to showcase your research work. It is more interactive than a competition wherein the judges gave me some valuable suggestions and advice on my research project.”

-Hridgandh Donde, ASPET postdoc member

“ASPET has a vibrant community that is engaging and it is easy to meet people”

-Anonymous survey respondent



2018 Graduate Student and Post-baccalaureate Travel Award Winners

ASPET Travel Awards

Application Deadline: Thursday, November 15, 2018, 8:00 pm ET

Young scientists are invited to apply for a travel award to help defray the costs of registration, travel, and housing to attend the ASPET Annual Meeting at EB 2019.

Step 1: **Submit your abstract** to EB in an ASPET topic category by November 14

Step 2: Complete your **ASPET travel award application** by November 15

In addition to the general travel awards, ASPET also offers specialty awards for members of groups underrepresented in the biomedical sciences and for members residing in developing countries.

For more information and to apply for a travel award, please visit:

<https://www.aspet.org/aspet/meetings-awards/aspnet-awards/aspnet-travel-awards>

Oral Presentations

Abstract Submission Deadline: Wednesday, November 14, 11:59 pm ET

You may be selected for one of a variety of speaking opportunities at this international meeting. Students and postdocs need to submit their abstract to EB in an ASPET topic category by the November 14th deadline. No other application is necessary.

Opportunities include:

- 3-minute datablitz talks
- Division showcases and platform talks (some include prizes!)
- Talks within the symposia listed above

ASPET Mentoring Network

The ASPET Mentoring Network is a professional development experience that uses career coaching to help participants develop the skills needed to succeed scientifically, professionally, and socially, including discussions about experiences and pressures faced by groups that are underrepresented in the sciences.

This program kicks off at the ASPET Annual Meeting at EB but continues year-round. See page 167 for details.



2018 Mentoring Network Participants



2018 Washington Fellow Jared Tur at the U.S. Capitol

ASPET Washington Fellows

The Washington Fellows Program enables developing and early career scientists interested in science policy to learn about and become more engaged in public policy issues.

Fellows receive complimentary registration to the ASPET Annual Meeting at EB but the program runs year-round. See page 166 for details.



Sessions at EB 2019 of Interest to Young Scientists

Over **20** sessions may be of particular interest to **young scientists**, including:

- Graduate Student – Postdoctoral Colloquium
- Journals Workshop: An Interactive Guide to Publishing, Reviewing, and Ethics Issues
- The Daily Datablitz
- Balancing Content, Critical Thinking, and Creativity in Graduate Education
- The Need for Scientists in Regulation and Policy: Academia, Government, and Industry
- Virtual Pharmacology and Experimental Therapeutics: Near or Distant?
- Undergraduate Networking and Career Development Luncheon
- Diversity and Inclusion Breakfast
- **More sessions at www.aspet.org/eb2019-program-TPharmFall**

Don't miss these dates

Friday, October 26, 2018

Washington Fellows Program application deadline

Wednesday, November 14, 2018

EB Abstract submission deadline

Thursday, November 15, 2018

Poster competition, travel award application deadline

Wednesday, November 28, 2018

Mentoring Network application deadline

February 5, 2019

Deepest registration discounts end

Remember to check ASPET when you register!

Service to the Local Community

ASPET gives back! Arrive a day early in Orlando and give back to the local community.

Since 2009, ASPET members attending Experimental Biology have volunteered their time for local charities the day prior to EB. Activities have ranged from home construction to painting, cleaning, stocking, food preparation, and food service.

Details about our 2019 project will be announced soon. Check out www.aspet.org/eb2019-TPharmFall for more information or contact Dr. Charles France at france@uthscsa.edu or 210-567-6969.





THE EXTRAORDINARY PERCY JULIAN

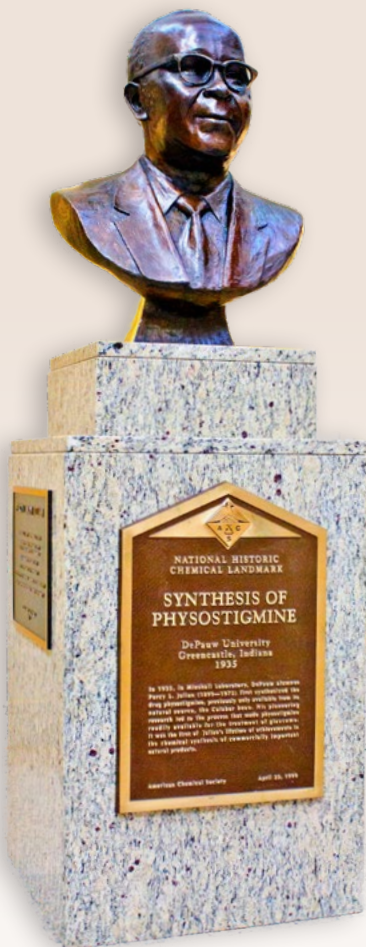
Rebecca J. Anderson, PhD

Percy Lavon Julian postage stamp, 1993, USPS Black Heritage® Stamps.

On April 23, 1999, the American Chemical Society presented a plaque to DePauw University, designating the institution's science center as a National Historic Chemical Landmark. The plaque recognized the pioneering research of Percy Julian, who "made physostigmine readily available for the treatment of glaucoma" (1).

Today, much better drugs are available for glaucoma patients, and physostigmine is mostly

a historical footnote. But in the 1930s, this was a major scientific achievement. It also marked the beginning of Julian's extraordinary career. No matter how challenging the problem in his personal or professional life, Percy Julian always succeeded. He had inherited academic prowess from his father and, as a child, learned one guiding principle from his grandfather: "There is always a way" (2).



Copyright held by DePauw University.

National Historic Chemical Landmarks dedication, 1999, DePauw University, Greencastle, Indiana.

Worth the Scars

Percy Julian was born in Montgomery, Alabama in 1899, the oldest of 6 children and the grandson of slaves (2). His father, James Julian, was a railway mail clerk (2, 3). Because of James's status as a federal employee, the family ranked higher than most African-Americans at that time, but public libraries in the South were closed to them. So, James amassed an extensive home library, and he studied mathematics and philosophy. He also impressed on all of his children the importance of formal education (2, 4).

Public education for Southern African-American students

ended at the eighth grade. Two additional years of training were available for African-American teachers. In 1916, Percy graduated from the State Normal School for Negroes, the teacher training school in Montgomery (3). Then, he was accepted at DePauw University in Greencastle, Indiana.

On a warm fall day, the entire Julian family stood on the railway platform to say goodbye to the teenager who embodied their hopes and dreams. Percy's grandmother had once picked a record 350 pounds of cotton in one day (3). His grandfather was missing 2 fingers, cut off a half-century earlier as punishment for learning to read and write (3, 5).

Percy was among several African-American students at DePauw, but the college dormitories were not open to them (4). He struck a deal with the Sigma Chi fraternity. In exchange for board and a bed in the basement, he worked as a waiter in the fraternity's dining hall (2-4). To help pay his tuition, Percy also worked as a ditch digger (2, 4).



Percy Lavon Julian, chemist.

On his first day of class, a white student reached out his hand and said, "How are you—Welcome!" Julian had never shaken hands with a white person and wondered whether or not he should. "But," he later recalled, "in the shake of a hand my whole life changed. I soon learned to smile and act like I believed they all liked me, whether they wanted to or not" (2).

Julian was classified as a "sub-freshman" at DePauw. During his first two years, he took classes at a nearby high school to earn his diploma, in addition to his regular college courses (1, 4). He soon caught up and majored in chemistry. The department was headed by William M. Blanchard, the first person DePauw had hired with a PhD in chemistry (1).

In 1920, Julian graduated as valedictorian of his class (1-4). At commencement, his great-grandmother showed Percy for the first time the deep scars she had received from a beating during the last days of the Civil War. She proudly held his Phi Beta Kappa key and said, "This is worth all the scars" (4).

During this time, James Julian moved his family to Greencastle, and Percy's two brothers and three sisters also subsequently graduated from DePauw (2, 6).

Reprinted with permission from The Historical Society of Oak Park and River Forest (Copyright © 2018)



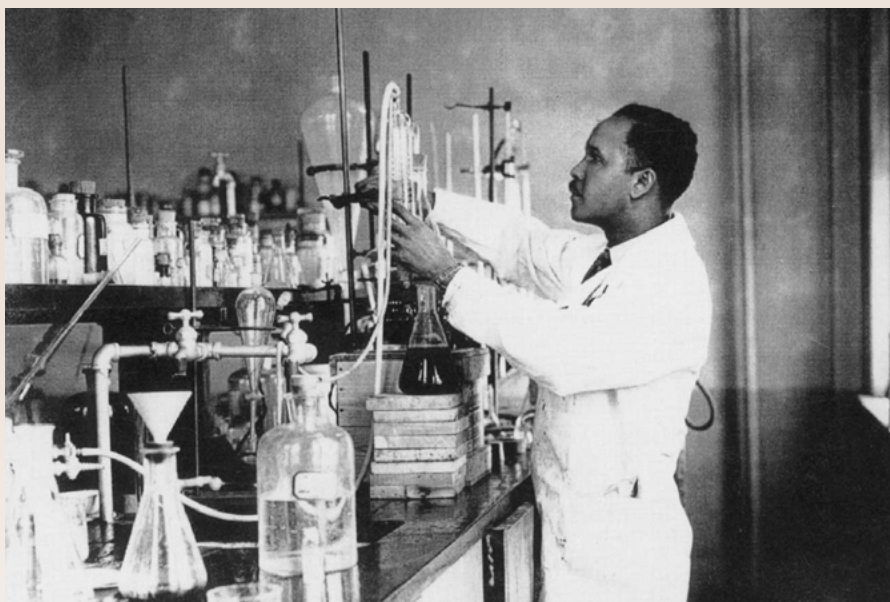
Dean William Martin Blanchard, DePauw University.

Going Places

Percy wanted to continue studying chemistry in graduate school, but everyone tried to dissuade him. His father urged him to study medicine. In those days, the only African-American families that enjoyed near-middle class status were those whose breadwinner worked as a physician, undertaker, or federal employee, and in fact, Percy's two brothers eventually became physicians. To James, a chemist was no different than being a teacher, and "that in totality means you're going to starve to death" (3). He was all too familiar with the plight of lowly-paid teachers at African-American schools.

Likewise, Percy's professors discouraged him. Certainly, they were impressed with his undergraduate performance and had written letters of recommendation on his behalf to all the top graduate school programs in chemistry. Even his classmates assumed that he would receive a plum acceptance (3).

But the response was disappointing. Blanchard showed him a sampling of the replies, which expressed concern that, as an African-American man with a PhD, Percy would be overqualified (3, 4). One admitted, "We couldn't get him a job when he's done, and it'll only mean frustration. Why don't you find him a teaching job at a Negro college in the South? He doesn't need a Ph.D. for that" (6).



Chemist Percy Julian in his lab at DePauw University.

Julian chafed at the limitations imposed on him, but he made the best of his situation (4). He took a position as a chemistry instructor at Fisk University in Nashville and wrote a completely new set of lectures for the organic chemistry course (1, 4). William Blanchard, at DePauw, was so impressed with the lectures that he recommended Julian for the Austin Fellowship in chemistry at Harvard (4).

Julian arrived in Cambridge, Massachusetts, in 1922 and earned his master's degree in chemistry the following year (2, 4). While still a student, he began his lifelong advocacy for civil rights. He was in demand on campus as a speaker on social justice issues (3).

Julian remained at Harvard for three more years with the aid of minor fellowships, working as a lab assistant and studying biophysics and organic chemistry (3). But he was denied a teaching assistantship, an essential part of the doctoral program. Harvard was concerned that Southern white students would be offended by having an African-American teacher (3, 4). For many years afterward, Harvard's decision festered in Julian's memory, but he expressed his disappointment and anger only to his closest friends (2).

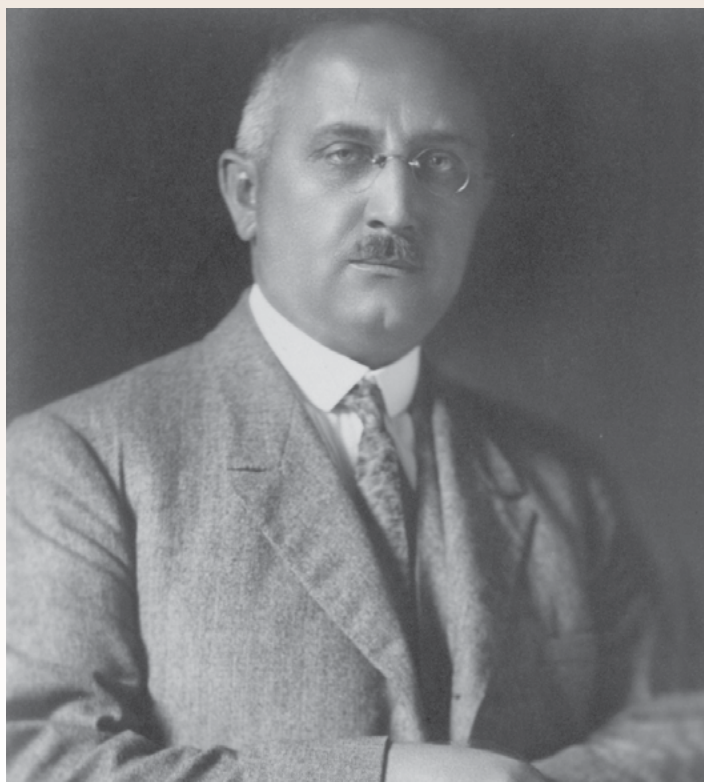
In 1926, Julian accepted a position as professor—and the only chemistry faculty member—at West Virginia State College, which at that time was an all-black institution (1-3). It was an era when pharmacologists were finding medicinal uses for plant alkaloids. And organic chemists sought to extract and identify those alkaloids and then synthesize them *de novo*.

Ernst Späth, a world-famous natural product chemist in Austria, was the first to synthesize

mescaline and one of the first to synthesize cuscohygrine, an alkaloid found in coca (2). In West Virginia, Julian re-created Späth's methods for synthesizing nicotine and ephedrine (4).

Julian's work won him the notice of Howard University, the nation's most prominent African-American university. In 1928, he was appointed associate professor and head of Howard's chemistry department (3, 4).

At Howard, Julian worked long hours, serving as everything from teacher and administrator to glass washer, stockroom clerk, and janitor (3, 4). He was a brilliant and magnetic lecturer, and his enthusiasm was infectious to colleagues and students alike (3).



Reprinted with permission from the Archive of the University of Vienna (Photographer: Theo Bauer)

Austrian chemist Ernst Späth, doctoral advisor to Percy Julian at the University of Vienna.

His greatest passion, though, was research (4). He constantly discussed research problems. Any student who happened by his lab at the end of the day would likely be invited to Julian's home, along with one or two associates. They would discuss chemistry while they prepared dinner, as well as during and after the meal, in the "warm company of a genial host" (3).

Waltzing through Vienna

In 1929, Julian came to the attention of the head of the Rockefeller Foundation, who was impressed with his ability and character (3, 4). Rockefeller awarded

Julian a General Education Board Fellowship (3). The grant allowed Julian, finally, to pursue his doctoral studies, and he elected to study under Späth at the University of Vienna (1-3). Späth's lab at Vienna's prestigious Chemische Institut was an internationally acclaimed center for natural products chemistry (2, 4).

In Vienna—for the first time in his life—Julian encountered no barriers and felt completely at ease (2, 4). He had access to all levels of society, and he took full advantage of it. He skied in the Rax Mountains, swam in the Danube, played tennis, and attended the opera. He took lessons to sharpen his piano skills and played spirituals and the classics with equal skill. He also learned to speak impeccable German (2, 4).

Julian's fellowship allowed him to purchase crates of glassware and lab equipment that were out of reach for the average graduate student in impoverished, post-World War I Austria (2). Those supplies, along with Julian's good humor and friendly personality, quickly won over his new colleagues. All of Späth's other 15 graduate students were his friends. Julian frequently entertained them at his elegant apartment, which was just a short walk from Späth's lab (2).

The Viennese graduate students were impressed with Julian's passion for hard work, profound chemical knowledge, and astounding memory. He was particularly noted for his neatness, clean work bench, and contagious, uninhibited laughter (2). Even Späth, a critical and implacable professor, called Julian "an extraordinary student, the like I have not seen before in my career as a teacher" (2).

For his PhD thesis, Julian isolated and identified a medicinal alkaloid found in *Corydalis cava*, a plant that grew in the Vienna woods (2, 5). This work formed the foundation for his later research on an extensive series of plant-derived alkaloids.

In September 1931, Julian received his PhD from the University of Vienna and sailed back to the US on the *Queen Elizabeth* (2). He had bloomed into a dapper, self-assured man of the world (4). Accompanying him was Josef Piki, a Viennese friend and fellow graduate student.

When they arrived at Howard University, Julian was promoted to full professor and laid plans to build a new chemical research center (3, 4). Julian vowed to "give every damned ounce of my energy towards...as much research as the day's hours and my strength will allow" (4).

Unfortunately, he soon became embroiled in controversy (3). He brashly involved himself in campus politics, and a scandal surrounding his personal

life erupted when some of his private letters were published in the local paper. While a graduate student, he had written frequently to friends and colleagues, embellishing his experiences in Vienna. In particular, he had bragged about the charms of Viennese women, with whom he had attended the opera and stayed out late drinking wine (4). He resigned his position at Howard in 1932 (3).

William Blanchard, who had become Dean of Liberal Arts at DePauw University, offered Julian a position as a research fellow, along with teaching responsibilities (1-4). With Blanchard's backing, Julian replaced DePauw's usual senior courses in qualitative organic analysis, organic synthesis, identification of organic compounds, and literature studies with an amalgamated combination of these courses in the form of fundamental research problems (2).

Every student who qualified to receive a research problem performed brilliantly. Over the next 4 years, 30 impressive senior theses resulted, 11 of which led to publications in the *Journal of the American Chemical Society* (2). Most of those papers read more like doctoral dissertations than senior theses.

The DePauw fellowship was a big step down from Julian's professorship at Howard and paid considerably less, but he could continue his research (4). Josef Piki had followed him to DePauw, and together they pursued a vigorous program synthesizing plant alkaloids (2). Their first project aimed high: the synthesis of physostigmine.

Breakthrough and Setbacks

In 1864, Julius Jobst and Oswald Hesse had isolated physostigmine, the main alkaloid found in the Calabar bean (2, 7). Physostigmine is a reversible acetylcholinesterase inhibitor, promotes drainage of aqueous humor from the eye, and decreases intraocular pressure. In the 1930s, physostigmine was the preferred treatment for glaucoma (4). But extracting physostigmine from Calabar beans was tedious and expensive.

Chemical synthesis might provide a viable alternative, and several research groups tackled this very challenging project. Among them was Sir Robert Robinson, a world-

famous researcher and leader in synthetic organic chemistry at Oxford University (5).

In 1932, Robinson published the last of a series of 10 papers in which he claimed to have synthesized d,l-eserethole, a critical alkaloid intermediate and one step from the final product, physostigmine (2, 5). Julian and Piki had followed a different synthetic path, relying on simple, inexpensive starting materials to make this molecule (5). Robinson and Julian gave their molecules the same name, but the two compounds had very different properties. Julian was confident that his synthesis had produced the correct molecule.

DePauw lacked the prestige of institutions like Oxford, and the young Julian was a virtual unknown compared to the eminent Robinson. Piki urged his friend to be cautious, fearing that challenging Robinson would stifle Julian's promising career and ruin his reputation, if he was wrong (2). Instead, a headstrong and confident Julian insisted on publishing.



Calabar plant.

Julian and Piki's paper pulled no punches: "We believe that the English authors are in error, that the compound they describe as d,l-eserethole is not the substance, and that we are describing for the first time the real d,l-eserethole" (8). Their detailed analytical data left no doubt who was correct.

Starting with phenacetin, Julian and Piki synthesized physostigmine in 11 elegant steps. The project took 3 years, and their 1935 paper, "The complete synthesis of physostigmine (eserine)," is considered a classic (1, 7).

Telegrams of congratulations arrived from around the world (2). Physostigmine became readily available for the treatment of glaucoma (1, 6). And the work established Julian's reputation as a world-class chemist. He was just 36.

After the grant funding Julian's position expired, Blanchard wanted to appoint Julian to the faculty, but despite his accomplishments, the DePauw Board of Trustees did not allow it (1, 3). He was also strongly recommended for a faculty position at the University of Minnesota, but the university's Board of Regents refused (3).

In frustration, Julian began applying for industry positions (1, 3). But time and again, he was turned away with apologies when the interviewer saw that he was African-American (4).

Finally, Harry Lewis, Dean of the Institute of Paper Chemistry in Appleton, Wisconsin, offered Julian a research staff position (2-4). Lewis had been impressed with several of Julian's DePauw students, who were in the Institute's doctoral program (2). Julian's professional credentials were impeccable, but Lewis and his colleagues struggled with how to accommodate him in Appleton. An old but still active city statute stated that "No Negro shall be bedded or boarded in Appleton overnight" (2)

"I'll Just Hire Him"

At DePauw, one of Julian's projects had involved isolation of another Calabar bean alkaloid, geneserin (2). He extracted oil from the bean, washed it with dilute acid, and then with water and set the flask aside. A few weeks later, he saw small glistening crystals in the liquid (1, 2). After recrystallization, he isolated a small amount of pure material. A literature search indicated that it was not geneserin, but rather a sterol, stigmasterol. (Stigmasterol contains a central steroidal unit of four fused rings that are common to steroids such as cholesterol and the sex hormones.)

Adolf Windaus and A. Hauth had first isolated stigmasterol in 1906 (2). About the same time, Erhard Fernholz and Adolf Butenandt published their first papers on steroid chemistry using stigmasterol as the starting material. Fernholz and Butenandt had extracted stigmasterol from soybean oil (2, 4).

The soybean had been gaining economic importance in the early 1930s. Henry Ford promoted its use for making automobile parts and lubricants. Glidden Company, a paint and varnish manufacturer, was also pursuing soy-based products.

To continue his stigmasterol experiments, Julian wrote to Glidden and requested five gallons of soybean oil. He was surprised when William J. O'Brien, the company's vice president, personally called and invited him to interview for a research position (2).

O'Brien was in Appleton attending a Board meeting of the Institute of Paper Chemistry. He listened while Dean Lewis and the Board deliberated over accommodations for Julian in Appleton. O'Brien thought, "If he is half as good as they say he is, I can use him at Glidden. I won't say anything about who he is; I'll just hire him" (2). O'Brien slipped out to telephone Julian.



Reprinted with permission from University of Oxford

Sir Robert Robinson, Nobel Laureate, and the Waynflete Professor of Chemistry (1930-1954) at Magdalen College in Oxford University.



Soybean plant

Julian went to Chicago for the interview and was hired on the spot as director of research in Glidden's new Soya Products Division. His job was to devise profitable products from soybean extracts (2, 4).

When Julian arrived at Glidden in 1936, construction had begun on a new plant for large-scale processing of soybean oil. The German construction firm, Electro-Chemie, had been contracted to build the plant. Julian frequently consulted in German with the large contingent of visiting technicians. He was on-call around the clock and functioned as engineer, chemist, researcher, and salesman. When completed, Glidden's plant was the world's first industrial-scale facility for isolating and producing vegetable proteins (2).

Julian's first success was isolating soy "alpha-protein" (4). Alpha-protein is mainly used for paper coatings, in which it serves as a pigment binder. Julian then adjusted the size of the soy protein to suit a variety of other applications, including "latex" house paints.

Glidden, in conjunction with a Pennsylvania laboratory, also used alpha-protein to create a fire-retardant product called Aero-Foam (4, 5). The

foam could be packaged in canisters and sprayed like shaving cream. It was effective in extinguishing otherwise uncontrollable oil and gasoline fires, especially those occurring on aircraft carriers (5). The US Navy called it "bean soup," and it saved the lives of thousands of servicemen during World War II (4).

The US Navy called it "bean soup," and it saved the lives of thousands of servicemen during World War II.

The factory's output of 40 tons of soy protein per day made the Soya Products Division Glidden's most profitable unit (2). In parallel, Julian's lab developed other soy-based products, including cooking oils, shortenings, and lecithin for Glidden's Durkee foods division, as well as plastics, glues, and high-protein food for livestock and dogs (4).

Leading by Example

Virtually everyone who worked with Julian was amazed and inspired by his intellect and work ethic. Josef Piki said, "Percy generated ideas faster than half a dozen people could critically review and test them. He also did most of the writing [and] did practically all of the analytical work" (2).

At Glidden, Julian was a tireless task master with a strong temper. He spoke and carried himself with a European flair, supervising his workers in a white coat. But he was highly respected and many of his employees were extremely loyal. Some stayed with him for decades (4).

Edwin Meyer, a key assistant at Glidden, said, "He was obviously a man of great energy and ability who galvanized us all. There may have been resentments that related to his color, but we were never made aware of them. We were too busy working" (5).

Julian was not only the first African-American to direct a modern industrial laboratory; he also hired grateful black and female chemists when no one else would (3, 4). And he never hesitated to help those who had personal or financial problems (2).

Accidental Bonanza

By the time Julian had been at Glidden for 4 years, he had acquired a reputation as the Division's chief troubleshooter. One day, a panicked worker sought

his advice about a 100,000-gallon tank of purified soybean oil that had been contaminated. Water had seeped into the oil and a white solid had formed in the bottom of the tank (1, 2).

Julian remembered his experience at DePauw, where he had crystallized stigmasterol from Calabar bean oil after exposure to water. He realized that the leaked water had precipitated the trace amounts of sterols contained in soybean oil (1). He rushed to the site and instructed the workers to centrifuge the whole tank. The oily white mass contained about 15% mixed soya sterols. With dogged persistence, Julian adjusted the accidental water-precipitate procedure, and his optimized refining method was able to extract 100 pounds of mixed sterols daily (2).

At this time, Julian was research director of the Durkee Food Division and manager of Glidden's Fine Chemical Division, in addition to research director of the Soya Products Division. Despite his heavy administrative responsibilities, he remained personally involved in research, and now he added steroid chemistry as a personal project (2). He reassigned some of his employees to work on steroids—specifically intending to use stigmasterol to synthesize human sex hormones, progesterone in particular (4).

Like nearly one in six women at the time, his wife had suffered miscarriages. Progesterone could reduce the risk, but it was expensive and supplies were limited (4). Progesterone was extracted from animal urine, a very inefficient process. Julian knew that making progesterone from soybean oil precursors would be easier and less expensive.

Working 14-15 hours a day including weekends, Julian devised innovative methods and specialized equipment for synthesizing steroids—methods that were widely adopted. Glidden became the first American producer of bulk quantities of progesterone and other sex hormones (2). The price of progesterone dropped dramatically—still with a healthy profit for Glidden (1, 2, 5).

In the 1940s, steroid chemistry was an active field. Switching from animal to plant sources represented a major breakthrough, making chemical synthesis of medicinal steroids easier and the drugs more widely available to patients. Russell Marker, most notably, discovered that the Mexican yam was a richer source of steroid precursors. For the rest of the decade, Marker's Syntex plant in Mexico and Glidden in Chicago produced most of the world's supply of progesterone (4, 5).

Competing Cortisones

Also in the 1940s, Lewis Sarett at the Merck Laboratories was the first to synthesize cortisone (2, 9). In Switzerland, Tadeus Reichstein synthesized a steroid that he called Substance S, which, like cortisone, was a hormone found in the cortex of the adrenal gland. Substance S differed from cortisone only by lacking an oxygen molecule at position C11.

In 1948, Philip Hensch and Edward Kendall at the Mayo Clinic discovered that cortisone reversed the symptoms of rheumatoid arthritis (2, 9). The synthetic routes devised by Sarett and Reichstein were landmark achievements, but they required dozens of steps, and the yield was low. Sarett's method used ox bile as the starting material, and thousands of animals were needed to produce enough cortisone to treat a single patient for a year (4). Cortisone, therefore, remained expensive to produce and limited in supply.

On the heels of Hensch and Kendall's discovery, Julian published a new and more practical method for synthesizing Reichstein's Substance S. Instead of animal bile, he used soybean derivatives as the starting material (2, 5). But converting Substance S to cortisone using organic synthesis techniques was not trivial.

Within a few years, researchers at Upjohn developed a microbiological process using *Rhizopus nigricans*, which was the first economical method for converting Substance S into cortisone. This same microbe could also metabolize progesterone to produce cortisone—an even better method (4, 5).

Julian admitted that because of his intense interest in steroids, his other work was receiving “scant attention...a circumstance which I must remedy” (2). He proposed that Glidden stop making cortisone from soybean-derived Substance S and switch to the sterol-rich Mexican yam. The reduced production costs and improved efficiency would position Glidden as a mass producer of cortisone, as well as progesterone (4, 5). But Glidden said no.

Julian's steroid research had drifted far afield from Glidden's core product line of paints. The company was already taking steps to get out of the steroid business. When this Division was sold to Pfizer, Glidden asked Julian to teach his Compound S production process to the Pfizer chemists (4, 5).

Personal Dignity

Julian's successes brought both the appreciation of Glidden and sizeable increases in pay (3, 4). His patents made him a fortune (6). His many "firsts" in steroid chemistry had also greatly enhanced his reputation, even more than his synthesis of physostigmine. He was showered with awards and honorary degrees and named to the boards of dozens of universities (2).

In 1950, with his success well established, Julian purchased a home in Oak Park, an upscale suburb of Chicago, where Ernest Hemingway and Frank Lloyd Wright also owned homes (2). The Julians were the first African-American owners in the neighborhood, and on Thanksgiving, the night before they moved in, arsonists poured gasoline on the wooden floors and up the staircase of their house (3, 4). Fortunately, it failed to ignite. Not to be deterred, the Julians cleaned the floors and moved in (4).

In June 1951, dynamite was thrown from a speeding car and exploded beneath the bedroom window of the two Julian children (3, 4). Percy and his wife were in Baltimore attending the funeral of Percy's father. Fortunately, the children and their sitter were unharmed (3).

Following this incident, Percy and his son spent many nights sitting in a tree in their front yard, with a shotgun in hand. Percy junior sensed that his father was fighting angry, but Percy made it a teachable moment and calmly counseled his son about "how wrong and how stupid it was" (4).

Many Oak Park residents rallied to the Julians' defense. They published a letter in the *Sun Times*, denouncing violence (3, 4). "We ask Dr. Julian and his family to accept our sincere apology that such un-American and bigoted action should occur in our village. We welcome them to Oak Park and are honored that they should desire to live among us" (3).

Turning Entrepreneur

When Glidden divested its interest in steroids, Julian realized that if he wished to continue this line of research, he would have to do it on his own (4). After 18 years at Glidden, he resigned in 1953 and created Julian Laboratories in Oak Park (1-3). He retrofitted a dilapidated, rat-infested warehouse into a fully functioning manufacturing plant (4, 5).

In the first few years, Julian focused his attention on building the business, with little time for research, except

for the steroid intermediates he was producing for his clients (2). He landed contracts with Upjohn, Ciba, Pfizer, and Merck to produce progesterone from soybeans (4).

But to compete with Syntex, Julian needed Mexican yams and a facility in Mexico to process them. Banks were reluctant to make industrial loans to people of color (5). So, he built Laboratorios de Julian de Mexico, just outside Mexico City, using his own savings, along with the assistance of friends and private investors (3, 4).

After the factory was built, the Mexican government refused to grant Julian a permit to harvest yams in Mexico (4). Just at that moment, Julian received a visit from Abraham Zlotnik. They had been fellow students in Vienna, and later, Julian had helped Zlotnik escape Hitler's Germany (4, 5).

Zlotnik knew Central American geography and said he was certain the yams that Julian needed also grew in Guatemala. He volunteered to make an expedition on Julian's behalf, quickly found a steady supply of yams, and arranged to ship them to Julian (4, 5). Julian had already sunk all of his cash into the Mexican factory and said he didn't know when he could repay Zlotnik. Zlotnik replied, "You've already paid me back" (4).



Mexican yam, Smithsonian Gardens.

Reprinted with permission from Smithsonian Gardens (Photographer: Matt Fleming)

In 1956, the US Senate held public hearings, investigating allegations that Syntex had used its influence with the Mexican government to maintain a monopoly on Mexican yams. Julian's company was one of several that claimed damages, and he was a key Senate witness (4, 5). As a result of pressure on the Mexican government, yams became readily available to any buyer (5).

By 1957, Julian had established plantations in Guatemala and another processing plant, Empress Agro-Quimica Guatemaleca (2-4). Meanwhile, Julian's Oak Park chemists found a way to quadruple production of progesterone from yams. The breakthrough made Julian Laboratories one of the world's largest producers of drugs from yams (3, 4).

Julian could have garnered huge profits, but instead he dropped the progesterone price 10-fold, from \$4000 to \$400 per kilogram (4). He set the price so that "everyone who needs it may get it" (2).

The businessman in Julian wanted to make money, but when he negotiated with a buyer, he would often make an over-generous offer or concession. Later, he would tell his attorney, Benjamin Becker, "I don't mind making a profit, but I want them to make one too" (2). Still, he became a millionaire and one of the richest black men in America (4).

Julian's syntheses of progesterone and other steroids were acclaimed as outstanding achievements, but he also pursued research on vitamin D, tryptophan, and yohimbine (3, 6). He studied the metabolic pathways of vitamin D, and pre-vitamin D₃ was a major product sold by Julian Laboratories to vitamin manufacturers (3). He also synthesized alanine intermediates and elucidated the metabolic pathway for conversion of tryptophan to kynurenine (2, 3).

His facile synthesis of the yohimbine ring skeleton paved the way for complete synthesis of reserpine, a rauwolfia alkaloid and early antipsychotic drug (2, 3). His monograph on the "Chemistry of Indoles" in volume 3 of *Heterocyclic Compounds* (1952) is considered a classic reference for researchers in this field (2).

In 1961, Julian sold Julian Laboratories to Smith, Klein, and French for \$2,338,000 (\$20 million in today's currency), remaining as president at a generous salary (1, 3, 5, 6). At the same time, Upjohn purchased the Guatemala factory (3).

In 1964, Julian founded and focused his efforts on two new enterprises in Franklin Park, Illinois. He became president of Julian Associates, Inc., and director of the nonprofit research organization, Julian Research Institute (1-3).

A Man of Stature

Percy Julian exemplified the American dream, going from obscurity to astounding business success. But he was also a humanitarian and claimed a wide circle of friends. One said, "His wit and charm and grace made him one of the most 'clubbable' persons it has ever been my pleasure to know. He very much cherished the company of others, and others cherished his company even more, if such was possible" (2).

Rather than being bitter about the numerous barriers he faced, Julian championed human rights (1, 3, 4). He delivered and published countless addresses on the advancement of blacks in America, fair housing, and related civil rights issues. He also raised funds for the NAACP Legal Defense and Education Fund and participated in dozens of civic societies (3, 4).

When Martin Luther King, Jr. was killed in 1968, Julian (as a trustee of Howard University) patiently negotiated with students who had occupied Howard's Administration Building. He had personally suffered more from racism than any of them, but he knew their actions were wrong. He gave them the benefit of his wisdom and persuaded them to leave peacefully (3).

For decades, Bernard Witkop, a lifelong friend going back to Julian's days in Austria, lobbied his colleagues to admit Julian into the National Academy of Sciences (4, 5). Julian was finally elected to the Academy in 1973.

In 1974, Julian began undergoing treatment for liver cancer. Although his family tried to restrict his activities, he continued to head Julian Associates and the Julian Research Institute (5, 6). He also served as a consultant to major pharmaceutical companies (1, 4). Until his last days in 1975, he never looked back. He constantly talked chemistry and was full of plans (2, 3). "I have had one goal in my life," he said, "that of playing some role in making life a little easier for the persons who come after me" (6).

In 1990, Julian was posthumously inducted into the National Inventors Hall of Fame (4). In 1999, coinciding with the 100th anniversary of Percy Julian's birth, the American Chemical Society designated DePauw University as a National Historic Chemical Landmark. In addition to his pioneering synthesis of physostigmine, the Society recognized "Julian's lifetime of achievements in chemical synthesis of commercially important natural products" (1). But to those who knew him, he was fondly remembered as a mentor, humanitarian, and "the man who wouldn't give up" (2, 4).

But to those who knew him, he was fondly remembered as a mentor, humanitarian, and "the man who wouldn't give up."

For more about Percy Julian's life and work, see the PBS NOVA documentary, *Percy Julian: Forgotten Genius*; available from: <https://binged.it/2Kr8USp>.

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Biosketch:



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Dr. Anderson will share the story of Rapamycin – the fountain of youth?

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Onesie: NB, 6M, 12M, 18M, 24M
Members: \$10.00 + Shipping



Men's Tie
Gray silk tie with ASPET logo
Members: \$25.00 + Shipping



Women's Scarf
Beige silk scarf with ASPET logo
Members: \$30.00 + Shipping



Meeting News

WCP2018 Kyoto: 18th World Congress of Basic and Clinical Pharmacology

Submitted by Michael Wood and Suzie Thompson

The 18th World Congress of Basic and Clinical Pharmacology (WCP2018) took place on July 1-6, 2018 in Kyoto, Japan. ASPET was pleased to support this event as a platinum sponsor. ASPET sent 10 delegates to participate in the meeting, awarded 10 travel awards to young scientists, and had an exhibition booth to promote the Society and recruit new members.

Booth

The ASPET booth provided attendees with information about membership, the Society's journals, and the programs we offer. We recruited 11 new members and spoke with many more prospective members interested in the Society. We also held a raffle and awarded ASPET plush donkeys to the lucky winners.

Program

All things pharmacology. This seemed to be the goal of WCP2018 programming. Themes were organized around the pharmacology of physiologic systems (e.g., cardiovascular system, respiratory system) and on pharmacology in disease states (e.g., cancer, infection). There were themes on subdisciplines of pharmacology (e.g., pharmacokinetics, toxicology) and broad health disciplines (e.g., health economics, regulatory science). There were also themes organized around treatment approaches (e.g., stem cell medicine, natural medicine) and general themes with wide appeal (e.g., education and training, industry-academia collaboration). There was certainly something for everyone and the geographic diversity of attendees certainly lived up to the "world" label.

While every attendee could chart their own course through the diversity of topics, the high quality keynote addresses were unopposed in the schedule. The first



keynote was delivered by Shinya Yamanaka, Nobel laureate for the discovery of induced pluripotent cells. Dr. Yamanaka did not emphasize the scientific details of stem cell technology, but instead presented a very engaging lecture on efforts underway to transform stem cell laboratory technology into a treatment. Dr. Yamanaka directs the Center for iPS Cell Research and Application (CiRA) at Kyoto University, and he reported that CiRa is contributing to a physician-initiated clinical trial for Parkinson's disease using dopaminergic progenitor stem cell transplants.

Karl Deisseroth of Stanford University conducted a whirlwind tour through the technologies he has created. Applications of optogenetics, hydrogel tissue chemistry (i.e., CLARITY and STARmap), frame-projected independent-fiber photometry (FIP) and multiplexed-alignment of molecular and activity phenotypes (MultiMAP) were all highlighted in the one-hour lecture. It was clear that his scientific contributions are transforming neuroscience research by enabling both exquisitely precise control of neuronal function and innovations in visualizing the activation of neurons in living networks. Feng Zhang of MIT presented the Tang Prize lecture (“Advances in Genome Editing Technologies”) that was presented at EB 2018. It was equally exciting the second time through.

Nancy Brown of Vanderbilt presented a compelling lecture on the clinical pharmacology of peptidase inhibition as cardiovascular treatments. She reviewed several of her seminal clinical pharmacology studies and concluded with new data (in press) that may explain why diabetic patients treated with dipeptidyl peptidase-4 inhibitors (DPP4i) may experience a greater risk of heart failure: potentiation of the vasoconstrictive effect of neuropeptide Y. The data suggest that DPP4i treatment could be contraindicated by concomitant angiotensin treatment (i.e., ACE inhibitors or ARBs).

Bryan Roth of the University of North Carolina surveyed his many contributions to the field of GPCR pharmacology. He highlighted recent collaborations that have revealed GPCR crystal structures, discussed applications of the designer receptor system he developed (i.e., DREADD) and emphasized the critical importance of understanding the selectivity of drugs (and how the PDSP he operates at UNC has made selectivity data available for researchers).

The balance of the program contained high-quality science as well, but the keynote sessions were real standouts. One odd dynamic of the midday keynote sessions deserves mention. Midday keynote sessions were followed immediately by sponsored luncheon seminars. The luncheon sponsors made it clear through signage that lunch boxes for these sessions were limited in number. The setting of the meeting was beautiful, but the remote location afforded few lunch alternatives. The result was a frenzied departure from the midday plenary audience, with many rising prematurely and clapping while exiting toward their lunch box claim. Speakers seemed bemused by the mass exodus.

The ASPET Division for Pharmacology Education also had many activities at the WCP2018 meeting. To read their summary, see page 192.



WCP2018 Travel Awardees with ASPET President Edward Morgan

Travel Awardees

ASPET Travel Awardees were given a unique opportunity to attend the meeting to present their research and meet with and learn from a worldwide network of pharmacologists. Below is a selection of firsthand accounts of their experiences. To read all of them, visit www.aspet.org/wcp2018

“Although ASPET has presented many opportunities during my career, I believe that attending the World Congress of Pharmacology in Kyoto was the highlight of my postdoctoral career. I enjoyed listening to lectures about cutting-edge advances in pharmacological research, especially Prof. Yamanaka’s work with induced pluripotent stem cells. However, the experience that I am the most thankful for was exploring Kyoto with my fellow members of ASPET. Not only did this travel award allow me to reconnect with familiar faces from the Mentoring Network and Young Scientists Committee, but I returned from WCP2018 with several new friendships. I highly recommend that trainee members of ASPET apply for travel awards to international meetings. It really is an amazing adventure!”

-Stephanie Davis

“Presenting my research on an international platform was an incredible experience as I got to talk to professors and peers from across the globe. I was also thrilled to be at the WCP2018 as I got the rare opportunity to listen to talks from Nobel laureates and several other renowned scientists. Kyoto felt like home because of friends from ASPET as well as other international graduate students that I met there. Not only is the meeting an unforgettable experience but beautiful Kyoto and the welcoming and extremely helpful people will remain in my heart for a long time.”

-Priyanka Swami

“This was an exceptional meeting during which I had the opportunity to deliver an oral presentation on my thesis work, hear from many exceptional presenters, and network with other labs from around the world. I was amazed at how many incredible presentations I could attend during the conference. The opportunity to hear the latest findings from some of my personal science heroes in the plenary sessions and award lectures was incredible. I incorrectly surmised that a conference of this size would make it difficult to network and connect with new people – in fact this was exactly opposite my experience! I made new friends from labs around the world and even managed to discuss potential collaborations and post-doctoral fellowships. ASPET’s support was key to my attendance, so I cannot say thank you enough for this opportunity!”

-Pierre Thibeault



Young Scientists at the WCP2018 meeting in Kyoto, Japan

The next WCP meeting will take place on July 16-22, 2022 in Glasgow, United Kingdom, hosted by the British Pharmacological Society.

Delegates of IUPHAR voted for the 2026 meeting location during WCP2018. WCP2026 will take place in Melbourne, Australia.

Upcoming Meetings

ASPET will be exhibiting at the following upcoming meetings. Be sure to stop by our booth if you plan to attend!

Neuroscience 2018

November 3-7 | San Diego, CA

SfN's 48th annual meeting, Neuroscience 2018, is the world's largest neuroscience conference for scientists and physicians devoted to understanding the brain and nervous system. Visit ASPET booth 4101.

2018 Health Professions Week

November 5-9 | Online Virtual Event

Health Professions Week is an exciting, free, week-long virtual event for high school and college students interested in learning more about careers in health professions. Learn more and register online at <https://www.aspet.org/aspnet/meetings-awards/other-meetings/2018-health-professions-week>.

ABRCMS 2018

November 14-17 | Indianapolis, IN

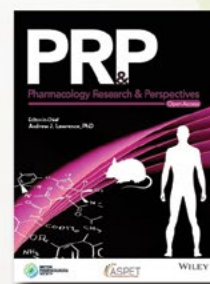
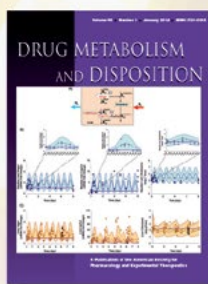
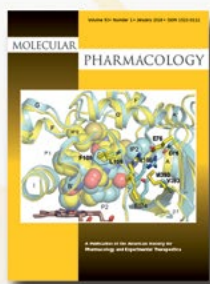
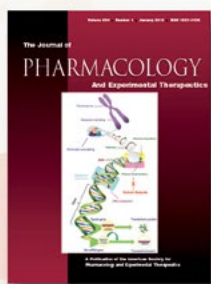
The Annual Biomedical Research Conference for Minority Students (ABRCMS) is one of the largest communities of underrepresented minorities in science, technology, engineering, and mathematics. Visit ASPET booth 1245.

Pharmacology 2018

December 18-20 | London, United Kingdom

The British Pharmacological Society's flagship annual meeting attracts over 1,100 scientists each year from across the world.

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Science Policy News



Namandje Bumpus, PhD

Interview with Namandjé N. Bumpus

Dr. Namandjé N. Bumpus is an associate professor of medicine in the division of clinical pharmacology at the Johns Hopkins University School of Medicine.

In March, she was invited to Capitol Hill to present a briefing to members of the Congressional Biomedical Research Caucus, co-chaired by Steve Stivers (R-OH), Steve Cohen (D-TN), Jackie Speier (D-CA), Joe Barton (R-TX).

The caucus is organized by the Coalition for Life Sciences, an alliance of professional organizations working together to foster public policies that advance basic biological research and its applications in medicine and other fields.

She spoke with Tyler Lamb, ASPET's Senior Manager for Government Affairs and Science Policy, about her experience.

TL: Tell us about your involvement with the Coalition for Life Sciences and how the invitation for you to present a briefing came about.

NB: I was not at all familiar with the Coalition for Life Sciences but received an email inviting me to present a briefing to the Congressional Biomedical Research Caucus. I did ask how they found me and was told that someone from their group had seen me present the Annual NIGMS Director's Early Career Lecture and based on that decided to reach out to me about delivering a briefing.

TL: What was the subject of your briefing?

NB: The topic they chose for the briefing was "How Do Our Bodies Process Medicine?". I talked a bit about pharmacology overall and then focused in on drug metabolism. I gave clinical examples of the impact of drug metabolism on therapeutic outcomes and also discussed how experiments are done in the lab to gain an understanding of drug metabolism. Members of the Biomedical Research Congressional Caucus and their staff attended.

TL: Can you describe the challenges in preparing a briefing for a political audience and how it may have differed from speaking to an audience of scientists?

NB: The primary challenge is trying to break down complex topics into terms that can be readily understood by an audience with a wide range of scientific backgrounds. For this talk, while I did show some data and the chemical structures of drugs to indicate how they are metabolized, I thought it was essential to focus on the big picture importance of drug metabolism and the impact that pharmacologists make through both clinical studies and in the lab. I did so by centering the talk on drugs that are familiar to most people, such as many over the counter drugs. This approach seemed to resonate with the audience.

TL: What sort of feedback did you receive following the event?

NB: They seemed to be convinced that drug metabolism is important! And several folks mentioned that more resources should be provided for pharmacologists to understand the details of how drugs are metabolized! They were also very interested in pharmacogenetics and learning about how they can understand their own genetics better within the context of how they metabolize drugs.

TL: Many scientists want to be more involved in the political process but aren't sure where to begin. Was there any particular issue that sparked your interest in science policy?

NB: I first became involved in science policy when I was a postdoc as a member of the ASPET Science Policy Committee. I am very interested in ensuring that policy makers understand the importance of basic research in discovering and developing drugs. I think that the importance of basic research isn't always well understood by policy makers and others that don't directly participate in performing basic research.

TL: What are some of the critical issues in science policy that you feel scientists and researchers need to raise with legislators?

NB: I think that we need to increase awareness about the importance of pharmacology and continuing to train future generations of pharmacologists. We need to inform legislators about the science of pharmacology in settings where we can really present data demonstrating the impact that our work has on human health. Through these types of efforts, I think that it is also important to ensure that we advocate for resources to continue to move the science in our field forward.

TL: Often, staffers on the hill will reach out to us for expertise when an issue that relates to pharmacology receives mainstream coverage (e.g., the opioid crisis). Are there any issues on the horizon that you can identify where pharmacological expertise will be needed by lawmakers in the near future?

NB: I think that pharmacology within the context of ageing is going to continue to be increasingly important, such that expertise in geriatric pharmacology will be progressively in demand.

TL: What are some of the misconceptions about science policy and pharmacology that you've encountered?

NB: One would be that substantial experience or training in advocacy is required to be effective in communicating about science policy. I think that many scientists at all levels have the ability to communicate in a compelling way about the importance of the work done by scientists and the need to support them. Another misconception is that pharmacology is not a fundamental science. In part this is because many folks just aren't familiar with what pharmacology even is and because of this I think that the importance of our work can often be misunderstood and potentially overlooked by policy makers.



2019 Washington Fellows Program

Submit your application by October 26, 2018

Program Mission

The mission of the ASPET Washington Fellows Program is to enable developing and early career scientists interested in science policy to learn about and become more engaged in public policy issues. Fellows will develop an understanding of how public policy decisions made in Washington help shape science policy, such as funding for the National Institutes of Health and other science agencies. Fellows will also learn how to advocate effectively on Capitol Hill and in their home districts. This program will help Fellows develop the skills and insights to become future leaders in science.

What Will ASPET Fellows Do?

- **Advocate on Capitol Hill:** ASPET Fellows will come to Washington, DC, to meet with their congressional delegation to advocate for increased federal support for biomedical research and increased funding for the NIH. Fellows will be well trained by ASPET and prepared with the appropriate message to deliver to Congress. ASPET will cover transportation costs, hotel, and other reasonable expenses that follow ASPET's reimbursement policy.
- **Become Advocates in their Home Districts:** Washington Fellows will have the opportunity to meet with members of Congress in their home districts, act as a conduit to inform colleagues within their departments/institutions about federal legislative matters, and write op-ed pieces to local papers on current science policy issues. All these activities will be undertaken with the support and advice of ASPET.
- **Attend the ASPET Annual Meeting at Experimental Biology 2019:** ASPET Fellows will receive complimentary registration to attend the 2019 ASPET Annual Meeting in Orlando, FL.

Who Should Apply?

The ASPET Washington Fellows Program is open to any graduate student, postdoctoral trainee, or researcher no more than four years past the completion of his/her postdoctoral training. **Applicants must be members of ASPET in good standing** and have a strong interest in science and its intersection with public policy. Fellows will be selected by the ASPET Science Policy Committee.

Application Information

ASPET anticipates up to 10 Washington Fellows Program participants in 2019. Fellows serve one-year terms.

All applications must be submitted by **October 26, 2018** online at:

<https://www.aspet.org/aspet/advocacy/aspet-washington-fellows-program>.

Incomplete applications or applications received after October 26, 2018 will not be considered.

Please feel free to contact publicaffairs@aspet.org with any questions.

"After all our meetings on the hill, I felt truly inspired to get involved in advocacy as a component of my career and make this a significant part of my future."

-Raghav Tripathi,
2017 Washington Fellow



For more info:
www.aspet.org/ASPET_Washington_Fellows_Program
(301) 634-7060
publicaffairs@aspet.org

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Education News

Graduate Students and Postdoctoral Scientists: Apply to Join the ASPET Mentoring Network



ASPET Mentoring Network participants at the ASPET Annual Meeting at EB 2018.

The ASPET Mentoring Network: Coaching for Career Development is a professional development program designed to supplement the training that graduate students and postdoctoral trainees receive through their universities. Now in its fourth year, the ASPET Mentoring Network focuses on developing skills needed to succeed scientifically, professionally, and psychologically, including discussions about experiences and pressures faced by groups that are underrepresented in the sciences. As a professional development experience, the program uses a coaching model to help participants develop success skills for a variety of careers.

Graduate students and postdoctoral scientists accepted into the 2019-2020 program will attend

several events in association with Experimental Biology 2019 in Orlando, FL. These will include training, guided discussions, and an informal reception on Friday, April 5 and a half-day interactive program on Saturday, April 6. During this time, trainees will meet the coaches, other students and postdocs, and become part of a six-person coaching group. Each trainee will also meet individually with their coach during the EB 2019 meeting and participate in virtual group meetings throughout the year, typically held as monthly conference calls or webinars. Group events will be tailored to the specific needs of each coaching group but may focus on work/life balance, interview skills, networking, grant writing, and other topics frequently identified as important to growth as a professional.

Who Is Eligible?

Graduate students and postdoctoral scientists who are ASPET members in good standing are eligible to apply. If you're not a member, it's easy to join! Please visit <https://www.aspet.org/membership/>.

What Support Is Provided?

Applicants are strongly encouraged to apply for an ASPET travel award at www.aspet.org/travelawards. A limited number of travel awards will be available through the Mentoring Network to help defray travel

expenses for those with significant financial need who do not have other support. You will be able to indicate your interest in one of these special travel awards during the application process.

What Is Required to Participate?

You must attend and participate in all Mentoring Network programming during EB 2019 and be an active participant with your coaching group for the year following. We are not able to accept participants who cannot attend EB 2019 or who are only available for a portion of the programming.

What Do Previous Participants Have to Say about the Program?

"Our group instantly connected with each other, and it was amazing to see how much we all had in common. We support each other and plan monthly goals, which motivates us to achieve them. Most importantly, sharing each other's experiences helps us gain valuable insights."

"Participating in the ASPET Mentoring Network has significantly expanded my network in the ASPET community and has provided me with wonderful mentors and fellow mentees that support each other both professionally and personally. I've enjoyed hearing stories and getting career advice from a diverse group of people who are at different stages of their careers with varied experiences."

"I credit the Mentoring Network with helping me get my dream job in industry. The support of my coach and group members during the job application and interview process was invaluable."

"One memorable feature of the ASPET Mentoring Network is that it provides an open forum in which to discuss the ways our lives fit in and around science. Even though our discussions have been adeptly facilitated by established pharmacologists as mentors, of value to me has been the opportunity to interact with and learn from my peers. Despite many of us being in different pharmacology-focused fields, it is these relationships that will be most valuable as we all transition towards becoming independent scientists. I recommend participating in this program enthusiastically and without reservation."

"This served as an amazing support system for me. My group was a great sounding board for someone who works in a very small lab. I also feel like the activities at EB gave me a great tool kit to work with my PI to improve upon our mentor/mentee relationship."



How Do I Apply?

Applications for the ASPET Mentoring Network will open in early October. Please visit https://www.aspet.org/Education/ASPET_Mentoring_Network/ for additional details.

The 2019 program is supported by a grant from the Burroughs-Wellcome Fund.

For more information contact Catherine L. Fry, PhD at cfry@aspnet.org.

Health Professions Week 2018



ASPET is pleased to once again participate in Health Professions Week (HPW), November 5-9, 2018. HPW is an exciting, free, week-long virtual outreach event for high school and college students interested in learning more about careers in health professions. ASPET joins 19 other professional societies in educating students about different career paths in the health professions.

Promoting pharmacology to the general public and the broader health community to increase public awareness

of pharmacology as a discipline and the contributions of pharmacologists is a major goal in ASPET's long term strategic plan. By participating in HPW, ASPET will be educating young students about pharmacology and its sub-disciplines, different career paths in pharmacology, and the steps they need to take to pursue a career in pharmacology. Last year's event attracted over 6000 registrants from all 50 states and 34 countries.

Schedule of Events

The events planned for the week of November 5-9, 2018 include:

- **Keynote Address** – Two dynamic speakers, Dr. Christine Grant and Mr. LeDerick Horne, will inspire students on their path to a health care career
- **Advocacy Panel Discussion** – Current health and wellness advocates working on Capitol Hill will answer a series of questions from participants
- **Election Day Twitter Chat** – Attendees will get the chance to discuss their own health care interests in relation to the political climate, along with current advocacy efforts in their communities and among organizations
- **College Student Virtual Fair** – Registered college students will have the opportunity to chat and network with ASPET volunteers about careers in pharmacology
- **High School Student Virtual Fair** – High school students will have the opportunity to chat and network with ASPET volunteers about careers in pharmacology
- **Money Matters** – A panel of experts will discuss several financing options to prepare for an education in the health professions

Learn more about HPW 2018 and the scheduled events at www.aspet.org/hpw2018

Register for FREE at <https://explorehealthcareers.org/hpw/>

Help Us Spread the Word about HPW 2018

In order to make this a successful week, ASPET needs your help in spreading the word about HPW 2018. This is a FREE event for high school and college students, their teachers, and counselors. Help promote pharmacology and this important event by spreading the word to your community and beyond. Tell your neighbors, friends, colleagues, and family about

this event and encourage them to register to learn more about pharmacology, the important work that pharmacologists do, and how to pursue a career in research. A great way to get the word out is by posting information about this event on Facebook, Twitter, Instagram, and LinkedIn.

Download an HPW 2018 flyer at <https://bit.ly/2Mf2niE> to post in your department. Contact ASPET's marketing department at sthompson@aspet.org to obtain additional promotional materials (flyers, emails, etc.).

Volunteer at the Virtual Fairs

ASPET is seeking volunteers to participate in the college and high school virtual fairs. Volunteers will

be responsible for logging into the virtual booth and answering attendee questions through a chat room. Seven one-hour volunteer slots are available between 1 PM and 8 PM ET on Wednesday, November 7 for the College Student Virtual Fair and 4 one-hour volunteer slots are available between 11 AM and 3 PM ET on Thursday, November 8 for the High School Virtual Fair. If you would like to participate, please contact ASPET's education department at cfry@aspet.org.

Improving Education Drives Improving Health: Flipping Classrooms for STEM Teacher Development

Submitted by Robin W. Rockhold

At the University of Mississippi Medical Center (UMMC), a pharmacologist is leading professional development efforts in which high school STEM (science, technology, engineering and mathematics) teachers can work in partnership with medical center faculty and graduate students to develop highly engaging, pedagogically contemporary, learning modules to stimulate STEM education and improve health literacy. The UMMC Science Training Enhances Medical Interest (STEMI) program is supported by the National Institute of General Medical Sciences (NIGMS) through the science education partnership program (SEPA) which is charged with training programs at the K-12 level. In the clinical realm, the acronym STEMI refers to an ST-elevation myocardial infarction. Addressing a medical STEMI requires the highest

degree of professional acumen and application of a sense of urgency to provide the highest quality of care to the patient. The UMMC STEMI program is intended to address deficiencies in STEM education by improving the acumen of teacher pedagogy using the flipped learning methodology and by applying a sense of urgency to bring those capabilities into action as soon as possible. The overarching goal is to improve health in Mississippi by improving STEM education.

Why should pharmacology faculty be concerned about high school STEM teacher professional development?

Recruitment of graduate students into the profession of pharmacology has traditionally been focused on the undergraduate level. We now recognize that choices about education pathways and career orientation are often formed much earlier, perhaps even in middle school [Tai RH, Liu CQ,



Teachers learning to load a gel and mount rat brain tissues at the 2018 STEMI Summer Workshop at the University of Mississippi Medical Center

Maltese AV, Fan. (2006) Planning early for careers in science. *Science* **312(5777)**: 1143-1144]. Increasingly, science professionals are bringing high school students into laboratories to offer direct experience with pharmacology and other graduate research professions. A previous article in this section of *The Pharmacologist* highlighted such a program led by Nicole Kwiek at the Ohio State University College of Pharmacy [Education News, March 2017, 47-49; <https://bit.ly/2MiVVY2>]. While we have more than 28 years of experience in such biomedical research training of high school students at UMMC, we also realize that high school STEM teachers are key multipliers of any orientation of students to science. Each teacher is positioned to impact, either to inflame or douse, a passion for learning about science in literally thousands of students. A critical determinant of the polarity of that influence is how science information is presented to students. The use of active teaching methods, such as the “flipped learning” or “flipped classroom” paradigm, has a positive influence on student performance in STEM courses [Freeman S, Eddy SL, McDonough M, Smith MK, Okoroafor N, Jordt H, Wenderoth MP (2014). Active learning increases student performance in science, engineering, and mathematics. *Proc Natl Acad Sci USA* **111(23)**: 8410-8415].

What is “flipped learning” and does it apply solely to precollege teaching?

The origin of the term “flipped learning” is generally attributed to J. Wesley Baker [Chambers JA, editor (2009) *Selected Papers from the 11th International Conference on College Teaching and Learning*, Florida Community College at Jacksonville, Jacksonville, FL p. 9 - 17]. In practice, it refers to a reversal of the traditional role of a teacher in secondary schools, from being the primary source of knowledge, dispensed through lecture, to a role as facilitator of discovery and exploration beyond basic, factual details. In this paradigm, teachers organize knowledge paths by which students access the lowest levels in Bloom’s Taxonomy of Learning, typically the core facts and relationships with which students must be familiar before they can advance to more complex learning tasks, application, synthesis, and creation of new knowledge. Students must be shepherded, by the teacher, to accepting responsibility for doing that phase of learning before coming to class. In effect, doing their homework before, rather than after, class time. Teachers then

use what was formerly lecture time in class to engage students in active inquiry, exploration, and activities that guide students to more advanced learning. While there is growing awareness of this model of teaching, many secondary school teachers remain challenged in its application. A place for flipped learning at the graduate and professional school level is a source of active debate, particularly among pharmacologists teaching medical and dental students, as evidenced by programming in meetings such as recent ASPET, Experimental Biology, and the International Association of Medical Science Educators meetings.

How do the National Institutes of Health (NIH) play a role in this effort?

The NIGMS supports a large majority of training programs funded by NIH, including the T32 programs. It also provides specific support for K-12 STEM education through the Science Education Partnership Awards (SEPA). Currently, SEPA funds R25 awards for 5 year periods with direct costs of up to \$250,000/year. Dr. Jon Lorsch, Director of NIGMS, has encouraged active collaboration among SEPA awardees and those supported by the Institutional Development Award (IDeA) state programs, including IDeA Networks of Biomedical Research Excellence (INBRE), Centers of Biomedical Research Excellence (COBRE), and the IDeA Program Infrastructure for Clinical and Translational Research (IDeA-CTR).

Can engaging in such non-traditional professional activities have career benefits?

ASPET has actively encouraged graduate programs in pharmacology to prepare students for multiple career roles, not only in traditional academic research or pharmaceutical development and manufacturing, but also in pursuit of focused teaching careers with application of the most effective teaching methods. The ASPET Division for Pharmacology Education is a leader in this latter effort, in part through its Academy of Pharmacology Educators. Pharmacologists with a primary interest in professional education can apply to be recognized as Fellows in the Academy of Pharmacology Educators, which awards the designation of FAPE to a professional title. To become a Fellow, a balanced portfolio showing scholarship in pharmacology education, external funding for education, evidence of educational innovation, and teaching experience, among other attributes is required. A criterion-based rubric is used to determine

award of status as a Fellow. In addition, academic health science centers and medical schools are increasingly recognizing the value of NIGMS training program awards for professional advancement. Finally, for those interested in careers in professional administration, the recognition of leadership and

management skills that are crucial to success with career outreach programs is not infrequently associated with advancement into administrative positions.

AAMC-CFAS Meeting in Review

Submitted by John L. Szarek and Joe Blumer

The CFAS (Council of Faculty and Academic Societies) annual meeting was held April 18-21, 2018 in Chicago, IL. As a CFAS member society, ASPET was represented by John L. Szarek (Geisinger Commonwealth School of Medicine). CFAS meetings allow faculty representatives to identify, communicate, and advise the AAMC (Association of American Medical Colleges) on critical issues facing medical schools and academic societies and to educate faculty representatives on ways to effect change. There were 138 CFAS representatives and AAMC staff who attended the meeting. The themes most important to ASPET included discussions of advocacy, well-being, and medical education. The forums for discussion of these topics included plenary sessions, breakout sessions, and breakfast roundtables.

Advocacy

The opening plenary and a subsequent breakout session covered how best to advocate for biomedical research, education, and clinical care. The session began with a description of a low-cost, easy to manage, basic science advocacy program to talk to congressional legislators. An advocacy team including a mix of faculty, postdocs, and students and doing some homework before embarking on such a program were key features to success. The AAMC and FASEB were two examples where information, training, and resources can be found to become an informed advocate (www.aamc.org/advocacy; <http://www.faseb.org/Science-Policy-Advocacy-and-Communications/Become-an-Advocate/Advocacy-Tool-Kit.aspx>). In addition to contributions through meetings and events, AAMC and CFAS-member societies worked together through sign-on letters including a VA Research Letter (4/2018), NIH Funding Letter (3/2018), and F&A Letter (9/2017).

Well-being

It was particularly refreshing this year that the travails of basic science faculty were more at the forefront in this area. This was evident in the plenary session on bringing joy back into academic medicine which focused on institutional frameworks for promoting well-being and how institutions can holistically address burnout. Morale among biomedical scientists worsened significantly from 2008-2013. Challenges include funding, bureaucratic inefficiencies and faculty-administration conflict as main drivers of stress. In terms of burnout, quality of life, and related factors, biomedical scientists showed similar levels of burnout to physicians but had significantly lower quality of life. Quality, mental, health, burnout, students, and job are words associated frequently with basic scientist well-being as seen in the word cloud. The issue extends to PhD students as well. One-third of the sessions held during the meeting were dedicated to well-being.



There were several approaches discussed addressing the issue. In graduate medical education, the Clinical Learning Environment Review (CLER) Program provides feedback to residency and fellowship programs in six areas, including well-being, which are

believed to be essential to creating an optimal clinical learning environment. Institutionally, health system CEOs need to be involved in wellness programs and to provide financial resources to make them sustainable. This was exemplified in Stanford Medicine's hiring of a chief physician wellness officer, Tait Shanafelt, MD. Finally, the National Academy of Medicine's Action Collaborative on Clinician Well-Being and Resilience produced a website providing a repository of resources (<https://nam.edu/clinicianwellbeing>).

The conclusion was that it is time for CFAS to advance the agenda for all of academic medicine with respect to well-being.

Education

Through plenary and breakout sessions, issues related to medical student education were considered, many of which were the same as have been discussed at prior CFAS meetings and other venues including standardized learning outcomes, individualized learning processes, integration of formal knowledge with clinical experience, vertical integration of basic science across the curriculum, development of habits of inquiry and innovation in students, development of professional identity for students, and self-directed learning. The approaches taken by two institutions in an attempt to address these issues were presented. One of these, Rush Medical College, implemented a single pass curriculum anchored around clinical cases which included the pertinent content from all core disciplines. They adopted a flipped classroom approach with frequent formative assessments. The other example from the University of Minnesota was a competency-based, time-variable progression program called Education in Pediatrics Across the Continuum (EPAC). With support from the AAMC and the Josiah Macy, Jr. Foundation, five medical schools collaborated in the development of EPAC. Both programs are relatively early in their implementation so outcomes remain to be seen, but several challenges were identified including inflexibility of the system (e.g., financial

aid, the Liaison Committee on Medical Education LCME), curricular modifications, time management, and Step 1). With respect to the latter, AAMC is planning a summit on the issue of United States Medical Licensing Examination, or USMLE, Step 1 but details were not presented. It will be interesting to see how successfully these approaches address the aforementioned issues.

Other Discussion Areas

The attendees also heard a detailed update on the national academic medicine scene and AAMC priorities from AAMC President and CEO Darrell G. Kirch and Board Chair M. Roy Wilson, as well as a Washington advocacy update from AAMC Chief Public Policy Officer Karen Fisher. The meeting also debuted a leadership curriculum, where CFAS representatives could learn from experienced colleagues on how to develop and refine their own skills as faculty leaders. This curriculum will continue in future meetings.

CFAS continues to evolve, and evaluations from CFAS members will be used to help prioritize programming at upcoming CFAS meetings as well as providing additional focus for CFAS activities and initiatives. Basic science, particularly pharmacology, needs to be represented at these meetings, but our voice and those of other basic scientists could be stronger. Although the agenda for the meeting has been weighted more toward clinicians and their experience, there is no doubt that basic science is valued by the CFAS members and the AAMC. Our engagement in, and support of, CFAS activities will demonstrate our commitment to enhancing the profile of basic science within AAMC and, more importantly, the general public. As your representatives to CFAS, we are keen to advocate for the concerns of ASPET members at the CFAS meetings. Send us an email message with issues you would like us to raise at the next CFAS meeting. Visit the CFAS website for more information and resources: <https://www.aamc.org/members/cfas/>.



Journals News



Michael F. Jarvis, PhD

Michael F. Jarvis Selected for *PR&P*

PR&P is pleased to announce that Dr. Michael F. Jarvis has accepted the position of deputy editor for the journal. Dr. Jarvis is a senior scientific director and ACOS senior research fellow for Global Medical Affairs at AbbVie, Inc. He is responsible for leading medical affairs scientific oversight activities for multiple therapeutic areas within the Mature Business Organization at AbbVie. Dr. Jarvis has an extensive track record of leading drug discovery/translational research teams for the identification and clinical advancement of novel chemical entities.

Dr. Jarvis has served on the editorial board of the *British Journal of Pharmacology*, *Drug Development Research*, *Biochemical Pharmacology*, *Molecular Pain*, and *Purinergic Signalling*. He was the editor of *The Journal of Pharmacology and Experimental Therapeutics* from 2010 through 2015.

Dr. Jarvis has been an active member of ASPET. He is currently a member of the Program Committee, the Mentoring and Career Development Committee, and serves as a coach for the Mentoring Network. He has served on the Nominating Committee and held leadership positions in the Division for Drug Discovery and Development, and the Division for Translational and Clinical Pharmacology.

We welcome Mike to the editorial team and are excited about the future development of the journal.

PR&P is jointly published by ASPET, the British Pharmacological Society, and Wiley. For more information about *PR&P*, visit <https://bit.ly/2LM7mqY>.



Yurong Lai, PhD



Xiaobo Zhong, PhD

DMD Review Editors

Dr. Yurong Lai and Dr. Xiaobo Zhong have been selected by Dr. Jeffrey Stevens to serve as the new review editors for *Drug Metabolism and Disposition*. They succeed Dr. Nina Isoherranen, who served from 2015 until recently.

Dr. Lai is the Director of Drug Metabolism at Gilead Sciences, and Dr. Zhong is a professor in the Department of Pharmaceutical Sciences at the University of Connecticut School of Pharmacy. Both have been long-time contributors to *DMD* as authors, reviewers, and editorial board members. Dr. Lai was a guest editor for a special section on transporters in drug disposition and pharmacokinetic prediction published in the May 2018 issue of *DMD* (available at <https://bit.ly/2IGTt8b>).

BenchPress and ORCID

ASPET's online manuscript submission and peer review system, BenchPress, has made it easier to link your record in the system to your ORCID (Open Researcher and Contributor ID). An ORCID is a unique identifier used to disambiguate people with the same name. They can be used on personal web pages, assigned to publications, and are required by some funding agencies to apply for grants and track publication output.

BenchPress recently added a button to enable users to log in with an ORCID. You can easily link your BenchPress record to your ORCID from a link on the "Edit personal information" page. Once your record is linked, future manuscript submissions will automatically include your ORCID in your article metadata and appear with your published article.

The screenshot shows the BenchPress login interface. At the top, there are input fields for 'Email:' and 'Password:'. Below these is a checkbox for 'remember my email address' and a 'Sign in' button with a '(lost password?)' link. A red circle highlights a button labeled 'Log in with ORCID' with a small ORCID icon to its left. Below this button is a link that says '(Create an account with ORCID.)'. At the bottom, there are two sections: 'Enter the Author Area to:' and 'Enter the Personal Info Area to:'. The Author Area includes links for 'Submit a New/Revised Manuscript', 'Continue a Manuscript Submission', 'Proof a converted manuscript', and 'Check the Status of a Manuscript'. The Personal Info Area includes links for 'Change your Password', 'Update your Contact Information', 'Update your Availability Information', and 'Update your Expertise Areas'.

Haven't got an ORCID? Registering for one is simple at <https://orcid.org>. Once registered, you can link past publications to your ORCID. Researchers who use initials in place of a full first or middle name should especially make use of an ORCID to avoid confusion, but all authors will benefit from having their work correctly attributed with this unique and persistent identifier.

Avoid Being Tricked by Predatory Publishers

ASPET has provided information here before about predatory publishers and their journals, but many researchers remain unaware of this problem. Authors are still being duped into publishing in journals that provide no peer review and exist primarily, if not exclusively, to collect article publication charges.

How does this happen? Predatory publishers often create a journal with a name that is similar to, or exactly the same as, a well-established, legitimate journal. They count on authors in a rush to mistake it for the legitimate journal to which they intend to submit a manuscript. In other cases, predatory journals have new names and look respectable on the surface. They may have an editorial board with reputable members. But, those people may have no idea that they are on the board.

For all predatory journals, manuscripts undergo little if any peer review. Article publication fees often are not disclosed until after a paper is published. Unsuspecting authors then receive an invoice demanding payment of thousands of dollars.

Predatory journals have given a bad name to open access publishing. There are many legitimate, rigorously

peer reviewed, open access journals published by scientific societies and commercial publishers. *PR&P* (*Pharmacology Research & Perspectives*) published by ASPET, the British Pharmacological Society, and Wiley is one example. Being open access is not a sign that a journal should be avoided.

Help to detect fraudulent journals is available from Think Check Submit (<https://thinkchecksubmit.org/>). The site provides easy-to-use check lists to help you determine if a journal is legitimate. Make sure you are submitting your manuscript to the journal you really want and not a similarly named imposter. When in doubt, check with a librarian—they are familiar with the problem of predatory journals and can provide expert guidance.



Are you submitting your research to a trusted journal?
Is it the right journal for your work?



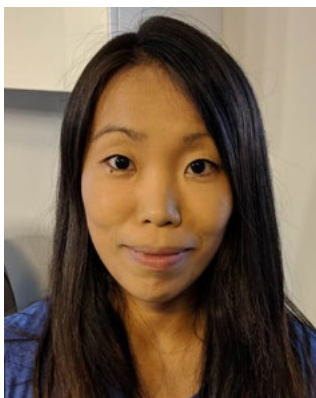
Use our [check list](#) to assess the journal



Only if you can answer 'yes' to the questions on our [check list](#)

Molecular Pharmacology Highlighted Trainee Authors

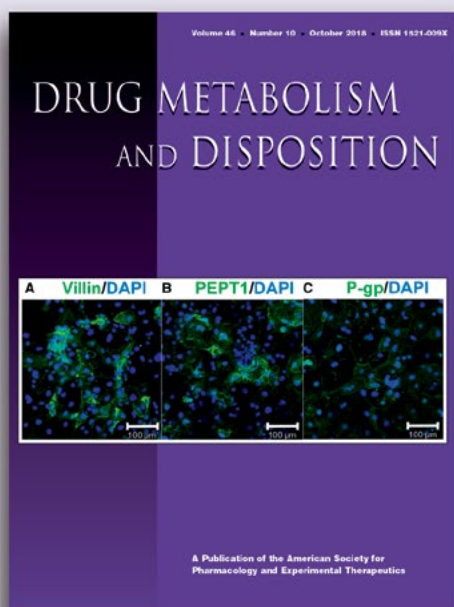
Since the June 2018 issue of *The Pharmacologist*, *Molecular Pharmacology* has honored three trainee authors (from left to right): Monica Soto-Velasquez (Purdue University); Stephanie Chin (University of Toronto); and Monique J. Windley (The Victor Chang Cardiac Research Institute, Australia).



The Highlighted Trainee Author program spotlights the work of a young researcher selected from each issue of the journal. Dr. Adriano Marchese, a member of the Mol Pharmacol Editorial and Advisory Board, manages the selection process. Trainee authors may be nominated by a corresponding author or self-nominated.

To learn about each honoree's areas of research, current projects, the anticipated impact of their research, and interests outside the lab, visit <https://bit.ly/2yX1YeH>.

Call for Papers...



A special section on the pharmacokinetic and drug metabolism properties of novel therapeutic modalities is being planned for publication in the August 2019 issue of *Drug Metabolism and Disposition*.

Guest Editors: Rob Foti and Brooke Rock

Deadline: February 1, 2019.

For more information, visit:
<https://bit.ly/2NxKZmB>



Membership News

Renew Your ASPET Membership for 2019

Thank you for choosing to be a member of ASPET! We hope you have enjoyed the benefits of membership as much as we have appreciated having you as a member. Thanks to your membership, ASPET was able to accomplish a lot this past year, including:

- Successfully engaging our young scientists and students in networking and professional development by awarding 124 travel awards to attend, present, network, and learn at the ASPET Annual Meeting at Experimental Biology and the World Congress of Pharmacology.
- Created a greater voice for pharmacology and science advocacy through our policy communications, meetings with legislators and staff, updates from our Science Policy Committee, and training of young scientists in advocacy via our Washington Fellows Program.
- Fostered high quality and innovative science by supporting the important work of our members through 56 scientific sessions, 320 speakers, and 894 abstracts at our annual meeting.
- Presented valuable research to pharmacologists through ASPET's journals, which had over 1,400 submissions over the last 12 months.



Why Renew?

ASPET continues to work hard to fulfill our mission of promoting pharmacology and to provide our members with the necessary tools to enhance their careers, expand their networks, and share their important research to transform discoveries into therapies.

We look forward to renewing your membership in the coming year so that, with your support, we can continue to make a positive impact in the science community. Here are a few things we have planned for 2019:

- The society will be implementing a new community engagement platform – a private ASPET member-only online community to share ideas, network, and collaborate.
- ASPET will continue to present high quality science, enable professional development, and provide excellent networking opportunities at the ASPET Annual Meeting at Experimental Biology 2019, taking place in Orlando, Florida.
- Members will be invited to apply for scientific achievement awards, travel awards, poster awards, and other opportunities to showcase their work.
- ASPET will continue to execute initiatives and objectives from the strategic plan (<https://www.aspet.org/aspet/about-us/2017-strategic-plan>). We would not be able to accomplish any of this without the support of our members.

How to Renew

Be sure to watch your email for your 2019 dues renewal notice later this month. Don't want to wait for the email? You may complete your renewal online by visiting www.aspet.org/renew or by contacting Member Services at 301-634-7060.

Thank you for your valued support of ASPET. We look forward for another amazing year!

Participate in ASPET's 2018–2019 Member-Get-A-Member Campaign

The Member-Get-A-Member campaign is conducted annually from September 1 to February 1. As an active member, you know firsthand the value that your ASPET membership provides. Member-Get-A-Member is the ideal opportunity to share your success by encouraging your nonmember colleagues to join. There is power in numbers! Help us recruit new members and contribute to the growth and sustainability of ASPET.



How it Works

- ✓ Tell your colleagues, students, and friends about the benefits of ASPET membership. See the list of member benefits on our website.
- ✓ Encourage them to fill out an application form online.
- ✓ Tell the applicant that they must enter your name and email in the “Sponsor Name/Email” field on the application form.
- ✓ Once they are approved for membership and their dues payment has been made, you will receive credit for your recruitment efforts.
- ✓ The more members you recruit, the higher the prize drawing into which you will be entered
- ✓ Every MGM participant will be recognized for their recruitment efforts on our website and in *The Pharmacologist*.
- ✓ Prize winners will be picked in February 2019.

Prizes

- Recruit 1-2 new members to be entered into the **\$25 American Express gift** card drawing.
- Recruit 3-4 new members to be entered into the **\$50 American Express gift** card drawing.
- Recruit 5+ new members to be entered into the **\$75 American Express gift** card drawing.

Helpful Tips

- Get your friends and students to apply for membership.
- Start with your department – check to see if your friends, colleagues, and students in your department are members. If not, ask them to apply!
- Contact the ASPET Membership Department if you need any recruitment materials such as membership brochures, flyers, and application forms.

Program Rules

- All regular, postdoc, affiliate, graduate student, post-baccalaureate, undergraduate, and emeritus members in good standing are eligible to participate in the program.
- When applying for membership, the applicant must enter the *marketing code*: **MGM** or use the **online MGM membership application form**.
- The recruiter's name and email must be provided as a sponsor on the application form.
- The applicant must qualify and be accepted for regular, affiliate, postdoc, graduate student, post-baccalaureate, or undergraduate membership and pay for membership before the recruiter is given credit for the new member and entered into the drawing.
- Participants may recruit an unlimited number of new members.
- The individual being recommended for membership must be a “new” member, that is, someone who has not been a member for at least one year.

New Members

Affiliate Members

Simon Taylor, Pharmaron, UK

Regular Members

Hydar Ali, Univ of Pennsylvania-
Sch of Dental Med

James V. Alvarez, Duke Univ, NC

Margaret C. Boadle-Biber,
Virginia Commonwealth Univ

Bruce Carleton, Univ of British
Columbia, Canada

Shao-Liang Chen, Nanjing
Med Univ, China

Aditi Das, Univ of Illinois at
Urbana-Champaign

Danita Eatman, Morehouse
Sch of Med, GA

Rajeshwary Ghosh, Univ of
South Dakota

Marcin Golczak, Case Western
Reserve Univ, OH

Eric R. Gross, Stanford Univ
Med Ctr, CA

Yoni Haitin, Tel Aviv Univ, Israel

Jiukuan Hao Hao, Univ of
Cincinnati, OH

Ku-Lung Hsu, Univ of Virginia

Marieke Kruidering, Univ of
California, San Francisco

Christopher Larbie, Kwame
Nkrumah Univ of Science &
Technology, Ghana

Corinne Linardic, Duke Univ
Sch of Med, NC

Li Ma, Donald & Barbara Zucker
Sch of Med at Hofstra/Northwell, NY

Francis Miller, Duke Univ, NC

Peter W. Mwangi, Univ of
Nairobi, Kenya

John F. Neumaier, Univ of
Washington

Paul J. Niklewski, Johnson &
Johnson, OH

Daniel S. Pilch, Rutgers Robert
Wood Johnson Med Sch, NJ

Sarah K. Pixley, Univ of Cincinnati
Coll of Med, OH

Joseph A. Roche, Wayne
State Univ, MI

Simone Schadt, F. Hoffmann-La
Roche Ltd, Switzerland

Robin C. Shoemaker, Univ of
Kentucky

Christopher Southan, TW2
Informatics, Sweden

Afifah B. Sutjiatmo, Fakultas
Farmasi, Univ Jenderal Achmad
Yani, Indonesia

Sean E. Thatcher, Univ of Kentucky

Frederick E. Williams, Univ of
Toledo, OH

Chen Yan, Univ of Rochester, NY

Nathalie K. Zgheib, American Univ,
Beirut, Lebanon

Postdoctoral Members

Young Woo Kim, Daegu Haany
Univ, Republic of Korea

Jacopo Lucchetti, IRCCS "Mario
Negri" Inst for Pharmacological
Res, Italy

Halley M. Oyer, Drexel Univ
Coll of Med, PA

Andrii Puzyrenko, All Saints
Univ Sch of Med, Dominica

Jeff Thomas, Drexel Univ, NJ

Maria H. Villalba, Texas Tech HSC

Graduate Students

Abdulkhakim Abubakar, Ahmadu
Bello Univ, Nigeria

Pravita Balijepalli, Washington
State Univ

Trisha A. Blair, Univ of the West
Indies, Jamaica

Andrew J. Condappa, Univ of the
West Indies, Jamaica

Chiara Evans, Albany Coll of
Pharmacy & Hlth, NY

Khalid Garman, Georgetown
Univ, DC

Mohammad Anwar Hossain,
Texas Tech Univ HSC

Victor O. Kolawole, Ahmadu
Bello Univ, Nigeria

Nancy Magee, Univ of Kansas
Med Ctr

Adesina Omoloye, De Montfort
Univ, UK

Peta-Gaye L. Thomas-Brown, Univ
of the West Indies, Jamaica

Jacqueline M. Zaengle-Barone,
Duke Univ, NC

Chongyu Zhang, Loyola Univ, IL

Post-baccalaureate Students

Kayla A. Schardien, National Inst
of Health, MD

Undergraduate Students

Alaa Abdelgawad, Univ of Arkansas
Arsany A. Abouda, Lipscomb
Univ, TN

Catherine Alek, Univ of Pittsburgh, PA
John-Paul Arias, Ave Maria Univ, FL
Nicholas L. Athans, Univ at
Buffalo, NY

Ketty Bai, Duke Univ, NC

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Kyrie Bernardi, Washington &
Jefferson Coll, PA

Rebecca Biltz, Michigan State Univ
Kenneth M. Booker, Univ of Illinois
at Chicago

Chelsey Braunwart, Defiance
Coll, OH

Tristan J. Bridges, San Diego City
Coll, CA

Ryan Campbell, The Coll of
Wooster, OH

- Robert Campbell**, Syracuse Univ, NY
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- Dana Chan**, Univ of Maryland
- Jeong in Choi**, San Diego City Coll, CA
- Metztli Cisneros**, Univ of California
- Shelby M. Coates**, Pacific Lutheran Univ, WA
- Erin Conley**, Univ of Illinois at Chicago
- Elias G. Contrubis**, Vassar Coll, NY
- Andrew Debray**, San Diego City Coll, CA
- Shaeloren S. Deering**, Spelman Coll, IA
- Roland Del Mundo**, City of Hope, CA
- Mackenzie R. Deters**, Michigan State Univ
- Rose H. Durnell**, Canisius Coll, NY
- Fayzeh El Banna**, Univ of Texas HSC at San Antonio
- Torrye Evans**, Mississippi State Univ
- Nikole Fendler**, Davidson Coll, GA
- Julia Ferrante**, Villanova Univ, PA
- Alyssa Foringer**, Walsh Univ, PA
- Gabriela M. Fort**, Middlebury Coll, VT
- DaJhnae C. Gambrell-Sanders**, Clark Atlanta Univ, GA
- Sharon R. Garrott**, Univ of Virginia
- Dede Golda Gbikpi Benissan**, Truman Coll, IL
- Sareh Ghadersohi**, Univ at Buffalo, NY
- Francesca L. Giacona**, Univ of Michigan
- Madeline L. Gish**, Hillsdale Coll, ID
- Karson O. Guthrie**, Univ of North Carolina at Chapel Hill
- Jessica Gutierrez**, San Diego State Univ, CA
- Abram N. Gutierrez**, Univ of Texas HSC at San Antonio
- Cameron M. Hewett**, Louisiana State Univ
- Brendan E. Hines**, SUNY Geneseo, NY
- Angelic L. Holston**, Fort Valley State Univ, GA
- Lisa Hong**, Univ of Maryland Baltimore Campus
- Samantha M. Horwitz**, Kent State Univ, OH
- James Howard**, Centre Coll, KY
- Sara E. Hudson**, Univ of North Carolina at Chapel Hill
- Nolan C. Hughes**, Rose-Hulman Inst of Tech, KY
- Stefan J. Kaliszek**, Univ of Pittsburgh, PA
- Jieun Kang**, Ernest Mario Sch of Pharmacy, Rutgers Univ, NJ
- Gabriella S. King**, Univ at Buffalo, NY
- Lauren A. King**, Loyola Univ, New Orleans, LA
- Brenna Kirkpatrick**, Univ of Kentucky
- Beauty A. Kolade**, Lehman Coll, TX
- Corwyn D. Krassy**, Univ of Arizona, AZ
- Sabrina Kwan**, Pomona Coll, WA
- Nicholas C. Latina**, Case Western Reserve Univ, OH
- David F. Lee**, Pennsylvania State Univ
- Amelia R. Long**, Univ of Massachusetts, Lowell
- Karen M. Lopo Zepeda**, San Diego City Coll, CA
- Storm Lotomau**, Pacific Univ, OR
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- Sarah McDonald**, Univ of Kentucky
- Madeline B. McDougal**, Washington State Univ
- Erin McNell**, St Bonaventure Univ, NY
- Eric Mi**, Brown Univ, RI
- Catherina L. Mobini**, Univ of Pittsburgh, PA
- Ryan D. Mohler**, Univ of Notre Dame, IN
- Jennifer Moody**, Community Coll of Allegheny County, PA
- Joel B. Nerios**, Univ of Texas HSC at San Antonio
- Ijeoma P. Okoye**, Vassar Coll, NY
- Micah Olivas**, California State Univ, Fresno
- Alexis N. Orr**, Michigan State Univ
- Jourdan L. Owens**, Univ of Kentucky
- Awais Paracha**, Saint Louis Univ, MO
- Dynasty M. Parker**, Winston-Salem Univ, NC
- Esmeka Parkes**, Univ of Arkansas
- Praveen Paudel**, Univ of New Mexico
- Jeremiah A. Paul**, Barry Univ, PA
- Oishi Paul**, Emory Univ, GA
- Sasin Payakachat**, Hendrix Coll, AR
- Stuart Phipps**, Morehouse Coll, GA
- Jacqueline Plau**, Univ of Hohenheim, OH
- Makenzie Postma**, Univ of North Carolina, Charlotte
- Josiah Quinn**, Michigan State Univ
- Madeline Rocks**, Johns Hopkins Univ, MD
- Soneida S. Rodriguez**, Univ of Michigan
- Dennis Rogers**, Univ of Nevada
- Michelle Rozwadowski**, Michigan State Univ
- Rebekah S. Ruiz**, Mississippi Coll
- Paloma Salazar**, Univ of Arkansas for Med Sciences
- Brycen Saunders**, Morehouse Coll, GA
- Dylan T. Schuler**, Univ of North Carolina at Chapel Hill
- Danielle A. Scott**, Texas A&M Univ
- Sahiti Seetamraju**, New Jersey Inst of Tech
- Alexa Sims**, Pennsylvania State Univ
- Katherine E. Skartvedt**, Hendrix Coll, AR
- Angela F. Smith**, Univ of Arizona
- Collin Sroge**, Purdue Univ, IN
- Nikolas Tsakeredes**, Washington State Univ
- Kalina N. Tsoлова**, Princeton Univ, NJ
- Abigail L. Turnwald**, Univ of Toledo, OH
- Kingsley Udo**, Morehouse Coll, GA
- Maya Vasishth**, Tulane Univ, LA
- Ronny J. Vasquez**, San Diego City Coll, CA

David J. Viramontes, Univ of Nevada at Reno

Kathryn M. Wall, Union Coll, NY

Kaylee Whitenack, Univ of Kentucky

Malcolm A. Williams-Green, Morehouse Coll, GA

Catherine L. Wingrove, Hope Coll, MI

Evelyn Wisniewski, Rutgers State Univ, NJ

Audrey Woody, Rhodes Coll, AR

Eileen Xu, Johns Hopkins Univ, MD

In Sympathy

ASPET notes with sympathy the passing of the following members.

Edson Albuquerque

Louis Allen Barker

James J. Kocsis

Elliot S. Vesell

A Tribute to Louis Allen Barker (1941–2018)

Submitted by Joseph Moerschbaeche and Wayne Backes



Louis A. Barker, PhD

Louis Allen Barker, PhD, emeritus professor of pharmacology and experimental therapeutics at Louisiana State University Health Sciences Center New Orleans, passed away in February in West Virginia where he resided.

Dr. Barker was an active member of the LSU Health New Orleans faculty from January 1982 to December 31, 2001, where he served

on the Institutional Review Board, First & Second Year Medical Students Promotions Committee, Academic Computer Committee, Graduate Advisory Committee, and Chemical and General Safety Committee. His administrative responsibilities included course director of dental hygiene pharmacology, dental assistant pharmacology, graduate medical pharmacology, graduate program in pharmacology and medical pharmacology. His teaching responsibilities included allied health pharmacology, dental pharmacology, dental hygiene pharmacology, graduate principles of pharmacology, medical pharmacology, nursing pharmacology, and advanced nursing pharmacology. He trained doctoral and masters graduate students. His research interests

included the characterization of drug–receptor interactions by means of functional assays.

Dr. Barker earned a Bachelor of Science in pharmacy from West Virginia University in 1964 and a Doctor of Philosophy in pharmacology from Tulane University in 1968. He was a postdoctoral fellow in neurochemistry at the New York State Institute for Basic Research in Mental Retardation from 1968 to 1970. He served on the faculty of Queens College CUNY from 1970 to 1972 and at Mount Sinai School of Medicine from 1972 to 1981.

He was a longstanding member of the American Society for Pharmacology and Experimental Therapeutics, being an active member since 1975.

Dr. Barker's honors included NINCDS Research Career Development Award, 1978-1982; Career Scientist Award, Irma T. Hirschl Foundation, 1977-1978; Scholarship Award, Foundation for Pharmaceutical Education; Merck Award for Scholarship; Lehn and Fink Gold Medal.

Dr. Barker served as program chairman for "Acetylcholine-Cholinesterase" at the FASEB Meeting in April 1978, program chairman for "Histamine and other Amines" at the Society for Neuroscience Meeting in October 1981, and program co-chairman and organizer for "Basic Principles of Pharmacology Applied to Shock Research" at the Shock Society Meeting in June 1990.

He was an ad hoc reviewer for the *Journal of Pharmacology and Experimental Therapeutics*; *Life Sciences*; *Canadian Journal of Physiology and Pharmacology*; *Peptides*; and *Cardiology in the Elderly*. He was a peer reviewer for the Oklahoma Center for the Advancement of Science and Technology Health Research Grants Program and a judge for the New Orleans Section of the American Association for Dental Research 17th Annual Dental Research Day in 1997. Dr. Barker was invited as a visiting professor for the Programa de Pós-Graduação em Ciências Fisiológicas, Universidade Federal do Espírito Santo Centro Biomédical, Vitória – ES – Brasil from September 1, 1998 to February 27, 1999.

Dr. Barker was awarded research grant funding by the National Institutes of Health, the American Parkinson's Disease Association, the National Foundation for Ileitis and Colitis, the Edward G. Schieder Foundation, the US Public Health Service,

the American Heart Association and the New York City Health Research Council.

He authored or co-authored 82 publications including abstracts, journal articles, reviews, symposia, and book chapters.

In his private life, Dr. Barker was a lifelong supporter of various charities including the ACLU, Doctors Without Borders, and Planned Parenthood. He was equally supportive of his alma mater, West Virginia University, and was a frequent sponsor of their White Coat program for new entrants to the School of Pharmacy. As part of his legacy he bequeathed a substantial sum to the LSUHSC Foundation and the L. Allen Barker Professorship in Graduate Studies as well as the WVU School of Pharmacy. Dr. Barker also bequeathed funding for three endowed professorships to the Department of Pharmacology and Experimental Therapeutics at LSUHSC.

A Tribute to Edson Albuquerque (1936–2018)

Submitted by Alvin V. Terry, Jr., PhD

Edson Xavier Albuquerque, MD, PhD, an internationally known pharmacologist and toxicologist, passed away suddenly at the age of 82 on July 22, 2018. At the time of his passing, Dr. Albuquerque was professor of epidemiology and public health and pharmacology at the University of Maryland School of Medicine (UMSOM). He had been a member of the UMSOM faculty since 1974. He served as the chair of the Department of Pharmacology at UMSOM from 1974 to 2010, when he became director of the Division of Translational Toxicology that he established in the Department of Epidemiology and Public Health.

Dr. Albuquerque was born in Recife, Pernambuco, Brazil. He earned a medical degree from the School of Medicine of the Universidade Federal de Pernambuco in 1959, and later received a PhD degree *summa cum laude* in physiology and pharmacology from Escola Paulista de Medicina in São Paulo, Brazil in 1962. After receiving his PhD, Dr. Albuquerque received postdoctoral training at Tulane University, the University of Illinois, the University of Lund, Sweden, and at the Karolinska Institute in Stockholm in Sweden.

In 1968, Dr. Albuquerque was offered an honor position as a Buswell Fellow at the University of Buffalo, New York. There he established his own

laboratory and was rapidly promoted to professor (1972) and acting chair of pharmacology (1973). In 1974, Dr. Albuquerque was recruited to the University of Maryland, Baltimore as professor and chair of the Department of Pharmacology and Experimental Therapeutics in the School of Medicine.

During Dr. Albuquerque's long and distinguished research career, he published more than 350 peer-reviewed journal articles with major contributions to the fields of both pharmacology and toxicology. In pharmacology, Dr. Albuquerque's research provided the foundation for the development of the so-called "nicotinic allosteric potentiating ligands," of which the Alzheimer's drug galantamine is the prototype. In toxicology, Dr. Albuquerque's research on organophosphorus (OP)-based insecticides and nerve agents has led to a better understanding of their biochemical mechanisms and long-term toxicity, as well as the development of potential new antidotes to OPs. As a result of the contributions to these fields, Dr. Albuquerque was the recipient of numerous accolades over the course of his career. These awards include the Order of the Grand Cross and the Rio Branco Award from Brazil, the Friedrich Merz Visiting Professorship from the Johann Wolfgang Goethe University in Germany, the prestigious

Jacob Javits Neuroscience Research Award from the National Institutes of Health, and the Otto Kraye Award from the American Society for Pharmacology and Experimental Therapeutics.

The following paragraph is quoted by Palmer Taylor, PhD, Sandra and Monroe Trout Professor of Pharmacology, founding and emeritus dean, Skaggs School of Pharmacy and Pharmaceutical Sciences, University of California, San Diego.

“The field of cholinergic neuropharmacology has lost a great leader whose pacesetter findings span five decades. I first met Edson at a meeting in Sweden, circa 1977, organized by the late Edith Heilbronn and Stephen Thesleff. Edson pioneered several electrophysiologic approaches that enhanced the applicability of microelectrode techniques in terms of sensitivity, spatial, and time resolution. His contributions span from studies of the neuromuscular junction to the central nervous system and were noted for their creativity and conceptual developments. Not only did he train many leaders in these fields, but he was a true standout in the discipline of pharmacology, serving as chair of the Department of Pharmacology at the University of Maryland, bringing to it international prominence. This is reflected in his superb mentorship of many young investigators in neuropharmacology.

Edson was also a leader in international cooperation on the pharmacological sciences, particularly forming alliances between Brazil, the United States, and European countries where he received much of his early training.”

Dr. Albuquerque is survived by his wife, Edna F. R. Pereira, PhD, associate professor of epidemiology and public health at the University of Maryland; and his children: Eric R. Albuquerque; Dr. Felipe C. Albuquerque, and his wife, Dr. Ruth Bristol; and Dr. Maria Luiza C. Albuquerque and husband William L. Schwartz. He is also survived by three grandchildren, Lucas and Oscar Bristol Albuquerque and Isabella Schwartz, three brothers (Elson, Edelson, and Edésio Albuquerque), and one sister (Dr. Edna Albuquerque Diniz), in addition to nephews, nieces, grandnephews, and grandnieces.

Those who wish to honor Dr. Albuquerque’s legacy and memory may donate to the Edson X. Albuquerque, MD, PhD, Memorial Scholarship and Research Fund, established in his honor by his family. The fund will support scholarships, symposia, and research related to neurotoxicology, neuropharmacology, and public health. Contributions to the fund may be made online at www.medschool.umaryland.edu/Edson.

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For more information and to start shopping, visit:
www.aspet.org/ASPET_Amazon_Smile



Members in the News

Achievements, Awards, Promotions, and Scientific Breakthroughs



Phil Skolnick, PhD

Opiant Pharmaceuticals

Phil Skolnick, PhD, Chief Scientific Officer at Opiant Pharmaceuticals, received the annual Lifetime Achievement Award from the American Society of Clinical Psychopharmacology (ASCP), and delivered a plenary lecture titled “Reflections on the

development of glutamate-based antidepressants” at ASCP’s meeting in May of 2018.

Dr. Skolnick has been a member of ASPET since 1977 and is a member of the **Divisions for Neuropharmacology** and **Behavioral Pharmacology**.



Robert Speth, PhD

Nova Southeastern University

Robert C. Speth, PhD, Professor of Pharmaceutical Sciences at Nova Southeastern University College of Pharmacy, Fort Lauderdale, Florida, was the 6th annual recipient of the Nova Southeastern University

Provost’s Research and Scholarship Award in October 2016. Dr. Speth was also the proud recipient of the 2017 “World Class Faculty Award” of the Greater Fort Lauderdale Alliance in April 2017.

Dr. Speth received his PhD in pharmacology from Vanderbilt and completed his postdoc at the University of Arizona with Dr. Hank Yamamura. He taught pharmacology at Washington State University until 2003, when he became the Chair of Pharmacology at

the School of Pharmacy at the University of Mississippi. In 2009, he moved to Nova Southeastern University. Dr. Speth is a distinguished researcher, receiving numerous honors, including being elected as a Fellow of the American Association for the Advancement of Science.

Dr. Speth has been a member of ASPET since 1995 and is a member of the **Divisions for Neuropharmacology, Behavioral Pharmacology, Cardiovascular Pharmacology, Pharmacology Education, and Translational and Clinical Pharmacology**.



Pancras C. Wong, PhD

Bristol-Myers Squibb

Pancras C. Wong, PhD, along with four of his colleagues (Drs. Robert Knabb, Donglu Zhang, Mimi Quan, and Donald Pinto) at Bristol-Myers Squibb will be receiving the

prestigious Sir James Black Award for Contributions to Drug Discovery from the British Pharmacological Society at their annual conference on the 19th of December 2018 in London, UK.

The award honors accomplished pharmacologists who have brought new breakthrough drugs to market. Dr. Wong and his team were awarded for their work on the discovery of and original research on Eliquis® (apixaban). Eliquis® (apixaban) is a direct oral anticoagulant (blood thinner) for the treatment of thrombotic disorders. It had an annual sales of about US \$5 billion in 2017.

Dr. Wong is Senior Research Fellow in Cardiovascular Drug Discovery at Bristol-Myers Squibb. He received his BA in chemistry from the University of

Oregon, Eugene, and PhD in pharmacology from the University of Minnesota, Twin Cities.

Dr. Wong has received a number of prestigious awards, including the American Chemical Society Award for Team Innovation for the discovery of Cozaar® (losartan) in 1997, the American Chemical Society Heroes of Chemistry Award for the discovery of Eliquis® (apixaban) in 2015 and the Robert R. Ruffolo Career Achievement Award in Pharmacology from ASPET in 2013.

Dr. Pancras Wong, PhD, has been a member of ASPET since 1990 and is a member of the **Divisions for Cardiovascular Pharmacology, Cancer Pharmacology, Drug Discovery and Development, Molecular Pharmacology, Pharmacology Education, and Translational and Clinical Pharmacology.**



Arun M. Ram, MD

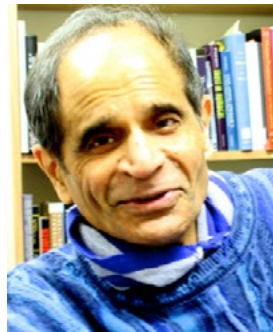
Eastern Virginia Medical School

Arun M. Ram, MD, Associate Professor of Pharmacology at Eastern Virginia Medical School (EVMS), was awarded the 2018 Crystal Apple Award for Best Faculty by the Student Government Association

members of the School of Medicine and School of Health Professions. The award goes to the faculty member who receives the most votes for contributing the most to students' learning and success.

Dr. Ram also recently received the EVMS Professional Enrichment and Growth (PEG) Grant for the 2018-2019 academic year. The grant awards up to \$10,000 to faculty who wish to engage in an activity that will help them achieve their professional goals as well as advance the academic missions of the department and the institutions.

He has been a member of ASPET since 2014 and is a member of the **Divisions for Pharmacology Education, Behavioral Pharmacology, and Neuropharmacology.**



Patangi K. Rangachari, PhD

McMaster University

Patangi K. Rangachari, PhD was awarded the 2018 IUPHAR-Education Section's Teaching Excellence Award. The award was given at the teaching satellite meeting of the World Congress of Pharmacology in Kyoto, Japan in July 2018. This award recognizes outstanding pharmacology educators who have made a sustained and significant contribution to education and/or training in pharmacology in any context.

Dr. Rangachari is a Professor (Emeritus) of Medicine at McMaster University. He has been actively engaged in teaching in a variety of programs, undergraduates, medicine, nursing, physiotherapy, pharmacy and biomedical engineering for 30 years. He has used a variety of formats in his courses, including lectures, problem-based tutorials and on-line teaching. He has published over 50 papers in peer-reviewed journals on educational issues and organized teaching symposia for ASPET, APS and IUPHAR and participated in workshops on problem-based learning in a number of countries. He has co-authored several books.

He has been a member of ASPET since 1993 and is a member of the **Divisions for Pharmacology Education, Cardiovascular Pharmacology, Drug Discovery and Development, Molecular Pharmacology, Toxicology, and Translational and Clinical Pharmacology.**



Claudio Cuello, MD, DSc

McGill University

Claudio Cuello, MD, DSc, Professor and inaugural Charles E. Frosst/Merck endowed Chair in Pharmacology at McGill University's Faculty of Medicine, was elected as a fellow of the

British Academy of Medical Sciences together with a group of 48 leading biomedical and health scientists. The new Fellows were recognized for their outstanding contributions to biomedical and health science, leading research discoveries, and translating developments into benefits for patients and the wider society. The new Fellows were formally inducted during a ceremony on June 27, 2018.

Dr. Cuello's lab focuses on unravelling the earliest biochemical-pathological events of the Alzheimer's pathology; searching for early biomarkers and novel experimental therapies capable of arresting or reverting early Alzheimer's symptoms. His group recently made important contributions to the understanding of CNS trophic factor deregulation both in Alzheimer's disease and in Down syndrome.

Dr. Cuello has been a member of ASPET since 1988 and is a member of the **Division for Neuropharmacology**.



P. Jeffrey Conn, PhD and Craig W. Lindsley, PhD

Vanderbilt University

P. Jeffrey Conn, PhD, Lee E. Limbird Professor of Pharmacology and Craig W. Lindsley, PhD, William K. Warren, Jr. Chair in Medicine, and Professor of Pharmacology, Chemistry, and Biochemistry at Vanderbilt University, were instrumental in the launch

of a new company, Appello Pharmaceuticals. Appello aims to develop, and to introduce into the marketplace, positive allosteric modulators (PAMs) of the metabotropic glutamate receptor subtype 4 as novel and competent candidates for the treatment of Parkinson's disease. For more information on Appello: <https://www.fiercebiotech.com/biotech/newcomer-appello-raises-10-5m-for-new-vanderbilt-parkinson-s-drug>

Dr. Conn has been a member of ASPET since 1992. Dr. Lindsley has been a member of ASPET since 2009. Both are members of the **Divisions for Neuropharmacology, Drug Discovery and Development, and Molecular Pharmacology**.



Catherine M. Davis, PhD

Johns Hopkins School of Medicine

Catherine M. Davis, PhD, an assistant professor in the Division of Behavioral Biology in the Department of Psychiatry and Behavioral Sciences at Johns Hopkins

School of Medicine, was recently awarded a 4-year, \$1.5 million grant from the National Aeronautics and Space Administration (NASA) to study the mechanisms of radiation-induced deficits in neurobehavioral performance and social processing. Dr. Davis's lab focuses on understanding the effects of normal tissue injury, primarily in the CNS, following exposure to various forms of ionizing radiation and assessing novel or repurposed compounds as possible radiation countermeasures to attenuate or prevent radiation-induced cognitive deficits in populations exposed to ionizing radiation, including cancer patients.

Dr. Davis has been a member of ASPET since 2008. She is a member of the **Divisions for Behavioral Pharmacology, Drug Metabolism and Disposition, Molecular Pharmacology, Neuropharmacology, Pharmacology Education, and Toxicology**.



Sumit Bandekar

University of Michigan

Sumit Bandekar, a PhD candidate in the Department of Medicinal Chemistry at the University of Michigan, is a proud recipient of the Ruth L. Kirschstein National Research Service Award for Individual Predoctoral Fellows (F31), National Cancer Institute (NCI). This award, which commenced for Mr. Bandekar on July 1, 2018, supports the training of promising doctoral candidates who will perform dissertation research in a scientific health-related field relevant to the mission of the NCI. Visit this link <https://www.cancer.gov/grants-training/training/funding/f31> for further details.

Mr. Bandekar completed his undergraduate work at the University of Michigan–Dearborn in biochemistry and physics. He is currently working on his PhD in medicinal chemistry. Under the tutelage of Dr. John Tesmer, he is studying the structural biology of the RhoGEF Trio, an effector of Gαq signaling.

Mr. Bandekar has been a member of ASPET since 2016 and is a member of the **Divisions for Molecular Pharmacology, Cancer Pharmacology, and Drug Discovery and Development.**



Ekundayo S. Samuel, MSc

University of Ibadan

Ekundayo S. Samuel, a PhD candidate at the University of Ibadan, is the 2018 recipient of the Dent-Young Award for his translational studies in cancer research and prevention in Nigeria. The Dent-Young Award

will allow him to embark on further cancer awareness raising, training of health screening personnel and ultimately the establishment of a cancer center that will be dedicated to cancer care and related activities in Nigeria. He is currently at the University of Bath on a Commonwealth split-site PhD scholarship.

Mr. Samuel has been a member of ASPET since 2015 and is a member of the **Divisions for Toxicology, Cancer Pharmacology, Cardiovascular Pharmacology, Molecular Pharmacology, and Neuropharmacology.**



Lakshmi A. Devi, PhD

Mount Sinai School of Medicine

Lakshmi A. Devi, PhD, Professor of Pharmacological Sciences and Dean for Academic Development and Enrichment at the Icahn School of Medicine in New York, delivered a keynote lecture at the 40th meeting of the Japanese Society for the Study of Pain in Nagasaki, Japan, in June 2018. Her research interests include G protein-coupled receptor dimers and orphanized receptors as novel therapeutic targets. Dr. Devi has authored >200 research articles and won many honors and awards including the NIH MERIT award and 2018 WCBR Pioneer Award. She is an elected Fellow of the American Association for the Advancement of Science.

Dr. Devi has been a member of ASPET since 1999 and is a member of the **Divisions for Neuropharmacology and Molecular Pharmacology.**



Nader H. Moniri, PhD

Mercer University

Nader H. Moniri, PhD, Professor and Associate Dean for Research, College of Pharmacy, Mercer University, Atlanta, Georgia, was recently appointed to full Professor at Mercer University College of Pharmacy in the department of pharmaceutical sciences, effective July 1, 2018.

Dr. Moniri joined the faculty as an Assistant Professor at Mercer University College of Pharmacy in Atlanta in 2006. He was promoted to Associate Professor with tenure in 2012, Associate Dean for Research in 2014, and to full Professor in 2018. His laboratory focuses on the molecular pharmacology and the signal regulation of G protein-coupled receptors (GPCRs) as well as drug discovery efforts to identify novel modulators of GPCR function.

Dr. Moniri has been a member of ASPET since 2016 and is a member of the **Divisions for Molecular Pharmacology, Cardiovascular Pharmacology, Neuropharmacology, and Pharmacology Education.**



Nicole Cartwright Kwiek, PhD

The Ohio State University College of Pharmacy

Nicole Cartwright Kwiek, PhD, has been promoted to Assistant Dean of Undergraduate Studies at The Ohio State University College of Pharmacy. Dr. Kwiek is Clinical Associate Professor in the Division of Pharmacology. Her research and outreach activities focus on the use of pharmacology as a context to engage science learners. Dr. Kwiek co-founded and co-leads Generation Rx, a national initiative aimed at promoting awareness of safe medication-taking practices and the dangers of prescription drug misuse. She is the Director of the Generation Rx Laboratory, an educational research laboratory at the Center for Science and Industry (COSI) in Columbus, Ohio. She also created the popular Pills, Potions, and Poisons summer science enrichment program for high school students. She is a multiple recipient of the College's Bachelor of Science in the Pharmaceutical Sciences Distinguished Teaching Award and an inductee of the ASPET Academy of Pharmacology Educators.

Dr. Kwiek has been a member of ASPET since 2015 and is a member of the **Division for Pharmacology Education**.



Emily R. Hankosky, PhD

University of Kentucky

Emily R. Hankosky, PhD, received an NRSA Postdoctoral Fellowship from the National Institute of Drug Abuse (NIDA) in July of 2018. Dr. Hankosky has been a postdoctoral fellow with Dr. Linda Dwoskin at the University of Kentucky since 2016. Her training focuses on the use of big data analytics to better understand substance use disorder risk and repurposing medications as therapeutics for stimulant use disorders.

Dr. Hankosky has been a member of ASPET since 2016 and is a member of the **Divisions for Drug Discovery and Development, Behavioral Pharmacology, and Translational and Clinical Pharmacology**.

Share your achievements, awards, promotions, and scientific breakthroughs with fellow ASPET members. Send your news to your division's communications officer:

Behavioral Pharmacology:

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alisonwakeford@emory.edu

Cancer Pharmacology:

Markos Leggas, PhD at
mark.leggas@uky.edu; &
Megan Zavorka Thomas, PhD at
zavorkathomas.1@osu.edu

Cardiovascular Pharmacology:

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& Jennifer Cash, PhD at
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Pharmacology Education:

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Toxicology:

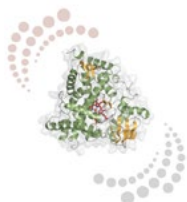
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Translational & Clinical Pharmacology:

Naeem K. Patil, PhD at
naeem.patil@vanderbilt.edu



Division News



Division for Drug Metabolism and Disposition



Dr. Larry Wienkers on Drug Metabolism and the Art of Giving Back

Submitted by Michael J. Espiritu and Aarti Sawant-Basak

Larry Wienkers, PhD, received his BS with dual majors in chemistry and biology and a Master's in chemistry from Western Washington University. He graduated from the University of Washington with a PhD in medicinal chemistry in 1993.

Early in his career, Dr. Wienkers, discovered the role of cytochrome (CYP) P450s 2C19 and 1A2 in the metabolism of (R)-8-hydroxywarfarin.

His seminal publications involved the discovery of multiple binding sites of CYP3A4 and structure-activity studies on CYP2D6. He has published and contributed to understanding the mechanisms and in vitro in vivo extrapolations of drug–drug

interactions of several mechanism-based inactivators including Raloxifene and Mibefradil, the latter being voluntarily withdrawn from the market.

Following his PhD, Dr. Wienkers completed a postdoctoral fellowship at the Upjohn Company in 1995 and afterward continued on as a research scientist. In his industry career, Larry went on to take increasing responsibilities including heading the Enabling Technologies group as well as the Drug Metabolism and Disposition Research group.

In 2003, Larry joined Pfizer as a Senior Director in Pharmacokinetics, Dynamics, and Metabolism. His leadership journey continued into Amgen where he led different functions within the Department of Pharmacokinetics and Drug Metabolism, until his recent retirement (June of 2018).

In addition to his continued contributions to P450 literature, drug development, and industry leadership, Dr. Wienkers has been an active member of ASPET, where his membership began in 1998. He was on the editorial board of *Drug Metabolism and Disposition* from 2001–2016 and chaired the Drug Metabolism and Disposition Division (DMDD) of ASPET during 2012–2014.

In 2013 Dr. Wienkers was elected as an American Association of Pharmaceutical Sciences (AAPS) Fellow. During his industry tenure, Dr. Wienkers led cross-functional teams through the discovery and development of > 30 INDs and > 10 NDAs. During his career, Dr. Wienkers published 76 peer reviewed articles and 10 book chapters. In addition to his industry and ASPET experience, he also served as a mentor, frequently offering advice to young scientists in industry and academia.

Through this interview, we had the opportunity to share his industry experiences and insights to our young scientists.

For our readers, can you summarize your industry career in the field of drug metabolism?

LW: I was extremely fortunate to graduate from the University of Washington School of Pharmacy, Department of Medicinal Chemistry in the early 90's, a time where across the industry about 40% of drug failures were a result of poor DMPK properties. My graduation basically coincided with a renaissance period of sorts across the pharmaceutical industry where DMPK scientists with solid in vitro metabolism skills had an opportunity to make meaningful contributions to their department. This early experience taught me to seek out activities and push for solutions which had the potential to positively impact the science carried out within the department. This mindset was basically the approach I applied for the next 20 plus years, across a couple of different companies and organizational roles.

In addition to your contributions to the pharmaceutical industry, you have been highly involved in ASPET activities. Can you briefly describe your ASPET/DMDD journey and comment on the most rewarding aspects of being involved with the society?

LW: Getting involved and trying to further the mission of ASPET has been highly rewarding and beneficial to me both personally and professionally. The Society, in particular the DMDD section, is comprised of fantastic scientists who are also committed to the mission of ASPET and are fun to interact with. The activity I most look forward to every year is the chance to be a judge for the graduate student poster competition and to interact with the presenters. Another ASPET activity that has been enjoyable has been our efforts to socialize basic concepts around the DMPK aspects of biotherapeutics. To this end, Dr. Dan Rock and I have been committed over the past few years to help introduce and demystify these concepts for students who may not have had the opportunity to be exposed in their classes and thesis research.

Can you share with our readers some of the most challenging and most exciting moments of your career?

LW: The most challenging moments of my career were associated with dealing with the up and down business cycles of a pharmaceutical company. During the down times we were sometimes forced to say goodbye to a number of good scientists, many of whom

had over the years become my friends. Although most times things worked out for people impacted by the corporate decisions, the event was still highly disruptive to their families and from a department standpoint, these actions confounded any momentum we had achieved around conducting innovative research. In contrast, the most exciting aspect of the job was any time where our department/discipline found itself in a position to provide a clever solution to a time sensitive question that enabled a promising program to progress to the next stage of the drug development continuum. There really isn't anything better than being presented with a challenging problem and having everyone across the department working hard together knowing that our efforts could help deliver a novel medicine that has the chance to treat a patient struggling with a grievous illness.

You are seen as a mentor to many junior and mid-career level scientists (industry and academia); Can you share your experiences as a mentor in this field of drug metabolism?

LW: When I was a graduate student at the University of Washington in the Department of Medicinal Chemistry I was fortunate to be given guidance and advice from Dr. William Trager and Dr. Kent Kunze. My luck continued at the start of my industrial career, where Dr. Paul Pearson and Dr. Guy Padbury were both extremely generous with their time and encouragement as I learned how to survive the pharmaceutical environment. In addition to corporate mentors, early in my career I was lucky enough to be able to interact with Dr. Paul Hollenberg of the University of Michigan; this relationship helped fuel my passion for carrying out basic research within my laboratory. These relationships, with the support and mentorship, positively shaped my career. In light of the people I mentioned above and many more, I hope this explains why I am committed to giving back to others whenever I can. To be honest, having an opportunity to interact with and help junior scientists is the most favorite memory of my career.

What advice would you like to provide to graduate students and postdoctoral trainees in the field of drug metabolism and pharmacokinetics, especially those who might be considering pursuing a career in the industry?

LW: The advice I have for graduate students and post docs looking to pursue a career in industry would be to

always remember to invest in yourself. That is, beyond contributing to your 401k and IRA, find a means and the personal discipline to make yourself better. Look to attend meetings and short courses, take advantage of any opportunity to present your work, and always be working on and writing a manuscript with a personal goal to publish at least one paper a year. It is extremely important to keep in mind that jobs and companies may not be as permanent as we would wish, but your investment in building a reputation as a thoughtful scientist will stay with you no matter where your career takes you.

What emerging research topics in the field of drug metabolism and disposition are you most excited about?

LW: It sounds cliché, but I would say that I am enthusiastic about nearly every aspect of DMPK science as practiced today. The evolution of small molecule in vitro technologies and their alignment with PBPK modeling continue to provide great insights into translating to humans. In addition, the promise of applying DMPK principles to large molecule biotherapeutics is also incredibly interesting and has the potential upside to meaningfully differentiate these candidates for clinical success. The discipline of DMPK, for the most part, is fairly agnostic to the therapeutic area and pharmaceutical modality; therefore, we are afforded the opportunity to wear many hats and always be learning new science (what's not to be excited about?).

Can you share your experience of industry–academia collaborations from your industrial career?

LW: With respect to industry-academic collaborations, my experience has taught me that, independent of the scope of the relationship, developing an authentic partnership where both parties learn from each other and achieve success is most important. It is relatively straightforward to set up a research collaboration with an academic investigator. However, without the human investment and a true commitment to science, these relationships quickly devolve to a transactional mindset, which, because it started with a loftier aspiration of collaboration, is usually devoid of agreed upon milestones and expectations. In this unfortunate situation, both parties end up a little frustrated and science does not progress, and the opportunity to do something special is lost.

Any closing comments?

LW: In closing, I would say that if you are an ASPET member, I would strongly encourage you to lean into the Society and get involved in any way you can. Every human effort is better when people are committed to a common cause. The benefits and connections that stem from your involvement in ASPET will aid in your career development in a number of meaningful ways; it is a worthy investment of time and effort.

Stay Connected... Renew Your 2019 Dues!

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Free manuscript submission to ASPET journals

Free email subscription to the ASPET NewsBrief



Renew online: www.aspet.org/Renew_Your_Membership



Division for Pharmacology Education

Division for Pharmacology Education Activities at WCP2018

Submitted by Jayne S. Reuben



DPE members from left to right: Gagani Athauda, Jayne S. Reuben, Carol Beck (ASPET Councilor), and John Szarek.

The Division for Pharmacology Education (DPE) was well represented at the 18th World Congress of Basic and Clinical Pharmacology (WCP2018), July 1-6, 2018 in Kyoto, Japan. Members of the DPE Executive Committee gave several oral and poster presentations.

DPE Past-Chair Jayne S. Reuben presented her findings about interprofessional education in a dental pharmacology course at WCP2018. Dr. Reuben is an associate professor and director of instructional effectiveness at the Texas A & M University College of Dentistry. In addition, Dr. Reuben chaired a session titled "IPE: Educating a New Generation of Healthcare Professionals to Prescribe Medications Safely and Effectively."



Gagani Athauda, MD.

DPE Executive Committee member Gagani Athauda presented two posters and gave an oral presentation at the IUPHAR-Education Section Pre-Conference Satellite Meeting which was held June 30-July 1, 2018 in Kyoto. Dr. Athauda is currently the vice chair and associate professor in the Department of Cellular Biology and Pharmacology at the Herbert Wertheim College of Medicine at Florida International University.

Dr. Athauda's presentations at the preconference included "Long-term Retention of Simulation-based Instruction in Basic Pharmacology," "Active Learning to Promote Early and Effective Physician Interaction with Pharmaceutical Industry Marketing Practices," and "Exploring the Role of a Simulation-based Clinical Activity in the Teaching of Introductory Pharmacology."

Dr. Athauda presented two posters at WCP2018 including "Developing an Integrated Longitudinal Antimicrobial Curriculum in an Allopathic Medical School" and "Developing a Visual Learning Tool to Aid the Studying of Antimicrobial Spectrum of Activity."

After the conference, Dr. Athauda gave an invited talk titled “Using Flipped Classroom Pedagogy to Teach Antimicrobial Pharmacology to Medical Students” at the Chiba University School of Medicine on July 10, 2018.

DPE Executive Committee member John L. Szarek, PhD, CHSE served on the steering committee that organized the preconference satellite symposium “Educating Scientists and Healthcare Professionals for 21st Century Pharmacology.” Dr. Szarek gave one of the plenary talks at the education satellite conference, “Introducing the Pharmacology Education Project.” During the General Assembly of the IUPHAR Education Section, he was elected as a member of the Executive Committee for 2018–2022.

Dr. Szarek was active during WCP2018 as well. He co-chaired a session with Dr. Simon Maxwell (University of Edinburgh, UK) titled “Introducing the IUPHAR Pharmacology Education Project — www.pharmacologyeducation.org.” In the symposium, he presented “Taxonomy and Structure of the Pharmacology Education Project Website.” In the session named “IPE: Educating a New Generation of Healthcare Professionals to Prescribe Medications Safely and Effectively,” Dr. Szarek presented the talk “Interprofessional Education: An Overview and Approaches to IPE in Health Professions Education.”



Dr. John L. Szarek (far left) with IPE symposium attendees and speakers.

Pharmacology Mnemonics Available for Educators and Students

Becoming acquainted with drug names is a hurdle students often find difficult to overcome when learning pharmacology. There is such wide variety of drug classes, examples, and individual drug characteristics that a learner may lose focus easily. “PharmABCology” is an ongoing project that aims to provide a means for pharmacology students in organizing drug names/classes that are used in specific disease conditions. Created by Dr. Willmann Liang, a faculty member at The Chinese University of Hong Kong and a member of the Division for Pharmacology Education (DPE), the mnemonics are a way for students and educators alike to more easily learn drug names and their mechanisms of action for a variety of conditions.

At present, mnemonics in the “PharmABCology” series are available for a number of disease conditions, including asthma, hypertension, and psychosis. Some mnemonics are more straightforward to the learner and focus solely on the name of the condition, while other mnemonics are more complicated and require the learner to also incorporate symptoms of the disease or drug-induced side effects. The list of mnemonics will be expanded and updated periodically and hopefully drugs for as many disease conditions will be included as possible.

Educators and students are welcome to use “PharmABCology” for teaching and self-studying purposes. To access the mnemonics, please email Dr. Willmann Liang (willmann@cuhk.edu.hk) with your full name, department/school, and institution, and whether you are requesting the mnemonics to use in your teaching materials or for self-study. This information is collected strictly for the purpose of contacting the individual users in the future when new teaching and learning tools become available.



The ASPET Office Has Moved

The ASPET office is now open at its new location: 1801 Rockville Pike, Suite 210, Rockville, MD 20852-1633. Our website, email, phone, and fax numbers remain the same. Please take the time to update your records.

ASPET was located on the FASEB campus in Bethesda, MD for the last 60 years. With FASEB's impending sale of the campus, ASPET has found a new home in a convenient location just a couple of miles up Rockville Pike. The new office is near the Twinbrook Metro stop and offers many amenities near the location.

ASPET experienced a lot of history during the 60 years on the FASEB campus. Follow the maze through some significant milestones as we travel from 1958 through 2018.

Start Here

1958

ASPET Moves Onto FASEB Campus

1965

ASPET Launches Molecular Pharmacology

1973

ASPET Launches Drug Metabolism & Disposition

1980

ASPET Formally Establishes Student Membership Category

1993

First Experimental Biology Meeting

2008

ASPET Celebrates 100th Anniversary

2018

ASPET Moves to New Home:
1801 Rockville Pike, Suite 210
Rockville, MD 20852-1633



1958

1965

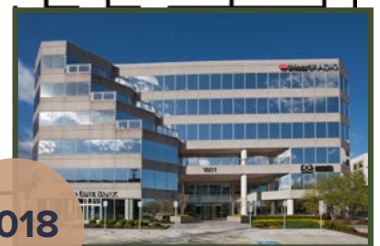
1980

1973

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2018

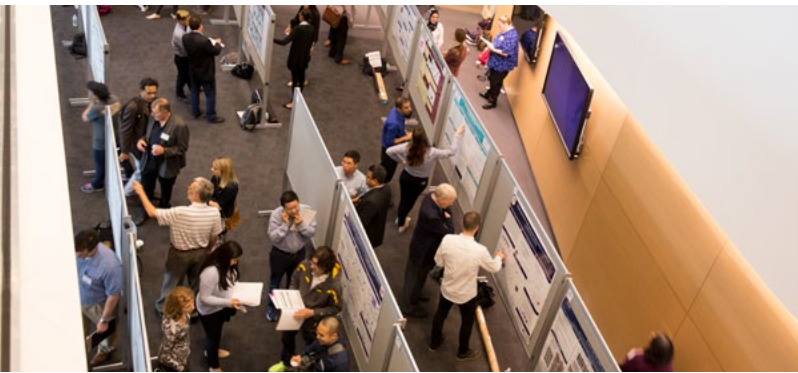


The answer key can be found on page 196.



Chapter News

2018 Great Lakes Chapter Annual Meeting in Review



The Great Lakes Chapter (GLC) hosted its 31st annual scientific meeting on June 22, 2018 at the Loyola University Stritch School of Medicine. The longstanding mission of GLC's annual meeting is to foster interactions among pharmacologists in the Great Lakes region and to provide a forum of learning and exchanging of ideas in all fields of the pharmacological sciences. This year the meeting had a very exciting program that focused on advances in cardiovascular pharmacology.

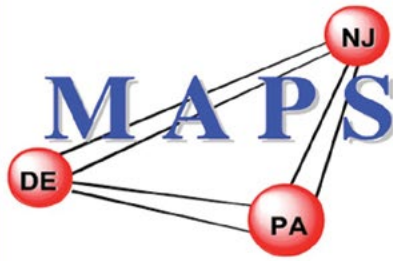
The morning session focused on an important aspect of the annual meeting, which is to provide students and postdoctoral fellows an opportunity to present their work and network with their fellow trainees, as well as senior scientists. This session consisted of a poster session/competition and a young investigators' symposium. Following these sessions, trainees participated in a longstanding favorite tradition of our annual meeting, the Lunch and Learn Career Workshop. This workshop gives students and postdoctoral fellows an opportunity to enjoy lunch and conversation with a variety of accomplished scientists from diverse career paths.

The afternoon symposium included presentations from five internationally recognized scientists and their work in the field of cardiovascular pharmacology. Joan Heller Brown, PhD, of the University of California-San Diego was the keynote speaker for the symposium, where she

presented her research concerning *Inflammation and Inflammasome Activation Initiated in Response to Pressure Overload by CaMKII δ Signaling in Cardiomyocytes Are Essential for Adverse Cardiac Remodeling*. In her keynote address, Dr. Heller Brown described the essential role of Ca(2+)/calmodulin-dependent protein kinase II delta (CaMKII δ) in the inflammatory response to cardiac pressure overload, which ultimately results in immune cell recruitment, fibrosis, and myocardial dysfunction.

The afternoon session continued with engaging presentations from Paul Burrige, PhD of Northwestern University (*Modeling the Pharmacogenomics of Doxorubicin-Induced Cardiotoxicity Using Human Induced Pluripotent Stem Cells*), Raul Gazmuri, MD, PhD, FCCM of Rosalind Franklin University of Medicine and Science (*The Sodium-Hydrogen Exchanger Isoform-1: A Long Overdue Target for Therapeutic Intervention*), Gary Gintant, PhD of AbbVie (*What Induced Pluripotent Stem Cell Derived Cardiomyocytes Can Teach You About Cardiovascular Models*), and W. Keith Jones, PhD of Loyola University Chicago (*Stem Cell Derived Exosomes as Therapeutics; Options and Opportunities*).

Mark your calendars for our 32nd annual scientific meeting, which will be held on June 21, 2019 at Midwestern University. The focus of our next meeting will be the microbiome.



Mid-Atlantic Pharmacology Society 2018 ASPET Regional Chapter Annual Meeting *Opioids and Analgesia*

September 27, 2018

Pennovation Center 3401 Grays Ferry Avenue
Philadelphia, PA

Online registration and abstract submission information:

www.aspet.org/maps/2018_annual_meeting/

Keep up-to-date with MAPS on Twitter: https://twitter.com/MAPS_ASPET

The MAPS Annual Meeting will include a keynote presentation, invited speakers, research poster competition with awards for postdoctoral, graduate and undergraduate categories, two trainees selected for oral presentations and a Biotech roundtable discussion with local companies. A networking reception/award ceremony will be held at the end of the formal talks.

KEYNOTE SPEAKER: Gregory Scherrer, PhD Stanford University

INVITED SPEAKERS:

Walter Kraft, MD

Sidney Kimmel Medical College of Thomas Jefferson University

Lee-Yuan Liu-Chen, PhD

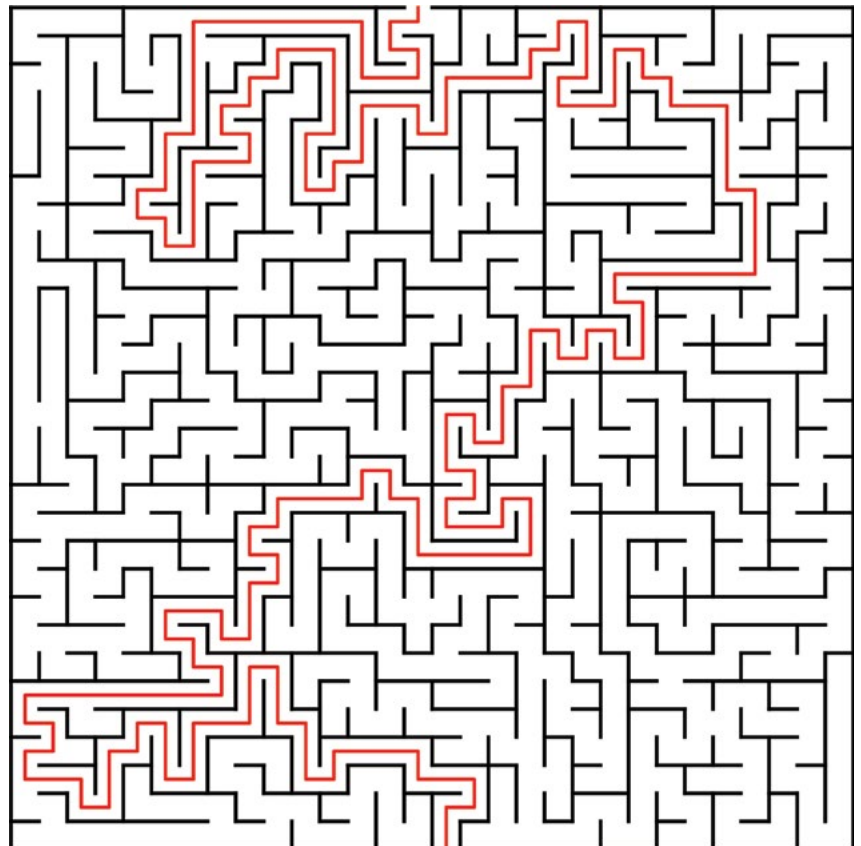
Lewis Katz School of Medicine, Temple University

Ishmail Abdus-Saboor, PhD

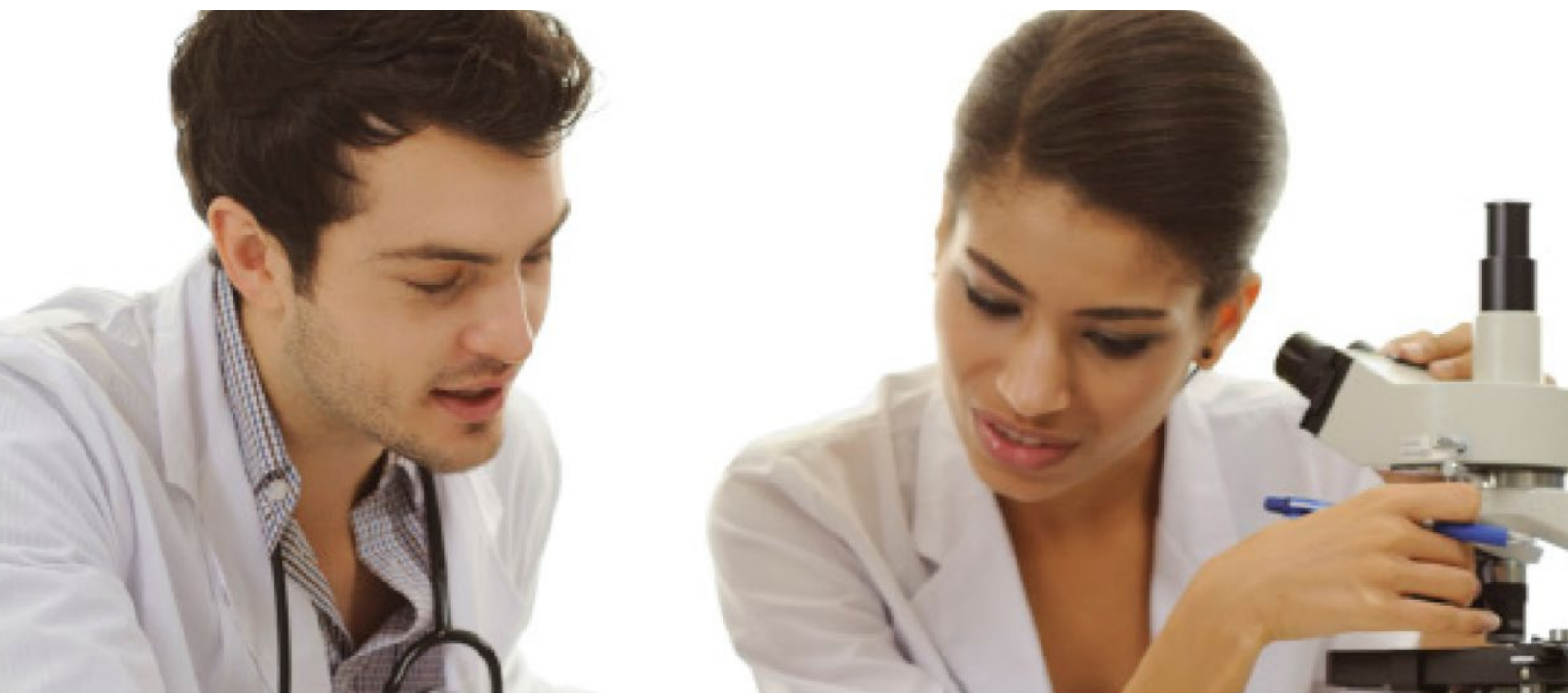
University of Pennsylvania

Maze Answer Key

The maze can be found on page 194.



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- Free & confidential résumé posting
- Access to jobs posted on the National Healthcare Career Network (NHCN)
- Career management resources including career tips, coaching, résumé writing, online profile development, and much more

Employers:

- Searchable résumé database
- Hassle-free posting; online account management tools
- Reach ASPET's Twitter followers (almost 2,000), LinkedIn Members (over 2,000), and email subscribers (over 4,000)
- Post to just ASPET or to the entire NHCN network
- Sign up for automatic email notifications of new résumés that match your criteria
- Job activity tracking

ASPET is committed to your success:

The ASPET Career Center is the best resource for matching job seekers and employers in pharmacology and related health science fields. Our vast range of resources and tools will help you look for jobs, find great employees, and proactively manage your career goals.



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