The Pharmacologist

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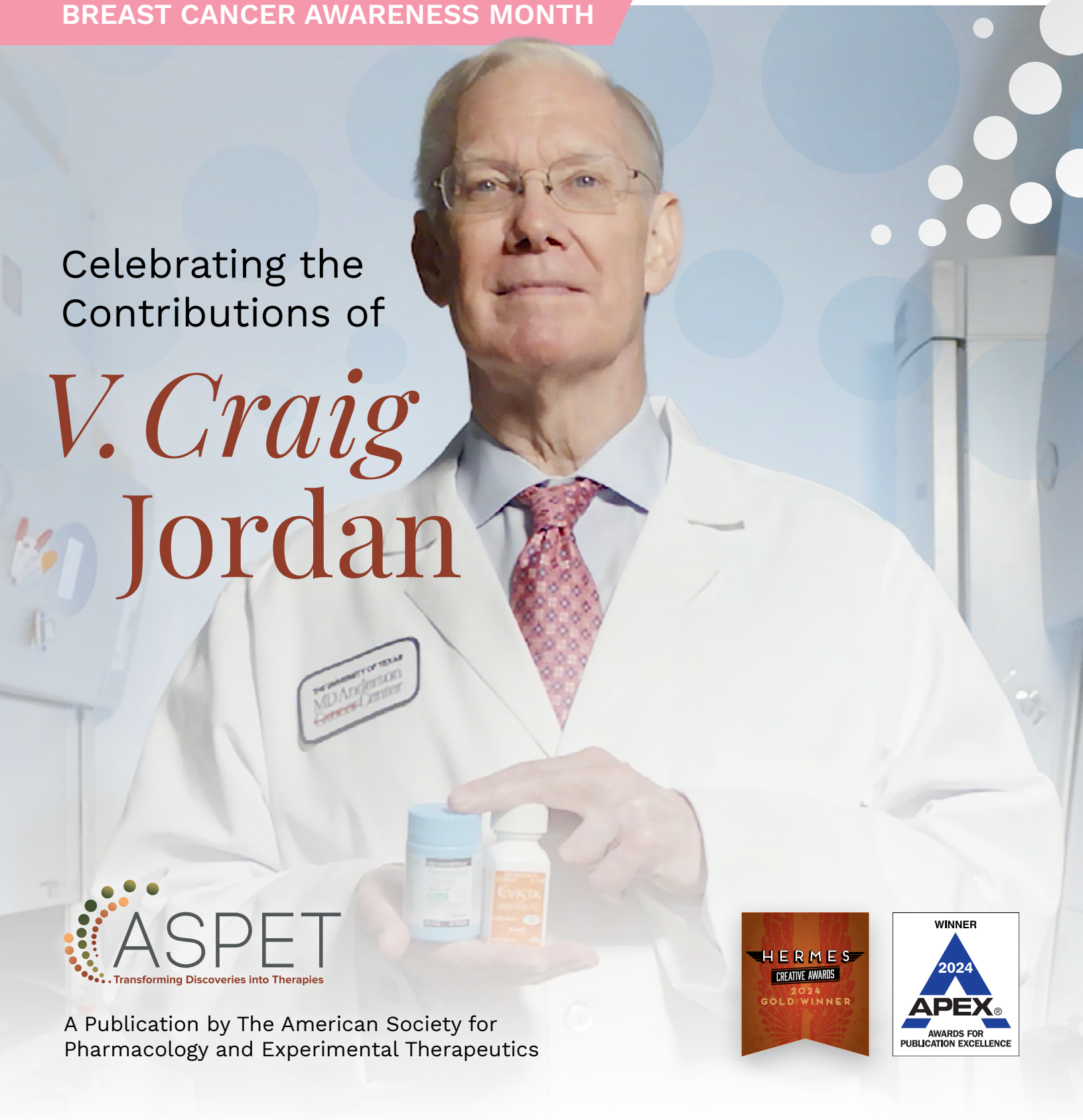
BREAST CANCER AWARENESS MONTH



Celebrating the Contributions of

V. Craig Jordan

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A Publication by The American Society for Pharmacology and Experimental Therapeutics

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In this Issue

BREAST CANCER AWARENESS MONTH

On the Cover: *Recognizing contributions from Dr. V. Craig Jordan during Breast Cancer Awareness Month. Cover image credit: MD Anderson Cancer Center.*

The submission deadline for *The Pharmacologist* is the first of every month for the following month's issue. Please contact thepharmacologist@aspet.org if you have questions. *The Pharmacologist* is published monthly by the American Society for Pharmacology and Experimental Therapeutics, 1801 Rockville Pike, Suite 210, Rockville, MD 20852.

Visit thepharmacologist.org.

Message from the President

Listen to ASPET President, Dr. Carol Beck, give updates on the ASPET IDEA Faculty Scholars Program, the Member-Get-A-Member program, updates on the Divisions and more!

Watch the video

Visit *The Pharmacologist* companion website for digital-only features and extras. thepharmacologist.org

A Note from Dave's Desk

ASPET Divisions Bring You Home

When I talk with ASPET members, I like to ask them about how they first got involved with the Society. Time and time again, the story I hear involves our divisions. For many members, the ASPET Divisions are how members meet future colleagues and make meaningful connections. Both anecdotally and in surveys, it's clear that many of our members first realize that ASPET is their professional home through their involvement with one of our divisions.

Every member of ASPET receives free membership in our divisions. Along with selecting one of the 10 divisions as your primary division, you can also select as many secondary divisions as you're interested in. Members can then choose from a variety of ways to engage with their division, as well as take advantage of their division's awards and benefits. As just a few examples, members can connect with colleagues at division virtual town halls, division-sponsored Focus on Pharmacology webinars, or a variety of events division host at the ASPET Annual Meeting each year. Additionally, divisions provide a variety of opportunities for awards to recognize excellence in their respective area of specialty and for outstanding poster presentations at the ASPET Annual Meeting.

In recognition of just how important the division experience is for our members, ASPET has recently established a new task force focused on strengthening that experience. In line with our Strategic Plan's focus on making ASPET the professional home for all engaged with pharmacology, the Strengthening Divisions Task Force has been created to evaluate how divisions currently operate, identify best practices from other associations that have divisions and recommend ways to improve the member experience with divisions going forward.

Divisions are a key component for how our members experience ASPET. Whether at the ASPET Annual Meeting or through a variety of virtual activities, I strongly encourage all our members to get involved with their division(s) as I'm confident it will be well worth your time.

Dave Jackson, MBA, CAE
Executive Officer, ASPET

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Celebrating the Contributions of *V. Craig* Jordan

Read and share this story online
thepharmacologist.org

By Lynne Harris, MA, APR

National Breast Cancer Awareness Month is an annual campaign in October to educate and increase awareness about breast cancer. The month-long effort began in 1985 as an annual recognition of the millions of women who have experienced or who have been impacted by breast cancer around the world, according to the World Cancer Research Fund International. In collaboration, the American Cancer Society and the pharmaceutical division of Imperial Chemical Industries (now part of AstraZeneca) began the effort primarily to promote the importance of mammograms. In 1993, the Breast Cancer Research Foundation formally established the pink ribbon as the symbol for breast cancer awareness. However, the pink ribbon had been in use two years prior when Susan G. Komen Foundation began distributing pink ribbons during its Race for the Cure events.

Each year, the collaborative effort draws the public together under focus themes. The theme for this year is “no one should face breast cancer alone” to emphasize the importance of community and support during the month. The larger goal is to raise funds for breast cancer research.

Breast cancer is the second most common cancer in the world after skin cancer. The disease manifests when abnormal breast cells form tumors. While most prominent in women, breast cancer can also occur in men. According to mayoclinic.org, symptoms can include a lump in the breast, a discharge from the nipple or changes in the size, shape or appearance of the nipple or breast. Treatment can range from chemotherapy, radiation and surgery.

The late Dr. V. Craig Jordan, CMG, OBE, DSc, PhD, FMedSci, FBPhS, FASPET, was an ASPET member for 44 years. He passed away on June 9 at the age of 76. Considered the "Father of Tamoxifen," Dr. Jordan was a science researcher and professor at The University of Texas MD Anderson Cancer Center. He was an American and British pharmacologist who is credited with discovering the first targeted therapy in cancer to treat breast cancer and osteoporosis. His work uncovered that tamoxifen and other compounds that selectively target estrogen receptors could both treat and prevent breast cancer. Recognized for his work in breast cancer research, he led a Tamoxifen Team that specialized in drugs for breast cancer treatment and prevention.

V. Craig Jordan:

Contributions and Honors

V. Craig Jordan was most recently a Dallas/Fort Worth Living Legend, Chair of Cancer Research, Professor of Breast Medical Oncology, Professor of Molecular and Cellular Oncology, Chief, Section of Basic Science Research and Pharmacology at the University of Texas MD Anderson Cancer Center. Prior to his position that started there in 2014, he served in positions at the University of Leeds, Switzerland's Ludwig Institute, the University of Wisconsin-Madison, Northwestern University, Fox Chase Cancer Center and Georgetown University. His dedication and commitment to his research throughout his career was remarkable. Early in his career, Dr. Jordan had the opportunity to begin shaping the future of treatments for several conditions including all stages of breast cancer, osteoporosis and menopause symptoms.

Dr. Jordan completed his undergraduate degree in pharmacology in 1969 from University of Leeds in West Yorkshire, UK, and his PhD in pharmacology from the same university four years later. He developed a strong interest in the therapeutic uses of tamoxifen, which was originally developed to block estrogen and prevent pregnancy. In fact, he wrote his doctoral dissertation on the drug.

Ironically, it was discovered that tamoxifen increased estrogen and fertility in women rather than decrease it. Dr. Jordan and the drug company agreed to let him experiment further with tamoxifen and research its use to treat breast cancer. Soon after, Dr. Jordan was lured to Worcester Foundation—where the research of oral contraceptives where widely done—by endocrinologist Michael Harper, who left soon after Dr. Jordan arrived.

Dr. Jordan went on to mark a new beginning for the treatment of breast cancer that would have a great impact on breast cancer prevention and treatments, ultimately, saving the lives of millions worldwide. Jordan's research uncovered "Selective Estrogen Receptor Modulators" (SERMs). Unexpectedly, Jordan discovered that "non-steroidal antiestrogens" could increase bone density in estrogen-free rats but simultaneously prevent estrogen-stimulated mammary tumor growth. SERMs became a successful treatment and prevention of breast cancer.

Dr. Jordan's legacy lives on and tamoxifen continues to influence future research for cancer drugs. Today, the drug is included on the World Health Organization's (WHO) Model List of Essential Medicines as a treatment for early breast cancer. According to WHO, "tamoxifen is on the list because it can be taken orally, has low-intensity monitoring and less severe side effects."

Continued on page 22

Leadership Profile

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A Conversation with ASPET's President-Elect Randy Hall, PhD

Randy Hall, PhD, is professor at Emory University, School of Medicine in Atlanta, Ga., and currently serves as ASPET's President-Elect. He received his PhD from the University of California at Irvine. Dr. Hall has previously served on the ASPET Council from 2020–2023. In addition, he has served ASPET in a variety of different leadership roles, including as a member of the Executive Committee on the Molecular Pharmacology Division, Board of Publications Trustees, Awards Committee, Program Committee and on the editorial boards of *Molecular Interventions* and *Molecular Pharmacology*. Dr. Hall's research area focuses on mechanisms of signal transduction by neurotransmitter and hormone receptors. Similarly, Dr. Hall served in numerous leadership roles on the Emory campus, including as the Director of Molecular & Systems Pharmacology Graduate Program. An ASPET member since 1999. Dr. Hall shares his insight and guidance for young scientists with *The Pharmacologist.*

How did you get started in pharmacology?

In grad school, I was in a neuroscience program but my research was highly focused on receptor pharmacology. During my post-doc studies, I continued to be obsessed by questions like: what makes a good drug target? What makes a good drug? Given this, when I began searching for faculty positions, departments of pharmacology seemed like a natural fit for me.

How did you first get involved with ASPET?

I joined ASPET in 1999 when I took a faculty job at Emory University in the Department of Pharmacology. I started attending the annual ASPET meetings and thoroughly enjoyed the chance to spend time with a lot of smart, interesting people who shared my passions. Moreover, my research greatly benefited from the feedback I received at these meetings.

What do you want the ASPET membership to know about you and your ideas on how to move the organization forward during your term?

There has never been a more important time than right now for ASPET and other scientific societies to continue the work of bringing people together. As we continue to emerge from the global pandemic-related restrictions of the past few years, scholars and scientists around the world are hungrier than ever for interaction and collaboration, with scientific societies playing an absolutely critical role in helping scholars with common interests find one another. My hope as President-Elect (and eventually as President) is to enhance the many ways in which ASPET brings diverse communities together to promote the advancement of pharmacology research, education, and public outreach.

What has been your proudest accomplishment in your career so far?

My proudest accomplishment is definitely seeing all the trainees from my lab (and from the pharmacology graduate program that I directed for 10 years) go off into the world and become leaders in academia, industry and government. I love keeping in touch with my trainees and offering whatever assistance and advice I can as their careers continue to blossom.

What advice would you give young scientists who are just starting out in their careers?

I would advise students to get out there and start regularly attending scientific meetings. It is incredibly valuable to get feedback on your research and even more valuable to meet like-minded people and begin forming the friendships and connections that will develop into your professional network.

Upcoming Events

British Pharmacological Society Pharmacology 2024
December 10–12, 2024 · Harrogate, North Yorkshire

Network and hear the latest developments and research in pharmacology from industry experts and emerging investigators.

ASPET 2025 Annual Meeting
April 3–6, 2025 · Portland, OR

Advancing the Science of Drugs and Therapeutics. Join us in Portland!

ASPET 2026 Annual Meeting
May 17–20, 2026 · Minneapolis, MN

Join us in Minneapolis!

20th World Congress of Basic and Clinical Pharmacology 2026
July 12–17, 2026 · Melbourne/Narrm, Australia

We will welcome the world's pharmacology and therapeutics community to the Melbourne Convention Centre in Melbourne/Narrm, Australia.

Interested in Being a Contributing Writer?

ASPET's *Pharmaco Corner* blog and award-winning flagship magazine *The Pharmacologist* seek contributing writers on a rolling basis.

PHARMACO CORNER

Discussing Science. Discovering Cures.

Pharmaco Corner is a dedicated space where pharmacology experts can discuss issues that affect them professionally and personally. The blog connects science and society through various pharmacology disciplines. Send your pitches to pharmacocorner@aspet.org.

The Pharmacologist

The Pharmacologist wants writers interested in contributing human interest and science stories focused on pharmacology. Contact us at thepharmacologist@aspet.org. Please include links to writing samples.

CALL FOR PAPERS

Emerging Voices in GPCR Biology in Special Issue of *Molecular Pharmacology*

Molecular Pharmacology will publish a new special issue in 2025 to celebrate the top-tier research showcased by attendees of the 4th Transatlantic ECI GPCR Symposium, a free online event organized for early-career investigators by early-career investigators. Original research topics, including a limited number of commentaries and consideration for mini-review articles, should align these areas:

- GPCR research including structural and computational approaches
- GPCR signaling and signaling partners
- New tools and methodologies
- The roles of GPCRs in health and disease
- GPCRs as drug targets

Submission deadline: November 1, 2024

Authors are encouraged to submit a pre-submission inquiry. All submission must refer to *MolPharm*'s Instructions to Authors.

Member Highlights

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ASPET Welcomes New Members

Each month, ASPET welcomes new members to our home for pharmacology. This month, we recognize 28 individuals from 25 universities and colleges who have joined 4,000 other members in the pharmacology community. Learn more about ASPET membership.

University of Southern Mississippi
Jason Ang

University of Washington
Shijie Cao, PhD

Circle Pharma
Peadar Cremin, PhD

Michigan State University
Hosam A. Elbaz, PhD

University of Michigan
Kobina Essandoh, PhD
Paulette B. Goforth, PhD

Southern Illinois University
Praise Fawehinmi, MSc

University of California, San Diego
Kaue Franco Malange, PhD

University of California, San Franciso
Jennifer R. Grandis, MD
Mark Von Zastrow, MD, PhD

The University of Texas at El Paso
Sergio Iniguez, PhD

Shobhaben Pratapbhai Patel School of Pharmacy & Technology Management
Jayesh D. Kadam, MPharm
Surabhi B. Patil, MPharm

Northern Michigan University
Amber L. LaCrosse, PhD

University of Sherbrooke
Christine Lavoie, PhD

Leiden University/Leiden Academic Centre for Drug Research
Martijn L. Manson, PhD

Georgia State University Library
Erin L. Morrey, PhD

Genentech
Sandeep K. Ravala, PhD

University of Toronto
Ruth Ross, PhD

University of Texas Health Science San Antonio
Nima Shariatzadeh, BS

AIIMS New Delhi India
Jatin Sharma, I, PhD

Methodist Hospital
Sangbin Shin, BS

Government Medical College & Hospital, Chandigarh
Jagjit Singh, MD, MBBS

University of Minnesota
Sade Spencer, PhD

The University of the West Indies, Mona Campus
Stacy A. Stephenson-Clarke, PhD

University of Utah
S M Riajul Wahab, PhD

Saint Louis University School of Medicine
Holly Walden, MS

National Cancer Institute, NIH
Brice Wilson, PhD

In Memoriam

Share this!

Dr. Emily Jutkiewicz (1975–2024), a member of ASPET since 2006, passed on September 21. She was the Past Chair of the Division for Behavioral Pharmacology and served on the editorial board of *The Journal of Pharmacology and Experimental Therapeutics*.

Dr. Jutkiewicz graduated from Tufts University in 1997 with a B.S. degree, cum laude, in Biology. The seeds for her life-long interest in animal behavior and pharmacology were sown during an undergraduate project at Tufts with Klaus Miczek, but they developed more fully during her post-baccalaureate years in the laboratory of Dr. Jack Bergman at McLean Hospital, Harvard Medical School.

At the University of Michigan as an associate professor of pharmacology, her research focused on investigating the developmental and opioid-related mechanisms contributing to psychiatric diseases, such as depression and addiction, particularly those involving delta opioid receptors (DOR). Agonists of DOR showed anticonvulsive and pain relieving activity, but also caused convulsions. She wanted to find a way to separate the two activities in order to develop safer DORs. Her lab showed that different signaling molecules (arrestins and Go-regulators of G-protein signaling) underlay the convulsive effects of the DOR as opposed to its antihyperalgesic and antidepressant-like effects, thus opening the door to development of a safer delta opioid agonist.

Dr. Jutkiewicz's expertise in animal behavior and her understanding of so many facets of pharmacology led to numerous collaborations with scientists within and outside of the university. Her skill at behavioral pharmacology was integral to the research of others. In 2018 she was awarded the Basic Sciences Teaching Award in Pharmacology, and in 2022 she was awarded the Master's Mentoring Award from the University of Michigan Rackham Graduate School.

Please read the full obituary written by former ASPET President, Dr. Margaret Gnegy.

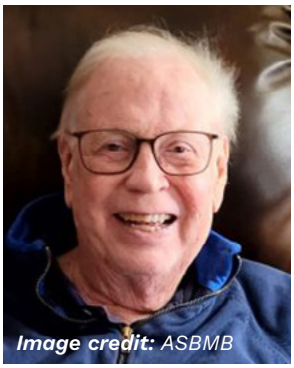

Image credit: *ASBMB*

Dr. George Alton Dunaway, Jr. (1941–2024), an ASPET member for 20 years, served on the Society's program committee, as chair of the Division for Pharmacology Education, on the web advisory committee, and was a member of the Division for Molecular Pharmacology.

Dr. Dunaway was an emeritus professor of pharmacology at Southern Illinois University School of Medicine, where he spent his entire career as a faculty member and researcher from 1975–2010. His research focused on the diversity of PFK subunits found in several human organs and his work on phosphofructokinase, or PFK, isoenzymes contributed to our understanding of glycolysis.

Dr. In addition to his numerous published research articles, he contributed three DNA sequences to the National Institutes of Health GenBank and contributed to the textbook "Brody's Human Pharmacology: Molecular to Clinical" as an associate editor, editing the section on drugs affecting the endocrine system.

Advocacy Impact

Share this!

This month *The Pharmacologist* features two new policy briefs written by participants of the 2024 ASPET Washington Fellows program. These topics present compelling arguments for policy improvements on an issue of personal importance to each Fellow. The policy briefs below discuss the need for more stringent policies on plastic pollution and establishing stronger policy guidelines that help with pain management for women.

Tackling Plastic Pollution: Prioritizing R&D, Global Treaty, and Transparency for Effective Policies

By Kalyanasundar Balasubramanian, PhD, The Ohio State University

Executive Summary

Plastic pollution poses a grave threat to human health and the environment, with 11 million tons entering oceans annually.[1] Despite its widespread use, less than 6% of plastic chemicals are regulated globally, contributing to many hazards.[2] Current initiatives, such as the U.S. Environmental Protection Agency's (EPA) Circular Economy objectives, aim to mitigate plastic pollution.[3] However, urgent action is needed. Our recommendation to Congress is to allocate funding to bolster EPA and NIH environmental sciences groups and advocate for global treaties to regulate plastic pollution and increase transparency in chemical usage. This approach enables science-based policy decisions, ensures accountability, and protects public health and the environment.

Background: Understanding the Plastic Pollution Crisis

Plastic is ubiquitous, yet its convenience bears significant environmental and health risks. Plastic pollution stems from its intricate composition comprising over 16,000 chemicals, including basic polymers, solvents, and additives. These additives, such as plasticizers, flame retardants, stabilizers, and pigments, are vital for delivering specific material functionalities. Alarmingly, nearly 4,000 of these chemicals are recognized as hazardous, yet less than 6% are subjected to regulation globally.[2,4]

The exponential growth of the plastic industry further exacerbates the crisis, with production skyrocketing from 2 million tons in 1950 to a staggering 348 million tons in 2017. Currently valued at $522 billion, the plastic industry is projected to double its capacity by 2040.[5] However, this economic boom comes at a severe cost to human health and the environment. Human health effects, greenhouse gas emissions, and marine species endangerment underscore the gravity of the situation.

Exposure to plastics poses significant risks to human health, potentially impacting fertility, hormonal balance, metabolic function, and neurological activity.[2] In 2018 alone, healthcare costs linked to plastic chemicals in the United States amounted to a staggering $249 billion.[6] Additionally, plastic production contributes to greenhouse gas emissions, with projections indicating that, by 2050, these emissions will hinder efforts to limit global warming to 1.5 °C.[2]

The consequences of plastic pollution extend far beyond human health, with more than 800 marine and coastal species affected by ingestion, entanglement, and other dangers.[7] This ecological impact threatens biodiversity and disrupts fragile ecosystems, underscoring the urgent need for decisive action to combat plastic pollution.

Problem and Current Initiatives

- Plastic pollution is a global crisis with significant economic, environmental, and public health implications.
- Plastic pollution presents multifaceted challenges, including chemical complexity, data gaps, and unregulated hazardous chemicals.
- The unchecked proliferation of plastic chemicals exacerbates the problem, with over 60% lacking essential information on usage and presence.

While the U.S. EPA's Circular Economy objectives aim to address pollution reduction and post-use management, gaps remain in governance and circularity. Urgent action is needed to fill these data gaps, enact a strong global plastics treaty, and enforce transparent plastic chemical management.

Policy Recommendations

As one of the world's leading users and generators of plastic, the U.S. has a critical role to play in reducing plastic pollution and protecting our environment, climate, and health.

1. *Strengthening EPA and NIH Environmental Sciences Groups:* Our recommendation to Congress is to allocate increased funding to enhance research capabilities and support innovation for safer alternatives.
    a. *Implementation:* Funding can be sourced through federal appropriations or public-private partnerships. Specifically, funds should be allocated to establish dedicated research programs focusing on developing safer plastic alternatives, improving recycling technologies, and studying the health impacts of plastic chemicals. Partnerships with academic institutions and private sector innovators will be essential for leveraging expertise and resources.
    b. *Impact:* Economic benefits include job creation and innovation in sustainable technologies. Politically, emphasizing public health and environmental protection may garner bipartisan support.
2. *Advocating for Global Plastics Treaties and Regulatory Reform:* Elected officials advocating for global plastic treaties by engaging in international negotiations to establish binding agreements on plastic pollution control.
    a. *Implementation:* Lobbying efforts and diplomatic negotiations can secure commitments from other nations. Precedents like the Montreal Protocol can serve as a roadmap. Examining the European Commission's plastic strategy offers valuable insights. Adopting these established methods in regulatory bodies and international forums will make the proposal more actionable.

b. *Impact:* Globally coordinated efforts can yield significant reductions in plastic pollution and streamline regulatory frameworks. However, political challenges and resistance from industry stakeholders may impede progress.

3. *Enforcing Transparency and Accountability Measures:* The EPA and state agencies implement a unified reporting platform for transparent plastic chemical management.
   a. *Implementation:* Legislative action can mandate reporting requirements and enforcement mechanisms. Before any legislative mandates, an interagency working group should establish a report on gaps in agency transparency and accountability and recommend a comprehensive reporting system. For example, California's Senate Bill (SB) 502 requires manufacturers to provide detailed information on product ingredients and usage, with suppliers stepping in if necessary. Non-compliance results in significant penalties, ensuring transparency. This model can be adapted federally to ensure comprehensive information on plastic chemicals.
   b. *Impact:* Enhanced transparency fosters consumer trust and facilitates informed decision-making. However, compliance costs and resistance from industry lobbyists may pose challenges.

Take Action

Plastic pollution poses risks to human health, including infertility and cancer, while also causing severe harm and death in wildlife, alongside contributing to climate change.

References can be found on page 28.

Congress must prioritize funding for EPA and NIH environmental sciences groups to conduct crucial research and support innovation for safer alternatives.

Elected officials must advocate for participation in global plastics treaties to enact international regulations on plastic pollution.

EPA and state agencies: unify reporting for transparent chemical disclosure, enforcing "NO DATA, NO MARKET" for accountability, and protecting public health and the environment.

Pain Management in Women's Healthcare

By Shwetal Talele, University of California, Irvine

Executive Summary

Pain is one of the first readily detectable signs of discomfort and women's pain is often dismissed due to inherent bias, lack of research and training, leading to misdiagnosis and/or poor treatment outcomes. Dismissing or misdiagnosing women's pain has consequences which directly affect the quality of life and chance of survival. This can be addressed by the medical boards through:

1. Increasing collaborative research between clinicians and scientists,
2. Improving pain reporting techniques and creating a database of pain management options and;
3. Improving training curriculum to include diverse perspectives.

Implementing these policies would lead to increased trust, credibility and understanding of women's pain. It would also result in standardization of pain reporting and allow women to advocate for better care.

Background

Women's pain is often dismissed by healthcare providers due to an inherent bias that women's pain is more psychological, insinuating that their pain is a result of their emotions and not real. These cases are more prominent in women of color due to the stereotype that they have a higher pain tolerance.[1] However, there is evidence that women feel pain differently than men. Women suffer more from chronic pain in terms of severity and frequency of symptoms such as migraine, arthritis and fibromyalgia. Women also suffer from female-specific conditions such as endometriosis, an inflammatory disease that causes pain in the reproductive system, urinary tract, and digestive system.[2]

Studies show that the bias against women's pain translates in the care they receive:[3,4,5]

- Females wait 29% longer to be seen than their male counterparts in emergency departments.
- Women's symptoms are twice as likely than men's to be misdiagnosed as mental illnesses and prescribed sedatives in place of pain medications.
- Women are less likely to have a complete medical assessment, and their pain is often attributed to menstrual cycle.
- Women are not administered pain medications during invasive procedures such as IUD insertions or pap smears and are often made to believe that their pain is only psychological.

Many differences in providing care are because women's pain is thought to be uncredible. Where men's pain is validated and they are seen as stoic, women's pain is often invalidated, and they are seen as hysterical and emotional.[6] It has been reported that undiagnosed pain leads to increased depression and anxiety. It affects their productivity, interpersonal relationships, and quality of life. Not providing pain management options during invasive procedures leads to them feeling violated and insecure to seek diagnosis and the care that they need. Additionally, articles report that years of undiagnosed pain has led to late-stage diagnosis of life-threatening conditions such as heart failure, cancer or endometriosis which limits their treatment options and survival.

The bias and inadequate treatment stems from a very subjective pain reporting method, a lack of research on pain in women and lack of appropriate education and training. Currently, pain is reported by rating it from 1–10 by the patient. The severity of the pain based on this rating can be interpreted differently by the healthcare provider, giving room for bias to foster.[7] Further, we need more research on pain in women to understand the gender specific differences which influence pain and understand how to alter existing pain management options to account for these differences. Finally, a study done on the curriculum of medical schools indicates that very little training is provided with respect to gender specific care, which does not equip the physicians and nurses to tailor care appropriately.[8]

Policy Recommendations

Policy recommendations can be made towards the medical boards such as American Medical Association and the Association of American Medical Colleges which certify medical schools:

- Increased translational research allowing clinicians and scientists to collaborate can lead to understanding pain presentation in women, develop strategies to successfully diagnose underlying conditions, and implement interventions to alleviate pain.
- Standardization of pain reporting and creation of database to store information on the pain reported, the treatment given and diagnosis including gender and age without compromising patient confidentiality. A study in 2012 explores the possibility of such a database including information that would be useful to collect.[9]
- Improvement in the training curriculum to include increased focus on gender specific differences in pain presentation, severity, and complexity.
- Increased diversity of physicians and nurses to shed perspective on pain management options and improve trust of underrepresented populations in healthcare.

Conclusion

Recently, numerous articles and advocacy groups have highlighted the disparities between genders in pain management which raises hopes that change is possible.[1,10] However, there is still a long way to go. The above policy recommendations are targeted towards making efforts to eliminate bias by increasing awareness and understanding. However, these are long-term solutions will take time to be implemented and for the results to be observed. Standardizing pain reporting and creating a database would probably have the least problems as it is easy, it stores large amounts of data that can be made readily available, and it can be modeled off multiple other databases maintained by medical boards and the Center for Disease Control and Prevention. Finally, creating a database would directly fuel into encouraging translational research allowing us to increase our knowledge base.

References can be found on page 28.

On Their Way...

Share this!

Each month, the editors of three of the American Society for Pharmacology and Experimental Therapeutic's (ASPET) journals choose who they call their Highlighted Trainee Authors. These early-career scientists are recognized for their innovative research published in *The Journal of Pharmacology and Experimental Therapeutics*, *Drug Metabolism and Disposition*, and *Molecular Pharmacology*. This feature showcases selected young scientists, demonstrates what drives them and reveals why pharmacology is important to them.

Nina Beltran

Nina Beltran is a fifth-year PhD candidate at the University of Texas at El Paso, whose interest in science stemmed from someone close to her.

"I became interested in neuroscience and pharmacology due to my brother's diagnosis of epilepsy, which inspired me to gain clinical and research experience as an undergraduate," said Beltran.

She has since developed a deep interest in the intersection of science and medicine, particularly the impact of pharmacology on public health. "I was motivated by my passion to investigate factors that can impact the therapeutic and adverse effects of medications and recreational substances," Beltran explained. "I am also passionate about advancing the current understanding of pharmacotherapies through scientific research."

Beltran's plan is to become a pharmacologist/toxicologist within the government or in the pharmaceutical industry, where she can apply her technical and scientific background to pharmacotherapies in a collaborative environment.

She credits her career development to the mentorship and guidance she has received from experienced scientists in the field and is thrilled to have her work published in the October issue of *The Journal of Pharmacology and Experimental Therapeutics*.

"Being published in *JPET* is a significant achievement that validates the rigor and impact of my research, providing me with the opportunity to contribute to and engage with a respected scientific community dedicated to advancing the field of pharmacology."

Kelly Manthei, PhD

In her role as a Research Development Officer, Dr. Kelly Manthei is tasked with helping researchers secure funding for their work.

"Throughout my research career I enjoyed and excelled at detailed-oriented tasks, writing, editing, and project management," explained Manthei. "As securing funding has become increasingly competitive, I was intrigued by the field of research development. In my new position, I use these skills to help faculty at the University of Michigan be more competitive in securing external funding."

As her career develops, she aims to further strengthen her abilities and capacity to support faculty with their proposals, thereby enabling them to advance their research. “As the research development field continues to evolve, I’m excited to contribute to its growth and raise awareness, all while striving to better support the research community,” said Dr. Manthei.

She is grateful to the exceptional mentors throughout her career who encouraged her to develop her writing skills and gave her opportunities to write and review grants and manuscripts. Dr. Manthei explained that she also networked with professionals in the research development field who provided invaluable insights and support that were essential for navigating her career transition.

“We are honored to be published in an ASPET journal, especially given its strong support for trainees and high-quality research. It’s rewarding to see this project, which began as an undergraduate thesis and grew through collaboration, featured in *Molecular Pharmacology*.”

Nayiar Shahid

Nayiar Shahid has a keen interest and passion for the world of research. After completing her master’s degree at the University of London, she embarked on a four-year stint as a research assistant at the University of Malaya in Malaysia, working on diabetes- and cancer-related projects.

Earlier in her career while working at Sanofi-Aventis she came to a specific conclusion that influenced her career path: “I realized that besides discovering new medicines and developing the already existed ones, targeting the signaling pathways that mediate the disease are the true means of reflecting the art of medical research,” said Shahid.

Currently, Shahid is broadening her research horizons at the University of Alberta working on the pharmacological, functional and molecular characterization of the membrane transport systems, under Dr. James R. Hammond. She’s also very heavily involved in on-campus student organizations, as well as being a graduate student representative on ASPET’s Division for Drug Metabolism and Disposition’s Executive Committee.

Her research opportunities have allowed Shahid to advance her learning and hone her research, writing and presentation skills.

“I am now driven to expand my knowledge in pharmaceutical science, drug discovery and pharmacology background further,” Shahid said, “and I will be uniquely prepared as a scientist to develop something innovative whether it be in industry or in an academic setting.”

As Shahid continues to persevere, she’s seeing her hard work, dedication and patience paying off. “To be qualified for this published work adds more prestigious value to the field that I am working on and towards my career and I am truly honored to be acknowledged in the world of *Drug Metabolism and Disposition* science through this interesting project.”

Journals Highlights

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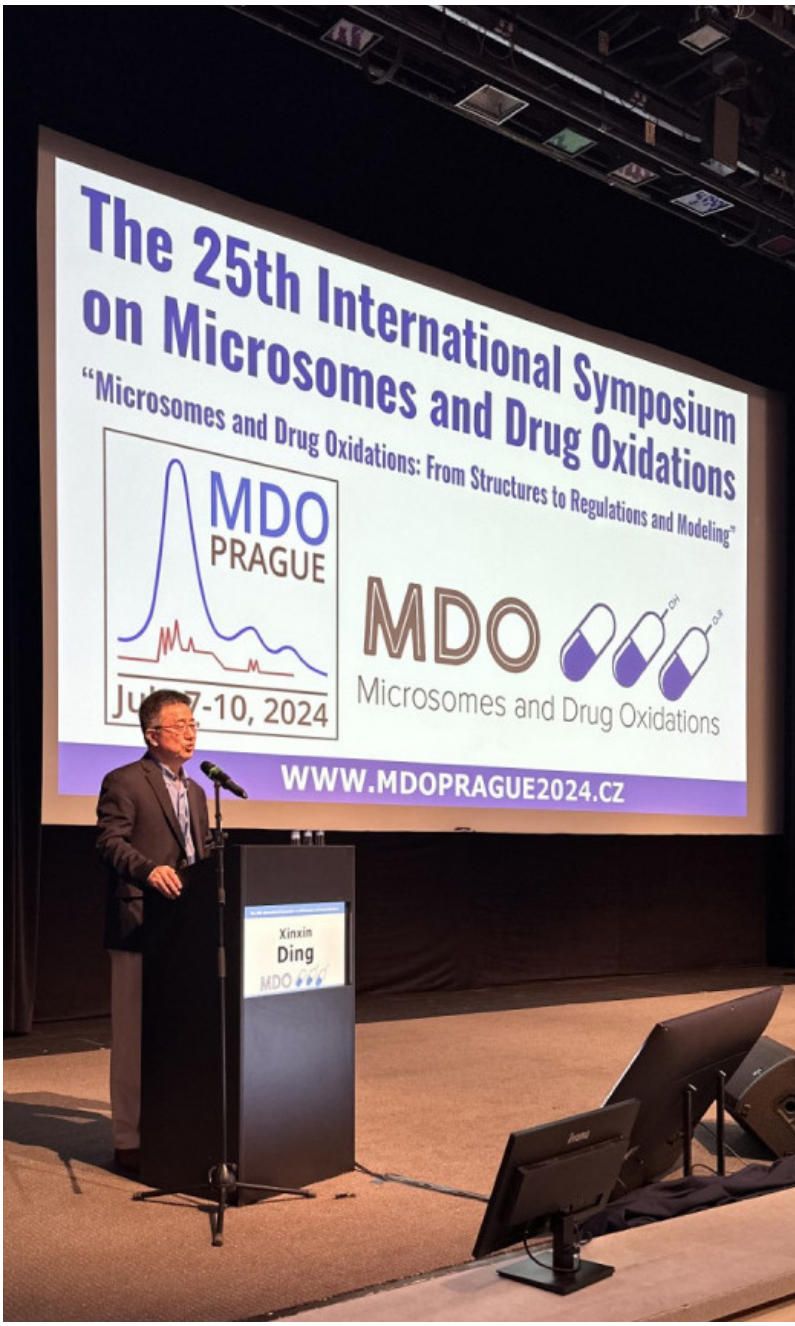
DMD Journal Editor Promotes ASPET Journals at MDO Prague 2024

Dr. Xinxin Ding, Editor-in-Chief of *Drug Metabolism and Disposition*, recently spoke at The 25th International Symposium on Microsomes and Drug Oxidations about publishing with ASPET's journals. Dr. Ding discussed the latest journals developments, including the new opportunities with the Society's partnership with Elsevier. ASPET currently publishes four journals—*The Journal of Pharmacology and Experimental Therapeutics, Drug Metabolism and Disposition, Molecular Pharmacology* and *Pharmacological Reviews*. In collaboration with the British Pharmacological Society and Wiley, ASPET publishes *Pharmacology Research & Perspectives*.

ASPET will launch its new *ASPET Discovery* journal in 2025. Dr. John Schuetz has been named as its new editor-in-chief and will start his term beginning January 1, 2025.

This new open access journal will publish bi-monthly and will focus on topics on interactions of chemicals with biological systems; drug absorption, distribution, metabolism and disposition; drug delivery; mechanisms of drug actions; pharmacokinetics and pharmacodynamics; toxicology and adverse drug responses; behavioral pharmacology and drugs of abuse; and preclinical, translational, and clinical pharmacology. Also, the journal will cover all types of therapeutic indications, such as cardiovascular, infectious, neurological, and cancerous; all forms of therapeutics, such as small molecules, biologics, and cells; and all research approaches, such as molecular, cellular, and systems pharmacology.



DMD *Editor-in-Chief Dr. Xinxin Ding speaks at the MDO Prague 2024 on ASPET Journals.*

ASPET
Transforming Discoveries into Therapies

ASPET Welcomes Dr. John D. Shuetz as Editor-in-Chief of *ASPET Discovery*

ASPET welcomes Dr. John D. Schuetz as the inaugural Editor-in-Chief of the Society's new Gold Open Access journal, *ASPET Discovery*. The journal is scheduled to launch January 1, 2025.

Cover Story

Continued from page 7

Dr. Jordan was named the 2023 Sir Henry Wellcome Gold Medal recipient, the highest award from the British Pharmacological Society that recognizes outstanding achievement and leadership in pharmacology and therapeutics. He received numerous awards during his 50-year career for his revolutionary research in women's health, most notably breast cancer. Dr. Jordan joined the British Pharmacological Society in 1976 and was selected as an inaugural Fellow in 2004. In addition to the Sir Henry Wellcome Gold Medal award, he was recognized by the British Pharmacological Society with the Gaddum Memorial Award (1993) and the Sir James Black Award for contributions to Drug Discover (2015).

After coming to the United States in 1980, Dr. Jordan joined ASPET. He was named an ASPET Fellow in 2021. He also received the ASPET Award for Experimental Therapeutics (1993), the Louis S. Goodman and Alfred Gilman Award in Receptor Pharmacology (2012) and the Reynold Spector Awards in Clinical Pharmacology (2019). Jordan was also a Member of the National Academy of Sciences (2009), the National Academy of Medicine (2017), an Honorary Fellow of the Royal Society of Medicine (2008) and a Fellow of the Academy of Medical Sciences (2009).

Reflections from The Tamoxifen Team

The Tamoxifen Team consisted of at least a dozen members. Many of them have expressed their appreciation for his mentorship, leadership, legacy and guidance throughout their careers.

Credit: Ling Wang

"Prof. Jordan created the "Tamoxifen Team" family and nurtured it until the very last week leading to his passing. He remained devoted to helping all of his mentees, even those at advanced levels. The "Tamoxifen Team" family members went on to help each other. Jordan offered not only academic support, but also emotional support, nurturing the very essence of what it means to be "human." In a world that celebrates scientists for their achievements, Jordan stands apart and shines through with his mentorship legacy."

Balkees Abderrahman, MD, PhD

Dallas–Fort Worth Living Legend scholar, University of Texas MD Anderson Cancer Center in Houston (2015–22), did her PhD with Dr. Jordan

Credit: Univ. of Tübingen

"Dr. Jordan had an indefatigable devotion to pharmacological research for the benefit of breast cancer patients. His everlasting efforts towards improving the outcomes of endocrine treatment remained until the very end of his life.

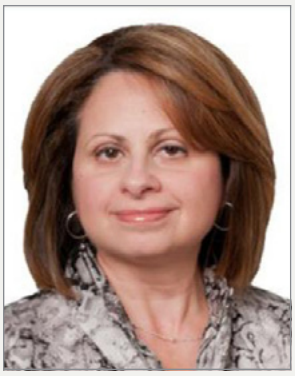
I knew Craig Jordan since he accepted my invitation to join our European Marie Curie Doctoral Training Network, "Fighting Drug Failure" as a "Super Mentor" more than 15 years ago. We became collaborators in the field of breast cancer research, particularly tamoxifen pharmacology. During that time, I had been the Deputy head of the Dr. Margarete Fischer Bosch Institute of Clinical Pharmacology in Stuttgart, Germany. I am now retired and continue to support my Institution as a scientific advisor.

In 2014, Craig Jordan and his team published a seminal paper in the British J Pharmacol *(Maximov* et al*) that paved the way to a novel drug concept for improved tamoxifen therapy in patients with compromised tamoxifen bioactivation. Inspired by their findings from in vitro simulations of the role of the metabolite endoxifen for the biological effects of tamoxifen, a phase I clinical trial has been developed and conducted by our team at the Dr. Margarete Fischer Bosch Institute of Clinical Pharmacology in Stuttgart, led by Prof. Matthias Schwab. It was early this year, when the results of the trial were discussed among collaborators. During my last visit to Craig at his home in Houston, Texas, in March of this year, I found a very ill Craig Jordan but with unbroken passion for pharmacological science. I had the pleasure to vividly discuss with him over lunch and his fierce discipline to support this work was second to none until his untimely death in early June.*

Craig Jordan's legacy of unwavering support for the progress of pharmacological research and his commitment to his scientist colleagues and breast cancer patients have been unsurpassed, leaving a deep void, but fueling the hopes for a better future through science."

Hiltrud Brauch, PhD

Associated Professor of Molecular Pathology, University of Tübingen, Germany, a collaborator and personal friend of Craig Jordan



Credit: *Univ. of Illinois Chicago*

"I am fortunate to have been mentored by Dr. Jordan at Northwestern University from 1994–2001. I arrived as a Research Associate and was eventually promoted to Research Assistant Professor. As a member of the Jordan "Tamoxifen Team," I benefited greatly from the translational training environment that he provided. As my mentor, he offered me many opportunities including sending me in his place to present my research at a conference in Monte Carlo. He also encouraged me to write my very first NIH RO1 grant, and with his advice, I was awarded the grant. He was instrumental in facilitating my tenure track position at the University of Illinois Chicago where I am now a professor. With my translational training foundation, I was able to develop a novel breast cancer drug, establish a start-up company and bring the drug to clinical trial. Dr. Jordan was supportive in every aspect of this journey and served as a Key Opinion Leader for our company. I am forever grateful to Dr. Jordan and I will miss him very much."

Debra Tonetti, PhD

Professor of Pharmacology, University of Illinois Chicago

Credit: *Long Island Univ.*

"Working with Dr. Jordan was very inspiring. It constantly reminded me of standing on the edge of a pioneering discovery, where our research took us closer and closer to changing the trajectory of a breast cancer patient's life. We were working with new compounds from Eli Lilly to characterize their differential pharmacology with estrogen receptor-mediated signaling. One of the compounds became the first selective estrogen receptor modulator (SERM) raloxifene.

Aside of my scientific training, Dr. Jordan provided an outstanding range of opportunities such as writing scientific review articles for first-class journals and giving presentations at respected international conferences. With him and his mentorship, I gained much needed self-confidence and learned to believe in hard work and success."

Anait S. Levenson, MD, PhD

Professor, Cancer Research and Pharmacology, Long Island University, Northwestern University Tamoxifen Team, and worked with Dr. Craig V. Jordan as a postdoctoral fellow (1994–98) and as a Research Assistant Professor (1998–2002)

Graduate Students & Postdoctoral Scientists:

Do you need some help planning your future? Do you have all the skills you need to succeed? Are you trying to decide among careers in academia, government, or industry?

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Northwestern University, Jordan's Lab, 1996

A Lifetime of Innovation

As the "Father of Tamoxifen," Dr. Jordan was an innovative pharmacologist who paid it forward to support others in the field. He tells of his successful mentoring of young scientists and describes how training experiences shaped the careers of his Tamoxifen Team in his book, "Tamoxifen Tales: Suggestions for Scientific Survival," published in 2022. The book highlights his students' and fellows' successes with recollections of their experiences in his Tamoxifen Teams that were in eight locations around the world.

"I recount my unlikely career ascent from only aiming to be a chemistry technician at the local pharmaceutical company ICI pharmaceuticals, now AstraZeneca, through the guidance of my teachers who convinced my parents I should apply to go to the university. I got an interview at one university, Leeds, and was given an offer to do a four-year course at their Department of Pharmacology. I then applied for a scholarship to do a PhD," Dr. Jordan shared with ASPET last year.

Dr. Jordan recapped his challenges to the discovery of tamoxifen. Despite the obstacles, he persevered and presented his dissertation on tamoxifen.

"[I wanted] to crystallize the isolated ER with an estrogen and antiestrogen. That didn't work. It took 25 years for others in the academic community to do that. I did structural variations of antiestrogens but that was so uninspiring. No one in the academic community wanted to examine my thesis. My head of the department nominated Dr. Arthur Walpole, who had a failed rat contraceptive that induced ovulation (the opposite) in women," Dr. Jordan explained.

His persistence and contributions led to a remarkable future for breast cancer treatment.

"I was sent to America for two years but found myself alone with no supervisor. I phoned Walpole to suggest turning their antiestrogen ICI 46,476 into a breast cancer drug. My early lab experiments created a strategy of the best way to use antiestrogen. Tamoxifen was born and the late Queen presented me with the Order of the British Empire [a prestigious award given to people who have made significant contributions to society in the United Kingdom] in gratitude from the nation. The Companion of the Order of St. Michael and St. George, [an award given to people who have provided important service to a foreign nation or Commonwealth] is for discovering SERMs in Wisconsin," Dr. Jordan told ASPET.

In summing up his career, Dr. Jordan added, "I hope this piques your interest from an academic whose contributions to medicine has received more than 50 international awards for work that has saved millions of women's lives or improved their health."

Lynne Harris, MA, APR

Lynne Harris, MA, APR, is ASPET's Director of Marketing and Communications and Executive Editor of *The Pharmacologist*. She has more than 15 years of experience as a senior-level executive leading communications strategy and 10 years as a journalist. She holds a master's degree in strategic public communications, Accreditation in Public Relations (APR) through Public Relations Society of America and a certificate in Integrated Communications.

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ASPET's 2024 *Member-Get-A-Member* Campaign

Help us recruit new members and contribute to the growth and sustainability of ASPET. As an active member, you understand the valuable benefits that ASPET membership offers. Your firsthand experience makes you an ideal advocate for encouraging others to join. This campaign is the perfect opportunity for you to share your success story and inspire others to become part of our community.

A growing ASPET means greater recognition for the field, more resources and support for our members, and a louder voice with policymakers.

Learn more about how it works here.

Participate in the Member-Get-A-Member campaign to be entered into a raffle to win a prize. The more members you recruit, the higher the prize!

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