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Dolores Cooper Shockley –

Trailblazer Extraordinaire

INSIDE

ASPET
Transforming Discoveries into Therapies

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On the cover: Clockwise, from the top left: Purdue University College of Pharmacy; The American Society for Pharmacology and Experimental Therapeutics; Thomas E. Shockley, Jr

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Message from The President

Dear Friends and Fellow ASPET Members,

I want to begin my second welcoming message as the president by thanking ASPET members and staff who, despite suffering from pandemic fatigue, are forging ahead in research, education, and service to science and pharmacology. At the same time, you are juggling your personal lives that seem to be so much more complex now compared with just a few months ago. Having grown up in rural Wisconsin, I will shamelessly quote Vince Lombardi, former coach of the Green Bay Packers football team, who said "It's not whether you get knocked down; it's whether you get up." Despite the significant challenges we all are facing because of COVID-19, we are making great progress toward solving not only COVID-19 but other public health challenges facing the world. I am amazed at the brilliance and perseverance of my pharmacological colleagues in these trying times!

I can assure you that this is not what I had in mind for the year that I was elected to serve as president of ASPET. I was anticipating visits to Washington to advocate for science and pharmacology, and I was especially looking forward to the annual business meeting at EB where I would have the privilege of presenting the scientific achievement awards, acknowledging the many travel awardees, sharing with you the successes of the Society over the past year, and formally thanking past-president Wayne Backes for his service to ASPET. Instead, I spend a considerable amount of time in virtual meetings with ASPET Council, staff, division leaders, and pharmacologists from around the world navigating the future of meetings, publications, finances, etc. While this is not the presidential year that I expected, it is turning out to be an exceptionally gratifying experience because of how we, as a Society, have come together to ensure that ASPET not only survives, but will flourish after COVID-19.

I share the disappointment of many of you that we are not meeting in-person in Indianapolis for EB 2021. That was a difficult decision for ASPET and other EB societies but, at the end of the day, cancelation was in the best interest of our members, and making the decision earlier rather than later softened the financial blow. In the meantime, ASPET is planning what is sure to be an excellent virtual meeting (April 27-30, 2021). Between now and then you can stay informed with the latest in pharmacology news and research through ASPET's journals, the Focus on Pharmacology virtual series of presentations, and ASPET*Connect*, the discussion platform allowing ASPET members to network and share ideas and advice. I look forward to reuniting with ASPET friends and colleagues at EB 2022!

For many years EB has been a welcoming home for the ASPET annual meeting and a convenient venue for our members to interact with colleagues from other disciplines and scientific societies. However, many of our long-standing partner societies have left or are planning to leave EB. That reality combined with one of the goals of the strategic plan, to reimagine the annual meeting experience for ASPET members, generated much discussion and analysis among ASPET Council and staff that lead to the decision to transition to a stand-alone ASEPT annual meeting in 2023. Although it is hard to abandon traditions, and many of us will miss not interacting with colleagues from other societies, this is an opportunity to cultivate a stronger sense of community for our members and our discipline.

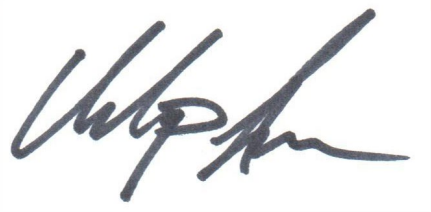
Having grown up in ASPET, this is the scientific society that I consider to be my home, and I know that is true for many of you as well. Because of our loyalty, it is up to us to ensure the long-term health of ASPET and make it a welcoming and rewarding scientific home. ASPET provides many valuable services to its members, including an exceptional annual meeting. The pandemic has forced the Society to shift some of its priorities and programs in order to continue serving its members in this virtual world. As members, we must be willing to modify our behavior to help the Society. In his inaugural address, John F. Kennedy famously challenged Americans to

"Ask not what your country can do for you – ask what you can do for your country." In these challenging times we must invest in our families, friends, colleagues, communities, institutions, and societies. I am asking all of you to do what you can for ASPET. Just as every vote counts in an election, your efforts to support the Society will help tremendously over time. First and foremost, please renew your annual membership. The cost of membership in ASPET is much less than for many other societies, and the benefits to members far outweigh the cost of annual dues. Second, please reach out to colleagues, including those who are not card-carrying pharmacologists but are working in areas relevant to pharmacology, and encourage them to join the Society. In particular, I encourage you to reach out to persons who are underrepresented in science and in ASPET. We must be proactive if we want to ensure that ASPET is as diverse and inclusive as possible. Diversity and inclusiveness do not just happen – they require a concentrated and ongoing effort by all of us to make ASPET a welcoming home for everyone in pharmacology. The wider divergence of voices and perspectives that we have in the Society, the more enriching our collective experience will be as ASPET members. Third, for those who are already in leadership positions (e.g., division executive committees), please reach out and recruit new members for your committee, especially persons from populations that are underrepresented in science and in ASPET leadership. Again, a more diverse and inclusive division leadership will translate to a more diverse and inclusive ASPET leadership (e.g., Council), which will translate to a healthier, more vibrant organization. Fourth, for those who are currently ASPET members but not participating in ASPET governance, please volunteer to serve on a division executive committee or other committee. The best credentials for serving on an ASPET committee are genuine interest and enthusiasm. Please do not wait for someone to ask you to join a committee - volunteer and you can make a difference! Fifth, please submit your manuscripts for publication in ASPET journals. I know that impact factor is an important metric for many of you and your institutions; however, the best way to improve impact factor is for members to submit their best work to ASPET journals. The high quality and popularity of ASPET journals has been a major strength of the Society, and that needs to continue in the face of growing headwinds in the open access publishing arena.

I hope that you have been tuning in to Focus on Pharmacology, a virtual series presenting high quality, innovative science in pharmacology and experimental therapeutics. The format is lively and fun with pre-meeting discussions on ASPET*Connect*, followed by live interactive webinars on Zoom, and post-meeting question and answer sessions with the presenters. Some of the terrific young scientists ("rising stars") in pharmacology were showcased recently in the Young Scientist Series that also included postdoctoral competitions. A recent session featured the Mid-Atlantic Pharmacology Society Annual Biotech Roundtable with presentations on novel approaches to combating COVID-19 as well as educational initiatives to foster interest in biotechnology. The Trainee Career Development Series has continued; this webinar series is sponsored by the ASPET Mentoring Network and was hosted by Matt Carter from Williams College, who presented "Designing science presentations: simple principles that can allow for great impact on audiences." I encourage you to propose a session and participate in future informative webinars.

As president, I will continue to make sure that a major focus of the Society is to advocate for science and scientists by supporting the Washington Fellows Program, the Science Policy Committee, and other opportunities to promote the importance of science. Now more than ever we need to inform the public and policymakers of the contributions scientists make every day to the health and well-being of society. Finally, thank you for giving me the opportunity to serve as president and please feel free to contact me if you have any questions or concerns about anything related to our Society. I look forward to a bright future for science and for ASPET.

Respectfully,



Charles P. France, PhD
ASPET President

2020 Year in Review

Stats are as of December 1, 2020

Membership

3,820 **total members**

in **69** **countries**

217 **new members** in 2020

Career Center

The ASPET Career Center averages **240** **jobs available** on the site daily

27,245 **page views** in the last year on the ASPET Career Center

Scientific Achievement Awards

Recognized **24** distinguished scientists with ASPET scientific achievement awards in 2020

ASPET Annual Meeting

The ASPET Annual Meeting at EB 2020 meeting was cancelled due to the COVID-19 pandemic. This is the first time a meeting has been cancelled in Society history.

5 divisions moved their canceled EB 2020 presentations by young scientists to the Focus on Pharmacology series.

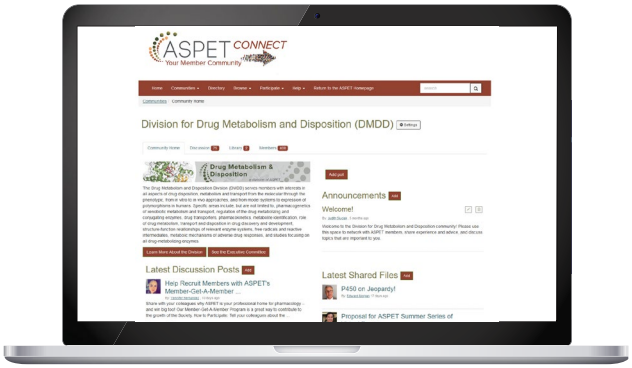
Abstracts

We received **937** abstracts in pharmacology topics for EB 2020. Although the meeting was cancelled due to the pandemic, the abstracts can be accessed at https://faseb.onlinelibrary.wiley.com/toc/15306860/2020/34/S1.

We appreciate our members that volunteer! Over the holidays, **116** abstract reviewers on **11** review teams submitted **8,192** reviews of EB 2020 pharmacology abstracts.

68 abstracts were designated as Program Committee Blue Ribbon Picks based on their top scoring.

ASPETConnect



Since ASPET*Connect*'s launch to the full membership on May 27, 2020, we have had **877 members** actively log in.

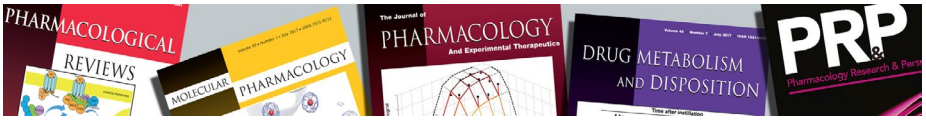
We have **10** Division Communities, **27** Committee Communities, **1** NERDS PIT (New and Emerging Researchers Doing Science: Pharmacologists in Training) Community. and **1** Focus on Pharmacology Community.

2,982 connections have been made on ASPETConnect.

266 members have uploaded their profile pictures.

Members have made **4,750 posts** on the various communities.

Publications



85 Open access articles were published

Manuscripts submitted from **58 different countries**

2,572 manuscript reviews completed

Data supplements accessed an average of **18,312 times per month**

Figures downloaded to PowerPoint an average of **9,055 times per month**

Articles accessed through RSS feeds an average of **42,875 times per month**

The Pharmacologist continues to be an important publication with **23,420 total hits** from December of last year through October of this year – a significant increase from previous years.

ASPET Webinar Series

This year, ASPET launched a new membership benefit: a series of online webinars called

Focus on Pharmacology.

ASPET has hosted **13** Focus on Pharmacology sessions in 2020.

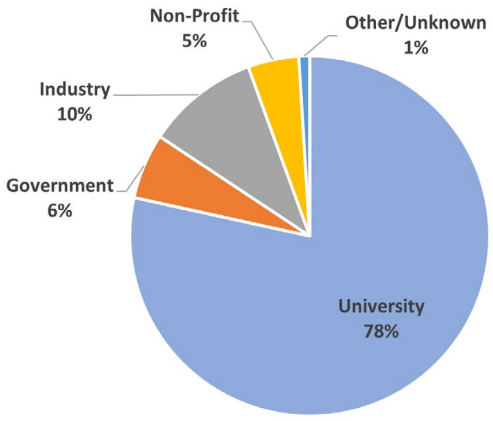
Session attendees have come from all over the world, including

United States	China	Iran	Mexico	Saudi Arabia
Australia	Denmark	Jamaica	Netherlands	Switzerland
Barbados	Ecuador	Jordan	Nigeria	United Arab Emirates
Brazil	Egypt	Kuwait	Pakistan	
Canada	Hong Kong	Lebanon	Philippines	United Kingdom
	India		Puerto Rico	

67 average registration per session

Total registrants:
826

All types of members are attending Focus on Pharmacology



Satisfaction with webinars in the Focus on Pharmacology series is rated:

4.6 out of 5

Science Policy

ASPET was consulted by congressional committees **5** times

16 **House office** visits (pre-COVID)

27 **Senate office** visits (pre-COVID)

10 **sign-on letters** endorsed

5 **bills** endorsed

5 **ASPET members** invited to participate in GAO reports

4 **Washington Fellows** who published op-eds

3 **regulatory comment letters** submitted

@ Social Media

2,158 **total "likes"** and **2,259** **followers** for ASPET's Facebook page

2,749 ASPET Twitter followers

2,319 ASPET LinkedIn group members

2020 Contributions

THANK YOU

to Our Supporters

This past year has been a challenging year for all of us, both personally and professionally. The coronavirus pandemic and the subsequent cancellation of the ASPET annual meeting at EB 2020, along with the ASPET office closure and the need to pivot many of our programs to virtual, created both chaos and opportunities that we have never dealt with before. Through it all, we want to thank all our members for your continued commitment and support of ASPET. By renewing your membership each year, publishing in our journals, and attending our meetings, you contribute to the growth and success of ASPET and the future of pharmacology.

We especially thank all our individual, institutional, and corporate contributors who have made donations to ASPET above and beyond their membership dues. These donations have helped ASPET support research, publications, science advocacy, and career development for scientists. Contributions from members help increase ASPET's impact in the science community and beyond.

ASPET gratefully acknowledges the following individuals who made contributions from November 2019 through November 2020:

Susan Amara
Bradley Andresen
Wayne Backes
James Barrett
Mary-Ann Bjornsti
Namandje Bumpus
Clinton Canal
Kathryn Cunningham
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Lori Hazlehurst
Michael Iadarola
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Linda Jones
Jonathan Katz
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Markos Leggas
Qing Ma
Edward Morgan
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Richard Okita
Mark Osinski
Robert Pechnick
Walker Prozialeck
Gary Rankin
John Raymond
Craig Stevens
Palmer Taylor
Pancras Wong
Jack Yalowich
Xiao-bo Zhong

Thank you to our 2020 Institutional Partners

Stony Brook University
University of Georgia
University of Minnesota
University of Texas Health San Antonio
University of Wisconsin
Washington State University

Thank you to our Corporate Sponsors

Burroughs Wellcome Fund

Association of Medical School Pharmacology Chairs (AMSPC)

Consider Donating to ASPET as Part of Your Year-End Giving

If you would like to help support ASPET's mission and strategies for a stronger pharmacology community, please consider donating to ASPET. There are many ways you can give and all donations are tax-deductible.

Contribute to ASPET's 2020 Featured Fund: Sustaining Member Fund

In our current climate, we recognize that the support of a professional community has never been more important, and ASPET has been working tirelessly on your behalf to help you maintain a community with fellow members and scientists. As we design a virtual annual meeting at EB 2021, offer more Focus on Pharmacology webinars, and create more networking opportunities through ASPET*Connect*, ASPET aims to keep our members engaged and connected. In 2021, ASPET expects to face financial, organizational, and environmental challenges. Your support through the **Sustaining Member Fund** will help ASPET continue to provide benefits and help sustain our membership and programs for 2021.

Donate to the ASPET Sustaining Member Fund at www.aspet.org/donate.

ASPET is committed to providing the best possible Society for our members who conduct research to save lives. The research of our members helps to develop new medicines and therapeutic agents to fight existing and emerging diseases. Your tax-deductible contribution, at any amount, will make a difference! To donate, please visit: www.aspet.org/donate.

Support ASPET by Shopping on AmazonSmile

AmazonSmile is a website operated by Amazon that lets customers enjoy the same wide selection of products, low prices, and convenient shopping features as on Amazon.com. The difference is that when customers shop on AmazonSmile (smile.amazon.com), the AmazonSmile Foundation will donate 0.5% of the price of eligible purchases to the charitable organizations selected by customers.

Choose ASPET as your charitable organization on AmazonSmile while doing your holiday shopping this year! Enter https://amzn.to/3jfibyg into your web browser to start shopping.

ASPET Commemorative Travel Awards

Support Young Scientists

An ASPET commemorative travel award is a great way to honor a family member, friend, colleague, or yourself. Create a lasting legacy with ASPET while supporting the future of young scientists.

ASPET is committed to supporting the future of pharmacology by encouraging the career development of young scientists through their participation in the ASPET Annual Meeting at Experimental Biology. We believe that attendance at the annual meeting provides the opportunity for young scientists to learn about recent advances in pharmacology, network with peers and international experts in the field, and to contribute their own work to the scientific dialogue. ASPET commemorative travel awards are given to the top scoring travel award recipients each year.

Establish a Commemorative Travel Award Fund:

If you are interested in initiating a new ASPET commemorative travel award, please contact ASPET's Executive Officer, Dr. Judy Siuciak at jsiuciak@aspet.org.

Donate to a Commemorative Travel Award Fund:

Travel awards are made possible through the generosity of our members and are always open for donations. ASPET currently has five commemorative travel awards. The Karl H. Beyer, Jr. Travel Award (established in 1997), the Steven E. Mayer Travel Award (established in 2010), the Akira E. Takemori Travel Award (established in 1998), the Atul & Jayashree Laddu Travel Award (established in 2016), and the Nancy Rutledge Zahniser Travel Award (established in 2017) celebrate the contributions of these members to the field of pharmacology and ASPET. Read more about each of these members online at www.aspet.org/donate/travel-award-funds.

If you would like to donate to any of the commemorative award funds, please visit us online at www.aspet.org/donate/travel-award-funds.

2021 Election

The ASPET election for president-elect, secretary/treasurer-elect, and councilor will open on January 6, 2021. Candidate biographies will be available online when the election opens. All regular, postdoctoral, emeritus, affiliate, and graduate student members are eligible to vote. Eligible voting members will receive a notification when the election opens.

The following divisions are also holding elections:

- Division for Behavioral Pharmacology
- Division for Cardiovascular Pharmacology
- Division for Drug Discovery and Development
- Division for Drug Metabolism and Disposition
- Division for Molecular Pharmacology
- Division for Pharmacology Education
- Division for Toxicology

Biographical information on division candidates can be found on page 251.

As the ASPET bylaws require, the election will be open for a minimum of thirty (30) days from the day of notification. The election will close on February 10, 2021.

Nominees for President-Elect

Michael F. Jarvis, PhD, FBPhS
Adjunct Professor, Pharmaceutical Sciences, University of Illinois-Chicago

Michael W. Wood, PhD
Senior Vice President, MapLight Therapeutics; Adjunct Professor, Department of Pharmacology & Physiology, Drexel University College of Medicine; Advising Board Member, Neurovation Labs; Scientific Advisory Board Member, Estrigenix Therapeutics; Principal & Founder, Neupharm LLC

Michael F. Jarvis, PhD

Candidate's Statement

The COVID-19 pandemic has fundamentally changed virtually all aspects of our professional and personal lives. In addition, ASPET is facing other recent transformative challenges including ongoing open access publication initiatives and potential changes to the Experimental Biology partnerships. Collectively, these events are likely to impact the ability of ASPET to advance pharmacological science and the professional development of its members. Going forward, these important influences will require flexibility and creativity from ASPET's leaders and members to address these challenges and continue the Society's mission of fostering the generation and communication of cutting-edge pharmacological science.

For nearly three decades, my membership in ASPET has provided me with valuable mentorship and inspiration as well as personal and professional collegiality across a diverse array of academic and industrial pharmacologists. I have had the good fortune to serve on numerous ASPET committees including the Board of Publications Trustees as editor of *JPET* and deputy editor of *PR&P*, Science Policy, Partnership, Program, and Mentoring and Career Development and to see firsthand the dedication and professionalism of its membership. My experience as a pharmacology researcher working on both basic research and clinical drug discovery programs, as well as with diverse Medical Affairs teams across a global organization, gives me a unique perspective on the great importance of ASPET's mission to advance pharmacology science and to facilitate the generation of new and impactful therapies. It is truly an honor to be nominated to run for the position of President of ASPET.

ASPET's Strategic Plan provides excellent guidance for addressing the current challenges facing the Society. The Strategic Plan fosters the development of early career pharmacologists by leveraging its engagement with students, educators, and research pharmacologists from academia, government, and industry. ASPET's scientific and policy community outreach efforts have expanded to form productive international collaborations with pharmacology societies from Japan, China, and most recently Canada. These efforts coupled with ASPET's established SURF, Washington Fellows, and Travel Award programs provide members with an enhanced level of scientific and professional engagement that continues to serve the Society and its members well. All these tactics and initiatives will remain critically important in the days ahead as we collectively learn how to continue and build our scientific and professional interactions in a socially distant virtual environment.

Two key elements of the Strategic Plan, Attracting and Developing the Next Generation of Pharmacologists and Reimagining the Annual Meeting Experience, have been essential drivers for the sustainability of the Society and remain vitally important today. These goals also serve as foundational elements that enable the Society to achieve its other key strategic goals. Effective management of the Society's resources and capabilities will be essential as the format and context of the annual meeting and its relationship with Experimental Biology necessarily evolves over the next few years. Well received changes to the annual meeting experience such as the ASPET Daily Datablitz oral poster presentation sessions and the EB Career Central experiences will require further reimagining in new virtual environments. I have benefited immensely from the curiosity and enthusiasm shown by pharmacology students and early career scientists and witnessed the positive impact of the Mentoring Network, Mentoring and Career Development Committee, and Big Ideas Initiatives on the next generation of pharmacologists as they navigate their early career milestones. Collectively, we must ensure that these important career development initiatives are sustained and continue to thrive.

If elected, I will work with the Society's leadership and staff to continue the great progress ASPET has made in developing and implementing new services and initiatives that are responsive to the challenges confronting the Society and its members. I will also work to further enhance ASPET's interactions with its members and the larger biomedical research community. These efforts include examining new ways to further support pharmacology education and advance pharmacology research excellence through ASPET's journals as they navigate the open access era. Another important aspect will be exploring new ways to increase interactions between the ASPET membership and ASPET's international and regional partners in terms of expanding scientific collaboration and enhancing the regional and national interactions. Finally, ASPET's continued efforts to shape key scientific, governmental, and global policy issues relevant to pharmacologists as a critical strategy for strengthening ASPET and sustaining biomedical research funding and productivity.

Michael W. Wood, PhD

Candidate's Statement

I joined ASPET late in my career. A mentor and friend asked me to join the Division for Neuropharmacology (NEU) to replace him as the Program Committee representative. I was immediately impressed by the closeness of the ASPET community and inspired by the collective sense of mission to maintain the prominence of pharmacology as a core scientific discipline.

Gradually, the generous spirit of fellow ASPET members inspired me to contribute more of my time to supporting that mission (e.g., serving as a judge for trainee competitions, volunteering for committee service). I served as the NEU Secretary/Treasurer and as an at-large member of the Program Committee. While serving on the Program Committee, I learned valuable lessons on leadership from the former chairs. Since 2017, I have served as Chair of the Program Committee. The annual meeting has been the core event that animates the ASPET member experience and it has been my privilege to help shape that experience. The setting for that experience is transforming.

There have been many changes since I joined ASPET and more changes are coming. External forces are driving ASPET to reconsider how it will grow in the coming decades. The relentless push toward open access threatens the primary source of revenue that has sustained ASPET since its earliest days. Several societies have recently communicated that they will not be involved in future Experimental Biology meetings and the global pandemic has forced the cancellation of EB 2020 and a reconfiguration of EB 2021. ASPET will weather the immediate challenges because its membership is committed and resilient. However, the annual meeting will need to be adapted to accommodate the coming departure of some EB member societies.

The ASPET Strategic Plan is now three years old. The overarching goals are sound, and they have been revisited annually by ASPET Council. There is no reason to change the macroscopic priorities of the ASPET Strategic Plan, but there is greater urgency to address the need to strengthen the organization and reimagine the annual meeting. Historically, the annual meeting has been the society's greatest expenditure. Meeting costs are offset somewhat by registration charges and vendor support, but the annual meeting remains the single greatest expenditure for the society. The annual meeting is also a key attraction for ASPET members. It delivers the tangible interactions that truly animate the member experience, it provides a platform to engage and attract new members and most importantly, it offers the opportunity to share what we all have in common – our love of the science of pharmacology. The need to reimagine the annual meeting is a priority for ASPET. We need to create a new event that is financially sustainable and scientifically and professionally inspiring. Accomplishing this goal will require a consensus of the ASPET membership, fresh ideas, and strong leadership.

I would like to continue my service to ASPET. I hope to strengthen the organization toward a bright future, and I hope to engage trainee members and veteran members alike to enable ASPET to thrive.

Nominees for Secretary/Treasurer-Elect

Kathryn A. Cunningham, PhD
Chauncey Leake Distinguished Professor of Pharmacology, Director, Center for Addiction Research and Vice Chair, Department of Pharmacology and Toxicology, University of Texas Medical Branch

Mary F. Paine, RPh, PhD
Professor, College of Pharmacy & Pharmaceutical Sciences, Washington State University

Kathryn A. Cunningham, PhD

Candidate's Statement

We are experiencing the unimaginable – a pandemic of global proportions. COVID-19 has changed our lives inextricably and provides the impetus to (re)create the future. As pharmacologists, we are offering our scientific expertise to avert the biological and social impacts of COVID-19, and we are making progress. However, the cancellation of the first ASPET meeting in its long history gives us pause to consider the future of our society. As a current member of the ASPET Council, I can attest to the strong leadership from the ASPET Council and staff in oversight of society function, and our commitment to assuring that ASPET survives and thrives. We have a strong strategic plan in place, and we must examine and reimagine our strategies, processes, and budgets to assure stability of our organization going forward. My leadership in translational research, administration and budget management attest that I have the experience and necessary skillset to work effectively with the ASPET Chief Financial Officer and Executive Officer, Council, Finance Committee, and Investment Subcommittee to assure the strong fiscal health of ASPET. I welcome the opportunity to serve ASPET and pledge to bring creativity and realism to the position of Secretary-Treasurer.

Mary F. Paine, RPh, PhD

Candidate's Statement

I am honored to be nominated for Secretary/Treasurer. I believe I am uniquely qualified for this Council position. As a pharmaceutical researcher, educator, and pharmacist, I have gained a broad perspective that will contribute to the ASPET mission of becoming the professional home for entities working to advance the field of pharmacology.

I have been active in ASPET since 2012, when I began my first term as Associate Editor for *Drug Metabolism & Disposition*. Through this role, I have contributed to ensuring high-quality research articles by engaging both established and junior researchers from multiple disciplines to provide balanced peer reviews. I have participated in editorial board meetings to exchange ideas and discuss ways to increase journal impact. These experiences, coupled with my tenure as Associate Editor for *Clinical Pharmacology & Therapeutics* (2014-19), are directly related to the Strategic Plan goal of "enhancing the ASPET journals".

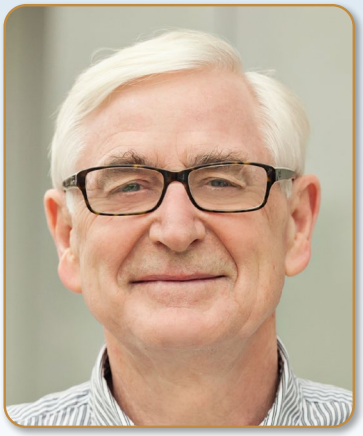
I served as Secretary (2003-04, 2006-08), President (2004-06), and Treasurer (2009-13) of the Research Triangle Park Drug Metabolism Discussion Group and as Secretary/Treasurer, including Elect and Past (2013-16), of ASPET's Division for Drug Metabolism and Disposition. As Principal Investigator of an NIH center grant since 2016, I oversee ~$2 million annual expenditures allocated to four sites. These experiences are directly related to the goal of "strengthening ASPET." The Secretary/Treasurer by default is a member of both the Finance Committee and Investment Subcommittee. I will work closely with these committees and ASPET leadership to ensure good stewardship of our organization's assets during these unprecedented times.

The goal of "reimagining the annual meeting experience" is paramount given that the 2020, and now 2021, in-person annual meeting have been cancelled due to the COVID-19 pandemic. Innovations will be essential for ASPET to maintain member interest and fiscal stability in the face of severe restrictions to our traditional modes of interaction. I will share my ideas with the Program Committee to meet this challenging goal.

If elected Secretary/Treasurer, I look forward to serving the ASPET community by innovating ways to meet financial obligations while ensuring ongoing initiatives to progress towards our fundamental mission. Thank you for your consideration.

Nominees for Councilor

Brian S. Cummings, PhD
Department Head, Pharmaceutical and Biomedical Sciences, University of Georgia



John R. Traynor, PhD
Edward F. Domino Research Professor, Professor and Associate Chair for Research, Department of Pharmacology, Medical School; Professor of Medicinal Chemistry, College of Pharmacy, University of Michigan

Brian S. Cummings, PhD

Candidate's Statement

My interest in being a Councilor of ASPET is derived from a passion to serve and advance the science of pharmacology and toxicology. I am particularly interested in ASPET's goal of attracting and developing the next generation of pharmacologists. I believe that one of the best ways to do this is to continue to highlight our trainees at all levels, undergraduate, graduate, and postdoctoral members, at our national meetings. This extends not only to poster presentations, but also enhanced oral presentation platforms (such as the Datablitz) and providing networking opportunities for career placement and transition for early career scientists. This vision goes hand-in-hand with another strategic goal of ASPET of reimagining the annual meeting experience. Being a member of the Program Committee was personally transformative and allowed me to understand the role of the divisions in setting the science of ASPET, and in creating an interactive, progressive and groundbreaking meeting platform. Innovations I have personally had a hand in creating include the Teaching Blitz, and I have also coordinated the student poster Datablitzes. These unique times we are experiencing create barriers, but also opportunities for changing how ASPET delivers the world's best pharmacological research. This includes smaller, in person, and larger virtual platforms that create forums to address inequities in diversity and gender in science. My experience on the Program Committee, the Partnerships Committee, and as a division chair has also allowed me to work hand-in-hand with the ASPET staff, and gives me a better understanding of the logistics and effort needed to serve as a Councilor. My experience as an Associate Editor for multiple journals, as well as my experience in leadership positions in other societies, also brings valuable perspective. I look forward to continuing to serve ASPET.

John R. Traynor, PhD

Candidate's Statement

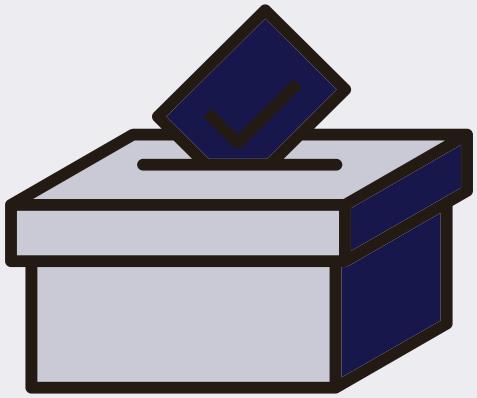
I am honored to be nominated to serve on ASPET Council. Following my tenure as chair of the Division for Neuropharmacology, I look forward to expanding the ways I can serve ASPET. I have been a member since 1997 when I joined the University of Michigan (from the UK). My students and I have regularly attended, and presented at, Society meetings. My career, covering 40 years of training pharmacologists and leadership roles in the International Narcotics Research Conference, fellowship of the British Pharmacological Society, and as an editor for the *British Journal of Pharmacology,* demonstrates I have the experience, enthusiasm, and commitment to help ASPET achieve the goals laid out in the strategic plan.

As an academic who has spent his life training pharmacology students, one aspect of the strategic plan that is vital for our future is attracting and developing the next generation of pharmacologists.

We must help schools recruit minority and women scientists into the profession of pharmacology and ensure these groups stay engaged with the Society, including those who take up non-traditional careers. The Society has made innovative efforts in this direction, but we must not be complacent, especially as our 2020 meeting was cancelled and our 2021 meeting will be virtual. Increasing use of online events, such as the Focus on Pharmacology series, and growing the number of followers on our social media platforms is essential, as is involving younger scientists in roles in the Society.

Another big challenge is our family of journals. These represent the scientific standing of our Society and are a crucial source of income. However, the journals face strong competition, so it is important we improve their impact. As an editor of the *British Journal of Pharmacology*, I have observed how the metrics of that journal have increased; such a transformation can happen at ASPET.

I have highlighted two aspects of the strategic plan, but it is necessary to tackle all components. If elected I look forward to employing my experience to assist the exceptional ASPET officers and staff as they work to ensure a bright future for our Society.



The ASPET 2021 election will open on January 6, 2021. All eligible voters will be sent notification with your login credentials to vote. If you have any questions, please contact membership@aspet.org.

April 27-30 - A Virtual Meeting Experience

ASPET 2021 Annual Meeting at Experimental Biology

Plan to attend the ASPET Annual Meeting at Experimental Biology (EB) from **Tuesday, April 27 to Friday, April 30, 2021**. Join 1600 scientists passionate about pharmacology as ASPET intersects with 10,000 other life scientists in physiology, biochemistry, molecular biology, pathology, and anatomy. It will be a one-of-a-kind virtual experience.

ASPET is committed to providing our members an excellent platform to **present** and **discover** the highest quality, innovative science in pharmacology and experimental therapeutics.

Submit Your Abstract

We encourage the submission of abstracts to ASPET topic categories in all areas of pharmacology and experimental therapeutics. The benefits received by accepted abstracts include:

- Receiving feedback on your work
- Being recognized for your scientific advances
- Sparking conversations with potential research collaborators
- Multiple formats to disseminate your research, including: a PDF upload of your poster, a short audio recording explaining your research, and publication of your abstract in the online EB platform and in *The FASEB Journal*
- Written Q&A about your research stored with your poster materials for visiting attendees
- Opportunities to compete for travel and poster awards (students and postdocs)

ASPET helps bring other scientists to you to discuss your work. Top scoring abstracts designated as *Program Committee Blue Ribbon Picks* are featured across all of EB, and are selected to give oral presentations at the popular ASPET Datablitz, in symposia, and in division platform showcases.

Abstract submissions close Thursday, January 7, 2021. Submit your abstract at www.aspet.org/eb2021/abstracts

ASPET is specifically seeking abstracts in the following research areas:

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

Didn't find your specialty listed? Search all pharmacology-related topics at www.aspet.org/eb2021/abstracts or search EB topic categories at https://bit.ly/2TnKujC.

Annual Meeting Program

For the full ASPET program with session descriptions, speaker names, and talk titles, visit www.aspet.org/eb2021/program.

ASPET Presidential Symposium

Chair: Charles France
Speakers: Jean Lud Cadet, Nadine Ezard, and Roneet Lev
Substance use disorders have increased in frequency and severity during the COVID-19 pandemic and, while the opioid epidemic is most prominent in the media, in many regions of the US the more difficult problem is widespread misuse of stimulant drugs such as cocaine and methamphetamine. Overdose deaths attributed to stimulant drugs alone or in combination with other drugs (e.g., opioids) have increased dramatically over the past several years. The three FDA-approved medications available for treating opioid use disorder (methadone, buprenorphine, and naltrexone) are effective in some patients; however, the opioid epidemic persists and there are no FDA-approved medications for treating stimulant use disorders or the coabuse of stimulants and opioids. In the President's Symposium experts will provide an overview and update of the current substance use disorder challenges facing clinicians and researchers as well as emerging novel approaches for developing more effective medications.

Julius Axelrod Award Lecture and Symposium: Targeting Muscarinic Acetylcholine Receptors for Treatment of Brain Disorders

Chair: P. Jeffrey Conn
Speakers: P. Jeffrey Conn, Ellen Hess, Rocco Gogliotti, and Andrew Tobin
Muscarinic acetylcholine receptors (mAChRs) play important roles in regulating multiple brain circuits and are potential drug targets for treatment of a range of debilitating brain disorders. However, until recently, highly selective ligands for specific mAChR subtypes have not been available. Recent advances have yielded the first truly selective activators and inhibitors of multiple individual mAChR subtypes. Speakers in this session will outline studies making use of these new tools to provide evidence that subtype-selective mAChR ligands may provide novel approaches for treatment of multiple brain disorders, including schizophrenia (Conn), dystonia (Hess), Rett syndrome (Gogliotto), and neurodegenerative disorders (Tobin).

"Guppy Tank" Translational Science Pitch Showcase

Chairs: Ryan Staudt and Harshini Neelakantan
This competition will showcase four trainee contestants effectively delivering science pitches describing the translational and commercial value of their scientific research. The session will also showcase a keynote talk by a seasoned scientific entrepreneur, who will highlight the hallmarks of a successful science pitch. Contestants are being trained by expert ASPET-affiliated mentors to craft and develop their final pitch presentations and will be scored by an elite panel of judges as well as the audience.

Development of Cannabinoids for Clinical Use - CNS Hazards and Therapeutic Effects

Chairs: Marcus Delatte and Ziva Cooper
Speakers: Brenda Gannon, Peter Winsauer, Marcus Delatte, and Ziva Cooper
The development of potential therapeutic products such as cannabinoids is a complex process that requires the integration of various types of data to understand the potential therapeutic and toxic effects of products in humans. This symposium will review the regulatory expectations of the FDA for the quality of cannabinoid-containing products that are either botanicals or highly purified drug products, discuss the antinociceptive and adverse effects of cannabinoids in animals and leverage these results to inform the design of clinical protocols, and review the analgesic and adverse effects of cannabinoids in humans.

Intracellular GPCR Signaling: Cell Biology, Pharmacology, and Physiology

Chairs: Nikoleta Tsvetanova and Adriano Marchese
Speakers: Nikoleta Tsvetanova, Karen O'Malley, Alan Smrcka, and Adriano Marchese
GPCRs and their downstream signaling cascades control all essential physiology and accordingly are targeted by close to half of the current drugs on the market. It is now clear that many GPCRs generate a discrete "second wave" of G protein-dependent signaling from internal organelles. Moreover, we are beginning to appreciate that active GPCRs

in different compartments can give rise to functionally distinct cellular responses, which in turn could underlie unique physiologies and selective drug actions. This symposium will feature both established and emerging new leaders in the study of intracellular GPCR signaling whose research collectively spans questions from basic cell biological and molecular mechanisms to physiology and pathophysiology.

Challenges of Academic Drug Discovery in Cancer

Chairs: Michelle Arkin and Markos Leggas
Speakers: Donna Huryn, Craig Thomas, Markos Leggas, and Michelle Arkin
This symposium will draw on the experiences of academic investigators to highlight their scientific efforts and challenges in academic drug discovery. Speakers will highlight individual paths and experiences including a new effort between academia and pharma to exploit artificial intelligence and machine learning to accelerate drug discvovery. Presentations will feature diverse efforts to develop drugs with topics ranging from the development of new computational platforms for accelerating drug discovery, the identification and pharmacologic targeting of p97 as a novel cancer target, and the development of dual-kinase inhibitors as a polypharmacologic strategy for overcoming adaptive resistance to therapy in acute myeloid leukemia.

Experimental Approaches for the Treatment of Infectious Disease

Chairs: Ross Corriden and Ericka Anderson
Speakers: Lynette Cegelski, David Gonzales, Lauren Bakaletz, and Liangfang Zhang
The COVID-19 pandemic highlights the need for development of novel anti-infective agents. Although academic researchers and the biopharmaceutical industry have quickly responded to develop candidate therapies to address COVID-19, an even larger infectious disease challenge remains largely unaddressed: antibiotic resistance. Each year in the US, 2.8 million people are infected with antibiotic-resistant pathogens; 35,000 die as a result of such infections. The 2014 UK Government Review on Antimicrobial Resistance concluded that, without a dramatic change in our response, antimicrobial resistance will result in 300 million premature deaths and up to $10 trillion in loss to the global economy by 2050, exceeding cancer as a cause of human mortality. Particularly at risk are patients already more vulnerable to illness from viral lung infections such as COVID-19; in fact, the CDC estimates that 29%-55% of the deaths recorded during the 2009 H1N1 influenza pandemic were caused by secondary bacterial pneumonia. Many major pharmaceutical companies have abandoned antibiotic R&D after judging it to be unprofitable, creating an innovation gap. Furthermore, because of frequent use of antibiotics for self-resolving issues, physician reliance on unnecessarily broad-spectrum regimes, widespread use of antibiotics in agricultural feed for growth promotion, and pure Darwinian evolution of bacteria, we face a dilemma where new anti-infective approaches are needed. This symposium will highlight translational research efforts aimed at resolving this unmet medical need.

Heavy Traffic: Targeting Diseases through Chemokine Receptor Antagonism

Chairs: Stephanie Davis and Sudarshan Rajagopal
Speakers: Sudarshan Rajagopal, Tracy Handel, Raphaela Goldbach-Mansky, S. Sakura Minami, Mostafa Khater, and Desislava Nesheva
Chemotactic cytokine (chemokine) receptors are G protein-coupled receptors best known for their role in promoting cell migration by responding to chemokines produced at sites of infection. Although the chemokine/receptor axis is important for normal immune function and wound healing,

REGISTRATION

Be sure your ASPET membership is up-to-date to receive the deepest discounts on registration fees. Registration discounts end Monday, April 12, 2021. Register at https://www.aspet.org/aspet/meetings-awards/meetingsannual-meeting/aspet-annual-meeting-at-eb-2021/registration

abnormal chemokine signaling is associated with numerous inflammatory diseases. This symposium will show how understanding the function and signaling pathways activated by chemokine receptors in order to develop better strategies for treating conditions such as cancer, HIV infection, Parkinson's Disease, cardiovascular disease, and COVID-19.

46 Years of GPCR Pharmacology and Mentoring in the Field of Pain Research

Chairs: Janet Clark and Kelly Standifer
Speakers: James Barrett, Felix Kim, Kelly Standifer, and Susruta Majumdar
Panelists: Grace Rossi, Wendy Su, Dennis Paul, Ying-Xian Pan, Geoffrey Ling, and Markham Luke
Gavril Pasternak's 45+ years in science produced 400 papers, 14 patents, and numerous well mentored students, postdoctoral fellows, residents, and visiting professors. ASPET recognized Dr. Pasternak with the Julius Axelrod award in 2012 for his contributions to the discipline of pharmacology and his mentorship of pharmacologists. To honor Gavril Pasternak, this symposium will highlight advances in opioid and non-opioid receptor-mediated signaling, development of novel pain and cancer therapies, and the significance of Gavril's body of work. The symposium will conclude with a panel discussion by former students, postdocs, and fellows on careers in pharma & biotech, marketing, academia, FDA, and NIH.

G Protein Signaling in Regulation of Metabolism and Diabetes

Chairs: Sheila Collins and Vladlen Slepak
Speakers: Vladlen Slepak, Michelle Kimple, Jurgen Wess, Sheila Collins, and Graeme Milligan
G protein-coupled receptors (GPCRs) activate signaling pathways in the CNS, pancreas, fat, and other tissues to regulate metabolism. This signaling is important in normal physiology, and its dysregulation can lead to disease such as diabetes and obesity, which are the major contributing factors to cardiovascular and other disorders. Talks in this session will address recently emerged and understudied aspects of G protein signaling, providing a unifying theme of how targeting novel mechanisms has the potential to be therapeutically relevant in metabolic disorders.

Protein Kinases in Tune

Chair: Alexandra C. Newton
Speakers: Alexandra C. Newton, John Brognard, Susan Taylor, Jenna Jewell, and Melanie Cobb
This symposium, chaired by the 2019 ASPET Axelrod Awardee, Dr. Alexandra C. Newton, will celebrate the exquisite regulation of protein kinases, one of the largest gene families in humans. The >500 members in this family are instruments nature uses to relay information throughout the cell. Every instrument not only has a precise and finely controlled role in the symphony that controls cell function, but is itself finely tuned for perfect pitch. When these instruments are not in tune, the ensuing cacophony is causal in disease. The symposium will cover protein kinases from structure to biology.

Gut Microbiota in Drug Efficacy and Toxicity

Chairs: Hyunyoung Jeong and Peter Turnbaugh
Speakers: Peter Turnbaugh, Andrew Goodman, Jennifer Wargo, and Beth McCormick
Gut microbiota is recognized as a key player in human health and diseases, but how gut microbiota modulates drug responses remains largely unclear. The overall objective of this symposium is to provide an overview of up-to-date research on how the gut microbiota impacts drug pharmacokinetics and pharmacodynamics, subsequently modulating drug efficacy and toxicity.

Novel and Integrated Intestine-liver Crosstalk on Hepatic Xenobiotic Metabolism

Chairs: Grace Guo and Hongbing Wang
Speakers: Andrew Patterson, Julia Yue Cui, Shiew-Mei Huang, Murat Cirit, and Guo Zhong
The liver stays in the center of drug metabolism that is regulated by xenobiotic receptors and endocrine factors during development, physiology and pathology. The intestine and liver are closely interacted and a role of intestine derived factors is emerging in critically regulating the endobiotic and xenobiotic metabolism in the liver. Novel medicine or technologies to treat human diseases will be developed inspired by these interactions. This symposium will bring the best knowledge, novel in vitro and in vivo technology, and application of intestine-liver crosstalk to audience with interest in novel drug development and pharmacology.

Cross Talk in Metabolism of Xenobiotics and Endogenous Substrates

Chairs: Amit Pandey and Xinxin Ding
Speakers: Rita Bernhardt, Aditi Das, D. Fernando Estrada, and Wen Xie
While much is known about reactions and substrates of xenobiotic metabolizing enzymes, their specificity toward xenobiotics, drugs, and endogenous substrates such as steroid hormones is less well understood. Protein-protein interactions also influence the substrate recognition and metabolism. The topics will address whether drug and steroid metabolizing enzymes can recognize different classes of substrates, how the substrate selection and activities are influenced, and whether ambiguity in substrate recognition leads to unexpected metabolic activities.

Recent Progress in Drugging the "Undruggable" RAS Oncogene

Chairs: Christine Canman and Kirsten Bryant
Speakers: John O'Bryan, Kirsten Bryant, Judith Sebolt-Leopold, and Marcus Ruscetti
The KRAS oncogene has always been thought to be undruggable and one of the Holy Grails of targeted cancer therapy. This symposium will highlight new approaches to selectively target mutant KRAS-dependent cancers ranging from the identification of novel allosteric regions of RAS important for signaling that ultimately could be targeted by small molecule inhibitors and new combination therapy strategies designed to exploit vulnerabilities of KRAS-dependent cancers or reverse immune suppression in the tumor microenvironment.

The Use of Chemogenetic Tools to Analyze Behavior in Non-human Primates

Chairs: Kathleen Grant and Verginia Cuzon Carlson
Speakers: Verginia Cuzon Carlson, Daicia Allen, Jessica Raper, and Takafumi Minamimoto
The in vivo manipulation of specific brain regions is invaluable for unraveling the circuitry bases of human complex behaviors and disease states. Non-human primates (NHP), such as the macaque, are a favorable animal model due to their human homology in cortical expansion sub serving prefrontal associative functions, fine motor control, social context, and physiology. In this session, we will describe the use of state-of-the-art chemogenetic constructs in awake-behaving NHPs. We will also discuss validation methods being developed for non-invasive imaging of viral targeting and expression focusing on PET/fMRI in NHPs.

Cancer Systems Pharmacology

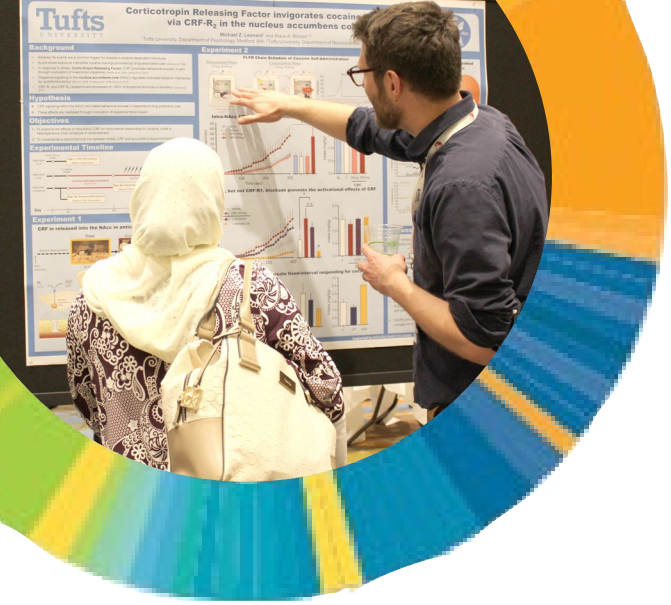
Chairs: James Costello and Laura Heiser
Speakers: Marc Hafner, Elizabeth Brunk, Pamela Kreeger, and Michael Lee
Systems pharmacology is the application of mathematical and computational modeling to understand the underlying molecular mechanisms that mediate therapeutic response and treament resistance, and to identify optimal treatment strategies. This session will cover diverse applications in cancer systems pharmacology. First, we will explore how measurements of drug response can be modeled as the integration of many cell-intrinsic and -extrinsic factors. Second, we will consider how mutations differentially affect protein function and how these mutations define and alter cellular states. Third, we will present the application of computational models to characterize the relationship between signaling networks and cellular decisions. Finally, we will investigate how heterotypic cell-to-cell interactions differentially affect response to drugs. Each topic combines experimental and mathematical approaches to demonstrate the power of systems pharmacology approaches.

New Tools in ADME Prediction: Quantitative Omics, Liquid Biopsies, and Modeling

Chairs: Bhagwat Prasad and Andrew Rowland
Speakers: Andrew Rowland, Aleksandra Galetin, Emi Kimoto, and Sara Shum
Characterization of variability in drug disposition is important for clinical study design and individualized drug treatment. As variability in drug disposition cannot be completely described by genetics, characterization of phenotypic variability is critical. This has fostered the development of plasma-derived exosomes as liquid biopsy and endogenous biomarkers for the prediction of drug metabolism and transport. Integration of metabolomics and proteomics data into physiologically based pharmacokinetic models also supports data translation for better prediction of drug disposition. This symposium will provide an update on various non-invasive and in silico approaches to drive the prediction of in vivo drug disposition.

KEYNOTES

Stay tuned—ASPET will announce our keynote lecturers in January.



Cardiometabolic Diseases: At the Crossroads of Adipose Tissue and the Heart

Chairs: Michael Tranter and Amreen Mughal
Speakers: Stephanie Watts, Michael Tranter, Lisa Norquay, Robert Bauer, and Kristin Stanford

The heart has the greatest energy requirement of any organ in the body, and up to 90% of this energy comes from free fatty acids released by adipocytes. Thus, adipose tissue biology is intricately linked to cardiovascular health, and the growing obesity epidemic increases the prevalence of cardiovascular disease risk factors for hypertension, atherosclerosis, and myocardial infarction. This symposium will explore novel therapeutic approaches and mechanisms of cross-talk between adipose tissue and the cardiovascular system that mediate metabolic homeostasis and pathophysiological processes.

Cardiac Leukocytes: A Therapeutic Quandary

Chairs: Douglas Tilley and Taben Hale
Speakers: Slava Epelman, Sumanth Prabhu, Pilar Alcaide, and Laurel Grisanti

Heart failure (HF), a progressive disease affecting millions of patients and costing billions of dollars annually, is regulated by inflammatory processes. Central to these processes are immune cells, which encompass both resident and recruited leukocyte populations that modulate a wide variety of cardiac remodeling responses including myocyte survival and hypertrophy, fibrosis, infarct stabilization and revascularization. Monocytes, macrophages and lymphocytes each exist along phenotypic spectra that change in response cardiac injury and dysfunction over time. The therapeutic impact of targeting resident versus recruited, and inflammatory versus reparative, leukocytes on cardiac health and disease outcomes is of significant interest. The speakers in this session will relay the relevance of these populations in the context of cardiac injury and HF, and discuss when and how their therapeutic modulation may be harnessed to improve HF outcomes.

Updating the Opioid Crisis: Novel Approaches to Reducing Opioid Abuse and Overdose

Chairs: Greg Collins and Sarah Withey
Speakers: Wilson Compton, Marco Pravetoni, Charles France, and Daniela Salvemini

The United States is in the midst of an opioid epidemic, with current estimates placing the number of opioid-related deaths at more than 70,000 per year. This symposium will provide an update on the current state of the epidemic, with an eye toward challenges that we will face in the coming years. This symposium will also describe novel pharmacokinetic and pharmacodynamic approaches to combat opioid addiction and overdose, such as opioid-specific vaccines and pseudo-irreversible opioid receptor antagonists. Finally, this symposium will discuss innovative approaches to reduce opioid addiction through the development of non-opioid strategies to relieve pain.

Mitochondrial Pathologies and Therapeutic Development – A Tribute to Craig C. Beeson

Chairs: Rick Schnellmann and John Lemasters
Speakers: John Lemasters, Bärbel Rohrer, Rick Schnellmann, Eileen Kennedy, Whitney Gibbs, and Pallavi Bhargava

Increasingly, mitochondrial dysfunction is recognized to play an important role in the pathophysiology of many prevalent diseases. Thus, mitochondria represent an important drug target for diverse diseases. Using examples from liver, kidney, and the nervous system, this symposium will highlight new developments in experimental therapeutics designed to reverse mitochondrial pathologies and enhance recovery of mitochondrial function. Development of a mitochondrial pharmacology holds promise to fill therapeutic voids in disease management. This symposium will be presented in honor of the late Prof. Craig C. Beeson and will include brief tributes.

ADME in Neonates and Infants: Therapeutics, Toxicity, and Development of New Drugs

Chairs: Pieter Annaert and Xiao-bo Zhong
Speakers: Tamorah Lewis, Pieter Annaert, Xiao-bo Zhong, and Jed Lampe

Patients at ages of neonate and infant are at developmental ages facing special challenges on drug therapy and toxicity. Most prescription drugs are used as off label for neonates and infants. They have the highest medical errors and adverse drug action rates. There is a specific requirement for inclusion of neonates and infants as a study population for therapeutic efficacy, toxicity, and development of new drugs. Several knowledge gaps exist, making too difficult to study neonates and infants. The aim of the symposium is to bring several experts in the field to discuss studies of ADME at these specific ages.

Behavioral Pharmacology of Biased Agonists

Chair: William Fantegrossi
Speakers: Mei-Chuan (Holden) Ko, Paul Prather, Mehrdad Shamloo, and Charles Nichols
Development of "biased ligands" preferentially activating specific signaling pathways by stabilizing subsets of receptor conformations that invoke distinct G protein-dependent or -independent signaling are underway. Development of novel analgesics acting via CB1, μ-, δ- and κ-opioid receptors is focused on identification of G protein-selective compounds that are devoid of β-arrestin 2 recruitment because evidence suggests that this may reduce adverse effects. Results of these efforts appear promising in vitro, but in vivo confirmation of biased agonism is relatively rare. This symposium will survey biased agonism across pharmacological classes, focusing on behavioral effects which may differentiate them from traditional unbiased agonists.

Immune Mechanisms in Pathologic Responses to Particles, Nanomaterials, and Nanomedicines

Chairs: Qiang Ma and K. Michael Pollard
Speakers: K. Michael Pollard, Jared Brown, Paola Italiani, and Seyed Moghimi
Particulates in the micro and nano range, including environmental pollutants, mineral and organic dusts, nanomaterials, nanomedicines, and metabolite crystals, can bio-accumulate in the body and cause a range of pathological conditions. These diseases, which include autoimmune disorders, organ fibrosis, cancer, and allergy, are frequently progressive and refractory to therapy with severe outcomes. Recent research has highlighted critical roles of the immune system in the response to particulates. This symposium will discuss the current understanding of immune mechanisms in disease development caused by particulates, with focus on autoimmunity, mast cell function, innate memory, and the idiosyncratic reaction to infusion of nanomedicines.

BPS-ASPET Symposium: A Current Perspective of Sphingolipid Signaling as a Therapeutic Target

Co-sponsored by the British Pharmacological Society and ASPET
Chairs: Kenneth Watterson and Simon Kennedy
Speakers: Sarah Spiegel, Nigel Pyne, Herve Le Stunff, and Paola Giussani
The sphingolipid system has an increasingly important role in a wide range of conditions and diseases, such as cancer, cardiovascular disease, diabetes, and multiple sclerosis. Biological targets such as sphingosine kinase, sphingosine-1-phosphate (S1P) receptors, and S1P lyase are therefore being actively pursued by academics and pharmaceutical companies in an attempt to develop better drugs for the treatment of these conditions. World-leading researchers, including Prof. Sarah Spiegel, the discoverer of the S1P molecule, will give a current perspective on the field, with an emphasis on the molecular and cellular mechanisms that underpin sphingolipid-targeted therapy.

Advance Your Teaching Skills

Pharmacology Education: Addressing the Opioid and Substance Abuse Crisis

Chairs: Laurel Gorman and Jayne Reuben
Speakers: Laurel Gorman, Rachel Linger, Leslie Newman, and John Mantsch
In the wake of a national crisis involving opioid over-prescribing and overdose deaths, the AAMC has recommended critical steps across different healthcare fields to improve the integration and innovation of opioid and drugs of abuse education at the foundational and clinical levels. Pharmacology educators have an essential role to play in this process in developing education processes, vertical and horizontal integration of addictive substance content, and the implementation of pain management education in medical, dental, pharmacy, undergradute, and graduate courses as well as in interprofessional education. This symposium will elaborate on national education recommendations and share examples from pharmacologists developing and implementing innovative curricula or active learning approaches in different pharmacology educational programs.

Teaching Blitz

Chair: Mark Hernandez
Speakers: Kevin Tidgewell, Sarah Lerchenfeldt, Sandeep Bansal, Maria Larrarte-Gonzalez, Diptiman Bose, and Paiboon Jungsuwadee
This session will showcase innovative strategies and methods for the teaching of pharmacology, physiology, biochemistry, and other biomedical science concepts and discuss how the teaching methods are implemented for remote learning. Speakers will present their inventive teaching practices or laboratory activities in brief interactive demonstrations followed by audience discussion. Participants will not only gain new teaching ideas but also guidance in how to implement these activities for remote learning.

Utilizing Educational Tools to Enhance Student Learning in a Virtual Learning Environment

Chairs: Katharina Brandl and Gagani Athauda
Speakers: Gagani Athauda, Katharina Brandl, Robert Theobald, and Helmut Gottlieb
The changing landscape of medical education results in the continuous evolution of educators beyond simply being content experts. In order to meet the needs of the new generation of learners, educators must be innovative and tech savvy. In addition, the recent pandemic has challenged the educators to shift to remote teaching. Speakers will present educational tools developed for the mastery of difficult pharmacology content, apps that can be used for "just-in-time teaching," iBooks and ePubs for interactive self-study learning, and tools for interactive audience participation. Participants will experience these tools through brief interactive demonstrations.

Developing Scientists into Best Practice Educators

Chair: Nicole Kwiek
Speakers: Nicole Kwiek, Laverne Melon, Patricia O'Sullivan, Justin Habash, and Katherine Gruenberg
Too often, academic scientists paradoxically demand the highest rigor of evidence for their research projects but then instruct students according to non-evidence-supported practices (including teacher-centered instruction such as lectures). Additionally, as the field of science continues to struggle with underrepresentation by minority groups, even experienced educators need development in creating inclusive learning environments. In this symposium, participants will learn about innovative strategies and programs to theoretically and experientially develop science faculty and future faculty in best practice teaching, including how to create an educational environment where all students feel valued and have equal access to learn. The speakers come from a multitude of disciplines and academic rank to share their expertise and personal experiences. Interactive strategies will be employed to deliver the content.

Multiple Choice Questions and Open-Ended Questions – Various Tools to Assess Pharmacology Knowledge

Chairs: Naunihal Zaveri and Marieke Kruidering-Hall
Speakers: Naunihal (Nina) Zaveri, Marieke Kruidering-Hall, and Stephen Schneid
Assessment is an important part of education, to gauge knowledge acquisition and learning, to motivate students, and to enhance retention. Recent changes in licensing examinations makes it even more important to identify and tailor assessments in pharmacology and pharmacotherapy. In 2020, the COVID pandemic shifted education and assessment to remote and virtual formats. During this symposium, we will use an interactive format to present how we utilize different approaches such as open-ended questions, one-liner tests, and Google forms to assess pharmacology knowledge in our medical, dental, and pharmacy curricula at different institutions, both pre- and post- COVID. We will engage participants with small group activities that provide the opportunity to create assessments that best suit their institution's needs.

Advance Your Career

NIH Funding and Other Translational Research Opportunities

Chairs: Rebecca Roof and Sailaja Koduri
Speakers: Rebecca Roof (NINDS), Sailaja Koduri (NIGMS), Christine Colvis (NCATS), Daniel Gossett (NIDDK), Zhaoxia Ren (NICHD), and Yisong Wang (NCCIH)
Panel members from scientifically diverse offices within the National Institutes of Health (NIH) will provide information on funding opportunities, resources, and institute interests. The panel will discuss how to get NIH funding for EB-related research and other opportunities as well as tips for success. Special attention will be given to training opportunites. Discussion will focus on both long-standing NIH interests as well as new initiatives in translation. During the session, a significant amount of time will be allotted for questions from the audience.

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

Hosted by the ASPET Board of Publications Trustees
Chairs: Emily Scott and Richard Dodenhoff
Speakers: Kenneth Tew, Kathryn Meier, and Richard Dodenhoff
The editors of ASPET's journals will lead an interactive workshop to address issues such as manuscript preparation, the review process, what makes a good reviewer, publishing ethics, and copyright issues. Following brief presentations, participants will work with editors and associate editors in small groups to answer questions and work through scenarios addressed by the speakers. Additional questions from participants will be encouraged. The workshop is appropriate for students at all levels, postbacs/postdocs, and scientists who might have an interest in taking on editorial roles in the journals.

Student - Postdoctoral Colloquium: Strategies for Dealing with Conflict and Difficult Conversations

Hosted by the ASPET Mentoring and Career Development Committee
Chair: Martha Davila-Garcia
Speaker: Sharon Milgram
Whether we like it or not, conflict is inevitable – in our work and in our lives. In this workshop we will reflect on our communication and conflict styles and explore how our styles may differ from the styles of others. We will also discuss a framework for conflict management and work through specific case studies relevant to research groups. Finally, we will touch briefly on wellness strategies to enhance our ability to deal with the inevitable stress that comes with conflict and difficult conversations. This session will provide a valuable set of tools for participants to move forward in their careers. There will be an interactive component included that allows participants to practice the guidance that will be provided in the presentation by Dr. Sharon Milgram, Director of the Office of Intramural Training and Education, NIH.

Diversity and Inclusion Session: Being Heard and Telling Your Story to Claim Your Place – Strategies for Success

Hosted by the ASPET Mentoring and Career Development Committee
Chair: Lakshmi Devi
Speaker: Ana E. Nunez
The focus of this session will be on implicit bias. We will hear from Dr. Ana E. Nunez, Associate Dean for Diversity, Equity and Inclusion, Professor of Medicine, Drexel University College of Medicine. Her presentation will highlight how to "decode" power dynamics and facilitate your personal success as a researcher, scientist, and expert in your field. By the end of the session participants will be able to describe how their research success includes personal leadership, self-advocacy, mentoring, sponsorship, and negotiation. There will be interactive small group breakouts and participants are encouraged to bring examples, scenarios, and questions that will enrich the discussion.

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, January 7, 2021, 11:59 pm PST

Poster awards are offered for outstanding poster presentations by ASPET student and postdoc members. Submit your abstract to EB in an ASPET topic category by January 7th. When prompted within the EB submission site, answer "yes" that you want to be considered for the ASPET Poster Competition.

We know many of you like to leave abstract submission to the last possible day. That's fine, but we strongly encourage you to prepare the following before the end of the year:

- Have your membership ID# handy (it can be found under your member profile at www.aspet.org)
- Be sure your ASPET membership is up-to-date (or join now)
- Plan to be the first/presenting author
- Determine which ASPET topic category you will use from the list at www.aspet.org/eb2021/abstracts
- Check to be sure that you are eligible here: www.aspet.org/posterawards

Presentations by the selected finalists will take place on the EB virtual meeting platform, April 27-30, 2021. Winners will be announced during EB on April 30.

ASPET Travel Awards

Application Deadline: Monday, January 11, 2021, 8:00 pm ET

Young scientists are invited to apply for a travel award to help defray the costs of registration to attend the ASPET Annual Meeting at EB 2021.

Step 1: Submit your abstract to EB in an ASPET topic category by January 7 at www.experimentalbiology.org

Step 2: Complete your ASPET travel award application by January 11 at www.aspet.org/travelawards

In addition to the general travel awards, ASPET 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: www.aspet.org/travelawards.

Oral Presentations

Abstract Submission Deadline: Thursday, January 7, 2021, 11:59 pm PST

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 January 7 deadline. No other application is necessary. Opportunities include:

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

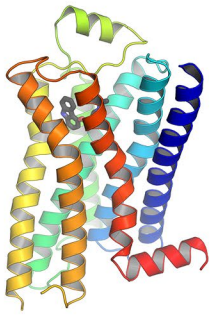
Career Resources

At EB 2021, there will be plenty of opportunities to develop your career in science, including:

- Short on-demand career development videos with bits of wisdom and quick take-aways
- Longer form workshops and symposia on career development topics
- Small group roundtables with a mentor to discuss topics such as resume/CV writing, designing science presentations, interview tips, getting published, etc.
- Postings of open jobs

DIVISION-FOCUSED SESSIONS

Each ASPET division will host a session focused on their specialty area of pharmacology. Many will feature their Early Career Awardees and/or Scientific Achievement Awardees as well as top abstract-based submissions from young scientists. To be considered for the abstract-based talks, be sure your ASPET membership is up-to-date and submit an abstract by January 7, 2021 to an ASPET topic category at EB. More information can be found at www.aspet.org/eb2021.



Joint Colloquium on G Protein-Coupled Receptors:

Evolving Insights from Pharmacology, Biochemistry, and Physiology

May 10- 11, 2021

This is a satellite meeting to Experimental Biology 2021.

Tremendous scientific advancements over the last decade indicate that GPCR physiology and pharmacology are much more complex than originally thought and that it may be possible to exploit this complexity to treat a wide variety of diseases. The objective of this colloquium is to expose scientists to recent discoveries and multidisciplinary approaches used to study GPCRs and provide opportunities for establishing collaborations that bridge complementary interests.

The event will feature speakers who have made exciting discoveries in GPCR research that range from molecular to systems biology, basic research to translational studies, and pharmacology to biochemistry to physiology.

Co-Chairs:

Tracy M. Handel - Univ. of California, San Diego
Paul Insel - Univ. of California, San Diego
Jennifer Pluznick - Johns Hopkins Univ. School of Medicine

Symposia Topics:

- Systems Biology Approaches to GPCR Physiology and Pharmacology
- GPCR Structural Biology and Drug Discovery
- GPCRs in Pathophysiology and Pathobiology

Virtual Posters

Poster presenters accepted for the GPCR Colloquium will be selected from abstracts submitted by January 7, 2021 to EB 2021. Submit to the topic category called "3016-ASPET GPCR Colloquium" within the EB abstract submission system.

Registration

Thanks to the generosity of our sponsors and support from ASPET, ASBMB, and APS, a ticket for the colloquium is being provided at no extra charge with your paid registration to Experimental Biology.

Sponsors

- ASPET Divisions for Molecular Pharmacology, Neuropharmacology, and Drug Discovery and Development
- American Society for Biochemistry and Molecular Biology (ASBMB)
- American Physiological Society (APS)
- Journal of Biological Chemistry
- British Journal of Pharmacology

Learn how your organization can support the colloquium. Contact meetings@aspet.org or (301) 634-7060.

Invited Speakers:

Brian Kobilka - Stanford University
Structural Insights into the Dynamic Process of G Protein–Coupled Receptor Activation

Mark Knepper – NHLBI
V2R-omics: Multi-systems Approaches to Define Vasopressin Action

Nina Wettschureck – Max Planck Institute for Heart and Lung Research
Single Cell Analysis of GPCR Expression: Implication for Physiology and Pathophysiology

Kirill Martemyanov - The Scripps Research Institute
Deciphering Diversity of GPCR Signaling

Sriram Kosuri - Univ. of California, Los Angeles
Combining Synthesis and Multiplexed Assays to Explore Human Biology: GPCRs as a Paradigm

Chris Tate – Cambridge Univ.
Molecular Basis for High-affinity Agonist Binding at the Beta1-adrenoceptor

Bryan Roth – Univ. of North Carolina
New Technologies for Structure-guided GPCR Drug Discovery

Minghong Ma – Univ. of Pennsylvania
G Protein–Coupled Olfactory Receptors: Novel Insights into Responsiveness and Mechano-Sensitivity

Laura Wingler – Duke Univ.
Molecular Mechanisms of Biased Signaling at the Angiotensin Receptor

Jerold Chun - Sanford Burnham Prebys.
SIP, LPA and Their Receptors in CNS Disorders

Kathleen Caron – Univ. of North Carolina
Novel Regulatory Functions of GPCRs in Vascular Growth and Remodeling

Willis (Rick) Samson – St. Louis Univ.
Novel Peptide-activated (Orphan) GPCRs: New Insights and Therapeutic Opportunities

Lora Heisler – Univ. of Aberdeen
Targeting GPCRs to Improve Obesity

Dolores Cooper Shockley—

Trailblazer Extraordinaire

Rebecca J. Anderson, PhD

On February 3, 1956, Autherine Lucy attended her first day of graduate school at the University of Alabama—the first African American student admitted to the university in its 121-year history *(1, 2)*. NAACP attorneys Thurgood Marshall (later a US Supreme Court Justice) and Arthur Shores had prevailed in their 3-year legal battle on Autherine's behalf *(1, 2)*.

Autherine encountered no resistance on her first two days of class. But in the evenings, groups of white students became increasingly agitated *(1, 2)*.

On the third day, Autherine passed through a hostile crowd of about 300 white protesters, who shouted hate-filled epithets *(1, 2)*. By the end of class, the crowd had grown to more than 2000, and university officials arranged for an escort to drive Autherine to her next class *(1)*. Along the way, their car was pelted with rotten eggs *(1, 2)*.

Autherine arrived safely at the Education Library building, but after that class, she had to wait two hours so that arrangements could be made to take her to her off-campus lodgings. While a friend created a diversion, she was safely driven in a patrol car, lying hidden in the back seat *(1, 2)*.

Dr. Dolores Shockley passed away at the age of 90 on October 10th, 2020 when this issue of *The Pharmacologist* was in preparation. She had been an ASPET member since 1980 and made a lasting impact on the field of pharmacology. Dr. Anderson was grateful to have had the opportunity to speak to Dr. Shockley and her family during the preparation of this article.

That night, the university's Board of Trustees voted to remove Autherine from the university, ostensibly for her own protection *(1, 2)*. Although Marshall and Shores immediately took steps to challenge that decision, the trustees' action was ultimately upheld in court *(1)*.

These events made news worldwide *(2)*. Among those who were asked to comment was Dolores Cooper, who had already blazed a few trails of her own—and succeeded against long odds.

Autherine Lucy and her lawyers, Thurgood Marshall, Arthur Shores, and Constance Baker Motley, walking past the federal courthouse in Birmingham, Alabama, on the day a federal judge ordered her readmission to the University of Alabama.

Starting Strong

Dolores Cooper was born in 1930 in Clarksdale, Mississippi, a small, rural town near the Arkansas border. Southern schools were segregated, and supplies were very limited for African American children. "We got the leftovers from the white school" *(3)*.

Fortunately, Dolores was surrounded by "a lot of educated people" who overcame, to a certain extent, the suppression imposed by segregation *(3)*. Several of her cousins were healthcare professionals. Her mother, an elementary school teacher, was a major influence and put a priority on her education *(4)*. "Most of what I did was learned at home" *(3)*. Her mother also arranged for Dolores to attend a Presbyterian high school, where she became well grounded in the sciences, especially chemistry *(3)*.

Clarksdale did not have a drugstore for African Americans, and Dolores set out to become a pharmacist. She resolved to come back to her hometown and open her own drugstore *(3, 5, 6)*.

She received a scholarship from Oberlin College. But Oberlin had no pharmacy school, and there was no dormitory space for her. Her mother had gone to school in New Orleans, so Dolores chose Xavier University of Louisiana *(3)*.

Colleges for Black scholars were first founded in the 1800s to train students who were prevented by law—primarily in the South and East—from attending white schools. Jim Crow laws and other forms of systemic racism continued to keep African American students from attending white schools until the 1960s *(7)*.

Xavier is America's only historically Black and Catholic university, and it has maintained a strong, proud reputation in science education. Its College of Pharmacy was established in 1920. Dolores's pharmacy classmates included Ernest Morial, who later became the first African American mayor of New Orleans. Richard Gumbel, the father of television journalist and sportscaster Bryant Gumbel, was their class president *(3)*.

Dolores graduated at the top of her pharmacy class in 1951 *(8, 9)*. Along with her bachelor's degree, she earned her pharmacy license, but during college, her interests shifted to pharmacology *(5, 6, 8)*.

Xavier University of Louisiana Class of 1951. From left to right: Richard Gumbel, Zirl Palmer, Dolores Cooper, Robert Simpson

Xavier University of Louisiana Class of 1951. From left to right: Dolores Cooper, Jurre Goodwin, Mother M. Agatha Ryan, Victoria Batiste, June Walker

Pursuing Purdue

Because of her outstanding academic record, Dolores was accepted to eight graduate schools, of which Purdue University seemed to be the obvious choice. Many of her pharmacy textbooks had been written by Purdue professors *(3)*. Glenn Jenkins, dean of Purdue's School of Pharmacy, later said that he "decided to take a chance on Dolores from that little school in Louisiana" *(8)*.

Purdue was integrated, but African American students still faced some discrimination on campus. For example, Black male students could not get haircuts at the Student Union. "A group of Black students (including me) petitioned President Hovde to remove this restriction, which he did" *(9)*.

During her first two years at Purdue, Dolores stayed in one of the women's Quadrangle Residences, where a wing had been designated for graduate students *(3, 9)*. It was her first exposure to students with diverse graduate majors and a broad range of cultures: New York Jewish students, Midwestern white students, and students from other countries *(9)*.

Purdue's student body comprised five men for every woman—and an even greater disparity in science and engineering *(3)*. When the university began accepting an increased number of undergraduate women, Dolores and her fellow graduate students were forced out of the women's dorm *(3, 9)*.

Dolores wanted to live near the campus—a community with few African American residents *(3)*. She soon learned there was more discrimination in West Lafayette than on Purdue's campus. But it was a different kind of discrimination. "You never knew when you would be rejected or refused" *(9)*.

"In Mississippi, as most Southern states, discrimination and segregation were overt. There were signs in bold letters—WHITE and COLORED. In West Lafayette, discrimination was covert and insidious. There were no signs—just a refusal to serve you or to rent you a room" *(9)*.

A Presbyterian minister rented her a room in his family's home for the summer *(9)*. This gave her time to team up with Mae, a white woman who was studying to be a clinical psychologist. The two had become friends in the residence hall and decided to share an apartment *(3, 9)*.

For several weeks, they answered numerous ads for "Apartments for Rent" and "Vacancy" locations. But everywhere they went, the apartment had "just been rented" *(3, 9)*. Finally, they agreed that Mae would go alone to answer the ad, and it worked. They found a nice apartment where Dolores lived until she completed her graduate studies *(9)*.

Changing Hearts and Minds

Both on and off campus, Dolores deftly navigated subtle but explicit discrimination. "When I was with my white friends from Purdue, they would go ahead and

Segregated movie theatre for African Americans in Leland, Mississippi, November 1939

seat us at some of the restaurants, but when I went with my Black friends, they wouldn't even seat us" *(3)*. Rather than protesting or submitting to this situation, she found a constructive way to change at least a few minds.

She joined the "Panel of Americans," a group composed of a white Protestant, a Catholic, a Jew, an Asian American, and a Black student (i.e., Dolores). Their aim was to improve race relations in the community *(9)*. The group visited churches and organizations in West Lafayette, introduced themselves, and answered questions. "I believe that we dispelled in some the fallacy of racial, ethnic, and religious inferiority" *(9)*.

The discrimination in her department was cloaked as an awkward compromise between accommodating her and the (predominantly white) undergraduate students. While studying for her master's degree, Dolores worked as a teaching assistant in Purdue's Department of Pharmacology *(6, 9)*. But her faculty advisor underhandedly put her out of sight by assigning her to assist a professor who was revising his chemistry textbook. When Dean Jenkins discovered this, he immediately ordered that Dolores be assigned to the undergraduate labs, along with the other pharmacology graduate students who were serving as teaching assistants *(3, 9)*.

Within a generation, those attitudes changed at Purdue. Dolores's niece and nephew graduated from the university's engineering program. Fred Cooper was co-founder of the Purdue Society of Black Engineers, and Michelle Cooper became the first female National Treasurer of the National Society of Black Engineers *(8)*. "I know and am very pleased that things have changed dramatically since my matriculation at Purdue and West Lafayette" *(9)*.

When she entered Purdue, she knew little about research, but she was determined to succeed *(3)*. "The community was something I could not control… But my zealous commitment to succeed propelled me to work harder…I was not going to be deterred nor a disappointment to myself, my family, and my undergraduate university" *(9)*.

For her doctoral dissertation, Dolores studied urine flow changes in response to pain and the effect of non-narcotic analgesics in both alleviating pain and restoring urine flow *(10)*. She also correlated the effect of ischemic pain on liver metabolism *(10)*.

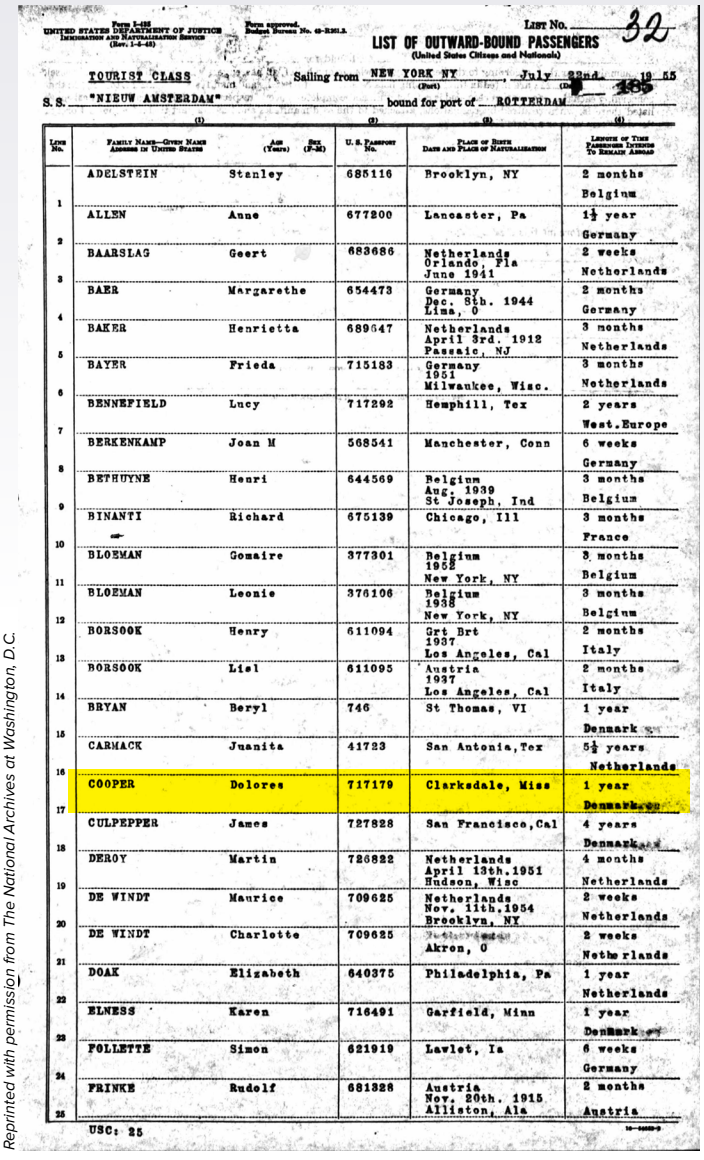
All the Purdue pharmacology graduate students were trained to become proficient in laboratory techniques and received an in-depth understanding of past and current scientific literature. She credited Purdue for preparing her well for the rigors of teaching and research at a medical school *(9)*.

In 1955, Dolores became the first African American woman to receive a PhD in pharmacology in the US.

Finally Feeling Free

Dolores received a Fulbright Fellowship to conduct postdoctoral research *(3, 8)*. One of her Purdue professors, Dr. Rasmussen, a native of Norway, urged her to consider studying with Prof. Knud O. Møller at the Institute of Pharmacology, University of Copenhagen *(3, 8)*.

Møller was a highly regarded clinical pharmacologist. In the 1940s, he introduced the term "euphomania" to describe drug addiction, because euphoria was a feature of drug addiction



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LIST OF OUTWARD-BOUND PASSENGERS
(United States Citizens and Nationals)

List No. 32

TOURIST CLASS — Sailing from NEW YORK NY (Port) July 22nd. 19 55 (Date)

S.S. "NIEUW AMSTERDAM" — bound for port of ROTTERDAM

(1) Line No.	Family Name—Given Name; Address in United States	Age (Years)	Sex (F-M)	(2) U.S. Passport No.	(3) Place of Birth; Date and Place of Naturalization	(4) Length of Time Passenger Intends To Remain Abroad
	ADELSTEIN	Stanley		685116	Brooklyn, NY	2 months
1						Belgium
	ALLEN	Anne		677200	Lancaster, Pa	1½ year
2						Germany
	BAARSLAG	Geert		683686	Netherlands	2 weeks
3					Orlando, Fla June 1941	Netherlands
	BAER	Margarethe		654473	Germany	2 months
4					Dec. 8th. 1944 Lima, O	Germany
	BAKER	Henrietta		689647	Netherlands	3 months
5					April 3rd. 1912 Passaic, NJ	Netherlands
	BAYER	Frieda		715183	Germany	3 months
6					1951 Milwaukee, Wisc.	Netherlands
	BENNEFIELD	Lucy		717292	Hemphill, Tex	2 years
7						West.Europe
	BERKENKAMP	Joan M		568541	Manchester, Conn	6 weeks
8						Germany
	BETHUYNE	Henri		644569	Belgium	3 months
9					Aug. 1939 St Joseph, Ind	Belgium
	BINANTI	Richard		675139	Chicago, Ill	3 months
10						France
	BLOEMAN	Gomaire		377301	Belgium	3 months
11					1952 New York, NY	Belgium
	BLOEMAN	Leonie		376106	Belgium	3 months
12					1938 New York, NY	Belgium
	BORSOOK	Henry		611094	Grt Brt	2 months
13					1937 Los Angeles, Cal	Italy
	BORSOOK	Liel		611095	Austria	2 months
14					1937 Los Angeles, Cal	Italy
	BRYAN	Beryl		746	St Thomas, VI	1 year
15						Denmark
	CARMACK	Juanita		41723	San Antonia, Tex	5½ years
16						Netherlands
	COOPER	Dolores		717179	Clarksdale, Miss	1 year
17						Denmark
	CULPEPPER	James		727828	San Francisco, Cal	4 years
18						Denmark
	DEROY	Martin		726822	Netherlands	4 months
19					April 13th. 1951 Hudson, Wisc	Netherlands
	DE WINDT	Maurice		709625	Netherlands	2 weeks
20					Nov. 11th. 1954 Brooklyn, NY	Netherlands
	DE WINDT	Charlotte		709625	[illegible]	2 weeks
21					Akron, O	Netherlands
	DOAK	Elizabeth		640375	Philadelphia, Pa	1 year
22						Netherlands
	ELNESS	Karen		716491	Garfield, Minn	1 year
23						Denmark
	FOLLETTE	Simon		621919	Lawlet, Ia	6 weeks
24						Germany
	FRINKE	Rudolf		681328	Austria	2 months
25					Nov. 20th. 1915 Alliston, Ala	Austria

USC: 25

List of outward-bound passengers aboard the SS Nieuw Amsterdam

common to both depressant drugs like morphine and stimulants like amphetamine *(11)*. In the 1930s, Danish physicians began prescribing those drugs more liberally, which Møller blamed for the sharp rise in drug addiction in the country. To address this problem, he advocated both restricting doctors' prescriptions and strengthening addiction treatment programs *(11)*.

In July 1955, Dolores boarded the SS *Nieuw Amsterdam* and set sail for Copenhagen via Rotterdam *(3)*. The Danish people were friendly, hospitable hosts and showed her respect that she had never previously experienced *(4)*. "It was the first time I ever felt free in my life" *(3)*.

At that time, Scandinavians had seen few Blacks. They were naturally curious, and some looked at her arms and thought it was paint *(4)*. "I would have these little Scandinavian kids walk up to me and touch me to see if my color would rub off!" *(3)*.

Dolores was in Denmark when Emmett Till was brutally beaten and murdered less than 40 miles from her childhood home in Mississippi *(9)*. And Autherine Lucy was challenging the color barrier at the University of Alabama. Both cases made headlines, even in Europe *(3)*.

Emmett Till in Mississippi

In the summer of 1955, a happy-go-lucky 14-year-old Emmett Till traveled from his home in Chicago to visit relatives in Mississippi *(12)*. Although he had attended a segregated elementary school, he was unprepared for the intensity of segregation in Mississippi. Despite his mother's warnings to take care, he conducted himself rather cavalierly with his Southern cousins and their friends *(12)*. One day during his visit, he entered a country store and bought some candy from the store's clerk, Carolyn Bryant, a 21-year-old white woman. Although the incident was later disputed, Till was accused of flirting with or whistling at Bryant *(12, 13)*.

A few days later, Carolyn's husband, Roy Bryant, returned from a business trip and heard about the encounter. Around 3:00 am on August 28, Bryant and his half-brother went to the home of Till's great uncle *(13)*. They forced Till into their car and drove away *(12)*. At some point that night, they brutally beat Till and shot him in the head. Three days later, Till's corpse was recovered from the Tallahatchie River. He was so disfigured that his relatives could identify him only by a monogrammed ring *(12)*. (Later, an autopsy revealed that Till had sustained extensive cranial damage, a broken femur, and two broken wrists, and there were bullet fragments in his skull.)

Till's mother insisted that her son's body be returned to Chicago and arranged for an open-casket funeral. Tens of thousands attended his funeral or viewed his mutilated face *(13)*. *Jet*, an African American weekly magazine, published photos of Till in his casket. The mainstream media picked up the story and republished the photos, triggering a public outcry across the US and abroad *(12, 13)*.

On September 23, 1955, an all-white jury deliberated about an hour and acquitted the two alleged murderers *(12, 13)*. In November, a grand jury declined to indict the two men on a separate charge of kidnapping. These legal decisions highlighted the brutality of Jim Crow segregation in the South and outraged many people around the country. More than any previous event, Emmett Till's death rallied support for the Civil Rights Movement that followed.

Autherine Lucy in Alabama

In the public domain

Autherine Lucy

Autherine Lucy was born in Shiloh, Alabama, the last of 10 children *(1)*. She received a 2-year teaching certificate from Selma University, and in 1952, she earned her bachelor's degree in English from Miles College in Birmingham *(1)*.

A classmate at Miles, Pollie Anne Myers, persuaded Autherine to join her in enrolling in the master's of education program at the University of Alabama *(2)*. Pollie was a civil rights activist with the NAACP and sought to challenge the university's whites-only admissions policy *(1)*.

Their applications were accepted, and they received dorm assignments. But when the Admissions Department discovered they were African American, their enrollment was rescinded *(1, 2)*.

Anticipating this rejection, their NAACP lawyers (Arthur Shores and Thurgood Marshall) then mounted a legal case to reinstate them *(2)*. While awaiting the court's decision, Autherine took a position teaching English in Carthage, Mississippi *(1)*. After the Supreme Court outlawed school segregation in *Brown v. Board of Education* in 1954, the NAACP pressed their case in Alabama. A US

District Judge quickly ruled in Autherine and Pollie's favor *(2)*.

The university hired private investigators to dig into the backgrounds of the two women, and they discovered that Pollie had been pregnant and unwed at the time she applied *(1, 2)*. The university rejected her admission, claiming this violated the university's moral code. But they could find no fault with Autherine.

With NAACP backing, Autherine bravely faced the all-white campus alone and successfully attended class for a few days. But an increasingly large and hostile crowd of white students protested, marched, and held rallies on campus *(1)*.

A court battle ensued, with the NAACP insisting on Autherine's constitutional right to be a student and the university trustees claiming that Autherine's presence on campus presented a safety hazard. The legal maneuvering led to a final court decision in favor of the university on February 29, 1956 *(1)*. This ended Autherine's opportunity to study at the University of Alabama. It was a crushing defeat for the NAACP and for Autherine personally. Throughout early 1956, the sensational case made news and was closely followed worldwide *(2)*.

In 1988, Autherine was invited to speak to a history class at the University of Alabama *(2)*. Afterward, a pair of faculty members urged the trustees to reverse her expulsion, which they did. She enrolled in the graduate program in elementary education. Coincidently, at the same time, her daughter, Grazia, began her undergraduate studies at the university. In 1992, both mother and daughter graduated. When Autherine walked across the stage to accept her master's degree, she received a standing ovation *(2)*.

That same year, the University of Alabama established the Autherine Lucy Foster Endowed Scholarship. It is awarded each year to a sophomore at the university. In addition, the Autherine Lucy Foster Award is presented each year to one faculty-staff member, one student, and one community member who have provided exemplary support for minority student programming. On November 3, 2010, the Autherine Lucy Clock Tower was dedicated and stands in Malone-Hood Plaza (named for Vivian Malone and James Hood, the university's first African American students) on the University of Alabama campus. On May 4, 2019, the university awarded Autherine an honorary doctorate.

In the public domain

Autherine Lucy Clock Tower

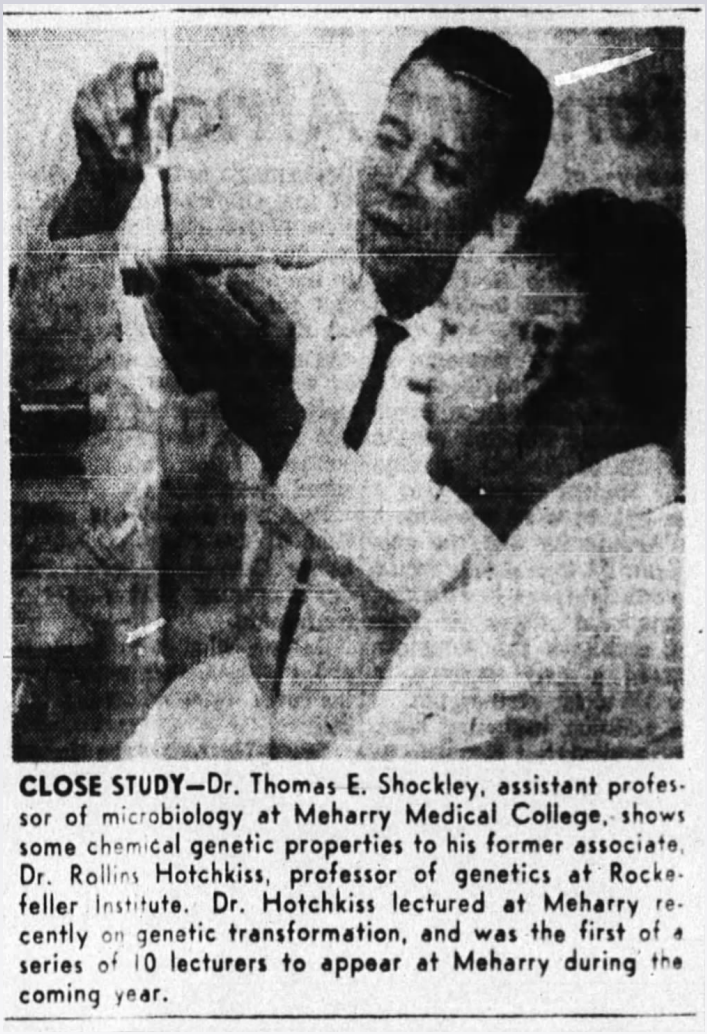
Dolores Cooper in Copenhagen

In Copenhagen, all the newspapers requested interviews with Dolores *(3)*. They wanted to understand why Emmitt Till and Autherine Lucy were treated so harshly. Dolores shared her experiences growing up in the segregated South and while studying at Purdue *(3)*.

She explained the inequality inherent in the education system in Mississippi *(4)*. Southern Black students learned from hand-me-down books whose tattered pages were heavily marked and defaced *(4)*. She clearly remembered the first time she was issued a brand-new textbook—in the 11th grade at the private high school *(4)*. To Dolores and Autherine, books were precious. More than anything else, books (and the education that books provided) could overcome almost any obstacle.

Dolores's postdoctoral research in Copenhagen centered on the factors that affect the hyaluronic acid engorgement of genital connective tissue in response to estrogen and testosterone *(14)*. She observed changes in connective tissue swelling in animals that had been hydrated or dehydrated by administration of drugs or salt solutions *(15)*. She also demonstrated the effect of histamine depletion and adrenalectomy on the extent of connective tissue swelling *(16)*. These results were published in four papers.

During her postdoctoral tenure, the Danish Fulbright office also arranged for her to visit pharmacology departments in Sweden, Norway, and Finland *(8)*.



CLOSE STUDY—Dr. Thomas E. Shockley, assistant professor of microbiology at Meharry Medical College, shows some chemical genetic properties to his former associate, Dr. Rollins Hotchkiss, professor of genetics at Rockefeller Institute. Dr. Hotchkiss lectured at Meharry recently on genetic transformation, and was the first of a series of 10 lecturers to appear at Meharry during the coming year.

Dr. Thomas E. Shockley

Work-Life Balance

Dolores returned to the US in 1957 and accepted a position as assistant professor of pharmacology at Meharry Medical College in Nashville *(3)*. Founded in 1876 as the Central Tennessee College to educate African Americans in medicine, Meharry graduated its first pharmacy class in 1890. It is one of the few historically Black colleges and universities that offers degree programs in medicine, dentistry, and allied health sciences *(3)*.

Also in 1957, Dolores met and married Thomas E. Shockley, a graduate of Ohio State University *(3, 6, 8,)*. He had joined the microbiology faculty at Meharry six months before Dolores arrived *(4)*.

Dolores was determined to continue her career alongside family life. "I never had to take a maternity leave because science changes too rapidly and I wanted to continue working to stay on top of those changes" *(5)*. Fortunately, her husband, who directed an active research program of his own, understood the demands that were put on academic scientists to conduct research and publish *(3)*.

But of necessity, her attention was divided. "I would have done more, but it was practically impossible" *(3)*. The Shockley's four children were close in age, and a full-time housekeeper was employed to stay with them during the week, until their youngest child was eight *(3, 5)*. "It took practically my whole paycheck to pay for the housekeeper, but at least I stayed active in my career" *(3)*.

Velvet Touch, Iron Will

From the beginning of her career, Dr. Shockley faced the same glass ceiling that many women encounter. When she was offered the job at Meharry, "the salary that I was quoted was ridiculous" *(3)*. She had been offered a higher salary at another university—an institution that had no medical school *(4)*. She told the president of Meharry that she could not possibly work for anything less than the salary that the entry-level male faculty were receiving *(3)*. And she got it *(4)*.

Later, the acting department chair, a white man, did a similar thing. He had recommended pay raises for all of the male faculty members. She had earned a raise, too, but since she was married, he said she didn't need a raise. "For a man, marriage was seen as a positive characteristic, but not in my case" *(3)*.

From 1959 to 1962, the Shockleys lived in New York City. She served as visiting assistant professor at Albert Einstein College of Medicine, and he conducted research at the Rockefeller Institute (now University) *(6, 8)*. When they returned to Meharry, he was appointed chair of the Microbiology Department *(4)*.

Dr. Shockley's teaching skills were soon recognized. From 1963-1966, she received the Lederle Medical Faculty Award *(8)*. The purpose of the award, sponsored by the American Cyanamid Company, was to recognize Medical School faculty who made teaching their priority and integrated clinical medicine with the biological sciences *(17)*. Lederle could not have picked a more appropriate recipient.

In 1967, Dr. Shockley was promoted to associate professor of pharmacology *(6, 8)*. In 1988, she became acting chair of the Pharmacology Department. She was made permanent chair in 1994 *(3)*. That marked another breakthrough.

Dolores Shockley was the first African American woman to chair a department of pharmacology in the US.

Did you know?

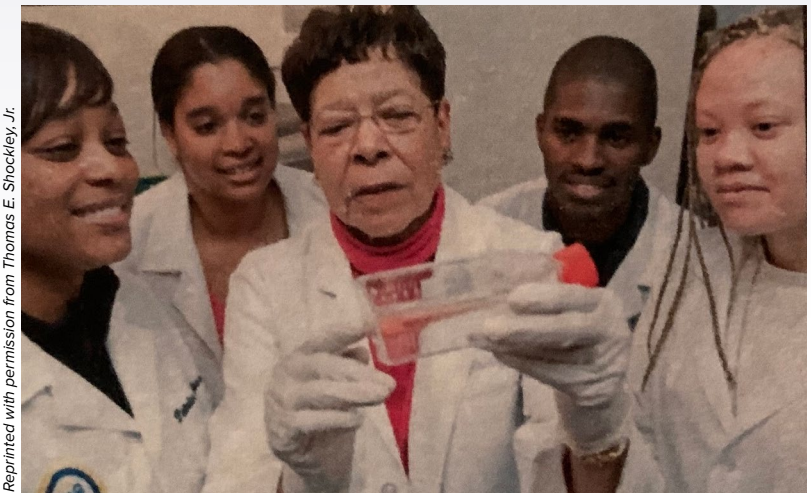
Currently, ASPET Council member Namandjé Bumpus is the only African-American woman chairing a pharmacology department at any medical school in the nation.

Integrating Research with Graduate Training

In her long career, Dr. Shockley's research interests covered a wide range of pharmacology topics. In the 1970s, she examined the effects of various drug classes on protein binding, drug-drug interactions, and the effect of dietary protein on liver metabolism *(18-20)*.

In the 1980s, she studied the effects of alpha-adrenergic agonists and antagonists on diuresis *(21)*. She also explored the effect of alpha-adrenergic drugs on opiate dependence and the use of S-adenosyl-L-methionine to create an animal model of parkinsonism *(22, 23)*.

She also studied the effects of certain drugs on stress: both how stress affects drug action and how drug administration affects the levels of stress-related biomolecules. In addition, she studied the efficacy of non-narcotic analgesics and how certain drugs affect nutrition *(6, 8)*.



Reprinted with permission from Thomas E. Shockley, Jr.

Dr. Shockley teaching her students

During her tenure as head of Meharry's pharmacology department, her research interests followed along two lines. One line explored pharmacological agents that interact with cocaine and other stimulants, with the goal of developing therapies for drug abuse *(24, 25)*. While studying the effects of cocaine on brain neurotransmitters, she reported that calcium channel blockers had the potential for treating patients with cocaine dependency and reversing acute cocaine overdose *(26)*. Specifically, the calcium channel blocker, isradipine, decreased the behavioral effects of cocaine in rats *(27)*. However, the benefit is dose-limited. High doses of calcium channel blockers potentiated the toxicity of cocaine *(28)*.

The other line of research focused on the neurotoxicity of polycyclic aromatic hydrocarbons, which are highly lipophilic molecules and widely dispersed in the environment. Using benzo(a)pyrene and fluoranthene as representatives of this chemical class, she showed a dose-dependent effect of these compounds and their metabolites on neurobehavior *(29-31)*. She also demonstrated that the acute neurotoxicity of benzo(a)pyrene was mediated by oxidative stress—specifically, inhibition of the brain antioxidant scavenging system *(32)*.

Finally, Dr. Shockley collaborated with colleagues on several clinical pharmacology studies. Using human liver microsomes, they found differences in metabolism of several drugs among the African American population, especially metabolism of H_1-antihistamines *(33, 34)*.

Most of Dr. Shockley's published research showcased the findings of graduate students who were conducting their dissertation research under her direction. More often than not, she gave them first-author status on the published articles.

A Dedicated Educator

Although Dr. Shockley was a productive researcher, she devoted most of her time and energy to graduate education *(3)*. The chairman who preceded her was an excellent pharmacologist, but under his leadership, the graduate training program had languished. Consequently, the department had trained few graduate students.

When she became the chair, she set a goal of graduating at least 3 PhD students every year *(3)*. Major universities typically have a large support structure to help their faculty identify and apply for grants *(7)*. But most historically Black colleges and universities have far less administrative support. HBCU faculty are on their

own when writing grant proposals and complying with the extensive federal grant requirements *(7)*.

Dr. Shockley had to work harder and be more persistent. But like every other endeavor, she accomplished this goal, too. It was with the greatest satisfaction that she received an NIH grant, which allowed her to build her department's graduate training program *(35)*.

To further broaden her students' exposure to pharmacology topics, she worked closely with Lee Limbird at Vanderbilt University. The two pharmacology departments developed a close collaboration. Monthly student seminars were held on both campuses. And each spring, a joint pharmacology retreat is held to foster collaboration and reciprocal mentoring.

Dr. Shockley's experiences in Scandinavia during her postdoctoral training had given her an international perspective, and she facilitated opportunities for her students to study abroad. She served as Meharry's foreign student advisor and as its liaison for international activities to the Association of American Medical Colleges *(5, 6, 8)*. Her goal was to ensure that "all of the students I train should be able to go much further than I did" *(3)*.

That philosophy is now at the core of all historically Black colleges and universities, where science, technology, engineering, and math (STEM) programs emphasize inclusivity *(36)*. They have found a way to give students a safe space to learn, while also preparing them to work in a predominately white world. Students are taught "to never question their intellectual capability and be willing to exude resilience in the face of difference and opposition" *(7)*.

In their study of ten historically Black institutions, Gasman and Nguyen found that "seeing African American students as capable of success from day one of their STEM experience can make a fundamental difference in how they perceive the likelihood and trajectory of their achievement" *(36)*.

For example, Dr. Shockley's alma mater, Xavier University of Louisiana, consistently produces more Black graduates who apply to and graduate from medical school than any other college or university in the country *(36)*. "Attending Xavier," Gasman and Nguyen said, "gives [students] the confidence that they will succeed in becoming a doctor. They have few doubts about the future they wish to achieve" *(36)*.

During Dr. Shockley's tenure as chair at Meharry, and largely through her efforts, nearly half of all the minority PhDs in pharmacology came from her department. "I think this will be my greatest contribution" *(3)*.

"seeing African American students as capable of success from day one of their STEM experience can make a fundamental difference in how they perceive the likelihood and trajectory of their achievement"

Her generosity and devotion to education extended well beyond the Meharry campus. She always made time and was truly delighted to help colleagues, family, and the community, as well as her students *(35)*. And she always did it with a smile. Her children observed, there were "no limits to what she would do to help" *(35)*.

She served on an outreach program that was associated with The Links, Inc., a national service organization of professional women of color. She also reached out to girls and introduced them to careers in science. She felt it was important for them to see African American women who had succeeded as scientists. "We have a responsibility to participate in outreach programs where young girls might be turned on to science" *(3)*. In her church, she tutored children in math and science *(3)*.

All four of the Shockley children received a college education, and two of them followed their mother into healthcare professions *(4)*. Thomas, Jr., became an orthopedic surgeon, and Janet is a pharmaceutical sales representative.

"She encouraged others with a sincere heart, not only her students but also her children and grandchildren, to ensure that they all reached their goals" *(35)*.

Dr. Shockley at Purdue University's Multicultural Programs Celebration, Honoring the Legacy and Accomplishments: Past to Present*, in 2017.*

Receiving Recognition

Dr. Shockley recognized the importance of participating in national professional societies, not only for her own career development but also to help her students launch their careers *(3)*. She joined ASPET in 1980 and became active in the Society's leadership. In 1988, she joined ASPET's Subcommittee on Minorities, which was under the Committee on Professional Affairs, and served as the subcommittee chair from 1991-1994. She also chaired ASPET's membership committee.

In 2010, ASPET honored her by establishing the Dolores C. Shockley Poster Award. This award recognizes students from under-represented groups who participate in the Society's annual Student/Postdoc Poster Competition.

Dr. Shockley also served on committees of the National Institutes of Health, the National Science Foundation, and the US Food and Drug Administration *(8)*.

In 2009, Vanderbilt University established the Dolores C. Shockley Lecture and Partnership Award, which recognizes individuals for their involvement in partnerships that foster minority scientist career development. The award is hosted by Vanderbilt's Pharmacology Department *(8)*.

In 2017, the American College of Neuropsychopharmacology (ACNP) established the Dolores Shockley Minority Mentoring Award to recognize ACNP members who have successfully mentored young scientists from under-represented groups in the field of neuropsychopharmacology.

Advice for Students

Dolores Shockley said that she never set out to be first at anything *(9)*. She simply wanted to do the best she could. But her "best" shattered barriers, and she has inspired generations of young men and women, not only to pursue their dreams, but also, as she said, to accomplish even more than she did.

In an interview when she was chair of pharmacology at Meharry, Dr. Shockley gave this advice to students who were considering a career in science: never be afraid to try, never be discouraged, close your ears to discouragement and negativity, study hard, get a good background in math, and realize that you will be reading all of your life *(3)*.

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Biosketch:

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In the next issue of *The Pharmacologist*...

Dr. Anderson will share the story of vaccines and Maurice Hilleman

Don't miss the March 2021 issue.

Meeting News

ASPET Announces Stand-Alone Annual Meeting Starting in 2023

This Fall, the ASPET Council voted unanimously to transition to a stand-alone ASPET annual meeting starting in 2023. We believe this is an opportunity to cultivate a stronger sense of community among members, greater creativity and flexibility in the meeting organization, more intimate networking interactions, and better overall value to our members.

The Council will be initiating a strategic planning process to design a new stand-alone meeting and as we move forward with implementation, we will be encouraging member participation and feedback. Stay tuned for additional information in the near future.

Read the full announcement at: https://www.aspet.org/aspet/news/news/2020/12/02/important-announcement-about-aspet-annual-meetings

Focus on Pharmacology Virtual Series

ASPET's Focus on Pharmacology Virtual Series was launched in July 2020 as a new venue for communicating cutting-edge science in pharmacology and experimental therapeutics. These webinars are broadcast live and have interactive components before, during, and after each session. The Focus on Pharmacology Virtual Series is sponsored by the Burroughs Wellcome Fund and is free for ASPET members. ASPET held 13 virtual sessions in 2020. Recordings of all the sessions are available in the ASPET*Connect* Focus on Pharmacology community.

Young Scientist Research Series

Several ASPET divisions have been using Focus on Pharmacology to feature their young scientists in scientific oral competitions.

Behavioral Pharmacology Postdoctoral Award Competition

Submitted by Gregory Collins

One of the most important aspects of the ASPET Annual Meeting is the opportunity for trainees to present their work to their peers and colleagues. Given that the 2020 meeting was cancelled due to the COVID-19 pandemic, the ASPET Program Committee established the Young Scientist Research Series to provide a virtual platform for our trainees to share their work with the larger ASPET community. The second in this series, which occurred on August 27, 2020, showcased the work of four postdoctoral fellows engaged in cutting-edge research in behavioral pharmacology. The speakers were selected based on abstracts submitted for the ASPET Annual Meeting at EB 2020, and included talks by Dr. Ewa Galaj from the National Institute on Drug Abuse Intramural Research Program, Drs. Fernando de Moura and Laura Erwin from Harvard Medical School/McLean Hospital, and Dr. Meghan Hibicke from Louisiana State University Health Sciences Center at New Orleans.

Dr. Galaj's talk entitled "Beta-caryophyllene, a Volatile Phytocannabinoid, Attenuates Cocaine Self-administration and Relapse in Rats" described an elaborate series of studies in which she demonstrated that the capacity of beta-caryophyllene, an FDA-approved food additive, to inhibit cocaine self-administration is mediated by its activation of peroxisome proliferator-activated receptor (PPAR)γ and PPARα, rather than its better known agonist actions at cannabinoid (CB)2 receptors. In summary, Dr. Galaj's work suggests that the repurposing of beta-caryophyllene might provide a novel approach to treating cocaine use disorder.

Dr. Moura's talk entitled "Receptor Mechanisms in Nicotinic Enhancement of Opioid Antinociception" described a series of studies in which he concurrently assessed the antinociceptive and rate decreasing effects mu-opioid receptor agonists and then evaluated the effectiveness of nicotinic drugs to selectively enhance the antinociceptive effect of opioids. Dr. Moura's work showed that the enhancement of opioid antinociception by nicotinic drugs is differentially influenced by efficacy at nicotinic (full > partial agonists) and opioid (partial > full agonists) receptors and ultimately suggests that nicotinic agonists may be clinically useful as adjuvants for opioid analgesia.

Dr. Hibicke's talk entitled "One Dose of Psilocybin in Late Adolescence Mitigates Deleterious Effects of Developmental Stress on Cognition and Behavioral Despair in Adult Female Rats" described ongoing efforts to evaluate the long-term antidepressant-

The Focus on Pharmacology series is free for all ASPET members!
If you know anyone who is not yet a member of ASPET and would be interested in attending the virtual sessions, encourage them to sign up for membership. Apply for membership at www.aspet.org/membership.

like effects of psilocybin using a chronic restraint stress model for depression and an object pattern separation task of hippocampal function in adolescent rats. Dr. Hibicke showed that a single dose of psilocybin in late adolescence was able to mitigate the cognitive and behavioral deficits produced by the adolescent stress exposure, thus providing further evidence for the development of psilocybin as a novel and long-lasting antidepressant.

Dr. Erwin provided the final talk in the session, entitled "Discriminative Stimulus Effects of (R)(-)-DOI and AM8936, a Synthetic Cannabinoid," and described studies aimed at determining the degree to which discriminative stimulus effects of cannabinoid CB1 receptor agonists overlapped with those of serotonin (5-HT)2A receptor agonists. Dr. Erwin's talk clearly demonstrated that there is bi-directional overlap between the discriminative stimulus effects of CB1 and 5-HT2A receptor agonists, suggesting similarities in their subjective effects that might contribute to the adverse effect profile of novel synthetic cannabinoids commonly identified in illicit drug preparations.

The talks were followed by a lively Q&A period that was moderated by Dr. Greg Collins from the University of Texas Health Science Center at San Antonio and Dr. Vanessa Minervini from Creighton University and featured questions submitted by the attendees via Zoom. In addition, the talks were judged by members of the Division for Behavioral Pharmacology executive committee. The winner, Dr. Ewa Galaj, was invited to join the committee as a postdoctoral representative. Although we all would have rather held this competition in person, this session provided a much-needed opportunity for the members of the Division for Behavioral Pharmacology, and larger ASPET community, to come together and talk about science.

View the recorded session at https://bit.ly/2Tomq09.

Professional Development Series

Zooming with Possibilities

Submitted by Jayne Reuben, PhD

The rapid transition to online learning has necessitated the rethinking of pharmacology instruction. This session provided attendees with a balance of easy-to-learn strategies and more detailed applications to engage students in remote/virtual learning environments. In addition, participants were able to move into breakout rooms to share the challenges that they have experienced in the transition to online teaching but also to get solutions in a small group setting from experienced educators and online instructors.

Dr. Jayne S. Reuben, instructional associate professor and director of instructional effectiveness at Texas A&M University College of Dentistry described various platforms available for student collaboration. She demonstrated examples of brainstorming/concept mapping platforms like the miro board (miro.com) and gaming activities like the new Poll Everywhere competition feature that can be used to make the virtual environment more interactive and student-centered. Dr. Reuben's students use Google documents to engage in asynchronous learning by asking and answering questions. Links to Zoom lectures can also be posted to the Google document so students have access to the session recordings before they are posted into Blackboard or other learning management systems (LMS). She cautioned against trying too many activities at once and suggested that faculty not be afraid to solicit feedback from their students and colleagues. She also recommended that faculty explore institutional resources including instructional designers, personnel from their Center for Teaching and Learning and College of Education faculty.

The second speaker was Dr. Helmut B. Gottlieb, a professor in the Department of Pharmaceutical

Sciences, Feik School of Pharmacy, at the University of the Incarnate Word. He gave demonstrations of his use of technology to engage students in face-to-face and synchronous online lecture formats. He presented several commercially available free polling programs that can be upgraded to include premium features (e.g., more than 40 students, grading, attendance, etc.). Many of these programs allow for integration with LMS platforms utilized by many institutions, including Blackboard and Canvas. Dr. Gottlieb uses Poll Everywhere to take attendance and keep students engaged throughout 2-3 hours lectures by including one to two polls within the first five minutes of class covering pre-assigned reading or previous class material. Another 2-3 polls are posted covering the major concepts every 15 minutes with the goal of regaining students' attention, reviewing important points, and preventing students from falling behind. Polls are also used to initiate discussions and stimulate participation.

Dr. Gottlieb provided a demonstration of PowerPoint animations and drawing tools that he uses to create storylines of how drugs work or illustrate a cellular response to a drug interacting with a receptor for example. He also uses them to visually direct students toward the main focus of the slide and showed how to build a dose-response curve and how a drug can bind and initiate a G protein–mediated signaling cascade pathway. Dr. Gottlieb included technology that he uses for drawing concepts: several drawing tablets, pen display monitors, and digital art pads that are available for purchase at various price points. These tools can be combined with Microsoft PowerPoint or OneNote to draw, write, and focus attention to one or more parts of the slide as well as combine the drawing to describe the processes and the animations to re-emphasize the concepts in a fluid visual description that was previously drawn.

Dr. Michelle Walker briefly described her responsibilities as a visiting professor in the Family Nurse Practitioner program in the Chamberlain University College of Nursing. Her presentation entitled "Using your LMS for Asynchronous Learning" explained the differences between approaches to asynchronous and synchronous learning and how the bulk of instruction is done asynchronously through posting and responding to students on weekly discussion threads. Dr. Walker uses these discussion threads to pose questions about case studies related to the weekly reading assignments. She explained that an instructor can determine if the students have a grasp of the content based on how completely they answer the initial questions for the thread. She discussed her use of the Socratic Method to encourage students with more in-depth questioning to think more critically about the content and to follow up if her students do not appear to completely grasp the material based on their discussion posts. Dr. Walker also provides peer-reviewed articles as a tool for students to apply and reinforce content learned from the textbook.

The session ended with a breakout discussion session facilitated by members of the Division for Pharmacology Education Executive Committee that provided an opportunity for session participants to exchange ideas and share solutions to common challenges encountered during the transition to online instruction.

View the recorded session at https://bit.ly/2HAZEzK.

Discover our next sessions at www.aspet.org/focus **and register on ASPET*Connect*. New sessions are regularly added to the schedule, so keep checking back!**

Thank you to our Focus on Pharmacology Virtual Series Sponsor

BURROUGHS WELLCOME FUND

The ASPET 2020 Focus on Pharmacology Series is brought to you with the generous support of Burroughs Wellcome Fund. Learn more about their Innovation in Regulatory Science Awards.
The application deadline is February 12, 2021.

Science Policy News

Recapping the Year in ASPET Advocacy

2020 confounded professional expectations for nearly everyone and the Science Policy department at ASPET was no exception. Though the year began somewhat predictably with the implementation of the FY 20 budget (signed into law on 12/20/19) and the ASPET 2020 Washington Fellows awardees flying to Washington, D.C. to advocate for increased funding for biomedical research in the FY 21 budget, by mid-March Capitol Hill had shut down and appropriators pivoted from working on FY 21 bills to writing emergency spending bills to combat COVID-19 and provide relief for U.S. citizens and industries. ASPET's advocacy pivoted, too, with some legislative and regulatory issues placed on hold while others emerged as pressing needs. The December issue of *The Pharmacologist* gives us an opportunity to look

back at the year in advocacy and take stock of the progress we've made and anticipate what's in store for the future.

Appropriations & COVID-19

In a repeat of previous years, Congress was again unable to pass appropriations bills under "regular order." At present, the House has passed 10 of its 12 appropriations bills and the Senate has passed zero. Because FY 21 began on October 1, the federal government is operating under a "continuing resolution" until mid-December (i.e., post-election). Below is a look at how the House's appropriations numbers match up with ASPET's requests, developed with FASEB:

- **National Institutes of Health (NIH)**
  - » $44.7 billion requested vs. $42.192 billion appropriated
- **National Science Foundation (NSF)**
  - » $9.1 billion requested vs. $8.548 billion appropriated
- **Department of Energy Office of Science (DOE SC)**
  - » $7.4 billion vs. $7.05 billion appropriated
- **Veterans Affairs (VA) Medical and Prosthetic Research Program**
  - » $860 million requested vs. $840 million appropriated

Additionally, in conjunction with its coalition partner the Alliance for a Stronger FDA, ASPET requested:

- **Food and Drug Administration (FDA)**
  - » $3.278 billion requested vs $3.212 billion appropriated

Though the release of the Senate numbers could have an impact on final numbers, at present it appears research agencies are in line for a much smaller percentage increase in funding than they

have received in recent years. ASPET and its partners pushed for increases at hill days, through fellowship programs, in testimony, and in correspondence with congressional leadership; however, the effects of the two-year budget agreement struck last year mean appropriators are working with a smaller pool of discretionary funds.

Appropriators have also had their hands full with emergency supplemental spending measures necessary to combat COVID-19. The three phases of the Coronavirus Aid, Relief, and Economic Security (CARE) Act have pumped infusions of funds into federal scientific agencies to fund the rapid development of therapeutics and a COVID-19 vaccine. ASPET and the scientific community have pushed for additional funds in a supposedly forthcoming CARES bill to assist researchers and institutions with costs incurred by shuttering labs. The community is also working with legislators to assist younger researchers. ASPET recently endorsed the Supporting Early Career Researchers Act to create a new postdoctoral fellowship program at NSF to help keep early career researchers whose employment opportunities have been impacted by the COVID-19 health crisis in the STEM pipeline. In addition to these efforts, ASPET also supports or supported bridge funding for stalled research projects, supplemental funding for NIH and the VA Medical Research Program, congressional resolutions condemning anti-Asian discrimination, and the establishment of a non-partisan committee to review the public health response to the pandemic.

Animal Research

ASPET continues to make progress towards its goal of becoming a leader in the animal research policy space. On the appropriations front, ASPET is working with a coalition of scientific societies and institutions to prevent language burdensome to researchers from being included in the final report that accompanies the FY 21 appropriations bill. ASPET also sent its own letter to the Senate Labor-HHS committee calling for the language to not be included. In the run up to the release of the final report, ASPET will continue to provide members the opportunity to contact their legislators to advocate directly on this important issue.

On the regulatory front, ASPET provided comment to an NIH Request for Information on enhancing rigor, reproducibility, and translatability in animal research. ASPET supports the goal of increased rigor and reproducibility but requested that if NIH were to move forward with requiring preregistration that it issue a separate RFI to explore the issue further. ASPET also suggested that some problems of rigor and reproducibility stem from low acceptance standards at scientific journals.

Lastly, ASPET developed a position paper on the adoption of research animals. ASPET supports adoption programs for healthy, post-study, research animals into long-term, private homes as companion animals provided they are an adoption program managed by the research institution itself, potentially under the guidance of an oversight body (e.g., an IACUC). This position paper will be used to formulate policy responses to future legislation and regulations on this issue. ASPET anticipates creating more position papers on animal research issues as we expand our involvement further.

Controlled Substances

ASPET's work in the area of controlled substances is still relatively new but ASPET has positioned itself as a leader in this space. At the beginning of this year, a legislative effort to make permanent the Drug Enforcement Administration's (DEA) temporary scheduling order placing all synthetic fentanyls into Schedule I was teed up for a vote in the Senate. ASPET worked with its partners to lobby the Senate Judiciary Committee to make the order temporary and during the interim request a report from the Government Accountability Office (GAO) on the effects of classwide scheduling. ASPET also sent a letter to the committee opposing classwide scheduling. The bill was modified to a temporary

order and included the directive to the GAO. That bill was signed into law in February.

In May, ASPET convened a group of members with expertise in Schedule I research to speak with the GAO's Health Policy Team regarding classwide scheduling. ASPET also helped organize several additional meetings among coalition partners so that GAO could hear from a wide range of researchers in multiple fields that would be impacted by the permanent placement of an entire class into Schedule I. The GAO is expected to issue its report early next year before the May expiration of the current temporary scheduling order.

Despite the challenges presented by COVID-19, and though work on all of these issues is far from over, ASPET's advocacy in 2020 has been fruitful and beneficial to our membership. And ASPET's advocacy doesn't stop at appropriations, animal research, and controlled substances. In addition to those issues, in 2020 ASPET's Science Policy department tackled the suspension of student visas, public access to peer-reviewed research, sexual harassment in STEMM, and anti-science bias in the public sphere. ASPET is looking forward to even stronger results and greater impact in 2021.

Keep Up-To-Date with Science Policy News

Sign up to receive ASPET's *Prescribed Policy* newsletter at https://www.aspet.org/aspet/advocacy/prescribed-policy-signup. *Prescribed Policy* is ASPET's monthly news summary that highlights legislative and regulatory developments that affect pharmacologists and biomedical researchers. If you have an item you'd like to highlight, please contact Tyler Lamb at tlamb@aspet.org.

Education News

Individual Summer Undergraduate Research Fellowship (SURF) Program

Applications Due Monday, February 1, 2021 for Summer 2021 Fellowships

ASPET's individual SURF program introduces undergraduate students to pharmacology research through a 10-week laboratory research experience. The goal of the program is to use authentic, mentored research experiences in pharmacology to heighten student interest in careers in research and related health care disciplines. The SURF individual awards are intended to support students whose institutions do not have a currently funded institutional SURF program. Research may be conducted at the student's home institution or another institution, as appropriate to the research project.

Who Should Apply

Undergraduate students conducting pharmacology-related research including, but not limited to, students representing departments of pharmacology, toxicology, pharmaceutical sciences, and/or biological chemistry are invited to apply to the program. Applications from women and underrepresented minorities are particularly encouraged.

Program Details

- Students must apply with a mentor who is a regular or affiliate member of ASPET in good standing or an emeritus member who is still active in research.
- Students and mentors must have already identified, and briefly describe, a summer research project that the student proposes to undertake.
- If awarded, ASPET will provide a student stipend of $2800 for a minimum of ten weeks' participation.
- The student must apply for membership in ASPET no later than the beginning of their summer research experience.

For more information and to apply, please visit https://www.aspet.org/awards/SURF/. For questions, please contact Catherine L. Fry, PhD at cfry@aspet.org.

Journals News

DMD Special Section on Natural Products

Natural products have been used by humans throughout history for medicinal purposes, and the current sales and use of natural products has increased dramatically in the past few decades. The general public often has the misperception that these products are "safe" since they are "natural" but may be unaware that natural products are not subject to the same pre-market testing requirements as pharmaceutical agents. Furthermore, generating better information for consumers on the safety and efficacy of natural products has been problematic as researchers and health care providers have lacked the resources and collaborations necessary to synthesize the results across scientific disciplines. The October issue of *Drug Metabolism and Disposition* addresses this educational need with articles on the state-of-the-art of natural product research and initiatives for improving human health. The guest editor for the special section, Dr. Mary Paine, has assembled 16 excellent articles, reviews, and commentaries that address natural product research ranging in scope from fundamental pharmacology and drug metabolism to clinical impact. Both Dr. Paine and the journal editor extend their thanks to the contributing authors and hope the ASPET community finds the October issue to be a valuable resource.

All of the articles in the special section are freely accessible through December 31, 2020 at https://dmd.aspetjournals.org/content/48/10.

JPET Special Section on Sexual Dimorphism

Chronic pain, drug abuse, and depression are complex diseases whose treatment and management are notoriously difficult. But there is one factor that is often ignored in the design and interpretation of studies on these diseases that adds an extra layer of complexity: sex. Sex differences have implications for brain wiring and the treatment of psychiatric disorders. Guest editors Dr. Stella Tsirka and Dr. Luisa Torres have gathered seven articles for the October *JPET* special issue that showcase original research and reviews pertaining to sex differences in the cells that control immune responses in the brain. Understanding the biological manifestations of such differences and their impact on the central nervous system might shape treatments for neurological and psychiatric disorders in the future.

The cluster of articles is freely accessible through December 31, 2020 at https://jpet.aspetjournals.org/content/375/1.

50 Years of Opioid Research – *Molecular Pharmacology* Special Section

The last 20 years have highlighted how devastating the use and abuse of opioids can be: around 50,000 preventable deaths from overdose each year, millions addicted, and a rising number of adolescents using illicit drugs. Curious how we got here and what you can do? Read up on the history. Learn about exciting new research. Discover new roles for opioids in our body. This special section of *Molecular Pharmacology* covers 50 years of fundamental research on opioids in a collection of reviews and original research articles brought together by Guest Editor Dr. Manojkumar A. Puthenveedu from leaders in the field.

All of the articles in the special section are freely accessible through December 31, 2020 at https://molpharm.aspetjournals.org/content/98/4.

Next *PR&P* Deputy Editor Selected

Jennifer Martin

Dr. Jennifer Martin has been chosen to serve as the next deputy editor of *Pharmacology Research & Perspectives* (*PR&P*), the open-access journal co-owned by ASPET, the British Pharmacological Society, and Wiley.

Dr. Martin is a senior physician in internal medicine and the chair of clinical pharmacology in the School of Medicine and Public Health at the University of Newcastle, Australia, and runs a large clinical pharmacology drug development and repurposing program. She is a director of Pathway of Research to Evaluation of Dose-Individualised Cancer Therapy (PREDICT), director of the Australia Centre for Cannabinoid Clinical and Research Excellence (ACRE), a board director of the Royal Australasian College of Physicians, and an elected member of the New South Wales Council at the Australian Institute of Company Directors. Over the last 12 years, she has been a member of the executive editorial teams of the *British Journal of Clinical Pharmacology*, the *Medical Journal of Australia*, and the *Internal Medicine Journal*.

Dr. Martin will begin the role in January 2021.

Molecular Pharmacology Adds a New Associate Editor

Cecilia Bouzat

Dr. Cecilia Bouzat was approved by the Board of Publications Trustees to serve as an associate editor for *Molecular Pharmacology*. Dr. Bouzat is the director of the Instituto de Investigaciones Bioquímicas de Bahía Blanca in Argentina. She is a research member of the National Research Council of Argentina and an associate professor of pharmacology with the Universidad Nacional del Sur.

Dr. Bouzat has served on the Editorial and Advisory Board of *Molecular Pharmacology* since 2013. She is a former member of the editorial board of *The Open Structural Biological Journal* and is a current member of the *Cellular and Molecular Neurobiology* editorial board. Dr. Bouzat has published nearly 100 journal articles and two book chapters. She has presented invited lectures through the Americas, in Europe, and in the UK.

New Associate Editor Joins *DMD*

Robert S. Foti

The Board of Publications Trustees approved Dr. Robert S. Foti to serve as an associate editor for *Drug Metabolism and Disposition* (*DMD*). Dr. Foti is a senior principal scientist with Merck in the Department of Pharmacokinetics, Pharmacodynamics and Drug Metabolism. He previously held positions with Amgen and Pfizer.

Dr. Foti has been a member of the *DMD* editorial board since 2012 and served as a guest editor for special sections in 2016 and 2019. He also serves on the editorial board of *Drug Metabolism Letters*. He has published 39 journal articles and 10 book chapters and invited reviews. Rob is chair of the ASPET Division for Drug Metabolism and Disposition and has been an ASPET member since 2012.

New *Pharmacological Reviews* Associate Editor

Jukka Hakkola

Dr. Jukka Hakkola has been named the Finnish Pharmacology Society's representative to the *Pharmacological Reviews* editorial board where he will serve as an associate editor. Dr. Hakkola is a professor of pharmacology and head of the Research Unit of Biomedicine at the University of Oulu. His research interests are metabolic pharmacology, xenobiotic-sensing nuclear receptors (especially PXR), diabetes and metabolic syndrome, fatty liver disease (NAFLD), hepatic molecular biology, endocrine disrupting chemicals, and cytochrome P450 enzymes. He has 72 peer-reviewed publications in international journals and has an *h*-index of 33.00. Dr. Hakkola was president of the Finnish Pharmacological Society from 2011 to 2013.

Editorial supervision of *Pharmacological Reviews* is shared jointly with the pharmacological societies of Britain, Denmark, Finland, Norway, and Sweden. As such, each of those societies has a representative on the journal's editorial board. Dr. Hakkola succeeds Dr. Markku Koulu as the Finnish society's representative. Dr. Koulu served the journal from 2007 until now.

New *JPET* Editorial Advisory Board Member

Gaetano Santulli

Dr. Gaetano Santulli has joined the Editorial Advisory Board of *The Journal of Pharmacology and Experimental Therapeutics*. He is an assistant professor of molecular pharmacology at the Norman Fleischer Institute for Diabetes and Metabolism, Albert Einstein College of Medicine, New York, NY.

In addition to being a reviewer for *JPET*, Dr. Santulli serves on the editorial board of several journals including *Diabetes*, *Scientific Reports*, *Cell Signaling*, and *Journal of Molecular and Cellular Cardiology*.

The Board of Publications Trustees thanks the new editorial appointments for their commitment and service to the journals and to ASPET.

Molecular Pharmacology Launches Emerging Concepts

In mid-September, the journal launched a new manuscript category called "emerging concepts." A short editorial at https://bit.ly/3kk8b7l explains the rationale for the type of article. Dr. David Gewirtz is the associate editor responsible for overseeing all papers in this category.

This category provides a venue for authors to present ideas for timely consideration by the journal's readership. For example, the article may present a new concept that the author feels is worthy of further investigation. The topic must be relevant to topic areas for the journal, and the manuscript must include appropriate citations. Emerging concepts papers are short – they are limited to three typeset pages. Submissions will be peer reviewed in a particularly expedited manner.

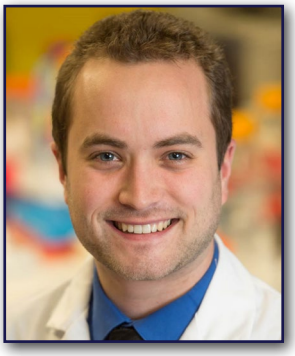
The first emerging concepts article is titled "Weak Microbial Metabolites: a Treasure Trove for Using Biomimicry to Discover and Optimize Drugs" and is freely accessible at https://bit.ly/33x6YmO.

Highlighted Trainee Authors

Congratulations to the latest Highlighted Trainee Authors selected for *Drug Metabolism and Disposition*, *The Journal of Pharmacology and Experimental Therapeutics*, and *Molecular Pharmacology*:

Drug Metabolism and Disposition

- Robert S. Jones (University at Buffalo/Genentech)
- Yu-Meng Jia (Xi'an Jiaotong University School of Public Health)
- Melissa Ruggiero (Kansas Medical Center)



Robert S. Jones

Yu-Meng Jia

Melissa Ruggiero

JPET

- Kirill Gorshkov (NIH National Center for Advancing Translational Sciences)
- Anne Gresch (University of Münster)
- Evelin Krajnc (ETH Zurich/ University Hospital Zurich)

Kirill Gorshkov

Anne Gresch

Evelin Krajnc

Molecular Pharmacology

- Amanda K. Davis (University of Michigan/ Zoetis)
- Miriam E. Barnett (University of Rochester)
- Elsa Martins (University of Geneva)

Amanda K. Davis

Miriam E. Barnett

Elsa Martins

A brief description of their areas of research, current projects, the anticipated impact of their work, and what they enjoy when not in the lab is online at https://bit.ly/2yX1YeH. We congratulate all of them for being selected.

Membership News

The Value of ASPET Membership

Everyone at ASPET works to fulfill the Society's 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. In this issue, we chatted with two international ASPET members to learn how their membership has benefitted their careers.

Helen Kwanashie is an ASPET member with Ahmadu Bello University in Nigeria. She joined ASPET in 2013.

Portions of this interview have been edited

Why did you join ASPET?

HK: Before joining ASPET, I had been a member of the West African Society for Pharmacology (WASP). Although WASP met some of my needs as a society, I needed more opportunities to interact with other pharmacologists on a wider international platform. which ASPET provided. The annual Experimental Biology (EB) meetings which ASPET co-hosts with four other FASEB societies was a major attraction to my joining ASPET. These multi-disciplinary annual gatherings of academia, industry, and government with no less than 10,000 attendees in any one year provide excellent fora for scientific discourse, networking, and collaboration relevant to my career advancement in pharmacology.

Other reasons why I joined ASPET include:

- the many divisions (10 in total) that facilitate interaction among members with similar interests
- the many awards at general and division levels (of which I have been a recipient)
- education and career opportunities
- ASPET's high-quality journals and other publications

How has membership in ASPET benefitted your career? HK:

HK: Membership in ASPET has benefitted my career as a university teacher and researcher in many ways, including the following;

- I have been provided a platform, especially though the Experimental Biology (EB) meetings, to interact with, network, and forge collaborations with other pharmacologists and academics from related fields.
- My primary membership in the Division for Pharmacology Education (DPE) has enhanced my skill set in the subject area and improved my teaching - thus achieving a multiplier effect.
- In 2017, I received an ASPET Pharmacology Educator travel award.
- My print subscription to *The Pharmacologist* is a focal point in my discourse with colleagues and students because of its rich content. This has resulted in some becoming ASPET members.
- I have easy access to ASPET's high-quality journals.

Why do you think it is important to attend the ASPET Annual Meeting at EB?

HK: It is of paramount importance for members to attend the ASPET Annual Meeting at EB, attended by about 1,500 members every year. EB provides an excellent forum to share one's research in pharmacology and experimental therapeutics with others in the field and provides limitless opportunities to forge networks and collaborations as well as generally advance one's career. The mix of related disciplines (anatomy, physiology, biochemistry, molecular biology, pathlogy, and pharmacology) and the opportunities that are offered is awesome! During the ASPET Annual Meeting at EB, it is also important to attend the awards ceremony and be motivated to aspire for more advances in one's career as a pharmacologist.

What advice would you give members who want to get more involved in ASPET?

HK: Simply joining ASPET is not enough. In order to benefit maximally from the society, as well as contribute to its growth and development, one needs to get more involved in ASPET - in other words, be an active member.

Getting more involved begins with a commitment to annual renewal of membership, as well as paying attention to and responding to communications from the society. Other ways to get more involved include attending its annual Experimental Biology (EB) meetings and publishing in one or more of its journals. I would further advise members who want to get more involved in ASPET to be active in at least one division of the society, help to advertise and recruit more members, and volunteer to take part in its programs such as the mentoring network. More recently, ASPET*Connect* offers a communication platform that brings traditional elements of networking and the more modern social media together.

What advice would you give to someone who is interested in a career in pharmacology?

HK: My advice to someone interested in a career in pharmacology would include an exposition to sub-specialties that they may choose from. The major ones are in academia (teaching and research in higher education), as a clinician (in hospital settings), and in industry (pharmaceutical and biotechnology). Other career possibilities are science communication/public engagement/training, regulatory agencies, policy formulation and implementation, etc. I would advise such persons to join their national and regional pharmacology societies in order to foster interactions with other pharmacologists.

In addition, I would advise that such individuals join one or two of the bigger societies with global outreach such as ASPET and the British Pharmacological Society (BPS), even if the society is outside their geographical zones. ASPET for example has several resources (e.g., teaching guides and career development information), programs (e.g., internships and mentoring network), etc., geared at supporting members in all career stages from graduate student to established professor, toward individual career advancement and job satisfaction. I would encourage anyone interested in a career in pharmacology to, among others, join ASPET and get really involved in a give-and-take manner - contributing to, as well as benefitting from, the society.

Where do you see pharmacology going in the future and why is it important to be an ASPET member?

HK: Going forward, I see pharmacology being less discrete and more diffuse in the sense that there will be more integration with related disciplines such as anatomy, physiology, biochemistry, molecular biology, pathology, genetics, nutrition, and immunology, etc. In particular, I see pharmacology interfacing more and more with immunology, molecular biology, and genetics. This will not be unique to pharmacology though, as the dividing lines between the life and biomedical sciences are fast disappearing - which is productive and good.

Similarly, even now, ASPET, like pharmacology, is in a good place; and like pharmacology, the prospects for ASPET in the future are challenging but exciting. Being an ASPET member will enable one to make contributions within one of the foremost pharmacology societies worldwide. In this role, and working collaboratively with other frontline pharmacology societies such as the BPS, industry, and government, one sees ASPET playing a leadership role in helping to shape the structure and operations of the International Union of Basic and Clinical Pharmacology (IUPHAR). In this regard, ASPET members are uniquely positioned to contribute to this effort to advance the science and application of pharmacology globally, transform discoveries into therapies, and contribute to global healthcare. In the midst of the novel coronavirus/COVID-19 pandemic, there is no time more appropriate than now to be an active ASPET member and make important contributions to global health in all ramifications.

Martin Michel is an ASPET member with Johannes Gutenberg University in Germany. He joined ASPET in 1990.

Why did you join ASPET?

MM: I joined ASPET more than 30 years ago when embarking on a postdoc in San Diego. My German supervisor advised me to because he felt that it was important for building a network. While networking seems standard advice today, it was not that routine in the 1980s. He gave another piece of advice that I found to be true: join few societies but be active in those you join.

How has membership in ASPET benefitted your career?

MM: What my German supervisor had advised turned out to be very true. I actively used ASPET to build a network in the US and maintained and expanded it after having returned to Germany. A sound understanding of how US researchers think and approach problems helped a lot in getting my papers published in US journals such as *Molecular Pharmacology* or the *American Journal of Physiology*.

On a very practical note: we got stranded at the tail end of a vacation on the West Coast after 9/11 and could not fly home but needed specialized medical care for my wife. I contacted an ASPET colleague nearby, and he was able to arrange that care within a few hours, so we could safely stay and wait until flights to Germany became available again two weeks later.

Why do you think it is important to attend the ASPET Annual Meeting at EB?

MM: Some people do not like these "big" meetings, but I do. The way it works for me is to focus on two things: extensive discussions with other researchers close to my own area of interest during the poster sessions and broadening my horizon by listening to selected symposia outside this area. And, of course, talking to people in the hallways and during receptions to maintain and expand that network.

What advice would you give members who want to get more involved in ASPET?

MM: Join one of the divisions and perhaps even a committee to increase your visibility. Talk to poster presenters, not only about their science but also about their experience in building a career. The career workshops during ASPET meetings also can be very helpful.

As someone who has worked in industry, what advice would you give to someone who is interested in a career in pharmacology?

MM: In a non-growing system (basically applies to academia in all industrialized countries), each professor by average can train only one person to reach the same career level in academia. If she has 20 trainees, the chance of finding a permanent academic position dwindles to 5%. All the others, sooner or later, will have to look for jobs outside of academia. Thus, looking for other jobs is not plan B, it is plan A. You can only find the job that is best for you if you learn about the various jobs that are out there. Attending ASPET meetings and talking to poster authors working outside academia can be a great way to learn about other options. And perhaps one of these conversations will lead to a job offer – you never know.

Where do you see pharmacology going in the future and why is it important to be an ASPET member?

MM: I love pharmacology for two reasons: it integrates questions and techniques from many disciplines, and it is aimed at developing treatments that will help people or animals. Being a part of the ASPET family will help to build the networks and identify the career opportunities that are right for you.

Be Sure to Renew Your Membership By December 31, 2020

Thank you for your continued investment with ASPET. Without your loyalty and support, we would not be able to provide our members with valuable benefits or continue our efforts developing and growing our pharmacology community. Please renew your membership by December 31, 2020.

Complete your renewal online by visiting www.aspet.org/renew or by contacting Member Services at 301-634-7060.

New Members

Regular Members

Nii Addy, Yale Sch of Med, CT
Thomas E. Ballard, Jr, Takeda Pharmaceutical Co Ltd, MA
Caroline A. Browne, Uniformed Services Univ of the Health Sciences, MD
Michael J. Brownstein, Azevan Pharmaceuticals, MD
Christopher L. Brummel, Concert Pharmaceuticals, MA
Kevin Church, Athira Pharma, Inc, WA
Pankaj R. Daga, Simulations Plus Inc, CA
Ying Guo, Xi'an Jiaotong Univ, China
Dayna M. Hayes, Radford Univ, VA
Shahrdad Lotfipour, Univ of California, Irvine
Rania Magadmi, King Abdulaziz Univ, Saudi Arabia
Atefeh Rabiee, Univ of the Pacific, CA
Adam Snook, Thomas Jefferson Univ, PA
Varun K. Soti, Lake Erie Coll of Osteopathic Med, NY
Laura S. Van Winkle, Univ of California, Davis
Jun Yoshioka, CUNY Sch of Med, City Coll of New York

Postdoctoral Members

Kara R. Barber, Univ of Arizona
Sinisa Cikic, Tulane Univ, Sch of Med, LA
Erik J. Garcia, Univ of Texas Med Branch, Galveston
Briana Mason, Univ of Texas HSC, San Antonio
Justin Meyerowitz, Stanford Univ, CA
Thomas J. Velenosi, NCI/NIH, MD

Graduate Students

Michael Anthony Abala, California Northstate Univ
Miriam Barnett, Univ of Rochester, NY
LaTaijah Crawford, Pennsylvania State Univ
Lucas B. Fallot, Uniformed Services Univ of the Health Sciences, MD
Laken Kruger, Washington State Univ
Yuma Ortiz, Univ of Florida
Kalina Reesec, Univ of Wisconsin
Nayiar Shahidc, Univ of Alberta, Canada
Gagandeep Singh, Univ of Toledo, OH
Jacqueline Smith, Univ of Texas Med Branch, Galveston
Joshua C. Zamora, Univ of Texas Med Branch, Galveston
Stephanie Zawada, Mayo Clinic - Graduate Sch of Biomedical Sciences, AZ
Diana Zebadua Unzaga, Univ of Tennessee

Post-Baccalaureate Students

Tomas Moutinho, Univ of Campinas, Brazil
Nipuna Weerasinghe, Univ of Arizona

Undergraduate Students

Nafis Eghrari, Arizona State Univ
Skylar N. Groves, Norfolk State Univ, VA
Anh Luu, Ohio Northern Univ

In Sympathy

ASPET notes with sympathy the passing of the following members:

Joseph L. Borowitz, PhD
Karen Seibert, PhD
Dolores Cooper Shockley, PhD
William B. Pratt, MD

Members in the News

Achievements, Awards, Promotions, and Scientific Breakthroughs

Jerri M. Rook

Vanderbilt University

Jerri M. Rook, assistant professor of pharmacology at Vanderbilt University, has been awarded the 2020 Melvin R. Goodes Prize for Excellence in Alzheimer's Drug Discovery. Presented by the Alzheimer's Drug Discovery Foundation, the prize recognizes leading researchers who are developing treatments for Alzheimer's disease and related dementias. Dr. Rook's research focus over the past 10 years has been on developing treatments for the cognitive decline associated with Alzheimer's disease. Her work has contributed to the development of the small molecule VU319, which targets a protein receptor in the brain that is essential to normal brain function, learning, and memory. This new method, known as positive allosteric modulation, is helping to fine-tune the circuitry of the brain.

Dr. Rook has been a member of ASPET since 2010 and is a member of the **Divisions for Neuropharmacology, Behavioral Pharmacology, Drug Discovery and Development, Drug Metabolism and Disposition**, and **Molecular Pharmacology**.

Daniel S. Pilch

Rutgers Robert Wood Johnson Medical School

Daniel S. Pilch is professor of pharmacology at Rutgers Robert Wood Johnson Medical School (RWJMS) and co-founder of Taxis Pharmaceuticals, Inc. Dr. Pilch was recently awarded the 2020 Professor Richard A. Harvey Excellence in Teaching Innovation Award for his outstanding contributions to medical education and curricular development at RWJMS. Dr. Pilch serves as a course director and oversees the pharmacology content of the curriculum at RWJMS. In 2015, Dr. Pilch was elected to membership of the Alpha Omega Alpha Honor Medical Society.

His research is focused on the development of new antibiotics that can be used in the treatment of infections caused by multidrug-resistant bacterial pathogens of acute clinical importance. Toward this goal, Dr. Pilch has worked on developing agents that target the essential cell division protein FtsZ. One of the lead agents (TXA709) resulting from this effort is currently undergoing clinical trials for the treatment of methicillin-resistant *Staphylococcus aureus* (MRSA) infections.

Dr. Pilch has been a member of ASPET since 2018 and is a member of the **Divisions for Pharmacology Education, Drug Discovery and Development, Drug Metabolism and Disposition**, and **Molecular Pharmacology**.

Jed Lampe

University of Colorado, Skaggs School of Pharmacy

Jed Lampe is an assistant professor at the University of Colorado Skaggs School of Pharmacy. He was recently selected for the prestigious University of Washington Alumni Award, "125 Alumni Legends for 125 Years," identifying him as one of 125 UW School of Pharmacy alumni legends "who have made significant contributions to the field of pharmacy by charting new territories spanning science, research, and patient care in an evolving healthcare system."

Dr. Lampe has been a member of ASPET since 2015 and is a member of the **Divisions for Drug Metabolism and Disposition** and **Drug Discovery and Development**.

Rong Huang

Purdue University

Rong Huang is an associate professor in the Department of Medicinal Chemistry and Molecular Pharmacology at Purdue University. Her lab applies an interdisciplinary approach to understand the molecular mechanisms of protein N-terminal modifications, design selective and potent inhibitors for methyltransferases and acetyltransferases, and develop targeted epigenetic drugs. She has been named a Showalter University Faculty Scholar, which is supported from the Ralph W. and Grace M. Showalter Trust. This represents an official recognition of the expertise and excellence specifically in life sciences at Purdue University.

Dr. Huang has been a member of ASPET since 2019 and is a member of the **Divisions for Drug Discovery and Development, Cancer Pharmacology, Drug Metabolism and Disposition, Molecular Pharmacology**, and **Translational and Clinical Pharmacology**.

J. Silvio Gutkind

University of California, San Diego

J. Silvio Gutkind has been appointed chair of the Department of Pharmacology at the University of California, San Diego (UCSD) School of Medicine. He earned a PhD in pharmacy and biochemistry from the University of Buenos Aires, Argentina, and received postdoctoral training at the NIMH and NCI. He established his laboratory at the NIH, where he was the chief of the Oral and Pharyngeal Cancer Branch (NIDCR). He joined UCSD in 2015 as professor in the Department of Pharmacology, and associate director of basic science at the Moores Cancer Center. Dr. Gutkind has made seminal discoveries on GPCR signaling, with emphasis on the role of G proteins and GPCRs in cancer. He has published more than 500 research articles in some of the most prestigious journals. Among Dr. Gutkind's many awards and accolades are the IADR's Distinguished Scientist Award, an NIH Merit Award, and the Pharmaceutical Research and Manufacturers of America's Research & Hope Award for Excellence in Academic Research, for his seminal studies on GPCR function in cancer. Dr. Gutkind was elected in 2019 to the National Academy of Medicine, recognizing his team's translational efforts in the area of cancer signaling. He has supervised and mentored many junior investigators, who are now playing leadership roles in multiple institutions in the U.S. and abroad.

Dr. Gutkind has been a member of ASPET since 2015 and is the current chair for the **Division for Molecular Pharmacology**. He is also a member of the **Division for Cancer Pharmacology**.

Nancy Kanagy

University of New Mexico Health Science Center

Nancy Kanagy was recently named chair of the Department of Cell Biology and Physiology at the University of New Mexico School of Medicine. She is the first woman to hold this position. In addition to her position as chair, Dr. Kanagy is a tenured professor and leads a successful research program where she investigates mechanisms associated with endothelial function on blood pressure regulation and hypertension. When asked what the toughest part about the position has been so far, she replied: "Running the department virtually. It makes it difficult when we can't stop by each other's offices to chat." Dr. Kanagy is a former executive committee member for the Division for Cardiovascular Pharmacology and just received her 25-year ASPET membership certificate.

Dr. Kanagy has been a member of ASPET since 1995 and is a member of the **Divisions for Cardiovascular Pharmacology, Toxicology**, and **Translational and Clinical Pharmacology**.

Clinton Webb

University of South Carolina

Clinton Webb has recently been named director of the new Cardiovascular Translational Research Center at the University of South Carolina. The center serves multiple schools at the university as it fulfills its mission to improve cardiovascular health in South Carolina and beyond through cutting-edge research, education, and service. The immediate goal of the center is to establish a diverse vibrant faculty who will develop collaborative programs addressing vascular and cardiac diseases.

Dr. Webb has been a member of ASPET since 1993 and is a past-chair of the Division for Translational and Clinical Pharmacology and the CVP Awards Committee. He was a field editor for the *Journal of Pharmacology and Experimental Therapeutics* from 1993 to 1998 and has served on the Graduate Student Convocation and Graduate Recruitment and Education Committees of ASPET. He is a member of the **Divisions for Cardiovascular Pharmacology** and **Translational and Clinical Pharmacology**.

Bradley McConnell

University of Houston

Bradley McConnell was recently promoted to full professor of pharmacology at the University of Houston, College of Pharmacy, Department of Pharmacological and Pharmaceutical Sciences. Dr. McConnell has been a faculty member at the University of Houston since 2008 and leads a successful research program where he and his research team are interested in defining β-adrenergic receptor (β-AR) mediated "biased" signaling, characterizing A-kinase Anchoring Protein (AKAP) "signalosomes" mediated signaling, and reprogramming progenitor cells to form mature cardiac conduction cells for heart repair. His research has been supported by the National Institutes of Health, the American Heart Association, and the Robert J. Kleberg, Jr. and Helen C. Kleberg Foundation.

Dr. McConnell currently serves as the programming chair for ASPET's Division for Cardiovascular Pharmacology. He is also a Fellow of the American Heart Association (FAHA) and a Fellow of the American Physiological Society's Cardiovascular Section (FCVS). Dr. McConnell has been a member of ASPET since 2013 and is a member of the **Divisions for Cardiovascular Pharmacology** and **Molecular Pharmacology**.

Kevin Murnane

Louisiana State University Health Sciences Center, Shreveport

Kevin Murnane was recently appointed to the position of associate professor in the Department of Pharmacology, Toxicology, and Neuroscience at Louisiana State University (LSU) Health Sciences Center, Shreveport. His research group is focused on the etiology, pathophysiology, pharmacology, neurobiology, and treatment of disorders of the central nervous system. Areas of special emphasis include substance use disorders, comorbid mood changes, and cognitive impairments, as well as neurodegenerative decline following exposure to abused substances. Recent studies have focused on the relationships between natural products, neuroinflammation, oxidative stress, and brain monoamine systems that are associated with mood, motivation, and cognition. Additionally, Dr. Murnane was appointed as the director of basic sciences research at the Louisiana Addiction Research Center (LARC). The mission of LARC is to provide addiction research and education in an integrated environment, pursuing the latest in innovative approaches and learning.

Dr. Murnane has been a member of ASPET since 2006. He is a member of the **Divisions for Behavioral Pharmacology, Drug Discovery and Development, Neuropharmacology**, and **Toxicology**.

Alicja Urbaniak

University of Arkansas

Alicja Urbaniak was recently promoted to the rank of instructor at University of Arkansas for Medical Sciences (UAMS). Dr. Urbaniak received her PhD in chemistry from Adam Mickiewicz University in 2017 and immediately after joined UAMS as a post-doctoral fellow in the laboratory of Dr. Timothy Chambers. Her research interests include therapeutically targeting cancer stem cells to disrupt key aspects of their function (self-renewal, drug resistance, tumor recurrence after therapy, and metastatic spread to distant organs). She is especially interested in breast cancer biology and discovery of novel small molecules with activity against breast cancer stem cells. Her current research project focuses on developing 3D tumor organoid models to better mimic tumor architecture and to facilitate rapid screening of small molecule drug candidates selectively active against cancer stem cells.

Dr. Urbaniak has been a member of ASPET since 2016 and serves as a member of the Executive Committee and communications officer for the Division for Drug Discovery and Development. She is also a member of the **Divisions for Cancer Pharmacology, Molecular Pharmacology**, and **Translational and Clinical Pharmacology**.

Grover P. Miller

University of Arkansas for Medical Sciences

Grover Miller is a professor in the Department of Biochemistry and Molecular Biology at the University of Arkansas for Medical Sciences. In September, he and his collaborator, S. Joshua Swamidass, MD, PhD, at Washington University-St. Louis, secured a multi-PI NIH R01 grant from NIGMS to fulfill aims described in their proposal entitled “Systematic Discovery of Bioactivation-Associated Structural Alerts” as a follow up to two previously NIH-funded studies. In their team, Dr. Swamidass develops metabolism and bioactivation models, while Dr. Miller experimentally assesses their performance and develops strategies to integrate them into study workflows. In broader terms, Dr. Miller’s research emphasizes the design and use of quantitative approaches to more accurately measure metabolism and bioactivation as a foundation for more robust correlations with toxicological mechanisms and outcomes. The potential impact of this approach was recognized earlier this year in his selection as a Sternfels Prize in Drug Safety finalist for a study on assessing bioactivation risks of tyrosine kinase inhibitors.

Dr. Miller has been a member of ASPET since 2016 and is also a part of the *Drug Metabolism and Disposition* editorial board. He is a member of the **Divisions for Drug Metabolism and Disposition, Cancer Pharmacology, Drug Discovery and Development, Molecular Pharmacology**, and **Toxicology**.

Samba Reddy

Texas A&M University College of Medicine

Samba Reddy has been named a 2020 Chancellor EDGES Fellow recipient for his significant accomplishments in neurosciences and drug discovery research. The EDGES Fellowship was launched in 2019 to honor faculty members who have demonstrated significant accomplishments and high levels of discipline in their respective fields. The Texas A&M Association of Former Students has also conferred Dr. Reddy with a Distinguished Achievement Award, the highest honor at the university level.

Dr. Reddy has been a member of ASPET since 1999. He is an Editorial Board member for the *Journal of Pharmacology and Experimental Therapeutics*. Dr. Reddy is a member of the **Divisions for Neuropharmacology, Drug Discovery and Development**, and **Translational and Clinical Pharmacology**.

Michael F. Jarvis

University of Illinois, Chicago

Michael Jarvis retired from AbbVie, Inc. as the ACOS Senior Research Fellow and Senior Scientific Director of Global Medical Affairs, on October 30, 2020 after 25 years of service. Over the course of his career, he contributed to all phases of drug discovery and development. A primary focus of his basic research was drug target identification and validation in neurological diseases including stroke, chronic pain, and inflammation. Dr. Jarvis has led multidisciplinary teams of scientists (molecular biology, chemistry, electrophysiology, and behavioral pharmacology) to interrogate a diverse array of Gprotein-coupled receptors and ligand-gated and voltage-gate ion channels as targets for the management of chronic pain. More recently, he supported nonclinical (safety) and clinical research for established drug therapies for a variety of indications including epilepsy, pain, neurology, cardiology, immunology, cystic fibrosis, and COVID-19. He has also developed clinical drug therapy transition strategies for the management of difficult diseases including epilepsy.

Dr. Jarvis has been a member of ASPET since 1992 and has served the Society in a variety of leadership, committee, and editorship positions. He will be taking over as Editor-in-Chief of *Pharmacology Research & Perspectives* in January 2021. Dr. Jarvis is a member of the **Divisions for Drug Discovery and Development, Behavioral Pharmacology, Neuropharmacology**, and **Translational and Clinical Pharmacology**.

Michael Rieder

Western University

Michael Rieder is a distinguished university professor in the Departments of Paediatrics, Physiology, and Pharmacology and Medicine at Western University and a scientist at the Robarts Research Institute. He is an MD/PhD trained in Canada and the U.S. with a long-standing research program in drug safety. Dr. Rieder holds the CIHR-GSK Chair in Paediatric Clinical Pharmacology at Western University. His research is focused on the pathophysiology of drug hypersensitivity, understanding the basis of variability in drug safety and in optimal therapy for children. On September 18, 2020, he was elected as a Fellow of the Canadian Academy of Health Sciences (CAHS). The CAHS Fellowship is one of the highest honors for members of the Canadian Health Sciences Community and Fellows are elected on the basis of leadership and achievement in advancing academic health science.

Dr. Rieder has been an ASPET member since 2018. He is a member of the **Divisions for Translational and Clinical Pharmacology, Pharmacology Education**, and **Toxicology**.

Srinivas Sriramula

East Carolina University

Srinivas Sriramula, assistant professor in the Department of Pharmacology and Toxicology, Brody School of Medicine at East Carolina University, has been awarded a new RO1 research grant "Neuroimmune Mechanisms of Kinin B1 Receptor in Hypertension" by the NIH. This 5-year grant for a total expected award of $1.8 million in funding will support his laboratory's continued research efforts in investigating the neural control mechanisms of hypertension. Dr. Sriramula's research is primarily focused on understanding the bidirectional communication between the central nervous system and the immune system in regulation of blood pressure. His research project addresses a highly novel role for kinin B1 receptor signaling in neuro-immune interactions of blood pressure regulation and provides insights for developing novel therapeutics in the future for the treatment of hypertension.

Dr. Sriramula has been a member of ASPET since 2017 and is a member of the **Divisions for Neuropharmacology, Cardiovascular Pharmacology, Molecular Pharmacology**, and **Translational and Clinical Pharmcology**.

Dawn Kuszynski

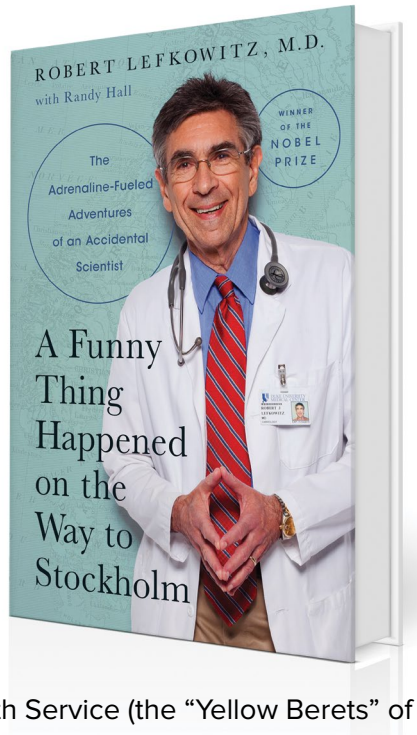
Michigan State University

Dawn Kuszynski is a fourth year PhD candidate in the Department of Pharmacology and Toxicology at Michigan State University. In Dr. Adam Lauver's laboratory, her work focuses on the adverse bleeding side effects that are associated with clopidogrel. She was recently awarded an NHLBI F31 grant entitled, "The Vascular Effects of Clopidogrel Metabolites." This grant focuses on determining how bleeding associated with clopidogrel treatment is mediated, in part, by non-platelet effects. Her hypothesis is that clopidogrel modulates purinergic receptor signaling pathways in the vasculature that results in vascular dysfunction and bleeding without a correlated decrease in platelet aggregation.

Ms. Kuszynski has been an ASPET member since 2019. She is a member of the **Divisions for Cardiovascular Pharmacology, Drug Discovery and Development, Toxicology**, and **Translational and Clinical Pharmacology**.

Member Spotlight: Robert J. Lefkowitz and Randy Hall - How to Deal with Distortion of Your Research on Television Game Shows

Submitted by Robert J. Lefkowitz, MD and Randy Hall, PhD



Robert Lefkowitz has written a memoir (with Randy Hall) entitled *A Funny Thing Happened on the Way to Stockholm: The Adrenaline-Fueled Adventures of an Accidental Scientist*, to be released by Pegasus Books on February 2, 2021.

Bob Lefkowitz has been an ASPET member for such a long time that he doesn't actually remember when he joined. It was at some point during the 1970's, a hazy decade for many who lived through it (we looked it up for him – he joined in 1977). In 1978, he won the society's John J. Abel Award, a prestigious prize given to young investigators who have made outstanding contributions to pharmacology. And what did his mother say upon learning of this illustrious honor?

"Well, that's nice Bobby, but it's not the Nobel Prize."

The story of Bob's demanding mother and many, many other stories are told in Lefkowitz's new memoir. This book recounts Lefkowitz's beginnings as a young cardiologist, his serendipitous move into research as a commissioned officer in the United States Public Health Service (the "Yellow Berets" of the NIH) to avoid being shipped off to Vietnam, and his scintillating research career at Duke that culminated in a Nobel Prize in 2012. An exclusive excerpt from this new book, in which Lefkowitz recounts some of his misadventures with the media, is presented below.

I was sitting down to dinner with my wife Lynn when my Uncle Henry called, breathless with excitement.

"Bobby! Bobby, I'm so proud of you. I can't even believe it. Your name was an answer on *Jeopardy!*"

I tried to interject something, but the words just kept pouring out of Uncle Henry's mouth in a torrent.

"It was something about sperm! Like, how does the sperm sense the egg? Oh Bobby, I'm just so proud of you. When you make it to Scotland, I'm coming with you."

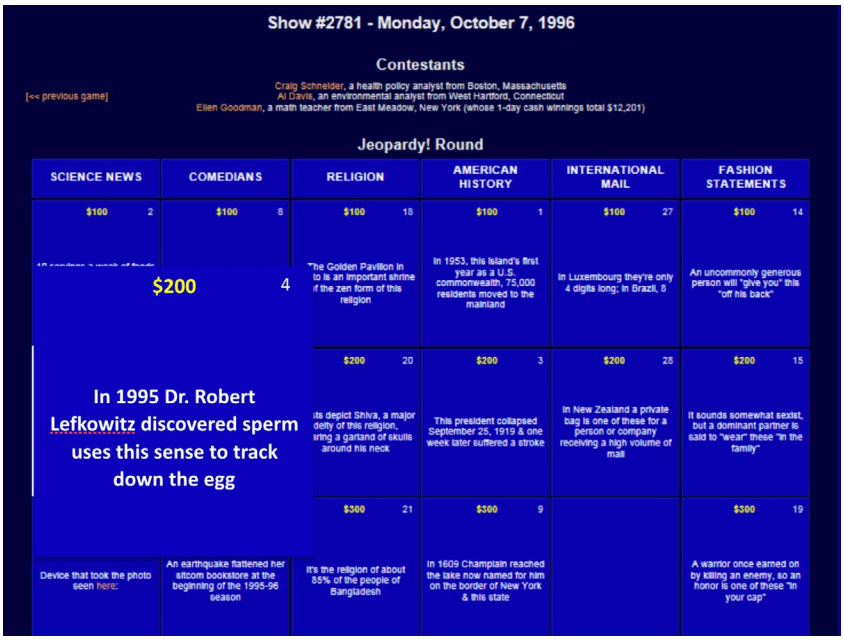
"Scotland? Why would I be going to Scotland?" I asked.

"You know, when you win that big prize," he replied.

"Do you mean Stockholm?"

"Scotland, Stockholm, what's the difference? I know you're going to win it soon. If your name is being mentioned on *Jeopardy!*, you must be getting close."

Uncle Henry was calling from New York City, where he obsessively watched the game show *Jeopardy!* every evening at 6:00 PM. In my home city of Durham, North Carolina, *Jeopardy!* didn't air until 6:30 PM, so Lynn and I turned on the TV and watched *Jeopardy!* during dinner. Sure enough, halfway through the first round, the $200 question in the category "Science News" was: "In 1995 Dr. Robert Lefkowitz



discovered sperm uses this sense to track down the egg." The contestant correctly responded, "What is smell?"

Given the status of *Jeopardy!* as the premier television game show in the USA, many people would view it as the culmination of a lifelong dream to have their name featured in a *Jeopardy!* answer. In my case, I had finally made it onto *Jeopardy!*, but with a major caveat: I was being credited with a discovery that I didn't actually make.

I have never conducted research on sperm motility. Indeed, despite the fact that I am a father of five, I must confess that I know very little about sperm. Most of my life's work has been focused on understanding how adrenaline exerts its effects through a large family of adrenergic receptors, and how these adrenoceptors and other G protein-coupled receptors are regulated by cellular processes such as phosphorylation and binding to beta-arrestins. So how did it happen that my name ended up associated with a question about sperm on the *Jeopardy!* episode that aired on October 7, 1996? The answer to that question requires a flashback to a year and a half earlier.

In early 1995, a science writers' conference was held at Duke University, where I teach and direct my research laboratory. This annual conference changed location each year, but the format was the same: several dozen prominent science writers would convene and listen to talks from eminent scientists to learn about the latest cutting-edge research in different fields. Given that the 1995 edition of this event was held at Duke, I was invited to participate and talk about my lab's work on the fundamental biology of G protein–coupled receptors. After my presentation, which mainly focused on my lab's work on adrenergic receptors, one of the reporters asked, "Is there anything else going on in your field that we should know about?" I replied that G protein–coupled receptors do a lot more than just mediate responses to adrenaline and other hormones. For example, there are specialized odorant receptors in the nose that mediate the sense of smell. Moreover, a recent report from a group in Belgium had even shown that several of these odorant receptors are found in sperm, where they may play a role helping the sperm to find the egg.

The next morning after this science writers' conference, I received a call from my son David, who was living in San Francisco at the time.

"Hey, Dad, I didn't know you were working on sperm," David said.

"What are you talking about?" I asked.

"There's an article in the San Francisco Chronicle this morning about how you discovered that sperm use their sense of smell to find the egg," David continued. "It sounds really interesting."

I thanked David for letting me know and told him that there had been a mistake I needed to correct. Unfortunately, as soon as I hung up from talking to David, I began to get other calls from various friends and colleagues asking about my new research interest in sperm. It turned out that the article David had seen in the San Francisco paper was written by a reporter from the Associated Press. Thus, this article had run in hundreds of newspapers around the world in addition to running in the Chronicle.

When I'd agreed to speak at the science writers' conference, I had been told that no stories would be published without approval from the scientists who gave the talks. However, I had not been contacted by the reporter from the Associated Press prior to publication of the sperm article. This article had just gone

straight to press crediting me with the discovery about odorant receptors in sperm.

Needless to say, I was mortified: I didn't want the researchers in Belgium to think that I was trying to take credit for their discovery. The first thing I did was call the Associated Press to set the record straight. They put out a clarification, but as with most clarifications, very few people saw it. Lots of people read the original article, which received incredible media attention, but very few people read the subsequent clarification in which I made clear I was talking about someone else's work. The second thing I did was call Gilbert Vassart, the Belgian scientist who was the senior author of the original article in *Nature* about odorant receptors in sperm.[1] I told Vassart the story about the science writers' conference and how I had given his group appropriate credit for the work, but somehow the journalist had simply gotten it wrong. Vassart was very understanding and thought the whole story was funny.

After contacting both the Associated Press and the Belgian group, I thought the story was over. However, it turned out that the story was just beginning. Someone from the *Jeopardy!* "clue crew" found the original article about a year after its publication but failed to find the clarification. And that was how my name ended up in a *Jeopardy!* question about sperm.

It wasn't just my Uncle Henry who saw my name mentioned on *Jeopardy!* that October evening in 1996. In the days that followed, I received numerous calls and emails from various family members, friends, and colleagues who had either seen the Jeopardy! show or heard about it. For the first few callers, I tried to explain the whole story, including the science writers' conference, the confusion over my comment about the Belgian group's work, et cetera. However, it took a huge effort to tell this story over and over again to every single person who called. Thus, after a few calls, I just began accepting all the congratulations without trying to explain.

"Yes indeed, it was exciting to see my name mentioned on *Jeopardy!* Yes, I know it may seem surprising that the question was about sperm, but research always takes you in unexpected directions."

After the hullabaloo over the *Jeopardy!* question died down, I figured that my career as a sperm expert was finally over. Sadly, I was mistaken. In the years that followed, I received numerous random calls and emails relating to this episode. One memorable call, several years after the *Jeopardy!* episode, was from a young lady who was a writer for *Flare*, a women's fashion magazine in Canada that's like a Canadian version of *Cosmopolitan*.

"Dr. Lefkowitz, we're putting together our annual gynecology update issue," said the journalist. "And we're hoping to get a quote from you about your research on sperm and the development of a male contraceptive."

I was tempted to say something crazy, just to give this journalist a juicy quote that would keep my legend as a sperm authority alive for another few decades. However, common sense kicked in and I told the journalist that she should actually talk with Gilbert Vassart in Belgium if she wanted to get an update on the latest research on chemical sensing by sperm.

I have the greatest respect for journalists, who have the difficult job of conveying complex information to the public. At the same time, I have found that it can be hazardous as a scientist to communicate with journalists. Like most scientists, I strive hard to make my research sound as interesting as possible when I write grant applications, which are aimed at convincing other scientists that the work is important enough to get funded. When I communicate with journalists, though, I have found that I need to take the opposite approach: rather than promoting my research, I need to undersell it and downplay it, because otherwise the journalist will end up making grandiose claims about the work that go far beyond what the research has actually shown.

Another example of overzealous journalism was the time I was credited with solving the mystery of why hair turns gray. Some years after the *Jeopardy!* episode, my lab published a paper in *Nature* about how beta-2 adrenergic receptors mediate stress responses that lead to DNA damage.[2] At the request of the journal, I talked to a small group of journalists to explain this work and tried to give examples of the deleterious effects of stress, briefly mentioning the graying of hair as one example. The study that my lab had published in *Nature* had nothing to do with gray hair, but rather was focused on basic cellular responses to stress. However, after I mentioned gray hair to the journalists, the media coverage of this work somehow became a narrative that was focused entirely on my lab's dramatic efforts to combat gray hair.

Given the fact that I've been incorrectly portrayed in the media as both a sperm expert and gray hair guru, you might think that I would just stop talking to journalists. In truth, though, I think it's very important for scientists to convey to the public the relevance of their research findings, because so much research is funded by taxpayer dollars. The public needs to know how their tax dollars are being spent, so it's crucial for scientists to take the time to engage and explain. At the same time, it's very important for scientists to avoid overhyping their work or overpromising potential benefits to the public. This is especially critical because there are politicians who are anti-science and seek to use any blatant overpromising as a cudgel to bash science and scientists. Thus, given the natural inclination of journalists to hype their articles, scientists actually need to undersell their research as much as possible when talking to the media, pointing out all the caveats, even though such efforts at understatement can often feel counterintuitive. Scientists who follow this advice will have smoother interactions with the media and hopefully avoid the fate of having their research distorted on news websites, social media, and television game shows.

Image provided courtesy of Bob Lefkowitz and Randy Hall

Dr. Lefkowitz, hard at work

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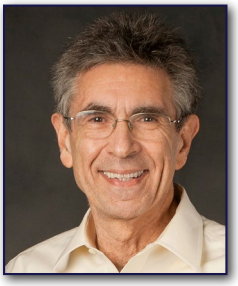
1. Parmentier M, Libert F, Schurmans S, Schiffmann S, Lefort A, Eggerickx D, Ledent C, Mollereau C, Gérard C, Perret J, Grootegoed A, Vassart G (1992) Expression of members of the putative olfactory receptor gene family in mammalian germ cells. *Nature* 355:453-5.
2. Hara MR, Kovacs JJ, Whalen EJ, Rajagopal S, Strachan RT, Grant W, Towers AJ, Williams B, Lam CM, Xiao K, Shenoy SK, Gregory SG, Ahn S, Duckett DR, Lefkowitz RJ (2011) A stress response pathway regulates DNA damage through β2-adrenoreceptors and β-arrestin-1. *Nature* 477:349-53.



Robert J. Lefkowitz is a Nobel Prize-winning scientist (Chemistry, 2012) who is best known for showing how adrenaline works via stimulation of specific receptors. He was trained at Columbia, the National Institutes of Health, and Harvard before joining the faculty at Duke University in 1973. In addition to being a researcher, Dr. Lefkowitz is a cardiologist as well as a cardiac patient. He has been honored by ASPET repeatedly; most recently, he was named in the 2019 inaugural class of ASPET Fellows. Dr. Lefkowitz has been an ASPET member since 1977 and is a member of the **Divisions for Molecular Pharmacology** and **Cardiovascular Pharmacology**.

Randy Hall was a post-doctoral trainee of Dr. Lefkowitz in the 1990's and is now a professor in the Emory University School of Medicine. He has published more than 100 scientific papers and received major awards for his research. He is also a prize-winning educator with strong interests in science writing and public outreach about science and medicine. Dr. Hall has been an ASPET member since 2001 is currently serving as a councilor on the ASPET Council. He is a member of the **Divisions for Molecular Pharmacology, Drug Discovery and Development,** and **Neuropharmacology**.

Division News

2021 Division Elections

The 2021 election includes nominees for ASPET Council (president-elect, secretary/treasurer-elect, and councilor), as well as officers from the Division for Behavioral Pharmacology (BEH), Division for Cardiovascular Pharmacology (CVP), Division for Drug Discovery and Development (DDD), Division for Drug Metabolism and Disposition (DMDD), Division for Molecular Pharmacology (MP), Division for Pharmacology Education (DPE), and Division for Toxicology (TOX). The election will open on January 6, 2021 and eligible voting members will receive an email with instructions.

Division for Behavioral Pharmacology

Nominees for Chair-Elect

Emily Jutkiewicz, PhD
Associate Professor and Associate Chair for Education of Pharmacology, Department of Pharmacology, University of Michigan

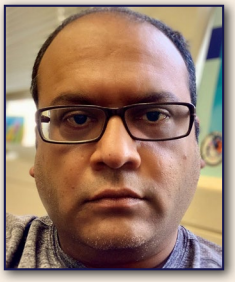
Lance McMahon, PhD
Professor and Chair, Department of Pharmacodynamics, University of Florida

Nominees for Secretary/Treasurer-Elect

Brenda Gannon, PhD
Assistant Professor of Pharmacology, Toxicology, and Neuroscience, Louisiana State University Health Sciences Center, Shreveport

Division for Cardiovascular Pharmacology

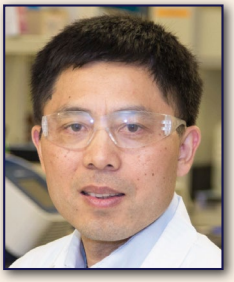
Nominees for Chair-Elect



Hemal H. Patel, PhD
Professor and Vice Chair for Research, Department of Anesthesiology, University of California, San Diego

Nominees for Secretary/Treasurer-Elect

Yagna PR Jarajapu, M Pharm, PhD, FAHA
Associate Professor, Department of Pharmaceutical Sciences, North Dakota State University



Yang Kevin Xiang, PhD
Professor, University of California, Davis

Division for Drug Discovery and Development

Nominees for Chair-Elect

Benita Sjögren, PhD
Assistant Professor, Department of Medicinal Chemistry and Molecular Pharmacology, Purdue University; Adjunct Assistant Professor, Department of Pharmacology & Toxicology, Indiana University School of Medicine

Craig Lindsley, PhD
University Professor of Pharmacology, Chemistry & Biochemistry, WCNDD Co-Director & Director of Medicinal Chemistry, Vanderbilt University, Warren Center for Neuroscience Drug Discovery

Nominees for Secretary/Treasurer-Elect

Alicja Urbaniak, MSc, PhD
Instructor, University of Arkansas for Medical Sciences

Division for Drug Metabolism and Disposition

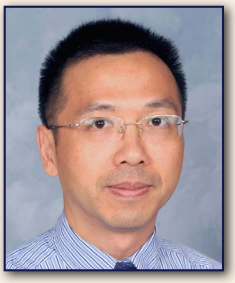
Nominees for Chair-Elect

Bhagwat Prasad, PhD
Associate Professor, Department of Pharmaceutical Sciences, Washington State University

Joanne Wang, PhD
Professor of Pharmaceutics, University of Washington

Nominees for Secretary/Treasurer-Elect

D. Fernando Estrada, PhD
Assistant Professor, Biochemistry, Jacobs School of Medicine, SUNY Buffalo



Haojie Zhu, PhD
Associate Professor, University of Michigan College of Pharmacy

Division for Molecular Pharmacology

Nominees for Chair-Elect

Carmen W. Dessauer, PhD
Professor and Vice-Chair, Department of Integrative Biology and Pharmacology, McGovern Medical School, University of Texas Health Science Center

Vladlen Z. Slepak, PhD
Professor, Department of Molecular and Cellular Pharmacology, University of Miami Miller School of Medicine

Nominees for Secretary/Treasurer-Elect

Mikel Garcia-Marcos, PhD
Associate Professor, Boston University School of Medicine

Nikoleta Tsvetanova, PhD
Assistant Professor, Department of Pharmacology and Cancer Biology, Duke University

Division for Pharmacology Education

Nominees for Chair-Elect

Helmut B. Gottlieb, PhD
Professor, Department of Pharmaceutical Sciences, University of the Incarnate Word, Feik School of Pharmacy

Nominees for Secretary/Treasurer-Elect

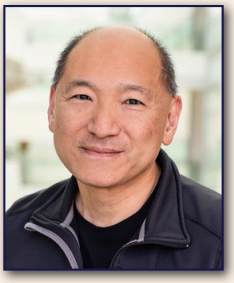
Joe Blumer, PhD
Associate Professor, Department of Cell and Molecular Pharmacology, Medical University of South Carolina

Diptiman Bose, MS, PhD, RPh
Associate Professor in Pharmacology, Department of Pharmaceutical and Administrative Sciences, College of Pharmacy and Health Sciences, Western New England University

Khalil Eldeeb, MD, MSc, PhD
Associate Professor of Pharmacology, School of Osteopathic Medicine, Campbell University; Adjunct Faculty, Wake Forest School of Medicine

Division for Toxicology

Nominees for Chair-Elect

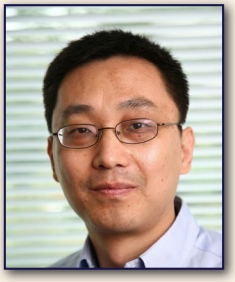


Yoichi Osawa, PhD
Professor of Pharmacology, Warner-Lambert/Parke-Davis Professor in Medicine, University of Michigan

Cheryl E. Rockwell, PhD
Associate Professor, Department of Pharmacology and Toxicology, Michigan State University; Acting Director, Applied Immunology Center for Education and Research, Michigan State University

Nominees for Secretary/Treasurer-Elect

Elaine M. Leslie, PhD
Associate Professor, Department of Physiology, University of Alberta



Qingcheng Mao, PhD
Associate Professor, Department of Pharmaceutics, School of Pharmacy, University of Washington

Interview with Atul R. Laddu, MD, PhD, President and CEO of Global Thrombosis Forum

Submitted by Mohamed Ghonim, PhD

Atul R. Laddu, MD, PhD is a retired physician-researcher and has been a member of ASPET since 1972. Dr. Laddu was born in Pune (formerly Poona), India and received his MD from G. R. Medical College, Gwalior, India (1962) and PhD from Delhi University (1967). He came to the U.S. in 1968 as a postdoctoral fellow conducting research in cardiovascular pharmacology in the department of Pharmacology at the Medical College of Wisconsin (formerly Marquette Medical School), working under the guidance of Pitambar Somani, MD, PhD and Harold F. Hardman, PhD, MD, the then Chairman of the department of Pharmacology. In 1976, Dr. Laddu moved to clinical research and was employed at several pharmaceutical companies including Abbott Laboratories, Dupont Pharmaceuticals, Eli Lilly and Company and Solvay Pharmaceuticals. During this time, he was responsible for getting drugs including abciximab (Reopro), acebutolol (Sectral), esmolol (Brevibloc), estazolam, terazosin (Hytrin), valproic Acid (Depakote) approved by the FDA and bringing them to market.

Dr. Laddu has had a life-long interest in both pre-clinical and clinical research and has authored over 150 publications in peer-reviewed journals. He has always had a passion for research and teaching and he and his wife established the Atul & Jayashree Laddu ASPET Travel Award to encourage young scientists to participate in research and present findings at the ASPET Annual Meeting.

In 2012, Dr. Laddu founded the Georgia Thrombosis Forum (GTF), an organization with a mission to increase awareness of thrombosis throughout local communities. Based on his work in the community, he was awarded the highest state award for community service by Georgia Governor Nathan Deal in January 2016.

In this exclusive interview, Dr. Laddu talks about his outreach work with the GTF.

Dr. Laddu, can you introduce yourself and tell us what motivated you to found the GTF?

AL: I am a retired physician-researcher and a member of ASPET for over 45 years. In 2012, I started Global Thrombosis Forum (GTF), in an effort to mentor young high school students in areas of research, publications, presentations, and leadership.

What is the overall mission of the GTF?

AL: The primary mission of GTF is to make the community aware of the life-threatening condition of thrombosis, and to mentor young high school students. We have volunteers working towards our mission.

Can you describe the contribution of the GTF to the scientific community?

AL: We have received proclamations for thrombosis in the State of Georgia, several counties, and cities in Georgia. We have diverse projects such as thrombosis in space, ovarian cancer, the role of physical therapy in the management of VTE.

How successful is the sponsorship program?

AL: To date, we have sponsored about 100 young students. We have received incredibly positive feedback. In the meantime, GTF is sponsoring 4-5 summer interns at the Albany College of Pharmacy and Health Sciences (ACPHS), and 5-6 at Loyola University.

What are the main accomplishments of the GTF?

AL: Here are some of the major achievements of GTF over the past 8 years, in addition to those described elsewhere in this interview:

1. A message about the risk/prevention of thrombosis to several thousands of members of the community.
2. The young members received training in public speaking, preparing the projects, and working

as interns that brings an independent working habit in them.

3. Gave internships that resulted in presentations at annual meetings of American Society of Hematology (ASH), FASEB, International Society of Thrombosis and Hemostasis (ISTH). The GTF students find their association with GTF and publications immensely helpful for college applications since they stand out against the competition.
4. I was awarded "Servant's Heart Award" by the Governor of Georgia for helping the community.

What are your prospective goals for the future of GTF?

AL: GTF has created a completely new technique to bring the best from the young students. The high school students possess tremendous untapped potential, which under the right circumstances, mentors, and opportunities, adds a big value. GTF is a non-profit organization, supported entirely through the efforts of the community members.

A Participant's Perspective: Interview with Sharan Krishnappan

Sharan Krishnappan is an 11th grade student and has been a participant in the GTF program for the last 4 years. Miss Krishnappan gives us her perspective of the program and how it has sparked an interest in scientific research below.

Why were you interested in joining the GTF program?

SK: I am an 11th-grader and have been with GTF for 4 years. I am now a stronger student with countless opportunities. Last summer, I spent 4 weeks working as a research intern at the ACPHS and Loyola University. This taught me how to live on my own and challenged my intellectual curiosity and created a strong passion for research.

A major theme in GTF is the mentorship. Our mentor, Dr. Atul Laddu helps guide us onto a path with which we can accomplish any goal we set.

Dr. Laddu is very understanding and always looks to bring out the student's best, creating timelines that students can complete without being overloaded by activities at school.

The expectations of GTF are simple. Put in hard work and GTF will guide the rest of the way. GTF has changed the dynamics of my life and led to so many opportunities that touched me in a positive way.

GTF's main goal is to give personal attention to students.

What are the fees for joining GTF and how long is the training program?

SK: The entire membership for GTF is free. Dr. Laddu's time and time of the BOD members are his donation to the community.

Can you describe the structure of the GTF program?

SK: It is a perfect balance with school activities. Dr. Laddu recognizes our interests, strengths and wants to help us learn more. As I continued to complete GTF projects, the complexity increased, including conducting research.

Was there any interference between the GTF activities and your daily school assignments?

SK: Never was a time where my assignments in GTF and my school were piling up on me. The students not only maintain their grades, but improve while working in GTF.

How was the research project assigned to you under the GTF program?

SK: Proclamation by the city of Atlanta, lifestyle changes after thrombosis, COMPSS Trial were some of the projects assigned to me. Dr. Laddu identifies topics of interest that he can offer to help all GTF volunteers stay passionate and involved in what they are doing.

Were there any networking activities integrated into the GTF program?

SK: GTF has been instrumental in widening my contacts. I have received contacts that I will be able to utilize for the rest of my life.

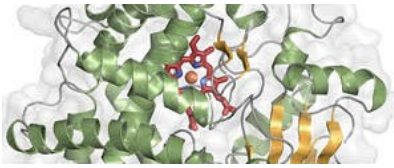
Can you describe the training environment in GTF?

SK: The overall atmosphere in the GTF is very friendly. GTF has given me another family. The members in GTF welcome us and look to see each other grow. With Dr. Laddu and Mrs. Laddu loving each and every volunteer in GTF, we are fully grateful for this family.

How the GTF program impacted you as a high school student?

SK: My overall experience with the GTF program has been very influential in my life. Through research, I have been able to satisfy my intellectual curiosity, and create connections with respected individuals. GTF has also given me another family. I have now become a more hard-working, well-versed, and organized student in the classroom and a more passionate, accomplished, and knowledgeable person outside of it. GTF continues to impact me every single day through the activities I conduct as it combines my passion with the people I enjoy most

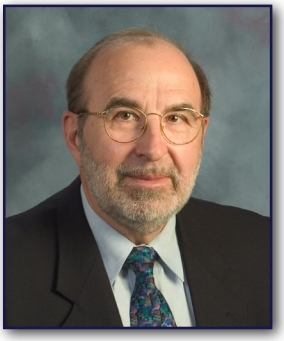
Read the full interview at www.aspet.org/laddu-interview



Drug Metabolism & Disposition
a division of ASPET

Dr. William Jusko and the Vanguard of the QSP movement

Submitted by Lindsay C. Czuba, PhD and D. Fernando Estrada, PhD



It is perhaps not a coincidence that the field of pharmacokinetics and pharmacodynamics (PK/PD) began growing around the same time as the independent career of long-time ASPET member Dr. William "Bill" Jusko. Bill's first encounter with pharmaceutical sciences came as a pharmacy student in the lab of the renowned Dr. Gerhard Levy at the University at Buffalo. Dr. Levy encouraged Bill to pursue a career in research, who subsequently went on to become first an Assistant Professor of Pharmacology at Boston University followed by a return to the University at Buffalo in 1972 as the Director of the Clinical Pharmacokinetics Laboratory. It was at the University at Buffalo where Bill became active in leading the nascent field from the use of basic models into the development and use of the complex quantitative systems pharmacology (QSP) models of today. His pioneering research elucidated novel insights into corticosteroid disposition and signaling and his mechanistic models of indirect responses and target-mediated drug disposition are fundamental to understanding the diverse actions of many drugs. Along the way, he has been the recipient of multiple landmark awards, including the 2018 Oscar B. Hunter Career Award from the American Society of Clinical Pharmacology and Therapeutics, as well as the top 2020 award from the American Association of Pharmaceutical Scientists. In this interview, Bill provides his unique perspective gained over a very productive career, both in terms of the science as well as his extensive experience in mentoring junior scientists.

What has surprised you the most about the way the field of pharmacology has changed during your career?

BJ: The advancements in computation and technology, the movement towards molecular measurements for understanding of drug actions, and the need for collaboration have been the most significant changes to occur during my career. It is difficult for an individual to carry out simple, inexpensive studies these days. Instruments are complex (e.g. LC-MS/MS), data generated is often extensive (e.g. -omics), the literature is wide-ranging, and sophisticated computation is frequently necessary. I've been fortunate to have collaborators with expertise in molecular biology and bioanalysis to complement my role in searching for the 'rules of biology' of drug action through PK/PD modeling.

What do you envision as the future of personalized medicine?

BJ: Early in my career, this area entailed therapeutic drug monitoring and development of pharmacokinetic nomograms for dosing patients. Over time our understanding of physiologic, disease, and drug interaction sources of variability in PK/PD has grown considerably with predictive software available. Today, the availability of pharmacogenetic screening capabilities and identification of diverse biomarkers for drug effects and disease severity has greatly advanced the field. Perhaps the next challenge will be to find rapid methods of assessing and understanding the epigenetic differences among patients and then using these measures, along with other factors and tools, to select and modify drug treatment regimens.

You have a long track record of mentoring junior scientists. How has your mentoring style evolved over that time?

BJ: Early in my career, I spent a greater portion of my time in the lab working alongside students and fellows. As they were performing studies with animals and human subjects and operating instruments, I was right there beside them to provide direct teaching, training, and assist in data generation. As my lab group grew, I began to rely on excellent technicians who supervised new students and carried out part of the experimental work. Unfortunately, I eventually lost my touch in mesmerizing rabbits for cardiac punctures to collect blood. My role evolved into largely generating ideas, writing grants, teaching theory, debugging computer code, and writing and revising manuscripts for publication. Over time, I believe I've developed a better eye for recognizing the diversity of skills and talents of trainees, and the patience to balance their interests and needs. My participation instead began to range from appreciable early supervision to the backseat of their later freedoms to explore independently inspired ideas (within reason and finances). For me, mentorship has always been more of a collaboration with junior scientists rather than my having a purely supervisory role.

How has your relationship with ASPET been beneficial during your career?

BJ: I have been very pleased to be a member and participant in ASPET since 1974. Scientific organizations such as ASPET are wonderful for bringing scientists together, meeting old friends, and providing forums for cutting-edge research presented by both new and established scientists. The sponsorship of scientific journals is best handled by societies such as these. ASPET creates and encourages innovation and leadership opportunities, as well as offers various means of recognizing individuals for their accomplishments and contributions to the field.

Chapter News

Great Lakes Chapter

GLC 2020 Annual Meeting in Review

The Great Lakes Chapter (GLC) hosted its 33rd annual scientific meeting on October 16, 2020. The longstanding goal of GLC's annual meeting is to foster interactions among pharmacologists in the Great Lakes region and to provide a forum of learning and exchange of ideas in the pharmacological sciences. This year's meeting had a very exciting program focused on the **Neuropharmacology of Pain and Addiction**. Due to COVID-19, the meeting was held virtually after being postponed from its original scheduled date in June 2020. The organizers had hoped to have an in-person conference in October 2020, but the resurgence of COVID-19 in the fall made that all but impossible.

The keynote speaker was **Dr. Michael Salter** (Hospital for Sick Children, Toronto) who gave the presentation "Sex, Pain, and Microglia". Dr. Salter is a leader in elucidating the cellular mechanisms of pain processing in spinal circuits and has made a number of important contributions in our understanding of the role of microglia in driving neuroinflammation and neuropathic pain. A particularly insightful aspect of his talk was a discussion and analysis of the sex-specific role of microglia in generating neuropathic pain. He fielded a fascinating discussion at the end of his presentation on the cellular and molecular basis of these sex differences in neuropathic pain and their relevance for development of therapeutics.

Other engaging presentations were given by **Dr. Anne-Marie Malfait** (Rush University School of Medicine) who spoke on inflammation and pain associated with osteoarthritis and the role of NGF in driving this inflammation in the knee joints, and **Dr. David Hackos** (Genentech, Inc.), who presented a fascinating story of the development, clinical trials, and tribulations of NaV1.7 channel inhibitors for chronic pain. The latter was particularly insightful as the NaV1.7 channel has frequently been touted as one of the best genetic targets for development of novel pain inhibitors, but its potential has not yet been realized. **Dr. Mary Eileen Dolan** (University of Chicago) talked about the "Genomic and Functional Studies of Chemotherapy-Induced Peripheral Neuropathy", and **Dr. Vania Apkarian** (Northwestern University) gave the presentation, "Predictive Mechanisms for Chronic Pain, Translational Opportunities" including an insightful discussion on the role of dopaminergic brain pathways in development of chronic pain. The symposium ended with an instructive discussion amongst panel members on the future directions of the field especially relating to novel therapeutics.

Due to the challenges imposed by the pandemic and difficulty of having in-person discussions, we decided to spin-off the student lunch-and-learn and mentoring sessions to a later date which will be announced in the next few months. GLC-ASPET is in the planning stages of putting together a student-led subgroup which will spearhead a symposium under the auspices of GLC-ASPET and include student presentations and mentoring sessions.

Next year's GLC-ASPET meeting is still in the planning stages, but the goal is to have an in-person meeting at Northwestern University on the pharmacology of COVID-19.

Mid-Atlantic Pharmacology Society (MAPS)

MAPS 2020 Annual Meeting in Review

The Mid-Atlantic Pharmacology Society (MAPS) held its 2020 Annual Meeting on October 30th in a virtual format and focused on our "Biotech Roundtable," which has been a popular portion of our previous in-person annual meetings.

The Biotech Roundtable discussion featured representatives from local biotech companies at various stages of development. The session was moderated by MAPS Councilor Kyle Palmer (Chief Science Officer, Opertech Bio). Panelists included Joseph Rucker (Integral Molecular) and his presentation "Supporting the Development of COVID-19 Therapeutics and Vaccines;" Cynthia Otto (Penn Vet Working Dog Center) presenting "The Scent of COVID-19, How Dogs May Help in Rapid Screening;" and Frank Leu (Thomas Jefferson University), who presented on "Educational Outreach: Opportunities in Biotech." Questions from meeting attendees probed into biotech operations, investor targeting phases, and career turning points. The entire session was recorded and is currently available on the MAPS website at Aspet.org/maps.

We are looking forward to a full meeting agenda next year! Thank you to all our sponsors, attendees, and presenters! We also thank the support from ASPET and the MAPS Officers and Councilors (Bradford Fischer, President; Thomas Keck, Vice President; Marlene Jacobson, Past President; Linda Console-Bram, Treasurer; Katherine Moore, Secretary; and Councilors Seena Ajit, Carol Beck, Julie Blendy, Kyle Palmer, and Ellen Unterwald). Please join us on social media at @MAPS_ASPET on Twitter and on LinkedIn!

See you next year!

ASPET

Transforming Discoveries into Therapies

Wishing you a warm holiday season and a happy new year!

from the ASPET staff