

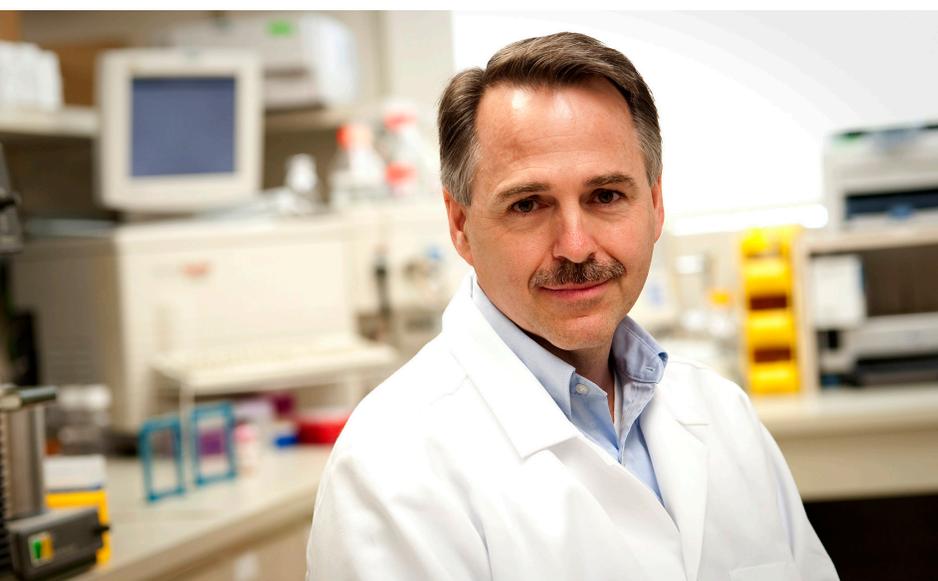
# The American Society of Pharmacognosy

Fall 2019

Discovering  
Nature's  
Molecular  
Potential

The ASP Newsletter: Fall 2019, Volume 55, Issue 3

## ASP President O'Keefe Addresses Members



(though I believe that a few of the misplaced votes might be from those looking forward to seeing me properly roasted).

We just finished another highly successful ASP annual meeting in Madison. Both the local and scientific organizers are to be commended for what was an invigorating symposium. Drs. Melany Puglisi-Weening and Tim Bugni are, I hope, taking a well-earned rest after seamlessly providing for us during our time in Madison. I would personally like to thank all those who helped make this meeting a success with a special thanks to all of the sponsors and vendors who once again supported our scientific conference. Without their active participation in the scientific process neither our research nor our meetings would be successful. It appears that our planet did not want the meeting to end, however, as the weather did its best to keep us all in Madison for another day.

Next year will be our Joint International Congress on Natural Product Research (ICNPR) where we join with our international allied societies. The ASP will again have the pleasure of hosting members of the Association Francophone pour l'Enseignement et la Recherche en Pharmacognosie (AFERP), the Italian Society of Phytochemistry and the Sciences of Medicinal, Food and Fragrant Plants (PHYTOSIF), the Japanese Society of Pharmacognosy (JSP), the Phytochemical Society of Europe (PSE), and the Society for Medicinal Plant and Natural Product Research (GA). In addition, in 2020 we will also have the special pleasure of

*continued on page 3*

By Barry O'Keefe, PhD

I am pleased to be given this opportunity to write a short article about what I hope will be a good year for the ASP. First off, I would like to thank Dr. Rachel Mata with whom I was nominated for the vice presidency of the ASP two years ago. Rachel is a truly outstanding individual. I hope we will all again get the opportunity to vote for Rachel for ASP president. I am still at a loss as to how she is not the one writing this article

ABOVE: President Barry O'Keefe  
PHOTO CREDIT: RHODA BAER PHOTOGRAPHY

### IN THIS ISSUE: FALL 2019

2019 ASP Annual Meeting Highlights	4	ICNPR 2020 Planning for San Francisco	17	ASP Investigates New Logo	24
Cordell Receives 2019 Farnsworth Award	6	Bingel Fellowship for Female Scientists	18	Hot Topics	26
Pauli Awarded 2018 Tyler Prize	8	Wagner Celebrates 90th Birthday	19	New Members	29
Bauer Receives 2019 Tyler Prize	10	Betz Receives 2019 Wiley Award	20	Field Notes	30
ASP Uses Science to Inspire Artists	14	Linus Pauling Institute 2019 Conference	21	Conference Calendar	33
Lane Receives Suffness Award	15	ASP Ambassador Program	22	Brief News From Washington	34
ASP Award Winners 2019	16	Keller Named Interim ASP Secretary	23	From the Archives	37
		2019 ASP Foundation Donors	23		

## EDITOR'S CORNER

By Edward J. Kennelly, PhD



It is a perfect autumn day here in New York as I write this column and a good time to reflect on the recent activities of the ASP. The annual meeting in Madison was a great success, and we feature here a recap by the program's organizers, Drs. Melany Puglisi and Tim Bruni. The topics covered were broad, and the quality and diversity of the speakers were exceptional. It was really a pleasure working with the organizers to promote the meeting via the *Newsletter*. The meeting included keynote talks from a number of award winners, including past ASP President Geoff Cordell who received the Farnsworth Award, and two Tyler Award recipients, Drs. Guido Pauli and Rudolf Bauer. Dr. Amy Lane received the Matt Suffness Award. We congratulate all of these awardees, and I hope you will take time to read about them in this issue of the *Newsletter*.

Next year's annual meeting will be a joint meeting known as ICNPR, organized with our international sister organizations. These joint meetings began in the 1970s and have grown in size and in the number of participating organizations and now include 7 participating scientific organizations, including AFERP, ASP, GA, KSP, JSP, PSE, and SIF. Dr. Roy Okuda, who along with Dr. Guy Carter and me are spearheading the organization of this meeting, updates members on the status of this San Francisco conference to be held July 25-30, 2020. I hope you will read about this exciting meeting and plan to join us in the bay area in the summer.

We welcome the new ASP President, Dr. Barry O'Keefe, who is best known in the Society as the person who inherited the job of roasting the outgoing ASP president at the final banquet of the annual meeting. Barry speculates that his election was due, in part, to members of the Society looking forward to roasting him. Count me in! Barry's vision for the Society can be found in the lead article, and I would suggest anyone who wishes to roast him to begin your research with this gem.

Several important new ASP initiatives are described in detailed articles in this issue of the *Newsletter*. The new ASP Ambassadors Program promises to be a way for ASP to begin to correct some biases that have been documented in the Society, and in science as a whole. I thank Dr. Brian Murphy for contributing another thought-provoking article. If you have not read his previous piece about gender bias in the ASP, please refer to the *ASP Newsletter*, volume 53, issue 4 ([www.pharmacognosy.us/wp-content/uploads/ASPNL\\_53-4.pdf](http://www.pharmacognosy.us/wp-content/uploads/ASPNL_53-4.pdf)). The ASP Foundation has announced the formation of a new award, formed from the generous bequest of long-time ASP member Dr. Audrey Bingel. In developing the Bingel award, the ASPF reached out to a number of key women scientists in the Society to discuss how to best shape the award to help well-recognized issues facing women in science. The new award is described in detail in an article by ASPF president, Dr. John Cardellina. I hope you can forward information about this award to ASP members who may qualify.

The biggest news that came out of the ASP annual meeting is not covered in this issue of the *ASP Newsletter*. *JNP* Editor, Dr. A. Douglas Kinghorn, announced he would step down from his quarter of a century heading the Society's flagship journal as of January 1, 2020. Associate Editor Philip Proteau will assume this role. We will run major stories about this transition in upcoming newsletters.

I hope your fall has been productive and as utterly beautiful as today in New York.

## EMPLOYMENT SERVICE

The Society offers a placement service to aid our members in seeking positions or employees. This service is available only to ASP members and is free to both the applicant and the employer.

For more information see the services website.

[www.pharmacognosy.us/jobs/](http://www.pharmacognosy.us/jobs/)

## NEWSLETTER STAFF

**Edward J. Kennelly, PhD**  
*Editor In Chief*

**Patricia Carver**  
*Copyediting & Proofreading*

**Nancy Novick**  
*Design & Production*

**Devhra BennettJones**  
**Gordon Cragg, PhD**  
**Kevin Tidgewell, PhD**  
*ASP Newsletter Committee*

**The contribution deadlines are:**  
Spring Issue Feb. 15  
Summer Issue May 15  
Fall Issue Aug. 15  
Winter Issue Nov. 15

**Please send information to:**  
Edward J. Kennelly, PhD  
Editor In Chief, *ASP Newsletter*  
Department of Biological Sciences  
Lehman College, CUNY  
250 Bedford Park Blvd. West  
Bronx, NY 10468  
718-960-1105  
[asp.newsletter@lehman.cuny.edu](mailto:asp.newsletter@lehman.cuny.edu)

ISSN 2377-8520 (print)  
ISSN 2377-8547 (online)



## ASP President O'Keefe Addresses Members

*continued from page 1*

hosting the Korean Society of Pharmacognosy (KSP) for the first time in the history of ICNPR.

The ICNPR will take place in San Francisco and has the theme of "A Global Perspective on Natural Products Research." This will be a truly historic meeting for the ASP as we will be hosting the largest international symposium of natural products research in our history. Many of you heard me speak about the importance of increasing the ASP's international outreach at our closing banquet in Madison. The 2020 meeting is an important step in that direction. It will be an opportunity for the ASP to hear from our allied international societies and learn new ways in which we can foster scientific communication and personal connections between our members. My hope is that we can build upon the 2020 meeting's international focus to broaden participation in the ASP by our international colleagues. I encourage everyone to make plans to attend the meeting in San Francisco as I believe it will be a historic meeting for the Society.

ASP meetings have always had a unique place in my adult life. I consider it a unique society among those of which I am a mem-

ber. I, as most of us who have been active in science for some time, attend many different meetings organized by a variety of scientific organizations. Many of these are in specialized scientific areas (microbiology, marine natural products, economic botany, pharmacology/pharmacy, cancer research, antibiotics/antivirals, etc.). The ASP is unique in that it encompasses many specialties from all of these areas and more. At ASP meetings, I often attend lectures on In addition, in 2020 we will also have the special pleasure of hosting the Korean Society of Pharmacognosy (KSP) for the first time in the history of ICNPR. topics with which I am unfamiliar. I cannot say that about most of the other meetings I attend. What is also unique about the ASP is that its size and the interdependency of its researchers gives our meetings, to me, a much more connected feeling. ASP members, almost by definition, are interdisciplinary researchers. We are always looking for that new colleague who will bring a new level of expertise and capability to our research. Often, the single best place to find them is at an ASP meeting. I encourage you all to make a new international colleague or connection at the 2020 ICNPR.

### **This will be a truly historic meeting for the ASP as we will be hosting the largest international symposium of natural products research in our history.**

We have spent a lot of time over the years I have been an ASP member debating the utility of the word "pharmacognosy." Many of us, myself included, have talked at times about how very few people know what pharmacognosy means. There is no doubt that this is true. However, after spending quite a bit of time over the last few years trying to find a better term that encompasses the breadth of science that the ASP encompasses, I must admit I have never found a more accurate term. A

benefit of the lack of general knowledge of the term pharmacognosy is that it leaves it to us to define it. If you Google pharmacognosy, the first listings and definition are from the ASP. I believe that we can turn this current lack of understanding into an opportunity to define the term pharmacognosy in a way that builds upon the interdisciplinary strength of the ASP. My hope is that we will all take this opportunity to use the term, to educate others on its meaning and importance, and to redefine pharmacognosy for the next generation of scientists. One new development toward that goal is the plan to look into options for updating the ASP logo. You can read more about that in another article in this newsletter.

I am very lucky to have followed several outstanding ASP presidents. They have all initiated important changes in the function of the ASP that I believe have strengthened us in unprecedented ways. Several important new initiatives, such as the ASP International Relations Committee and the ASP Ambassadors Program, are, to my mind, exactly the type of programs into which the ASP should be putting its effort. The ASP

has also made strides in putting more emphasis on inclusion and diversity in all of its functions. The strength of the ASP is found in that diversity, both demographic and scientific. The recently announced Audrey S. Bingel Award for Women Scientists is yet another example of the sustained excellence of ASP leadership, both in the Society and in the ASP Foundation. I was fortunate to know Audrey Bingel while I was a graduate student at the University of Illinois at Chicago. I can think of no more fitting use of the very generous bequest from Dr. Bingel to the ASP Foundation than for the proposed award.

My plans as ASP president are to try to continue to nurture these new ASP developments to fruition. We have made a great start but will need the active participation of our members to conscientiously guide the Society on the various committees involved with these initiatives. At the ASP closing banquet, I talked about how this Society is our home. The founders built a solid foundation and subsequent generations have added to that foundation to be more open and welcoming to researchers of different disciplines and backgrounds. I would like to encourage the next generation of ASP excellence, our younger members, to become full ASP members and more active in the ASP's governance. To do so, please look at the various committees listed on our ASP website ([www.pharmacognosy.us](http://www.pharmacognosy.us)) and contact the chairs of those committees to volunteer. My hope is that, by your active participation, our Society will become stronger, more diverse, increasingly international, and continue to be seen as a "home" society for yet another generation of pharmacognocists. ■



# 2019 ASP Annual Meeting Highlights

By Melany P. Puglisi, PhD and Tim Bugni, PhD

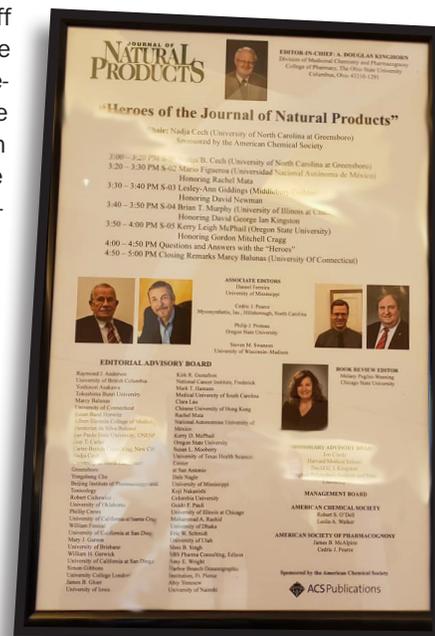
It's a wrap! We thank everyone for attending the 2019 American Society of Pharmacognosy meeting in Madison, Wisconsin and making it a success! We thank the organizing and scientific committees for all of their efforts in planning a diverse, inclusive and dynamic scientific program and social activities. We thank our gold sponsors (Waters and the University of Wisconsin – Madison School of Pharmacy), bronze sponsors (Bruker and SCIEX), and general sponsors for providing the support for this event. This year's program included three special sessions, *JNP* Symposium sponsored by the American Chemical Society, David Slatkin Younger Members Symposium sponsored by the ASP Foundation and Chicago State University, and the NIH Symposium sponsored by the NIH National Center for Complementary and Integrative Health.

The scientific program included two very well-attended workshops on Saturday: "A Hands-on Global Natural Product Social Molecular Networking Workshop for Beginners and Advanced Users," led by Dr. Pieter Dorrestein, and "Expanding the Structure Elucidation Toolbox with Anisotropic NMR Parameters," led by Drs. Thomas Williamson and Robert Gil. Jennifer Sheridan's workshop, "Breaking the Bias Habit," introduced members of the Society to ideas for promoting diversity and inclusion in the ASP by understanding our own biases. Presentations by Drs. Nancy Keller, Pieter Dorrestein and Nadja Cech kicked off a great week of science. Sessions included presentations on drug discovery, microorganisms, chemical ecology, pharmacology, marine natural products, dietary supplements and the human microbiome. Our five award lectures were given by Dr. Paula Brown (Water's Award), Dr. Amy Lane (Matt Suffness Young Investigator's Award), Dr. Guido Pauli (Varro Tyler Prize), Dr. Rudolf Bauer (Varro Tyler Prize), and Dr. Geoffrey Cordell (Norman R. Farnsworth Research Achievement Award).

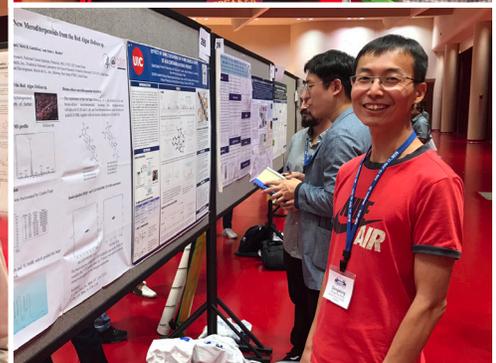
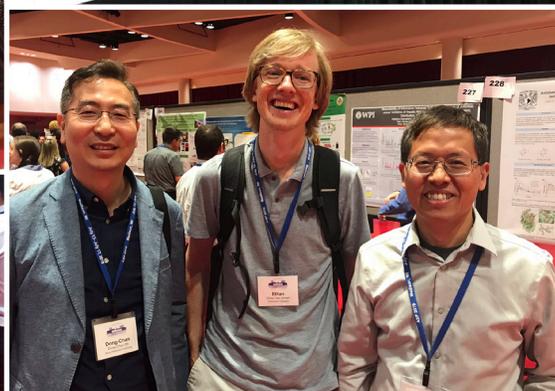
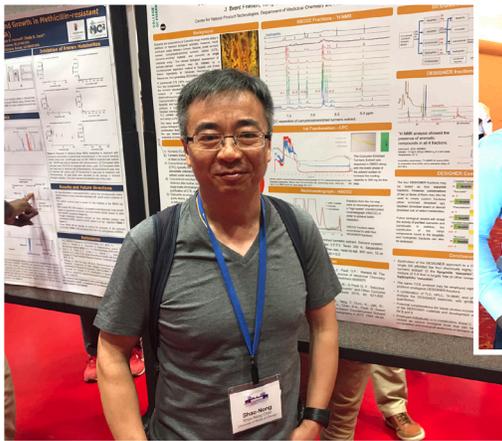
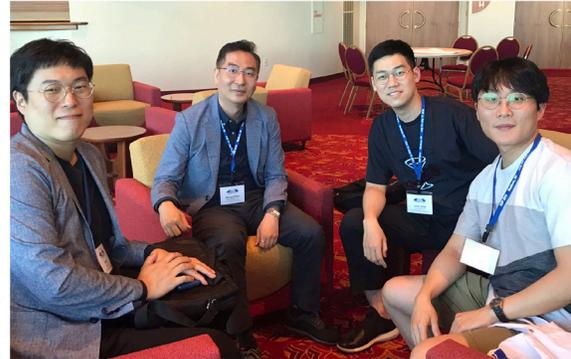
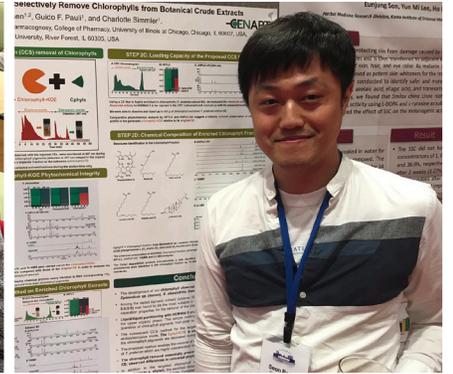
The weather cooled off and members enjoyed the President's Opening Reception sponsored by the Estate of Gerry and Lynn Brady on the roof of the Monona Terrace with beautiful views of Lake Monona and Madison. On Sunday evening younger members met at the SETT on the campus of the University of Wisconsin at Madison for a panel discussion followed by an evening of fun. Monday, we gathered at the Wisconsin Institute of Discovery for a fun evening featuring craft beers, excellent food and a night at The Zombie Institute. We thank the members of the ASP executive committee who served as the suspects! Congratulations to everyone who found out who did it along with the formula for the cure. Congratulations also to the winning teams!

Finally, a big thank you to the excellent group of student volunteers from the University of Wisconsin – Madison and Chicago State University for a job well done!

We look forward to seeing everyone in San Francisco in 2020! ■  
continued on page 5



# 2019 ASP Annual Meeting Highlights *continued from page 4*



# Cordell Receives 2019 Farnsworth Research Achievement Award

By Gordon Cragg, DPhil

**G**eoffrey A. Cordell, Professor Emeritus at the University of Illinois at Chicago (UIC), received the 2019 Norman R. Farnsworth Research Achievement Award at the ASP's annual meeting held in Madison, WI in July. This annual award is given to an ASP member who made outstanding contributions to natural products research.

Dr. Cordell commented, "I wish to thank, most sincerely, the ASP for this Norman R. Farnsworth Research Achievement Award. I am very flattered and deeply honored to be the 2019 recipient. This award is especially poignant for me, for it completes a cycle in life. It was Norm who hired me as a post-doc from MIT in 1972 when I couldn't find a job anywhere. We spent 35 years at UIC working together. He was my mentor and my boss, then for many years I was his boss. His vision for pharmacognosy as a highly collaborative, global natural product science was contagious. It inspired and encouraged me to witness and embrace a wider world of biologically active natural products rather than a novel alkaloid in a vial. He showed me, through example, how to spread that message and promote alternative thinking to move pharmacognosy forward. That made all the difference in my career, for it opened many doors, and led to marvelous research adventures with people and in places I otherwise could only dream of. Thank you Norm, and thank you ASP for this very meaningful recognition."

In his entertaining and inspirational award address entitled "Continuing Adventures on a Heterocycle," Geoff traced his career from gaining his PhD in heterocyclic natural product structural and synthetic organic chemistry at the University of Manchester, UK in 1970, through a series of doors offering new challenges and opportunities, to his ongoing dream and quest to promote the importance of natural products and their role in our global society. On completion of his PhD, Dr. Cordell was awarded a NATO postdoctoral fellowship to study with Prof. George Buchi at MIT. When considering moving on, no positions were available in the UK, US or Canada, but in 1972 he was offered a position by Dr. Farnsworth, and he joined the UIC Department of Pharmacognosy and Pharmacology. In his address he stressed his gratitude to Dr. Farnsworth for his timely offer, which "made him in many ways," and led to his rising through the ranks to full professor in 1980.



Dr. Geoffrey A. Cordell

**His research interests covered the chemistry, biosynthesis and bioactivity of the full range of plant-derived chemotypes, including 21 alkaloid and 14 terpenoid types as well as 21 other metabolite classes, such as chalcones, coumarins, flavonoids, lignans, pyrones, and xanthonnes.**

His research interests covered the chemistry, biosynthesis and bioactivity of the full range of plant-derived chemotypes, including 21 alkaloid and 14 terpenoid types as well as 21 other metabolite classes, such as chalcones, coumarins, flavonoids, lignans, pyrones, and xanthonnes. His studies focused on bioactivity-directed isolation which, coupled with dereplication procedures, led to the discovery of many novel anticancer, fertility-regulating and antimalarial agents. In addition, his group pioneered the application of several new one- and two-dimensional NMR techniques for structure elucidation, and for the unambiguous proton and carbon NMR spectral assignment of many compounds, including highly aromatic metabolites, and triterpenoid and steroidal saponins.

Much of this research was conducted through collaborative programs supported by the World Health Organization (WHO), Department of Defense (DOD), NIH, NCI, and other agencies and foundations, with direct costs exceeding \$40 million. From 1980 through 1988, he served as co-principal investigator of the "Multicenter Collaborative Approach for the Isolation of Fertility-Regulating Compounds from Plants" funded by the WHO. In 1990, he was principal investigator of one of the first National Cooperative Natural Products Drug Discovery Group (NCNPDDG) programs involving the development of "Novel Strategies for Plant-derived Anticancer Agents," and he remained involved in a leadership role through 2004. From 2005 to his retirement in 2007, he served as founding director of the Center for Advanced Discovery, Research and Explora-

tion (CADRE) in the Office of the Vice Chancellor for Research, a three-year, \$15 million grant-funded program focused on developing hand-held, stand-off devices for the sensing of chemicals and biomarkers in and from diverse natural sources.

During his 25-year tenure he served in various administrative positions, including associate dean in the graduate college, assistant vice chancellor for research responsible for campus-wide human and animal subject research and faculty issues, and from 1988-1999 he was head of the department of medicinal chemistry and pharmacognosy. Since 1983, he has been president of a consulting company, Natural Products, Inc., specializing in advising govern-

*continued on page 7*

continued from page 6

ments, international agencies, companies, and academic institutions on various aspects of the development of academic research and natural product research programs.

Since retiring in 2007, Dr. Cordell has continued to dedicate himself to helping natural product groups in many countries worldwide through short-term visits, lectures and workshops. He has distinguished himself in his commitment to promoting the conservation and sustainable use of biodiversity, and was named Outstanding International Ethnopharmacologist of the Year in 2015 by the International Society of Ethnopharmacology.

After years of writing about sustainable medicines, in 2012 he introduced the new term “ecopharmacognosy” to bring focus to the philosophy and practices of developing natural products as sustainable medicinal agents.<sup>1</sup> More recently, he introduced the concept of “medicines security” to be considered for assuring the availability of both natural and synthetic medicinal agents for the future,<sup>2</sup> and he has promoted the importance of quality, safety, efficacy, consistency and accessibility (QSECA) for traditional medicines research and for the resultant products for the patient.<sup>2</sup>

He is the author of some 600 research publications and reviews, three books on alkaloids, and is the editor of 37 books, including 29 volumes in *The Alkaloids, Chemistry and Biology* series. He is on the editorial advisory board of 30 international journals and was one of the four editorial board members of the original *Dictionary of Alkaloids*. Since 1987 he has been writing extensively about the revival of pharmacognosy, its status as the high-tech pharmaceutical science, its future role in global health care, the strategies for drug discovery in natural products research, and the quality control of traditional medicines, and has been a plenary speaker at over 175 international meetings, as well as delivering over 275 lectures at colleges and corporations worldwide. In addition, he has served on advisory boards of organizations such as the WHO, NIH, and the National Academy of Sciences, as well as assisting various countries and universities in their development of traditional medicines, and of their administrative and research resources.

In recognition of his outstanding services to our discipline, he has received many honors, including election as Fellow of the Royal Chemical Society, the Linnean Society of London, the American As-

**His studies focused on bioactivity-directed isolation which, coupled with dereplication procedures, led to the discovery of many novel anticancer, fertility-regulating and antimalarial agents.**

sociation of Pharmaceutical Scientists, and the Illinois State Academy of Sciences. He is an honorary or visiting professor at ten universities in Asia and Latin America and currently has research collaborations in ten countries spanning Asia, the Caribbean, Europe and Latin America. As noted by a prominent Asian colleague in a support letter, “Geoff stands alone as a major contributor from the US to the development of natural products in at least fifteen countries in the Asian region over the past 40 years. He operates without prejudice, and treats people as equals and peers, encouraging openness and discussion. We all respect Geoff from

our deepest heart.” ASP President Barry Okeefe agrees with these comments stating, “Dr. Cordell’s contributions to the ASP and to natural products research are profound. He has made significant advances in several areas of science and has been a prolific author of important publications. Perhaps most inspiring to me personally though has been Geoff’s encouragement of sustainable and conscientious studies in natural products.”

Dr. Cordell has served the ASP with distinction in many capacities, most notably as president in 1985-1986, and is an ASP honorary member and fellow. Through his exemplary national and international leadership, he has served, and continues to serve, as a role model and inspiration to both his peers and to the younger generation of scientists in our discipline.

In opening his award address, he complimented the many young members present for their outstanding contributions to the meeting, and in closing, he offered the following words of advice: Find a Good Mentor; read Something that means Something (Cutting Edge); be critical of what you read and write; AI is not your salvation, YOUR intervention is needed; become a better scientist than your “boss”; set aside your ego and COLLABORATE – you are always part of a team; think “Ecopharmacognosy” and Sustainability in developing your research programs and practices; think how emerging technologies can be integrated into pharmacognosy – innovate for the future and think out of the box!! In offering this advice, Dr. Cordell has listed SIXTY CHALLENGES, as well as dreams for the future, such as Integrated Natural Product Data Systems,<sup>3</sup> which he considers of importance to the natural products community in addressing “some pertinent issues in the development of natural products for enhanced global health by the year 2030,”<sup>2</sup> and you are encouraged to check the details in reference 2. ■

### LITERATURE CITED

- 1 Cordell, G.A. Cognate and cognitive ecopharmacognosy – in an anthropogenic era. *Phytochem. Lett.*, **2017**, 20, 540-549. (and Cordell references therein)
- 2 Cordell, G.A. Sixty challenges – a 2030 perspective on natural products and medicines security. *Nat. Prod. Commun.*, **2017**, 12, 1371-1379.
- 3 Allard, P-M, Bisson, J., Azzollini, A., Pauli, G.F., Cordell, G.A., and Wolfender, J-L. Pharmacognosy in the digital era: shifting to contextualized metabolomics. *Curr. Opin. Biotech.*, **2018**, 54, 57-64.

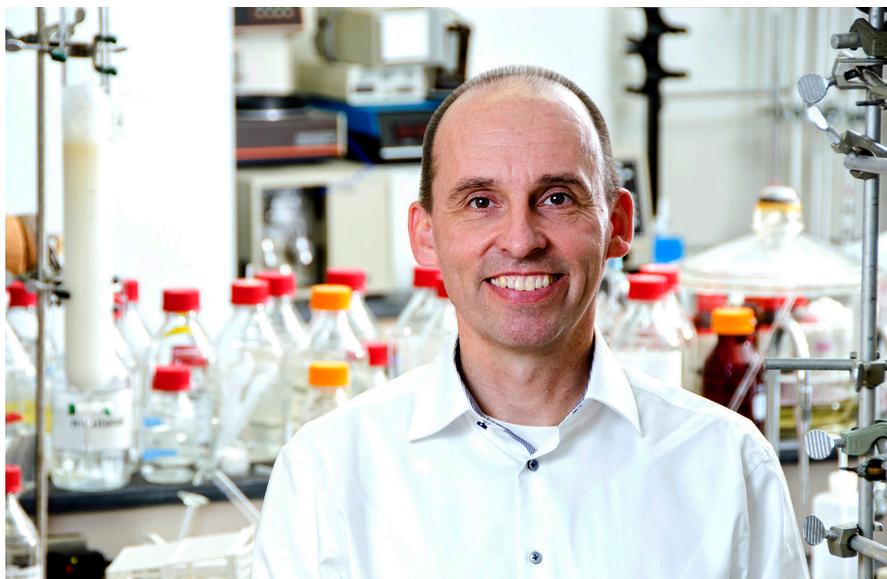
# Pauli Awarded the 2018 Tyler Prize

By Daneel Ferreira, PhD

**A**SP member Professor Guido Frank Pauli of the College of Pharmacy, University of Illinois at Chicago (UIC) received the 2018 Varro E. Tyler Prize at the 2019 ASP Annual Meeting in Madison, Wisconsin on July 17. Because of a family emergency, he was unable to attend the 2018 ASP meeting in Lexington, Kentucky, hence the delay in his reward presentation.

Trained as a pharmacist with specialization in pharmaceutical analysis, Dr. Pauli holds a doctoral degree in pharmacognosy. He is currently the Norman R. Farnsworth Professor of Pharmacognosy, Director of the Program for Collaborative Research in the Pharmaceutical Sciences (PCRPS), and Associate Director of the Institute for Tuberculosis Research (ITR) at the University of Illinois at Chicago College of Pharmacy. In July 2019, he was appointed as a UIC Distinguished Professor.

His basic and translational research project involves bioactive natural products (NPs) from diverse sources, particularly plants and actinomycetes, NP technologies (CENAPT), dietary supplements (Botanical Center), clinical and dental intervention materials, drug discovery, the NAPRALERT database, and institutional training programs. Main research interests encompass the metabolomic analysis of natural health products, botanicals, anti-TB hit-to-lead development, dental biomodifiers, and pharmaceutical analysis. He is an expert in the development of analytical methods and innovative ap-



Dr. Guido Pauli

PHOTO CREDIT: JOSHUA CLARK, UIC PHOTO SERVICES

proaches, including quantitative NMR and countercurrent separation. Dr. Pauli seeks to address challenges posed by the metabolomic variation in nature and enhance the understanding of natural products as health products and sources of new drugs.

The award lecture, "Tyler, Taylor & Tales: The Complexity of Reductionism," gave a summary and new perspectives on botanical research aimed at the same scientific goal Dr. Varro E. Tyler pursued in his own career: the rationalization of the use of medicinal plants for human health. Reflected in the title, the lecture consisted of three main elements. One element related to the vision by Tyler and his ASP colleagues to employ modern methodologies to interrogate intriguing and unanswered questions related to plants used as medicines, dietary supplements, and foods. The awardee explained the development of countercurrent separa-

*continued on page 9*

**His basic and translational research project involves bioactive natural products (NPs) from diverse sources, particularly plants and actinomycetes, NP technologies (CENAPT), dietary supplements (Botanical Center), clinical and dental intervention materials, drug discovery, the NAPRALERT database, and institutional training programs.**

*continued from page 8*

### **Main research interests encompass the metabolomic analysis of natural health products, botanicals, anti-TB hit-to-lead development, dental biomodifiers, and pharmaceutical analysis.**

tion-based technologies for the production of botanical knockout extracts. He also demonstrated how they could serve as unique tools for the inversion of the classical reductionist approaches to the identification of active principles.

The second main element of the talk showed advancements that address the challenge of chemical standardization of botanical products, which results from their inherent chemical complexity and the difficulties in interfacing well-characterized materials with the biological systems available for evaluation. Using the mathematical Taylor series as an analogy, the lecture gave insights into recent approaches that can achieve a near metabolomic, multi-marker standardization using quantitative nuclear magnetic resonance (qNMR) among other methods.

The third element emphasized the caveats posed by a relatively small number of highly over-studied natural products that can be designated as Invalid Metabolic Panaceas (IMPs). Being invalid as bioactive, improbably as drug leads and interfering as in vitro agents, it was shown how IMPs distract researchers from more important efforts to understand botanical active principles.

An overarching theme that connected to all three main elements of the lecture was the concept of Residual Complexity. Reflected in a series of over 30 publications, Residual Complexity describes and emphasizes

the importance of attention to detail in natural products research. Residual Complexity was shown to play an important role in studies that aim to reduce biological activities of botanicals to simple explanations; more often than anticipated, these bioactivities turn out to be linked to distractors such as chemical instabilities, reactivity, low abundance components including impurities, and/or dynamic chemical changes in biological test systems.

Former ASP President Susan Mooberry commented: "Dr. Pauli has contributed enormously to the field of pharmacognosy and this award is a fitting tribute to him. Prof. Pauli's development of efficient and sensitive methods for separating and identifying constituents from a wide range of botanicals represents significant advances in the field. He has contributed in multiple therapeutic areas from dietary supplements to the discovery of compounds with efficacy against tuberculosis. It is fitting that Dr. Pauli receives the Varro E. Tyler Prize, which commemorates another founder of the American Society of Pharmacognosy."

The award winner commented: "Receiving the Tyler Award from the ASP community for my work in the field of plant-based natural products is both very exciting and a humbling experience. Being associated with Tip Tyler's name is also a great motivation to continue my work on botanical dietary supplements, which are used by the public more widely than ever." ■

**He is an expert in the development of analytical methods and innovative approaches, including quantitative NMR and countercurrent separation.**

**Dr. Pauli seeks to address challenges posed by the metabolomic variation in nature and enhance the understanding of natural products as health products and sources of new drugs.**

# Bauer Receives 2019 Tyler Prize

By Stefan Gafner, PhD

The 2019 ASP Varro Tyler prize was given to Dr. Rudolf Bauer, professor of pharmacognosy at University of Graz, Austria, during the 2019 ASP Annual Meeting in Madison, WI. The award lecture was entitled “The Echinacea Story: A Scientific Life Dedicated to a North American Medicinal Plant.”

Professor Bauer studied pharmacy at University of Munich and received his PhD in 1984 from the Institute of Pharmaceutical Biology, University of Munich, under the supervision of Professor Hildebert Wagner; he stayed in Munich until 2003, first as a scientific assistant, then as a post-doctoral fellow. In 1993, Professor Bauer was appointed as associate professor at the Institute of Pharmaceutical Biology, University of Düsseldorf; since 2002 he is full professor of pharmacognosy at University of Graz, Austria, and since 2004 he is head of the Institute of Pharmaceutical Sciences. From 2002–2007 he has acted as president of the Society for Medicinal Plant and Natural Product Research (GA). In addition, he has been engaged as the founding president of the Good Practice in TCM Research Association 2012–2014, and as president of the International Society of Ethnopharmacology from 2015–2017.

Former ASP President Susan Mooberry commented: “The award of the Varro E. Tyler Prize to Professor Rudolf Bauer is especially appropriate to recognize Professor Bauer’s outstanding contributions and decades of research evaluating *Echinacea* plant preparations and their role in preventing and reducing symptoms of the common cold. His extensive research on multiple echinacea



Dr. Rudolf Bauer

PHOTO CREDIT: SISSI FURLGER FOTOGRAFIE

preparations has helped uncover the differences among *Echinacea* species, plant parts and extraction methods and has led to clinical trials of echinacea preparations. Anyone who has suffered from the common cold can appreciate his extensive body of work on this North American botanical. Professor Bauer is well deserving of this award.”

In his informative lecture, Professor Bauer talked about the bumpy road of echinacea from a medicinal plant used by Native American tribes living in the plains to a modern phytotherapeutic ingredient. He explained that roots have been substituted with *Parthenium integrifolium* roots for several decades. This mistake also made its way into the first scientific investigations by Professor Bauer of what ap-

peared to be *Echinacea purpurea*, just to find out that the new sesquiterpene esters isolated were actually from *P. integrifolium*.

Professor Bauer subsequently established many of the known constituents and bioactivities of echinacea and was also involved in a small number of human clinical trials. One of these trials, published in the highly regarded *New England Journal of Medicine*, detailed the results of a double-blind, placebo controlled study with 437 healthy volunteers that were challenged with a rhinovirus, which was directly applied to the nasal mucous membranes. While the echinacea treatment was superior to placebo, the results did not reach statistical significance. The study was reported by the mainstream media as evidence for the lack of efficacy of echinacea in preventing the common cold and led to a substantial

*continued on page 11*

**His extensive research on multiple echinacea preparations has helped uncover the differences among *Echinacea* species, plant parts and extraction methods and has led to clinical trials of echinacea preparations.**

### **The data shows that these alkamides are CB2-specific cannabinomimetics, which lead to physiologically relevant immunostimulatory activities.**

*continued from page 10*

drop in echinacea product sales for a number of years. The composition of the placebo was not detailed in the paper, but it may have had its own effect because it was a well-known herbal digestif.

Other notable highlights in Professor Bauer's scientific career linked to echinacea are certainly the highly cited systematic reviews and meta-analysis of echinacea preparations for the prevention and treatment of the common cold, published in the Cochrane Database of Systematic Reviews, and the discovery of echinacea alkamides as cannabinoid receptor ligands. The data shows that these alkamides are CB2-specific cannabinomimetics, which lead to physiologically relevant immunostimulatory activities. Professor Bauer certainly had a major impact on the advancement of the science of the medicinally-used *Echinacea* species; as he stated himself in the award lecture, a major portion of his over 370 scientific publications were on *Echinacea*.

Dr. Bauer has performed research in phytochemistry and in the development of quality control methods for medicinal plants for more than 35 years. Besides his interest in the composition and bioactivity of echinacea, Professor Bauer has investigated a large number of other medicinal plants. More recently, his research has focused on the quality and activities of plants used in traditional Chinese medicine (TCM), and on the effects of herbal extracts on the human gut microflora. For this purpose, together with two microbiologists, he has established the "Microbiome and Health Initiative Graz," which is studying the interaction of plant extracts and intestinal bacteria and their impact on human health. Besides his reputation as an exceptional scientist, he stands out as a person who has built many bridges among scientists and has always fostered a very collab-

orative environment on a local and international level.

Professor Bauer has received numerous awards, most prominently the Egon-Stahl-Award of the Society for Medicinal Plant Research (1990). He also received the International Award of the Belgian Society of Pharmaceutical Sciences (1996), the Norman R. Farnsworth Excellence in Botanical Research Award of the American Botanical Council (2010), the Distinguished Achievement Award of the International Conference on the Science of Botanicals, Oxford, MS (2016), the Qihuang International Prize of China Association of Chinese Medicine (2017), and the Outstanding International Scientist Award (Pranab Banerji Memorial Award) of the Society for Ethnopharmacology India (2018). In 2019, he received an honorary doctorate from the University of Helsinki.

"I feel very much honored and grateful to receive the 2019 Varro E. Tyler Prize from the American Society of Pharmacognosy," wrote Professor Bauer in an email. "This prize has a special meaning for me, because I met Varro Tyler many times when he came to Europe to attend the annual meetings of GA, and I appreciate him very much because he was an outstanding pharmacognosist and also a very kind and supportive person — a gentleman in science.

I would like to thank the ASP and the Foundation for honoring me and our contributions to pharmacognosy with this award. It will strengthen my bonds to ASP and will foster collaborations with North American scientists."

As expressed in the Tyler award nomination letter, "Rudi is a very worthy candidate for the Tyler Award and a very well qualified scientist whom the ASP can value as a friend and collaborator to many of us in the Society." From all the ASP members, congratulations, Professor Bauer! ■

**Dr. Bauer has performed research in phytochemistry and in the development of quality control methods for medicinal plants for more than 35 years. Besides his interest in the composition and bioactivity of echinacea, Professor Bauer has investigated a large number of other medicinal plants. More recently, his research has focused on the quality and activities of plants used in traditional Chinese medicine (TCM), and on the effects of herbal extracts on the human gut microflora.**

# ASP Again Uses Science to Inspire Artists for the Farnsworth and Tyler Awards

By Barry O'Keefe, PhD

Three years ago, the ASP Executive Committee decided to enlist artists to create original art to be presented annually to the winners of the Norman R. Farnsworth Research Achievement Award and the Varro E. Tyler Prize. The artists would be provided with the nominating materials for the award recipients and asked to create art inspired by the science of the awardees. The use of scientific excellence in the inspiration for beautiful art goes back millennia. ASP is fortunate that we are able to continue this proud tradition.

This year, at the 60<sup>th</sup> Annual Meeting of the ASP in Madison, Wisconsin, three new pieces of art were bestowed upon Drs. Guido F. Pauli (2018 Tyler Awardee), Rudolf Bauer (2019 Tyler Awardee), and Geoffrey A. Cordell (2019 Farnsworth Awardee). Numbered prints of the original artworks (only 50) were for sale at the meeting and will continue to be available through the ASP business office while they last (\$25). This year's three winning artists and the works of art they created are below:

## 2018 TYLER PRIZE AWARDEE DR. GUIDO F. PAULI ARTIST—ROBERT SAWYER (ART INSTITUTE OF CHICAGO) TITLE—TEXTILE

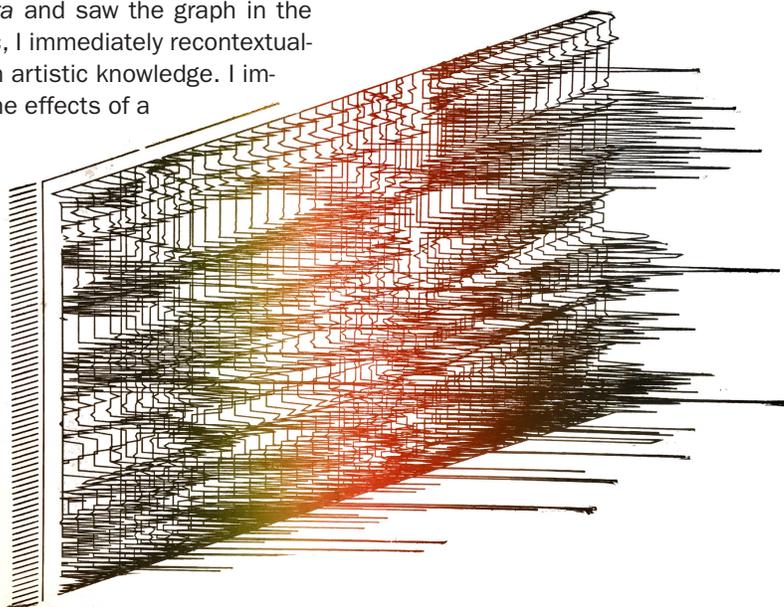
**I had found his research compelling specifically as it relates to chemical profiling of EO's.**

Mr. Robert Sawyer is a master's student in fine art at the Art Institute of Chicago. His work, entitled *Textile*, depicts patterns of shape and color that bring to mind the qNMR studies for which Dr. Pauli is known. Mr. Sawyer states, "In response to Dr. Pauli's work, I had found his research compelling specifically as it relates to chemical profiling of EO's. When I first read about his research of the *Eucalyptus citriodora* and saw the graph in the *Journal of Natural Products*, I immediately recontextualized the graph into my own artistic knowledge. I immediately thought about the effects of a



Mr. Robert Sawyer

blend roll on a relief print. As I continued to sketch out the pattern, I started to see how graphs like these cover a significant portion of our scientific understanding of the item in research and began to see the reference/relation of fabrics and textiles. What I propose is to create a brilliant colored print that bears resemblance to the chemical profiling graphs but also incorporates texture to look quilt-like." ■



2019 TYLER PRIZE AWARDEE DR. RUDOLF BAUER  
ARTIST—KARLI MOGEN (UNIVERSITY OF DUNDEE, SCOTLAND)  
TITLE—HERBA-MEDICA



Ms. Karli Mogen

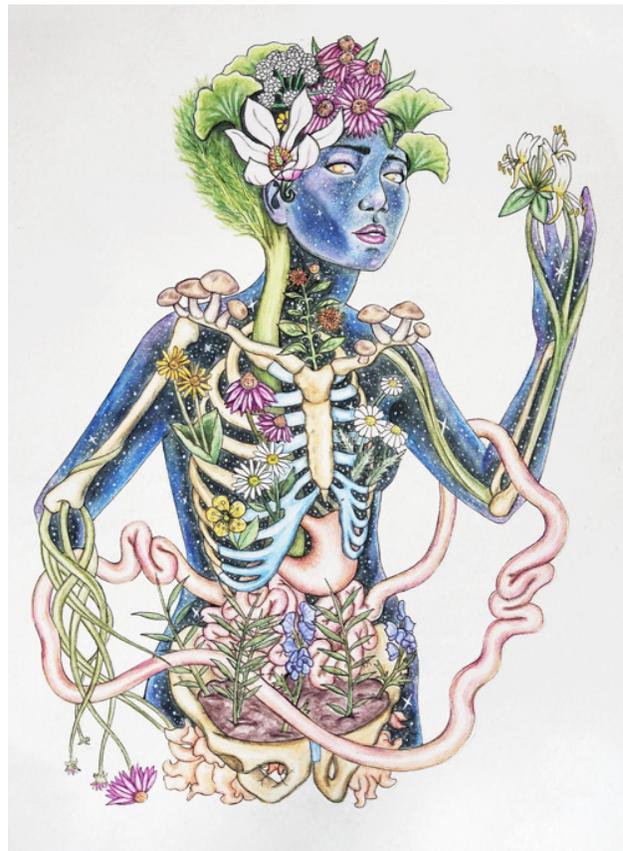
**M**s. Karli Mogen is a mixed media artist from south Florida skilled in numerous techniques and experienced in various traditional and digital media. Her work has been shown in several exhibitions in Colorado and Florida, where she attended the University of Florida for her BFA with a concentration in drawing. She is currently pursuing

a master's in medical art from the University of Dundee in Scotland.

On her work for Dr. Bauer, Ms. Mogen states, "Each plant within the figure is one that Dr. Bauer has researched. I decided to give the figure Chinese characteristics because Dr. Bauer has done a lot of work in China with traditional Chinese medicine, and many of the plants depicted have a place in such practices. Much of Dr. Bauer's work is dedicated to investigating the pharmacological uses of *Echinacea* species, so I thought it important to make that plant and its purple flowers a main focus throughout the piece. Another area of research that really caught my eye is his study of herbal extracts and the intestinal microbiome, which is represented by the string of small intestines floating around her arms and in her abdomen.

This piece is essentially a visual overview of Dr. Bauer's impressive lifetime of work with various medicinal plants. As her hair, the figure grows wild fennel (*Foeniculum vulgare*), *Ginkgo biloba*, *angelica* (*Angelica archangelica*), *Magnolia biondii*, echinacea (*Echinacea purpurea*), and a tiny yellow daisy (Asteraceae family). The wild fennel stalk continues down the figure, acting as her spine. On her clavicles, shiitake mushrooms (*Lentinula edodes*) grow. Just above her sternum is an *Uncaria tomentosa* (cat's claw) plant and sprouting

from her ribcage are arnica (*Arnica montana* L.), more echinacea, more daisies, a *Hypericum perforatum* (St. John's wort), and chamomile flowers (*Matricaria chamomilla*). Blooming from her right hand is a honeysuckle (*Lonicera*) plant and spindling out of her left arm are even more echinacea flowers. Planted in her pelvis are ginger (*Zingiber officinale*) and *Aconitum carmichaelii* (Chinese aconite/wolfsbane/monkshood), whose roots are shown sprouting from the bottom because it is the roots of these plants that Dr. Bauer's research seems to focus on." ■



**"Each plant within the figure is one that Dr. Bauer has researched. I decided to give the figure Chinese characteristics because Dr. Bauer has done a lot of work in China with traditional Chinese medicine, and many of the plants depicted have a place in such practices."**

**2019 FARNSWORTH AWARD WINNER DR. GEOFFREY A. CORDELL  
ARTIST—TIMOTHY PHELPS (JOHNS HOPKINS UNIVERSITY)  
TITLE—THE POWER OF PLANTS**



Mr. Tim Phelps

**M**r. Tim Phelps, with a BFA from Wittenberg University and MS from the University of Michigan in medical and biological illustration, is currently a professor and medical illustrator teaching and illustrating for 33 years in the graduate program of the department of art as applied to medicine at Johns

Hopkins University School of Medicine in Baltimore, Maryland. He has received over 40 regional and national awards for his artwork published in textbooks, magazines, and professional journals. Projects have included multiple surgical texts and atlases on otolaryngology, orthopedics, surgical pathology, and cardiac surgery. Mr. Phelps is a past president and past chair of the Board of the Association of Medical Illustrators. He received the Max Broedel Award for Excellence in Education from the Association of Medical Illustrators in 2015.

In discussing how Dr. Cordell's work inspired his art, Mr. Phelps said, "The interplay of properties of attractants and repellents of plants fascinates me. While we think of plants as releasing chemicals to entice pollinators, they can also produce alkaloids acting as natural defenses against potential predators that may want to consume them. Additionally, the beauty and breadth of plant species framed in the 'possibilities' of alkaloids, not only in the preservation of their continued existence but as possible benefits to managing and curing disease and sustaining humankind's preservation as well, is amazing. Dr. Cordell's lifetime filled with worldwide travel, teaching, and research uncovering mysteries of alkaloids in a joyous journey embracing the science and 'power' of plants makes this award well deserved!"

We congratulate all the awardees and thank all of the artists for their contributions to the ASP. Their combined efforts truly show the power of mutual inspiration. ■



**“The interplay of properties of attractants and repellents of plants fascinates me. While we think of plants as releasing chemicals to entice pollinators, they can also produce alkaloids acting as natural defenses against potential predators that may want to consume them.”**

# Lane Receives Suffness Award

By Marcy J. Balunas, PhD

**A**t the 2019 ASP meeting in Madison, WI, the Matt Suffness Award was presented to Dr. Amy Lane, an associate professor of chemistry at the University of North Florida (UNF).

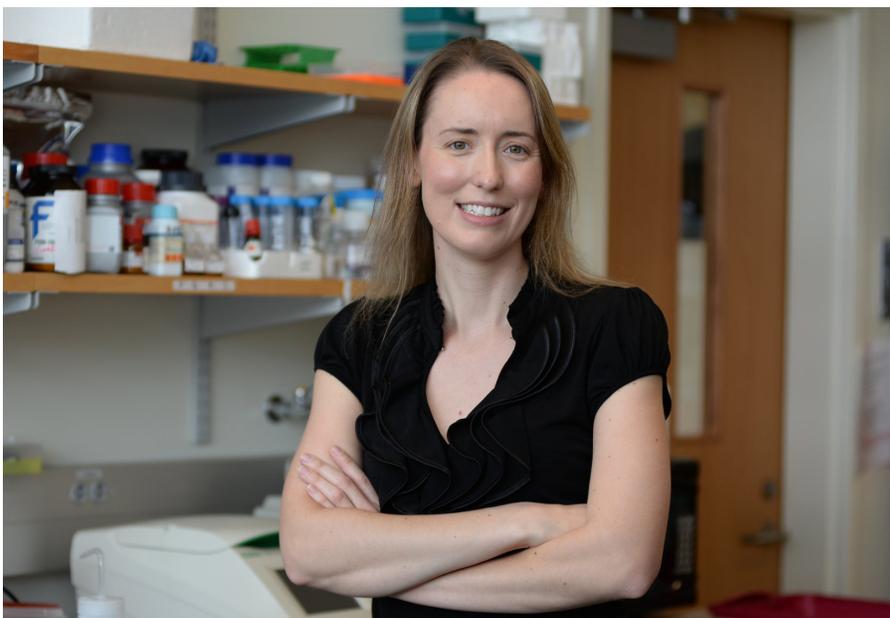
Dr. Lane has been at UNF since 2010, being promoted to associate professor with tenure in 2016. She received her BS in chemistry from Indiana State University, having several research experiences during her undergraduate career. She then moved to Georgia Institute of Technology where she was an NSF IGERT fellow in the lab of Dr. Julia Kubanek. Dr. Lane then conducted her postdoctoral research at Scripps Institution of Oceanography where she was an NIH IRACDA postdoctoral fellow with Dr. Brad Moore.

Dr. Lane presented her research, entitled “Unlocking the Treasure Trove of Biosynthetic Pathways from the Sea,” highlighting her findings related to the catalysis of 2,5-diketopiperazines by cyclodipeptide synthases. Her research program focuses on biosynthesis of marine-derived molecules, and she has published 27 manuscripts, including 13 since arriving at UNF, and holds one patent. She has received both local and national funding, including an NSF Research in Undergraduate Institutions grant as well as the ASP Research Starter Grant, among many others.

In response to what the award means to her, Dr. Lane said, “I am extremely humbled and honored to receive the Matt Suffness Award. I have long been impressed by the caliber of previous Matt Suffness awardees and am excited to join this group. I am grateful for the enthusiasm and support that ASP provides to early stage investigators.”

ASP President Dr. Barry O’Keefe commented that “Dr. Amy Lane is highly deserving of the Matt Suffness Young Investigator Award. She has set up an outstanding independent laboratory; and her publications in microbial biosynthesis, working primarily with undergraduate students, are of the highest level. I truly enjoyed her talk in Madison and look forward to hearing more from her in the future.”

One thing that sets Dr. Lane apart from most if not all other Suffness awardees is that she has done all of this at a primarily undergraduate institution. Since starting at UNF, she has worked



Professor Amy Lane, 2019 Suffness Awardee.

PHOTO CREDIT: JENNIFER GRISSOM

with approximately 40 undergraduates with only one master’s student, and 11 of her 13 UNF manuscripts have undergraduates as co-authors. Dr. Lane has anywhere from six to eight undergraduates in the lab each year and actively mentors them, working alongside them to develop their research skills to the level needed for publication. This all is in parallel to an intensive teaching load, teaching three to four courses with over 300 students each semester! This is an amazing indication of both her dedication to teaching as well as her commitment to continuing an active research program, further highlighted by her recent selection as a 2019 Henry Dreyfus Teacher-Scholar.

The Matt Suffness Award recognizes the contributions of younger natural product scientists and provides a special forum for these ASP members to present research results. The award is named after Dr. Matt Suffness, who served as the ASP president in 1989-90 and began a Young Investigator’s Symposium. Dr. Suffness is best known for his commitment to the development of taxol as an anticancer drug, and he is remembered for his tireless support of natural product research, his efforts to facilitate multidisciplinary research efforts and his accessibility and sound advice. He was particularly helpful to younger investigators trying to establish a successful research program and career. ■

**Her research program focuses on biosynthesis of marine-derived molecules, and she has published 27 manuscripts, including 13 since arriving at UNF, and holds one patent.**

# ASP Award Winners 2019

The ASP and ASP Foundation wish to recognize and congratulate all award winners. Best wishes and congratulations to all!

## Norman R. Farnsworth Research Achievement Award

Geoffrey A. Cordell  
University of Illinois, University of Florida, Natural Products Inc.

### 2018 Varro E. Tyler Prize

Guido Pauli  
University of Illinois Chicago

### 2019 Varro E. Tyler Prize

Rudolf Bauer  
University of Graz, Austria

## Matt Suffness Young Investigator Award

Amy L. Lane  
University of North Florida

### Kilmer Prize

Abu Bakar Siddique  
University of Louisiana at Monroe

## Undergraduate Research Award

Julia Asay  
University of California San Diego

Ashley Fukuchi  
University of Hawaii at Hilo

Itzel Lizama-Chamu  
University of Illinois Chicago

Samuel Tanoeyadi  
Oregon State University

## Research Starter Grant

Stephen Eric Nybo  
Ferris State University

## Active Member Travel Grant

Osayemwenre Erharuyi  
University of Benin

C. Benjamin Naman  
Ningbo University

Holly A. Showalter (Johnson)  
Waukeel Community Schools

## D. John Faulkner Travel Award

Mohamed Ibrahim  
University of Mississippi

## David Carew Student Travel Award

Daniel Shin  
Seoul National University

## Jerry McLaughlin Student Travel Award

Skylar Carlson  
Smithsonian Marine Station

Seoung Rak Lee  
Sungkyunkwan University

## Lynn Brady Student Travel Award

Munhyun Bae  
Harvard Medical School

Sunghee Bang  
Duksung Women's University

George F. Neuhaus  
Oregon State University

Choon Yong Tan  
Ohio State University

## Waqar H. Bhatti Student Travel Award

Angela Sester  
TU Dortmund University

## Student Research Award

Taylor A. Lundy  
University of Kentucky

## Student Travel Award

Julia Austin, University of Illinois Chicago  
Omer I. Fantoukh, University of Mississippi  
Jacklyn M. Gallagher, University of North Carolina at Greensboro  
Laura Ioca, University of Illinois Chicago  
Sonja L. Knowles, University of North Carolina at Greensboro  
Logan W. MacIntyre, University of Prince Edward Island  
Carla Menegatti, University of São Paulo  
Shogo Mori, University of Kentucky  
Emily Paris, University of California San Diego  
Sara P. Puckett, University of Connecticut

## 2019 Arthur E. Schwarting Award

Robert L. Bertrand, Mona Abdel-Hameed, and John L. Sorensen.\*  
Lichen Biosynthetic Gene Clusters. Part I. Genome Sequencing Reveals a Rich Biosynthetic Potential. *J. Nat. Prod.* **2018**, **81** (4), 723-731. (DOI: 10.1021/acs.jnatprod.7b00769)  
AND Robert L. Bertrand, Mona Abdel-Hameed, and John L. Sorensen.\*  
Lichen Biosynthetic Gene Clusters. Part II. Homology Mapping Suggests a Functional Diversity. *J. Nat. Prod.* **2018**, **81** (4), 732-748. (DOI: 10.1021/acs.jnatprod.7b00770).

## 2019 Jack L. Beal Award

Aleš Machara\*, Jan Krivánek, Klára Dolejšová, Jana Havlíková, Lucie Bednářová, Robert Hanus, Pavel Majer, and Pavlína Kyjaková.  
Identification and Enantiodivergent Synthesis of  
(5Z,9S)-Tetradec-5-en-9-olide, a Queen-Specific Volatile of the Termite *Silvestritermes minutus*. *J. Nat. Prod.* **2018**, **81** (10), 2266-2274.  
(DOI: 10.1021/acs.jnatprod.8b00632).

# ICNPR 2020 Planning for San Francisco

By Roy Okuda, PhD

The International Congress on Natural Products Research (ICNPR 2020) will be held in San Francisco, California, USA from **July 25 to 30, 2020**. ICNPR 2020 is the 10<sup>th</sup> such international gathering since 1970 and involves a collaboration between ASP and other natural products societies from other parts of the world. The Congress in 2020 will, for the first time, involve a total of **seven** partner organizations: AFERP, ASP, GA, KSP, JSP, PSE, and SIF. This will be the first ICNPR with the KSP as a participating society, and we warmly welcome our colleagues from Korea!

San Francisco is one of the most iconic cities in the world. Known variously as “Baghdad by the Bay,” “Frisco,” or simply as “The City,” San Francisco is consistently listed as one of the most desirable tourist destinations in the world. After a highly successful ICNPR in New York City in 2012, ASP is pleased to host the next Congress on the “other” side of the United States!

One important change from prior International Congresses and ASP meetings is that the meeting will begin on Saturday, July 25, 2020 and end at noon on Thursday, July 30, 2020. We are anticipating a large attendance and hence higher demand for oral talks, and thus the extra period on Thursday will allow for several dozen additional contributed talks than if the meeting ended on Wednesday. See the website [www.icnpr2020.org](http://www.icnpr2020.org) for a general program.

A unique feature in the Scientific Program for ICNPR 2020 will be seven plenary symposia, organized and managed by each of the seven participating societies. A special Memorial Symposium will recognize the late Drs. Koji Nakanishi and Yuzuru Shimizu.

In addition, the Scientific Program Committee is planning six topical symposia:

- **Advances in Cannabis Research**
- **Modernization of Traditional Medicine Systems**
- **Cutting-Edge Technologies in Natural Products Research**
- **Next-Generation Natural Product-Derived Drugs**
- **Climate Change’s Impact on Natural Product Sciences**
- **Natural Product Applications in Agriculture**

Additional topical sessions, including marine, plant, microbial, synthesis, biosynthesis and genomics, are under development. Contributed oral and poster presentations will be accepted starting in January 2020.

The venue for ICNPR 2020 is the Hyatt Regency San Francisco at Embarcadero Center, which is located in the heart of the business district of The City. The hotel is adjacent to both San



Viewing downtown San Francisco from the Golden Gate Bridge

Francisco Bay and the Bay Bridge and offers spectacular views of both. A special rate has been negotiated. **Please do not make reservations until you receive information on how to register using the ICNPR 2020 rates (expected in January 2020).**

The Hyatt Regency Embarcadero is within walking distance of some of The City’s best known attractions, including Chinatown, Pier 39, and Union Square. Multiple transit options stop next to or across the street from the Hyatt, including BART, San Francisco Muni (bus and light rail), and the San Francisco Cable Car, which will get you to other parts of San Francisco.

The airports for ICNPR 2020 are San Francisco International (SFO) or Oakland International (OAK). Bay Area Rapid Transit (BART) has trains from both airports that stop at Embarcadero Station, across the street from the Hyatt Regency. Later in the year a detailed set of travel instructions from the airports will be posted on the ICNPR 2020 website. In the meantime, you may see information at [www.bart.gov](http://www.bart.gov).

In the coming year, additional details about ICNPR 2020 will be provided in the *ASP Newsletter*. You can also check on the most recent updates by going to the Congress website:

[www.icnpr2020.org](http://www.icnpr2020.org)

We expect to open meeting registration, abstract submission and hotel registration by January 2020. ASP members will be notified when these sites open.

As ICNPR 2020 Co-Chairs, Drs. Guy Carter, Ed Kennelly, and Roy Okuda look forward to seeing you in San Francisco next summer! ■

**The Congress in 2020 will, for the first time, involve a total of seven partner organizations: AFERP, ASP, GA, KSP, JSP, PSE, and SIF.**

# Newly Established Audrey S. Bingel Fellowship for Female Scientists

By John Cardellina, PhD

The American Society of Pharmacognosy Foundation and the American Society of Pharmacognosy are pleased to announce the establishment of the Audrey S. Bingel Fellowship for Female Scientists.

The Audrey S. Bingel Fellowship is intended to provide funds, up to \$25,000, to assist a female scientist in transitioning from a current career track to another, or to bolster the likelihood of success in her current, preferred career path. This fellowship is made possible by a bequest from the estate of Professor Audrey S. Bingel to the American Society of Pharmacognosy Foundation and was inspired by her keen interest in women's health, other issues of concern to female researchers, and mentoring young female scientists.

Despite significant increases in the number of women entering the broad field of natural products over the past 30-40 years, there remain formidable challenges for women to succeed (or, in some cases, even enter or gain a foothold) in certain career paths in natural products. Further, women can face obstacles that do not appear to impact men to the same extent. Sometimes these issues prompt women to consider alternative career paths. Such issues may include, but are not limited to: pregnancy; childbirth; neonatal child care; care of an elderly or ill parent, which disproportionately falls to daughters; and gender bias in the workplace.

The Foundation board formed a subcommittee (Drs. Cindy Angerhofer, Melany Puglisi-Weening, and John Cardellina) to develop criteria for the conceived award, but that group realized almost immediately that more input from a broader swath of ASP members would be critical to bring the concept to fruition. So an ad hoc working group was formed and included Drs. Susan Mooberry, Alice Clark, Barbara Timmermann, Rachel Mata, Marcy Balunas, Tawnya McKee, Kerry McPhail, Nadja Cech, Amy Wright, Catherine Neto, Susan Ensel, Jaclyn Winter, and Wendy Strangman. "I can not overstate how important this working group was to the successful development of the Bingel Fellowship. The group took the concept and worked intensely to establish criteria for the award and identify acceptable, meaningful uses of the funds," said Dr. Cardellina, ASPF Chair.

The funds could conceivably be employed for, but are not limited to: additional time for research; formal training; a sabbatical or an internship in a laboratory or other organization with a new focus for the applicant; seed money to initiate a truly new research direction; course buy-outs; bridging funds for childcare; and time for



Dr. Audrey Bingel

grant writing/job hunting/attendance at scientific meetings.

In developing the Audrey S. Bingel Fellowship, the Board sought to be flexible about what constitutes a challenging situation requiring need for financial help, and how a female colleague might use the fellowship to achieve her objective(s); consequently, the Audrey S. Bingel Fellowship selection committee will be expected to exercise due diligence and concern in evaluating the details of each proposal/application. As with all the ASP awards and grants, the ASPF Board, individually or collectively, will have no involvement in the selection of awardees.

The key to a successful application, then, will be making a clear, cogent

case for the need for funding and a well-designed plan for the use of the funds to attain the desired outcome.

## APPLICATION PROCESS

- **Eligibility: The applicant must be an American Society of Pharmacognosy member in good standing for at least three years.**
- **The application/proposal (from two to no more than five pages, including any citations) will be comprised of:**
  - the circumstances prompting the proposal (and need for support),
  - a plan for the intended use of the funds,
  - anticipated outcome(s),
  - how this fellowship and the outcomes will impact the career path of the applicant, and
  - a brief budget outlining the timeframe and use of the requested funds.
- **Curriculum vitae, to include:**
  - a summary of current position and activities,
  - a list of current and pending grants/other funding, and
  - a complete list of publications.

**NOTE:** The fellowship will not be subject to indirect costs by the parent institution/employer of the awardee. Should the awardee not be employed in academia, this fellowship might be vulnerable to taxation by federal, and possibly state, authorities.

*continued on page 19*

# Wagner Celebrates 90<sup>th</sup> Birthday

By Rudolf Bauer, PhD

**O**n August 28, Professor Emeritus Dr. rer. nat., Dr. h. c. mult. Hildebert Wagner celebrated his 90<sup>th</sup> birthday. Two days later, a big birthday party with many of his former students and visiting scholars, coworkers, and collaborators, including some ASP members, took place in Munich.

Prof. Wagner headed the Institute of Pharmaceutical Biology at Ludwig-Maximilians-Universität in Munich for more than 25 years. Here he also started his pharmaceutical career with an undergraduate degree (1953), PhD under Prof. Ludwig Hörhammer (1956), and habilitation (1960). His extraordinary scientific activity with 900 publications, his groundbreaking research in the field of medicinal plant research, analytics, isolation and structural elucidation, and especially with the focus on pharmacologically relevant natural products, and the many conferences he organized in Munich brought him worldwide recognition. His scientific life was dedicated to the acknowledgment and the support of phytotherapy. For this goal he worked tirelessly as a researcher, teacher, author of many books, speaker at conferences, and co-editor of many scientific journals.

Many awards and prizes, as well as five honorary doctorates, have been awarded to Prof. Wagner during his long scientific career. Twenty-five years ago, shortly before his retirement, he fulfilled a long-cherished wish, and together with his long-standing friend the late Dr. Norman Farnsworth, he founded the scientific journal *Phytotherapy*. Today, with an impact factor of 4.18, this journal is one of the leading international publications in the field.

In quite good health, Prof. Wagner is enjoying life together with



ABOVE: Dr. Hildebert Wagner (at table) celebrating his 90<sup>th</sup> birthday with friends and colleagues in Munich, Germany.

his wife Ursula in Bavaria where he is still writing and painting. We are very happy to have him still in our midst, to benefit from his great experiences and above all to be able to experience and admire his uninterrupted enthusiasm for sciences. ■

## On behalf of the large circle of students around the world

Prof. Dr. Angelika M. Vollmar, LMU, Germany  
Prof. Dr. Verena Dirsch, University of Vienna, Austria  
Prof. Dr. Hermann Stuppner, University of Innsbruck, Austria  
Prof. Dr. Ikhlas Khan, University of Oxford, Mississippi, USA  
Prof. Dr. Dr. h. c. Rudolf Bauer, University of Graz, Austria

## Newly Established Audrey S. Bingel Fellowship for Female Scientists

continued from page 18

### DECISION PROCESS

An *ad hoc* committee, appointed by the ASP president and comprised of three to five members of the ASP (with a majority female), will review any pending applications twice a year\* and present the name(s) of selected awardee(s) to the Executive Committee for approval. Awardees will be publicly announced at the next annual ASP meeting. \*The selection committee will set two review cycles (e.g., to start May 15 and November 15); applications received prior to those cycle dates will be evaluated in a 30-day period starting with the cycle date. The committee chair may exercise discretion in arranging an accelerated review by the committee, should the applicant make a case that her circumstances warrant a more rapid review. It is anticipated that the first review of applications will take place late this fall and at six month intervals thereafter.

### FOLLOW-UP REPORTING

After completion of the award timeframe (anticipated to be 1-2 years), each awardee must submit a brief report (2-4 pages) to the ASPF Board within two months, summarizing the specific impact(s) of the fellowship with regard to career development and advancement.

The funding for the Bingel Fellowship is not sufficient to maintain the award in perpetuity. So, while the ASPF Board of Directors will seek substantial support in the form of co-sponsorships, we invite and encourage ASP members to consider making contributions to the Audrey S. Bingel Fellowship in their annual gift to the ASPF. ■

# Betz Receives 2019 Wiley Award

By Paula N. Brown, PhD

**Known as an authority on botanical identification and phytochemical analysis, Dr. Betz has extensive knowledge concerning the safety and quality of botanical dietary supplements across the United States and beyond.**

**A**t the 133<sup>rd</sup> Annual AOAC International Meeting in Denver Colorado, Dr. Joseph M. Betz received the 2019 Harvey W. Wiley Award, the association's highest honor for lifetime scientific achievement.

Known as an authority on botanical identification and phytochemical analysis, Dr. Betz has extensive knowledge concerning the safety and quality of botanical dietary supplements across the United States and beyond. Betz earned a BSc degree in biology at the University of the Sciences (USciences) in Philadelphia, an MSc in marine and environmental science at C.W. Post/Long Island University and his PhD in pharmacognosy at USciences. He joined the NIH Office of Dietary Supplements as director of the Analytical Methods and Reference Materials Program in 2001 where he oversaw efforts to promote development of validated analytical methods and reference materials for dietary supplements until taking on the role of acting director in 2018. Prior to joining NIH, he spent 12 years as a research chemist at FDA's Center for Food Safety and Applied Nutrition and served two years as vice president for scientific and technical affairs at the American Herbal Products Association.

"I am humbled to receive this award," said Dr. Betz. "To be selected from all the brilliant analytical chemists with whom I've worked over my career is a wholly unexpected honor."



Dr. Joseph M. Betz

BELOW: Eagle Scout Betz negotiates obstacles not only in his position at NIH.



With more than 30 years in the dietary supplement community, Betz has most certainly made significant contributions, advancing the state of practice for dietary supplement quality and safety. Betz is a past recipient of the American Botanical Council's first Norman R. Farnsworth Award for Excellence in Botanical Research, the American Herbal Product Association's Herbal Insight Award for Contributions to the Botanical Sciences, and the American Society of Pharmacognosy's Varro E. Tyler Prize for outstanding scientific contributions to the broad field of dietary supplements, with special emphasis on botanicals.

His efforts have had a direct impact on natural product research standards, and his foresight in supporting development and delivery of method validation training programs resulted in a significant increase in available analytical methods and quality publications. Often referred to as "the Boy Scout of the Dietary Supplement Industry," Betz is in fact an Eagle Scout who is viewed by industry as both a speaker of scientific truths and subject matter expert who always generously shares his knowledge. So while it may be an unexpected honor for Dr. Betz, it is most certainly a very well-deserved honor. ■

**His efforts have had a direct impact on natural product research standards, and his foresight in supporting development and delivery of method validation training programs resulted in a significant increase in available analytical methods and quality publications.**

# Linus Pauling Institute 2019 Conference

By Edward J. Kennelly, PhD

The 10<sup>th</sup> Linus Pauling Institute's International Conference (LPIIC) was held August 14-16 in Corvallis, Oregon, hosted by ASP member Dr. Richard van Breemen, who was also the Society's 2017 Varro E. Tyler Award recipient. The conference covered cutting-edge research in the area of botanical dietary supplements, vitamins, redox biology, and neurological diseases.

The LPI was founded in 1973, and its mission is "to determine the functional roles of micronutrients and phytochemicals in promoting optimal health and to treat or prevent human disease, and to determine the role of oxidative stress and inflammation in health and disease." As its new director, van Breemen brings considerable expertise in both micronutrients and phytochemicals.

A number of ASP members participated in this conference including Drs. Nadja Cech, Stefan Gafner, Edward Kennelly, Amala Soumyanath, Fred Stevens, and Alan Wong. The first day of this three-day conference focused on botanical dietary supplements, with speakers from NIH-NCCIH and FDA who discussed the challenges of botanical research and botanical drug development. The 25<sup>th</sup> anniversary of DSHEA was a particularly appropriate time to hear speakers reflect on the progress in the field. Soumyanath updated attendees on the process to get regulatory approval for her clinical studies on an herb used in Ayurvedic medicine, *Centella asiatica*. The regulatory environment for doing clinical trials and getting an IND is complex and requires considerable documentation.

The safety and application of botanicals was discussed in a subsequent session. A number of academic scholars were present to describe their latest research and the state-of-the-art methods in understanding the safety and mechanisms of action of botanical dietary supplements. Cech described work she has done using cutting-edge metabolomics approaches to the authentication of botanical dietary supplements. Kennelly followed up with his two decades of research on black cohosh, in which he demonstrated that the common explanation for the

## The conference covered cutting-edge research in the area of botanical dietary supplements, vitamins, redox biology, and neurological diseases.

mechanism of action of this plant for women's health is not correct. Furthermore, he and others found that about 1/3 of black cohosh products in the United States are adulterated.

Stevens presented his new results of the use of polyphenols from hops for the treatment of metabolic syndrome and inflammatory bowel disease. Graduate student Wong, under the supervision of van Breemen, presented a poster on his LC-MS analysis looking at urinary estrogen derivatization to determine modulation of estrogen metabolism in women resulting from the use of botanical dietary supplements.

Van Breemen has been director at the LPI for over a year now, and this was the first LPIIC he organized. He noted, "During the last year of his long life, Linus Pauling contributed to passage of the Dietary Supplement Health and Education Act in 1994 (also known as DSHEA) in a letter to Senator Edward Kennedy that was read into the Congressional Record. Still law today, DSHEA ensures that dietary supplements like vitamins, minerals, and botanicals remain non-prescription and available over-the-counter to all consumers. In recognition of the 25<sup>th</sup> anniversary of DSHEA, the 10<sup>th</sup> Biennial Linus Pauling Institute International Conference included a symposium on regulatory issues and research priorities for botanical dietary supplements. We featured presentations by scientists from the National Institutes of Health, the Food and Drug Administration, the dietary supplements industry, and international academic experts."

The meeting closed with a talk by Nobel Laureate Dr. Louis Ignarro who was recognized for his discoveries regarding nitric oxide as a signaling molecule in the cardiovascular system. ■



# ASP Ambassador Program: Engineered Problems Require Engineered Solutions

By Brian Murphy, PhD

**A**ccess to scientific opportunity is not equal in the United States. The National Science Foundation (NSF) reported that underrepresented minority (URM) populations are employed in the scientific workforce at substantially lower rates than their presence in the US population. Conversely, it is estimated that **51% of the science and engineering workforce** is white male, a substantially higher rate than their presence in the US population. This is a direct reflection of over a century of discriminatory social engineering that restricted access to educational, legislative, judicial, housing, and social welfare resources to communities of color and other URM populations.

Of course, the ASP does not exist in a vacuum. Within a margin of error, the composition of our membership is reflective of the overall heavily biased STEM workforce in the US, and in particular lacks scientists of color. Thus, the challenge of including URM populations and giving equitable access to opportunity in the ASP is our problem that we need to solve.

**T**he survival of our discipline relies on new ideas. The effort to diversify our membership does not need to rest solely on moral grounds. There are specific strategic incentives that result from incorporating scientists from diverse backgrounds. It is well documented that gender, ethnic, racial, and socioeconomic diversity (among other categories) have positive effects on the impact of research performed in a given environment by providing access to a broader toolbox of methods and ideas. *Nature* dedicated an **entire issue** toward documenting the benefits of diversity and inclusion toward scientific research.

On a diverse team, individuals are forced to think outside the traditional dogmas that guide their practices. This places the team in a more favorable position to design innovative solutions. *Scientific American* **highlighted** additional benefits of assembling diverse groups:

*"This is not only because people with different backgrounds bring new information. Simply interacting with individuals who are different forces group members to prepare better, to anticipate alternative viewpoints and to expect that reaching consensus will take effort."*

The natural products discipline is faced with several grand challenges, from determining how much remaining chemical space contains new structural scaffolds, to designing a greener and more comprehensive synthetic toolbox, to realizing the full potential of genome mining to discover new drugs, among other challenges. Each requires atypical thinking and innovative ideas that will be inspired

when diverse groups of scientists team up, debate, and build. Fostering this environment and setting an example for other STEM disciplines should be the ASP's mission in the coming five years.

**T**he ASP's greatest strength is simultaneously its major shortcoming. I have been a member of the ASP since 2002. Speaking candidly, we are very much a tight knit, "homegrown" society. I mean this in a positive way. Many maintain strong ties with one another over the years. We often exchange graduate students, postdocs, and technicians. A wonderful consequence of this is that students are able to benefit from multiple pathways of career advancement that are readily accessible through existing social and professional networks. Many of the young professors in our field have in the past worked directly under other more senior ASP members; again, this is a positive phenomenon. However, in particular this recruitment pipeline has failed to incorporate communities of color. This cycle needs to be amended by adding additional avenues of recruitment that give us access to pools of talented scientists that we are failing to reach.

**T**he Diversity and Inclusion Committee and the ASP Ambassadors Program. In 2014 (under President Phil Crews), Dr. Barry O'Keefe initiated a "12-step" program to rebrand the ASP, in part to recruit a talented new generation of scientists. In 2018 ASP President Susan Mooberry formed the Diversity and Inclusion Committee, which is co-chaired by Drs. Nadja Cech and Esther Guzman, to address issues of inequity within the ASP. One of the major initiatives of this committee was the formation of the ASP Ambassador's Program. This program is a recruitment effort targeted at URM scientists, designed to expand our pipeline of those who engage in natural products research.

This program is at its infant stages, and much growth lies ahead of us. It is far from a comprehensive solution toward curbing inequality. A provocative discussion at the ASP meeting in Madison explored the very real challenges facing the recruitment and inclusion of URM populations into our society, including: unequal access to undergraduate research experiences, income inequality and resulting barriers toward pursuit of higher education, and inclusion into a sometimes non-inclusive culture of current graduate programs. Addressing these will require a major shift in attitude and awareness of scientists that are currently immune to these systemic obstacles.

**I**ntroducing the new ASP Ambassadors. Despite receiving many outstanding applications, the committee selected three that exhibited a unifying theme: the necessity of listening. Our three Ambassadors are Dr. Christine Salomon of the University of Minnesota, Dr. Sandra Loesgen of the University of Florida, *continued on page 23*

## ASP Ambassador Program: Engineered Problems Require Engineered Solutions

continued from page 22

and Ms. Katherine Zink of the University of Illinois at Chicago. Ambassadors are to develop and maintain relationships with local institutions and organizations that serve URM populations (examples include predominantly undergraduate institutions (PUIs), historically black colleges and universities (HBCUs), Hispanic serving institutions (HSIs), and other institutions with official minority-serving designations). Ambassadors will offer information about the possibilities of a career in natural products research to young scientists and serve as a conduit to those wishing to become involved with the ASP.

**Engineered problems require engineered solutions.** Our country has attempted to integrate historically segregated populations in the past, and few have stated it more eloquently and sobering than author James Baldwin, as he reflected on how society can take corrective action to undue past injustices:

*"...but I think that the past is all that makes the present coherent, and further, that the past will remain horrible for exactly as long as we refuse to assess it honestly."*

Engineered problems require engineered solutions. The ASP Ambassadors Program represents a modest first step toward correcting centuries of affirmative action that gave the white male population in particular unequal access to opportunity in the US. Fortunately for our society, our path toward equity aligns a greater moral imperative, an imminent social responsibility, and a recruitment effort whose effects will substantially improve the intellectual capacity of the ASP. ■

## Keller Named Interim ASP Secretary

By Patricia Carver, MA



Dr. Amy Keller

PHOTO CREDIT: LESLIE KNAUB

**D**r. Amy Keller has been named to serve as interim ASP secretary, stepping in for Dr. Nicholas Oberlies as he takes on his new role as the Society's vice president. Keller, an assistant professor of medicine at the University of Colorado's Division of Endocrinology, Metabolism and Diabetes, has been an ASP member since 2006. She also served as assistant editor of this newsletter for

11 years from 2006-2017.

Keller stated, "I'm so pleased to serve the ASP in this capacity, as it contributes to the greater good of the Society. It also means I get to work with phenomenal fellow members!" She will serve temporarily as secretary until an official secretary is chosen in the next ASP election.

**The Society congratulates  
Dr. Keller and wishes her  
the best of luck in  
her new role.**

## 2019 ASP Foundation Donors

The ASP Foundation wishes to acknowledge and thank its donors. The ASPF was founded to promote, support, and further the scientific and educational interests and purposes of the ASP. If you wish to make a donation, please visit the ASPF webpage for instructions at [www.pharmacognosy.us/what-is-pharmacognosy/the-asp-foundation/](http://www.pharmacognosy.us/what-is-pharmacognosy/the-asp-foundation/)

### FOUNDATION PATRONS

Gordon Cragg, PhD  
A. Douglas Kinghorn, PhD  
David Kingston, PhD  
Robert Krueger, PhD  
Jim McAlpine, PhD  
Susan Mooberry, PhD  
Phil Proteau, PhD  
Ben Shen, PhD

### FOUNDATION ASSOCIATES

Lindsay McQuery, PhD

### FOUNDATION FRIENDS

Cindy Angerhofer, PhD  
James B. Gloer, PhD  
Kirk Manfredi, PhD  
Rachel Mata, PhD  
Kerry McPhail, PhD

Ted Molinski, PhD  
Dale Nagle, PhD  
Richard Powell, PhD  
Judy Slatkin  
Laura Stoll

### OTHER DONORS

Phil Crews, PhD  
Harald Gross, PhD

Robin Marles, PhD  
Phillip Williams, PhD

### MATCHING GIFTS

Network for Good  
BMS Matching Gift Program

# A Farewell to “Leaves from an Erlenmeyer Flask”? ASP Investigates Options for New Logo

By Barry O’Keefe, PhD

The ASP is now 60 years old, and during its history it has had two different logos. The ASP logo was last redesigned over 40 years ago from the script-in-a-circle logo seen here to the “leaves from an Erlenmeyer flask” design in 1978 (two versions of which are shown below). The 1978 logo design is usually seen in green but also has been depicted in black and purple in ASP newsletters over the years. The ASP Executive Committee recently approved a plan to get professionals involved in developing potential new logo designs.

## “Leaves from an Erlenmeyer flask”



## Recent logos

A partner in a major logo design firm in New York, Mr. Sagi Haviv of Chermayeff & Geismar & Haviv, accepts *pro-bono* logo design projects that he oversees as part of his role as a professor at the School of Visual Arts in New York City. In this process, 8-12 different artists will undertake up to ten different logo designs each for the ASP. These designs then will be refined and reduced in number with input from Haviv and other professors at the School of Visual Arts and then presented to the ASP.

If the ASP decides to use one of the logos, Haviv has suggested that it is customary to provide an honorarium

it to the winning designer of \$500-\$1000. It should be noted that Haviv’s firm generally charges ~\$200,000 for logo design projects and have designed the logos of such prominent entities as the Smithsonian Institution, PBS, National Park Service, Library of Congress, and Harvard University Press among others.

ASP has created a small initial committee of members Drs. Nick Oberlies, Amy Keller, Chris Thornburg and Barry O’Keefe to work with Haviv and the School of Visual Arts to help the designers in their efforts. This will require travel to NYC to meet in person with the designers this fall and to do so again at a later date to view their designs. They will then present options to the ASP Executive Committee, which will decide if one of the designs will be used.

There are several potential areas for improvement: to make the logo more representative of the Society (more than just plants growing out of a flask), more intuitively understandable by a larger audience, and to aid in the rebranding of the term pharmacognosy so that it is more accessible and well-recognized. This effort is consistent with the overall ASP rebranding initiative wherein, once we voted to keep the name of the ASP, we acknowledged the need to increase our efforts to improve the recognition of the term pharmacognosy.

The goal of the project is to have a logo chosen prior to the 2020 ICNPR so as to “roll out” the new logo to the largest possible audience. Below is more information on Haviv and the School of Visual Arts in NYC.

Haviv is a partner and designer at Chermayeff & Geismar & Haviv. Among the over 60 identity programs he has designed are the lo-

First ASP logo



**There are several potential areas for improvement:  
to make the logo more representative of the Society  
(more than just plants growing out of a flask),  
more intuitively understandable by a larger audience,  
and to aid in the rebranding of the term pharmacognosy  
so that it is more accessible and well-recognized.**

*continued on page 25*

## A Farewell to “Leaves from an Erlenmeyer Flask”? ASP Investigates Options for New Logo

**The goal of the project is to have a logo chosen prior to the 2020 ICNPR so as to “roll out” the new logo to the largest possible audience.**

*continued from page 24*

gos for the US Open Tennis Championships, Leonard Bernstein at 100, Harvard University Press, Conservation International, and LA Reid’s Hitco Entertainment.

A go-to expert on the process of effective logo design, Haviv contributes regularly to Bloomberg Businessweek, PBS, Fast Company, and NBC’s Meet the Press. He speaks about logo design around the world, including for TEDx, the AIGA, the HOW Design Conference, the Brand New Conference, Princeton University, the Onassis Foundation, the American Advertising Federation, and Columbia Business School, among many others. His team has designed the logos of the Smithsonian Institution; PBS; National Park Service; Library of Congress; Armani Exchange; John D. and Catherine T. MacArthur Foundation; National Aquarium, Baltimore; Southern Poverty Law Center; Brown University; Conservation International; Women’s Tennis Association; State Farm; Brennan Center for Justice; Milwaukee Institute of Art & Design; Harvard University Press.

He teaches Visual Identity Design at the School of Vi-



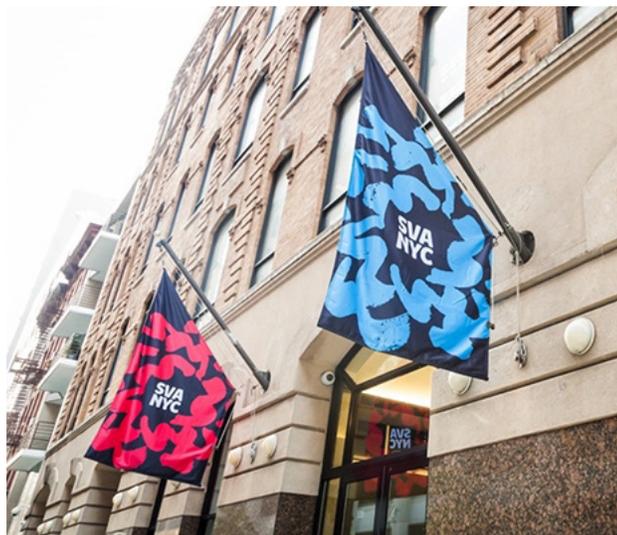
Mr. Sagi Haviv

sual Arts in New York City. He also is coauthor of *Identify: Basic Principles of Identity Design in the Iconic Trademarks of Chermayeff & Geismar* (Print Publishers, 2011) and *Identity: Chermayeff & Geismar & Haviv* (Standards Manual, May, 2018).

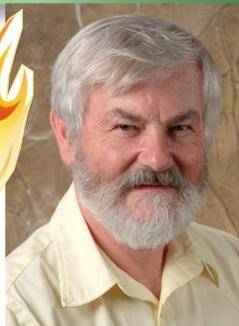
The School of Visual Arts was founded in 1947 and is a member of the Association of Independent Colleges of Art and Design. The School of Visual Arts has been a leader in the education of artists, designers and creative professionals for seven decades. With a faculty of distinguished working professionals, a dynamic curriculum and an emphasis on critical thinking, SVA is a catalyst for innovation and social responsibility. It is ranked in the top 25 Best Colleges of Art and in the top ten Best

Schools for Design in the United States in 2019. ■

**A go-to expert on the process of effective logo design...**



# Hot Topics in Pharmacognosy: An Orally Active Dipeptidyl Peptidase IV Inhibitor from a TCM-derived Natural Product Structure



By David Newman, DPhil

In the time period from the beginning of 2011 to the end of June 2019, a number of agents have been approved as treatments for type 2 diabetics, adding to some earlier compounds not commented on here. These generally fall into two pharmacological classes, the “gliptins” whose target is DPP IV, and the “flozins” that target the sodium-dependent glucose transporter inhibitors (SGLTi’s).

Taking data from the 2016 review by Newman and Cragg,<sup>1</sup> which covered approved drugs worldwide from January 1, 1981 to December 31, 2014, and it should be emphasized, not just FDA approved, a very common error that people make when referring to this and our earlier reviews in their papers. There were eight approved “gliptins” between 2006 and 2014, but only those from 2011 and 2012 will be noted: linagliptin (**1**) in 2011 and then three, teneligliptin (**2**), anagliptin (**3**) and gemigliptin (**4**), in 2012. All of these, including the earlier compounds, were classified as “S/NM” under our usual coding, or “synthetic/natural product mimic.” In contrast, there were six SGLTi’s in the time frame from 2012 to 2014, and all were classified as “S\*/NM” or “synthetic with an NP pharmacophore.” Of these two were in the EU, one in the USA and three in Japan.

So one might think that the market might be saturated! However, in the last four and a half years (January 1, 2015 to June 30, 2019) using data that will be submitted to *JNP* later this year, and now covering drugs approved worldwide from 1981 to June 2019, there were four “gliptins” approved

for the treatment of type 2 diabetes. Interestingly, none were approved in the USA. In 2015, evogliptin (**5**) was approved in Korea, omarigliptin (**6**) and trelagliptin (**7**) in Japan, and then in 2016, gosogliptin (**8**) was approved in Russia. All of these still fell into the S/NM category.

However, a very recent paper in the *Journal of Medicinal Chemistry* by Li et al.<sup>2</sup> from Shanghai and Beijing, demonstrated the first series of compounds that could establish a significant weekly dosing schedule. This series is of definitive interest as the two compounds approved in 2015 in Japan have had some significant safety/toxicity problems, so the companies involved are not extending the drugs to any other country/agency.

In 2011, Zhang et al.<sup>3</sup> used the TarFisDock algorithm to search for bioactive materials from the medicinal plant *Daphne odora* Thunb var. *marginata* which is used in TCM as a treatment for diabetes. From the interaction network that demonstrated the interrelationships among the compounds, they identified the natural product isodaphnetin (**9**) as a potential inhibitor of DPP IV. The natural product had an IC<sub>50</sub> value of 14.13 μM as an inhibitor of DPP IV. By using “scaffold hopping” followed by matching of ligand-receptor “shapes,” two orally active derivatives (**10**, **11**) were synthesized with IC<sub>50</sub> values close to the 2 nM level. These were described in the 2016 paper by Li et al.<sup>4</sup> with (**10**) having the superior pharmacodynamic parameters, demonstrating over a 24

*continued on page 27*

**However, in the last four and a half years (January 1, 2015 to June 30, 2019) using data that will be submitted to *JNP* later this year, and now covering drugs approved worldwide from 1981 to June 2019, there were four “gliptins” approved for the treatment of type 2 diabetes.**

## Hot Topics in Pharmacognosy: An Orally Active Dipeptidyl Peptidase IV Inhibitor from a TCM-derived Natural Product Structure

continued from page 26

hour inhibition of DPP IV and an excellent performance in oral glucose tolerance tests in mice.

Further optimization of the 2 nM compound (**10**), referred to in the previous paragraph, was carried out by the same group using sophisticated modeling techniques with derivatives of that compound, which led to the synthesis of compound (**12**)<sup>2</sup> where the final change was to substitute the second methoxy group in the naphthalene ring for a nitrile. Although this is a “second generation offspring” of the natural product, the underlying structure of the TCM-derived NP (**9**) can be seen in (**12**) with effectively identical stereochemistry around the fused rings.

Although no formal IC<sub>50</sub> figure was given for compound (**12**), the K<sub>d</sub> value for compound (**10**) was quoted as 2.38 nM with the initial IC<sub>50</sub> value of close to 2 nM, with the corresponding IC<sub>50</sub> value for the natural product iso-daphnetin (**9**) being quoted as 14.43 μM. Thus it can be assumed that the listed K<sub>d</sub> value of 177 pM is close to the IC<sub>50</sub> for compound (**12**) if assayed under comparable positions. These figures mean that the optimization of the natural product structure led to an increase of greater than 80,000 times (14,430 nM versus 0.177 nM) in biological activity against the same target, and in addition, the optimized compound exhibits a “fast-on; slow-off” mode of inhibition of DPP-IV.

The pharmacology discussion demonstrated that the compound has a long half-life across mouse and rat, with a long

terminal half-life of over 25 hours from p.o. dosing in mice, with a significantly longer T<sub>1/2</sub> than the controls, sitagliptin and omarigliptin. In addition, the oral availability is >98% in rats. In *db/db* mice, significant reduction in glucose levels were seen and insulin levels were elevated in these models of diabetes 2. In addition, an assay of compound (**12**) to determine the level for significant blockade of the human potassium channel, *hERG* demonstrated an IC<sub>50</sub> of > 40 μM, well above the levels demonstrated for activity as a drug in rodents *in vivo*, so there appears to be a significant safety level as far as any cardiac problems that might occur.

This compound is a long way from being a human use drug, but the data so far published demonstrates that its structure is significantly active, is the first compound from a natural product with this activity and is orally active with excellent pharmacodynamics. What is also of significant import is that in the 2019 paper, the authors reported production of over 10 kilograms of the required compound for ongoing preclinical studies. Thus not only did they optimize a natural product structure, they also provided a synthetic method to overcome the “bane of a drug discovery program,” viz. provision of adequate supplies to continue pre-clinical and clinical trials.

It will be very interesting to follow this compound due to the thorough details that have been provided by the authors in their three publications in journals that have very high

continued on page 28

### LITERATURE CITED

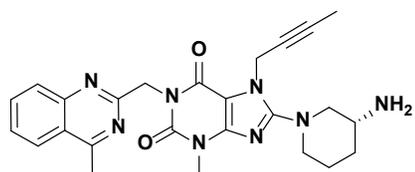
- 1 Newman, D.J. and Cragg, G.M. Natural products as sources of new drugs 1981 to 2014. *J. Nat. Prod.*, **2016**, 79, 629-661.
- 2 Li, S., Qin, C., Cui, S., Xu, H., Wu, F., Wang, J., Su, M., Fang, X., Li, D., Jiao, Q., Zhang, M., Xia, C., Zhu, L., Wang, R., Li, J., Jiang, H., Zhao, Z., Li, J., and Li, H. Discovery of a natural-product-derived preclinical candidate for once-weekly treatment of type 2 diabetes. *J. Med. Chem.* **2019**, 62, 2348–2361.
- 3 Zhang, S., Lu, W., Liu, X., Diao, Y., Bai, F., Wang, L., Shan, L., Huang, J., Li, H., and Zhang, W. Fast and effective identification of the bioactive compounds and their targets from medicinal plants via computational chemical biology approach<sup>†</sup>. *Med. Chem. Commun.* **2011**, 2, 471-477.
- 4 Li, S., Xu, H., Cui, S., Wu, F., Zhang, Y., Su, M., Gong, Y., Qiu, S., Jiao, Q., Qin, C., Shan, J., Zhang, M., Wang, J., Yin, Y., Xu, M., Liu, X., Wang, R., Zhu, L., Li, J., Xu, Y., Jiang, H., Zhao, Z., Li, J., and Li, H. Discovery and rational design of natural-product-derived 2-phenyl-3,4-dihydro-2H-benzo[f]chromen-3-amine analogs as novel and potent dipeptidyl peptidase 4 (DPP-4) inhibitors for the treatment of type 2 diabetes. *J. Med. Chem.* **2016**, 59, 6772-6790.

**The pharmacology discussion demonstrated that the compound has a long half-life across mouse and rat, with a long terminal half-life of over 25 hours from p.o. dosing in mice, with a significantly longer T<sub>1/2</sub> than the controls, sitagliptin and omarigliptin.**

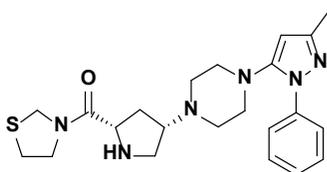
# Hot Topics in Pharmacognosy: An Orally Active Dipeptidyl Peptidase IV Inhibitor from a TCM-derived Natural Product Structure

continued from page 27

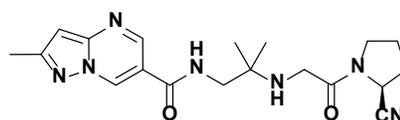
## Compound Structures



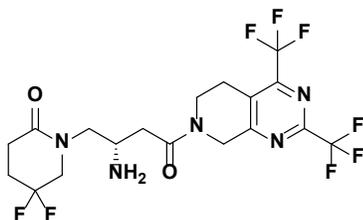
1. Linagliptin



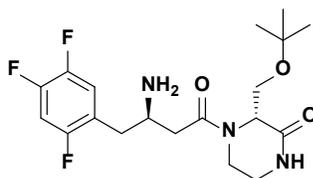
2. Tenziglipatin



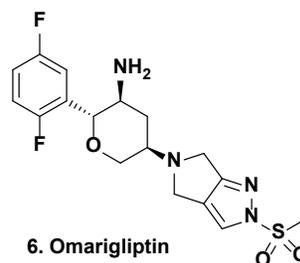
3. Anagliptin



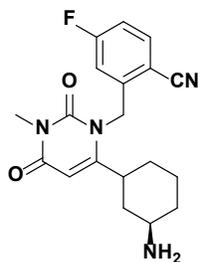
4. Gemigliptin



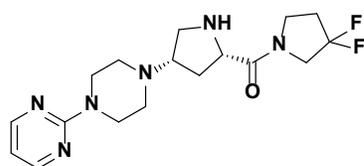
5. Evogliptin



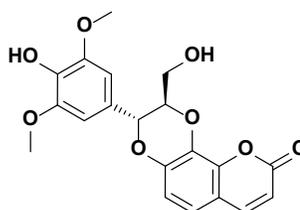
6. Omarigliptin



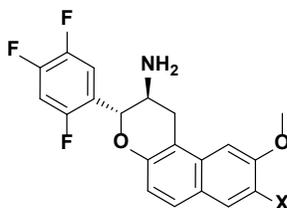
7. Trelagliptin



8. Gosogliptin



9. Iso-daphnetin



10. X = O; K<sub>d</sub> = 2.38 nM

11. X = SO<sub>2</sub>

12. X = CN; K<sub>d</sub> = 177 pM

# New Members of ASP Fall 2019

ASP would like to welcome our new members. The Society's main objectives are to provide the opportunity for association among the workers in pharmacognosy and related sciences, to provide opportunities for presentation of research achievements, and to promote the publication of meritorious research. New members include 27 full members and 13 associate members. We look forward to meeting you and learning more about you and your work.



## FULL MEMBERS

### Dr. Donovan Adpressa

Merck and Co., Inc.  
Jamaica Plain, MA  
Senior Scientist

### Mr. Nana Bafi-yebo

Health Canada  
Ottawa, Canada  
Biologist

### Dr. Ken Burns

University of Wisconsin –  
Madison  
Madison, WI  
Research Specialist

### Dr. Fausto Carnevale Neto

University of Washington  
Seattle, WA  
Acting Instructor

### Dr. Jean Christopher Chamcheu

University of Louisiana at  
Monroe College of Pharmacy  
Monroe, LA  
Assistant Professor

### Dr. Manisha Dikshit

Uttarakhand Ayurved University,  
Rishikul Campus  
Haridwar, Uttarakhand, India  
Assistant Professor

### Dr. Charles Fermaintt

UT Health San Antonio  
San Antonio, TX  
Postdoctoral Fellow

### Dr. Chung Sub Kim

Yale University  
New Haven, CT  
Postdoctoral Associate  
in Chemistry

### Dr. Yuta Kudo

Tohoku University  
Sendai, Miyagi, Japan  
Assistant Professor

### Dr. Tsvetelina Mandova

Gilson Purification SAS  
Saint-Avé, France  
Senior Scientist

### Dr. Lance McMahon

University of Florida College of  
Pharmacy  
Gainesville, FL  
Professor

### Dr. Wael Mostafa

King Saud University  
Riyadh, Saudi Arabia  
Bioinformatician

### Prof. Min Kyun Na

Chungnam National University  
Daejeon, Republic of Korea  
Associate Professor

### Dr. Valerie Paul

Smithsonian Marine Station  
Fort Pierce, FL  
Director

### Mr. Todd Pinkerman

Suburban Surgical Co. Inc.  
Wheeling, IL  
VP Sales

### Dr. Michail Plioukas

University of Nicosia  
Nicosia, Cyprus  
Lecturer

### Dr. Diana Roopchand

Rutgers University  
New Brunswick, NJ  
Assistant Professor

### Dr. Jeffrey Rudolf

University of Florida  
Gainesville, FL  
Assistant Professor

### Dr. Young Shen

Young BioPharma, LLC  
Andover, MA  
President

### Dr. Holly Showalter

Waukee APEX / Waukee  
High School  
Waukee, IA  
Instructor

### Dr. John Sorensen

University of Manitoba  
Winnipeg, Manitoba, Canada  
Associate Professor

### Dr. Ashootosh Tripathi

University of Michigan Natural  
Products Discovery Core  
Ann Arbor, MI  
Director

### Mr. Jeffrey Van Santen

Simon Fraser University  
Burnaby, BC, Canada  
Researcher

### Dr. Bhaskar Vemu

University of Illinois at Chicago  
Chicago, IL  
Postdoctoral Research  
Associate

### Dr. Shibiao Wu

MilliporeSigma  
Laramie, WY  
Senior Scientist

### Dr. Tadahiro Yahagi

Nihon University School of  
Pharmacy  
Chiba, Japan  
Assistant Professor

### Dr. Mesfin Yimam

Unigen, Inc.  
Tacoma, WA  
Director

## ASSOCIATE MEMBERS

### Ms. Clairese Claudet

Louisiana Agriculture  
Preservation Society  
Gray, LA  
CEO

### Mr. Ananiya Demessie

Oregon State University  
Corvallis, OR  
Graduate Student

### Ms. Susan Egbert

University of Manitoba  
Winnipeg, Manitoba, Canada  
Graduate Student

### Mr. Auday Eida

Oregon State University  
Corvallis, OR  
Graduate Student

### Mr. Paolo Governa

University of Siena  
Siena, Italy  
PhD Student

### Mr. Vinh Le Ba

Chungnam National  
University of Korea  
Daejeon, Republic of Korea  
PhD Student

### Ms. Amanda Christine Maldonado

University of Illinois at Chicago  
Chicago, IL  
Graduate Student

### Mr. Preston Manwill

The Ohio State University  
Columbus, OH  
PhD Student

### Mrs. Lucy Noon

Bath Spa University  
Bath, UK  
Undergraduate Student

### Ms. Tithi Roy

University of Louisiana  
at Monroe  
Monroe, LA  
Graduate Student

### Mr. Hideaki Takahashi

Showa Pharmaceutical  
University  
Machida, Tokyo, Japan

### Ms. Roamie Thatcher

City College of San Francisco  
San Francisco, CA  
Student

### Ms. Fiona Tymms

British Columbia Institute  
of Technology  
Burnaby, BC, Canada  
Researcher



# Pharmacognosy Field Notes: Microbiome Sampling from the Tropics to the Poles

By Marcy J. Balunas, PhD

In our search for deeper understanding of the chemical interactions between microbes and their eukaryotic hosts, we have departed from the University of Connecticut (UConn) to explore areas from Panamanian coral reefs to Alaskan harbors and many places in between. The organisms we have collected range from the charismatic (e.g., squid and ants) to the everyday, and we are most interested in exploring the chemistry that drives these host-microbe interactions, both for insights into their chemical ecology as well as their potential as drug discovery leads.

In our collaboration with Dr. Spencer Nyholm (UConn Molecular and Cell Biology), we focus on a symbiotic bacterial consortium with the Hawaiian bobtail squid (*Euprymna scolopes*), housed in the accessory nidamental gland that protects squid eggs from pathogens and predators. Spencer has worked with these squid for many years, and so my lab had only seen them in his UConn tanks after collection by others. However, in May 2016, we were fortunate to attend the 28<sup>th</sup> Annual Squid-Vibrio Pow Wow in Honolulu, Hawaii.

During the day, we attended the meeting, highlighting the squid symbiosis with the bioluminescent bacterial symbiont, *Vibrio fischeri*. In the evening, though, we went to a beach known for populations of these squid, who emerge at night to hunt for food, protected from predation by their bioluminescent symbiosis. These nighttime collections took the form of shuffling through knee deep water with a high-powered flashlight to spot the squid jetting quickly away. With some practice (and a lot of luck), squid were netted and determined to be of appropriate size for collection. Fortunately for me, my collaborator has been doing this for a long time because, after four hours, my lab collected a sum total of



Amanda Fenner and Samantha Gromek on the hunt for Hawaiian bobtail squid on the island of Oahu at dusk, wading through the water with high powered flashlights to spot the luminescence of their bacterial symbiont *Vibrio fischeri*.

PHOTO CREDIT: MARCY BALUNAS

zero squid whereas he and his team had netted 10-12. The squid were brought back to a lab at the University of Hawaii before shipping, using transport originally set up for shipment of live aquarium fish back to UConn.

In another collaboration, we work with Dr. Jonathan Klassen (UConn Molecular and Cell Biology) to study the bacterial symbionts of *Trachymyrmex septentrionalis* fungus-growing ants. In a similar fashion, we had seen Jonathan's lab-raised ants and their intricate fungus gardens but had never performed field collections. So, in July 2017, we took the ferry to Long Island with Jonathan to perform collections. Unlike the pleasant Hawaiian evening breezes, this daytime terrestrial sampling was hot, with temperatures nearing 100°F that day. As is typical, forest fieldwork demanded long pants and hiking boots, so there was no relief from the heat as we hiked along wide trails and abandoned roads. Fortunately, Jonathan has performed these collections all along the East Coast and had ideas where we might find colonies, using a small horseshoe of beige detritus as the only clue that there might be a fungus-garden below. A meticulous excavation began, giving a wide berth to the colony, digging down about two feet and then slowly approaching the fungus garden, eventually digging with spoons and brushes to ensure the delicate gardens remained intact. After carefully removing the garden, we used a homemade tubing system to suck out the scurrying ants, essential to maintaining the gardens in the lab and an important part of this multipartite symbiosis. Between the three of us, we collected 5-6 gardens that day and transported them back to UConn where they were left to equilibrate before further experiments.

*continued on page 31*

**In our collaboration with Dr. Spencer Nyholm (UConn Molecular and Cell Biology), we focus on a symbiotic bacterial consortium with the Hawaiian bobtail squid (*Euprymna scolopes*), housed in the accessory nidamental gland that protects squid eggs from pathogens and predators.**

## Pharmacognosy Field Notes: Microbiome Sampling from the Tropics to the Poles

*continued from page 30*

Our tunicate-associated bacteria research has involved sampling from a wide range of environments, including dive trips to both the Caribbean Sea and Pacific Ocean in Panama as well as less traditional sampling in Alaskan waters. In August 2012, we went from Homer, AK to the NOAA/University of Alaska Fairbanks field station in Kasitsna Bay. For this scouting trip we wanted to explore shallow tunicate populations and planned for sampling during maximum tidal differentials (~23 feet in this area), such that we could examine marine tunicates from dry land. In the strangest of these collections, we walked from the field station along a dirt road to a remote harbor, spotting more than one bear en route; who knew bears would be an issue on a marine field trip! Numerous tunicate species were collected at several harbors and beaches along the coast, processed in the field station labs, and shipped back to UConn.

In much less exotic tunicate sampling, every year we go to the UConn Avery Point campus located in Groton, CT, about an hour from our labs. Both solitary and colonial tunicates are plentiful from submerged ropes along the UConn docks, giving the whole lab an opportunity to participate in collections. Live and preserved samples are easily transported back to the labs after our annual lab picnic at this beautiful coastal campus.

In an unusual twist on traditional pharmacognosy sampling, we worked on the microbiome of human fecal samples during my sabbatical with Dr. Patrick Schloss at the University of Michigan. Fortunately, the samples of primary interest were part of a larger regional sampling effort and were already collected, catalogued, aliquoted, and frozen. Even still, working with frozen stool has proven to be one of the more distasteful extractions I have performed, although easily the most biologically relevant when studying human disease.

Microbiome fieldwork has taken us all over the world, allowing for numerous unique collection experiences, working with phenome-

*continued on page 32*



Part of the squid collection team (Marcy Balunas, Spencer Nyholm, Samantha Gromek, Allison Kerwin, Sarah McAnulty, and Andrea Suria).

PHOTO CREDIT: AMANDA FENNER



Sara Puckett collecting ants after extracting their fungus garden from beneath the soil on Long Island. After searching for above ground evidence, gardens are painstakingly excavated using small spoons to ensure the fragile gardens remain mostly intact.

PHOTO CREDIT: MARCY BALUNAS

**In another collaboration, we work with Dr. Jonathan Klassen (UConn Molecular and Cell Biology) to study the bacterial symbionts of *Trachymyrmex septentrionalis* fungus-growing ants.**

## Pharmacognosy Field Notes: Microbiome Sampling from the Tropics to the Poles

continued from page 31

**Our tunicate-associated bacteria research has involved sampling from a wide range of environments, including dive trips to both the Caribbean Sea and Pacific Ocean in Panama as well as less traditional sampling in Alaskan waters.**

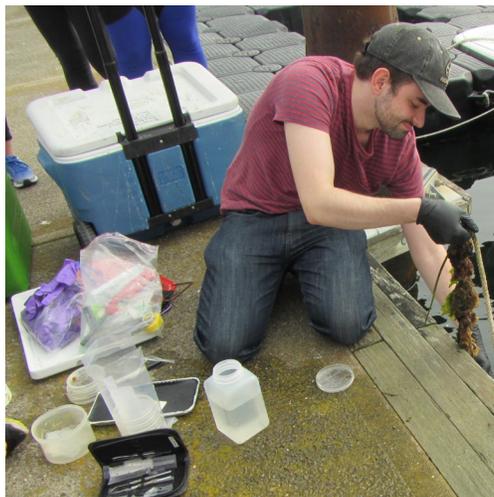


ABOVE: Kim Diver near Kasitsna Bay, Alaska next to pylon encrusted with marine invertebrates, showing an approximation of the tidal differential that allowed for sampling of marine tunicates from dry land.

PHOTO CREDIT: MARCY BALUNAS

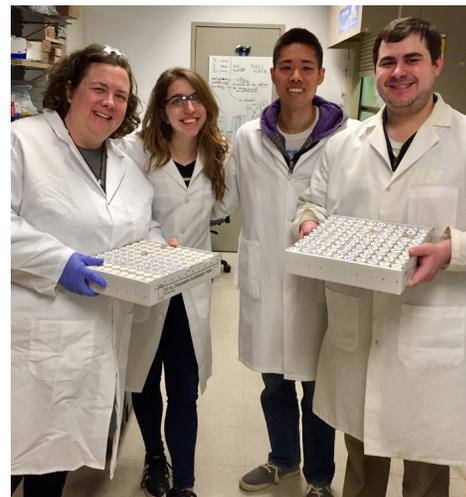
RIGHT: The Balunas Lab after our tunicate collection trip and before our annual picnic (Marcy Balunas, Lucas Gitzel, Andrew Maxwell, Brendan Stewart, Sara Puckett, Lava Kareem, Samantha Gromek, Cindy Li, Kailey Huot, Robert Samples, and Karen Tan).

PHOTO CREDIT: KIM DIVER



Robert Samples collecting marine tunicates off a dock at the UConn Avery Point campus. Solitary and colonial tunicates are then prepared for bacterial isolation and microbiome analyses.

PHOTO CREDIT: KIM DIVER



No action shots of human fecal sample collection! In fact, these are some of the extracts made during a sabbatical at the University of Michigan (Marcy Balunas, Kaitlin Flynn, Marc Sze, Charlie Koumpouras).



nal collaborators who utilize genomics tools to study bacterial community composition, biosynthesis, metagenomics, transcriptomics, and biosynthesis. In almost all cases, research in my lab then involves some combination of chemical extraction of the microbiome and/or of bacterial isolates, metabolomics,

and isolation of bioactive metabolites. With such a large variation in samples, we have spent countless hours optimizing protocols for field collections, processing, and transport as well as methods for extraction and analysis. We are always looking forward to our next adventure! ■

# Conference Calendar

The *Newsletter* is pleased to announce the following upcoming conferences and meetings. The events portrayed here reflect what listings and notices the *Newsletter* has specifically received. For a more extensive calendar, please visit the ASP website at [www.pharmacognosy.us](http://www.pharmacognosy.us). If you have a conference or event you would like mentioned, please send us relevant information, including any graphics or appropriate fliers, at [asp.newsletter@lehman.cuny.edu](mailto:asp.newsletter@lehman.cuny.edu).

## **3<sup>rd</sup> International Conference on Natural Products Discovery and Development in the Genomic Era**

**January 12-16, 2020**

**San Diego, CA**

[www.sim.confex.com/sim/np2020/cfp.cgi](http://www.sim.confex.com/sim/np2020/cfp.cgi)

## **Gordon Research Seminar: Chemical Biology and Drug Discovery from the Marine Environment**

**February 22-23, 2020**

**Gordon Research Conference: Discovery, Functional Development and Enabling Technologies of Marine Natural Products**

**February 23-28, 2020**

**Ventura, California**

[www.grc.org/marine-natural-products-grs-conference/2020](http://www.grc.org/marine-natural-products-grs-conference/2020)

## **T20 Phytochemical Society of Europe**

**March 6, 2020**

**Liverpool, UK**

[www.ysm2018.wixsite.com/t20liverpool](http://www.ysm2018.wixsite.com/t20liverpool)

## **4<sup>th</sup> Annual Institute of Cannabis Research Conference**

**April 4-6, 2020**

**Pueblo, Colorado**

[www.csupueblo.edu/institute-of-cannabis-research/2020-conference/index.html](http://www.csupueblo.edu/institute-of-cannabis-research/2020-conference/index.html)



## **Gordon Research Seminar: Integrative Microbial Oceanography**

**May 23-24, 2020**

**Gordon Research Conference: The Interconnected Microbial Ocean**

**May 24-29, 2020**

**Les Diablerets, Switzerland**

[www.grc.org/marine-microbes-conference/2020/](http://www.grc.org/marine-microbes-conference/2020/)

## **Society for Economic Botany joint with International Society for Ethnobiology**

**May 31-June 4, 2020**

**Mona, Jamaica**

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

## **3<sup>rd</sup> International Conference on Marine Fungal Natural Products - MafNap 2020**

**June 2020**

**Athens, Greece**

**Directing Biosynthesis VI**

**June 29-July 1, 2020**

**Edinburgh, Scotland**

[www.rsc.org/events/detail/39023/directing/biosynthesis-vi](http://www.rsc.org/events/detail/39023/directing/biosynthesis-vi)

## **14<sup>th</sup> International Coral Reef Symposium**

**July 5-10, 2020**

**Bremen, Germany**

[www.icrs2020.de](http://www.icrs2020.de)



## Brief News from Washington

By Georgia Perdue, PhD

- **The FBI gave Dr. Francis Collins distressing news regarding research integrity.** At the June 23 Advisory Committee to the Director of the NIH (ACD), **Dr. Collins reported he sent out 10,000 letters last August re: “how foreign influences are affecting research integrity.”** Even though the number of researchers involved at NIH is relatively small, it nevertheless **“is serious.”** **Inconsistencies in publications and grant documents were noted by staff members. Some salient points:**
  - **Biomedical researchers diverted proprietary information on grant applications.** NIH-supported researchers produced information for other entities.
  - **Peer reviewers shared confidential information with others “who had no business seeing it...” including foreigners,** thus [influencing] funding decisions.
  - **Researchers failed to disclose substantial resources from “others,” including foreign governments** “which threatens to distort the appropriate use of NIH funds.”
  - NIH personnel reached out to 60 institutions for failing to disclose foreign resources... millions of dollars, foreign employment arrangements and foreign grant support. **“American institutions were unaware.” “Peer review was violated.”**
  - **Researchers are double dipping by having joint arrangements where they have to spend some months overseas, while American institutions are paying them for 12 months.** Scientists failed to disclose to NIH equity in foreign institutions while they even had NIH funding. Many have patents....!
- **NIH Recommendations: Broaden awareness: work with NSF, DOE, DOD, FBI and many more.** Re-evaluate existing policies, forms etc. **New forms for grant applications are being developed with clear instructions.**
- **Former NIH Director James B. Wyngaarden, M.D. died on June 19.** In his statement, Dr. Francis Collins noted his **“masterful leadership of NIH and many outstanding contributions to the biomedical research community and beyond.”** He was appointed by President Ronald Reagan and served for seven years. **Dr. Collins related how in 1993, while he was a professor at the University of Michigan, Dr. Wyngaarden asked him to head up the nascent Human Genome Project. The rest is history.** Dr. Wyngaarden was instrumental in the birth of the **Children’s Inn** which opened in 1990. It has **“provided support and lodging” for more than 15,000 families of children with cancer receiving treatment at the Clinical Center.** (see entire statement online )
- **Wonderful News since the “War on Cancer” was declared in 1972.** The end of May, 2019, the headline of the *Journal of the National Cancer Institute* read: **The Annual Report to the Nation: Overall Cancer Mortal-**

*continued on page 35*

**The FBI gave Dr. Francis Collins distressing news regarding research integrity. At the June 23 Advisory Committee to the Director of the NIH (ACD), Dr. Collins reported he sent out 10,000 letters last August re: “how foreign influences are affecting research integrity.” Even though the number of researchers involved at NIH is relatively small, it nevertheless “is serious.”**

## The Annual Report to the Nation: Overall Cancer Mortality Continues to Decline.

.....

**He attributes the good news to research leading to new drugs, identifying targets and the use of drugs in appropriate combinations.**

continued from page 34

**ity Continues to Decline.** The “war” is a collaborative effort among the NCI, CDC, American Cancer Society, and the North American Association of Central Cancer Registries.

- At the June joint meeting of the Board of Scientific Advisors (BSA) and National Cancer Advisory Board (NCAB), Dr. Douglas Lowy, Acting NCI Director, noted the “**substantial decrease in cancer mortality rate...**” He attributes the good news to research leading to new drugs, identifying targets and the use of drugs in appropriate combinations. **Dr. Lowy also added that as promised in the State of the Union speech in February, President Trump increased funds for research in childhood cancer. And, the House, in keeping with the President’s proposal of a 5% increase, added \$300 million for pediatric research in the budget.** Stay tuned.
- **Resources are being increased for childhood research at the Frederick National Lab for Cancer Research,** noted Dr. Lowy. He emphasized the **enormous advances that have been made [against] melanoma, adding, “Glioblastoma needs more research.”**
- **“There is an increased interest in tuberculosis research,”** said Dr. Anthony Fauci at his June 3 Advisory Council meeting. **“We have an open pathway to make major improvements in fighting tuberculosis.”** (see *Ending Tuberculosis: We Can Get There with a New Roadmap*, Robert W. Eisinger & Anthony S. Fauci, *STAT*, March 24, 2019).
- At the same Advisory Committee meeting Dr. Fauci not-

ed that **from August 1, 2018-May 30, 2019 there were 1974 confirmed cases of Ebola in the Congo, particularly the North Kivu and Ituri Provinces. “There were over 2,000 more cases reported in the northeastern part of the country.”** “It is very difficult to conduct clinical trials in the Congo because of security issues,” added Dr. Fauci who shared a headline from *The Telegraph* newspaper: **“Ebola Doctor Killed as Violence Hampers Response to Outbreak in DRC.”** Then on July 17 Reuters reported: **“WHO Declares Ebola Outbreak is International Health Emergency.”** Ebola has spread into Uganda! Stay tuned.

- **Great news in August from NIAID: Clinical trials conducted in the Congo using 4 drugs to treat Ebola ended ahead of schedule because of successful treatment!**
- **Highly Recommended: A detailed and very informative reference re: Cannabis and Cannabinoids** can be found on NCI’s *Physician Data Query* (PDQ). Some history: PDQ was put together in response to the famous National Cancer Act of 1971 and additional legislative requirements. The PDQ staff is housed in its own building off the NIH campus! Under President Nixon, The Act provided unprecedented amounts of money to NCI!
- **Warnings from FDA on plant products: CBD (cannabidiol)** – Acting FDA Commissioner, Dr. Ned Sharpless, zeroed in on CBD and its use in foods, cosmetics, and dietary supplements, which is prohibited by FDA. **On**

continued on page 36

**...there were 1974 confirmed cases of Ebola in the Congo, particularly the North Kivu and Ituri Provinces. “There were over 2,000 more cases reported in the northeastern part of the country.” “It is very difficult to conduct clinical trials in the Congo because of security issues,”**

.....

**Clinical trials conducted in the Congo using 4 drugs to treat Ebola ended ahead of schedule because of successful treatment!**

**On May 31 at a public hearing dealing with cannabis in products on the market, Dr. Sharpless emphasized the risks associated with CBD and THC. Their safety in many different products is not definitive. He is concerned at the paucity of knowledge especially about CBD.**

*continued from page 35*

- May 31 at a public hearing dealing with cannabis in products on the market, Dr. Sharpless emphasized the risks associated with CBD and THC. Their safety in many different products is not definitive.** He is concerned at the paucity of knowledge especially about CBD. Stay tuned.
- **The University of Maryland School of Pharmacy will be offering a Master's degree course in "medical cannabis."** Stay tuned!
  - **Dr. Helene Langevin, Director of the National Center for Complementary and Integrative Health, announced at her June Advisory Committee meeting, that the RFA dealing with cannabinoids, *Exploring the Mechanisms Underlying Analgesic Properties of Minor Cannabinoids and Terpenes*, was sent out. Results from the review of the applications will be revealed at the next Advisory Committee meeting. Stay Tuned.**
  - With all the craziness going on about cannabis and its derivatives **an excellent article** was posted online July 10. Written by Luke Niforatos, and headlined, **"The pot industry's got lots of tricks – Sens. McConnell and Shelby, please don't fall for them."** It is a must read [Niforatos is Chief of Staff and Senior Policy Advisor to *Smart Approaches to Marijuana*].
  - **Help for opioid cravings:** Dr. Fauci told his Advisory Council that **"NIH is going to test a new drug to curb opioid cravings."** There have been **"promising results so far."** Stay tuned.
  - **Influenza vaccine:** NIH will soon begin its first in-human trial of a universal Influenza candidate, noted Dr. Fauci.
  - **Funding:** NIH and FDA have each been given a proposed 5% boost. Stay tuned for final figures!
  - **Who could even fathom that scientists would be doing research on plants from the Civil War era for their medicinal value. A book written by botanist Francis Porcher** is the source researchers at Emory University, led by **ASP member**
- Dr. Cassandra Quave**, and the Walter Reed Army Institute of Research are using to conduct research on three plants: *Quercus alba* (white oak bark and galls), *Liriodendron tulipifera* (tulip poplar leaves, root inner bark, branch bark) and *Aralia spinosa* (leaves of devil's walking stick). To date, researchers have found "antimicrobial activity against multidrug resistant bacteria associated with wound infections." (see *Scientific Reports*: 2019:9) NCCIH provided partial funds for the study.
- **FDA continues its battle with companies promoting "false claims" about kratom products.** Stay tuned.
  - **Source for new medicines? The National Science Foundation's Divisions of Biological Infrastructure and Environmental Biology** are funding very unusual research on **cicada fungus** carried out by West Virginia University researchers. Their findings reveal cicada fungi, *Massospora*, "contains chemicals similar to those found in hallucinogenic mushrooms." The cicadas lose their limbs and "eccentric behavior sets in." "Many important drugs are discovered by accident while looking for something else," says Sam Scheiner, Director of NSF's environmental biology program. Stay tuned!!! (see journal *Fungal Ecology*).
  - **Unusual and interesting:** On June 10, **Simon Groot, a Dutch seed specialist, was named the 2019 World Food Prize Laureate, often referred to as the Nobel Prize for Food and Agriculture.** Over the last 40 years Groot worked to develop **disease resistant vegetable seed. In addition to increasing the vegetable production in more than 60 countries, the quality of the vegetables have also been improved. Secretary of State Mike Pompeo** presided over the announcement "ceremony" at the State Department. Also present was **Dr. Kenneth M. Quinn, former ambassador to Cambodia**, who after his retirement became president of the World Food Prize Foundation. The prize and \$250,000 will be awarded in October, in Des Moines, home of the foundation. ■

**With all the craziness going on about cannabis and its derivatives an excellent article was posted online July 10. Written by Luke Niforatos, and headlined, "The pot industry's got lots of tricks – Sens. McConnell and Shelby, please don't fall for them."**

# From the Archives: Treasures from the ASP Archives

By Devhra BennettJones, CA

For millennia archival records have provided essential clues to history. The Lloyd Library & Museum is the official archives repository for the American Society of Pharmacognosy (ASP). The library's holdings include the ASP's corporate archives and donations from individual members totaling more than 1,100 linear feet. The Lloyd Library focuses on preserving and making these rare and unique materials accessible. The scientifically-based archives offers vital information about specific research endeavors and scientific research trends. This edition of *From the Archives* highlights treasures of historical documents and images of five distinguished ASP members, Drs. George Hocking, Tip Tyler, Harry Fong, Monroe Wall, and Mansukh Wani.

**George M. Hocking** (1928-2001) was professor of pharmacy at Auburn University and a well-known expert on medicinal plants. In the 1940s Hocking worked as the chief pharmacognosist at S.B. Penick & Company in New York, NY His archives contain fascinating resources about industrial pharmacognosy. S.B. Penick was founded in 1914 by Sydnor Barksdale Penick in western North Carolina. His firm sold milled medicinal plants and manufactured pharmaceuticals from the early 1900s through the 1960s. As an interesting aside, in 1938 S.B. Penick & Company purchased the formulae, processes, inventions, personal

property and assets from another pioneer in industrial pharmacognosy, the Lloyd Brothers Pharmacists Corporation, the manufacturers of the botanical-based "Specific Medicines" brand.

Throughout Hocking's career, he was considered a top authority on medicinal plants, served as an expert adviser to the government of Pakistan in 1951, and was a member of several committees of the American Pharmaceutical Association. Hocking authored numerous scientific papers and texts, including *A Dictionary of Terms in Pharmacognosy*, 1955, and its greatly expanded second edition, *A Dictionary of Natural Products*, published in 1998. His other interests included compiling folklore with an emphasis on folk medicine, traveling, and stamp collecting.

In 1997 the Rho Chi Honor Society Chapter at University of Illinois-Chicago (UIC) invited **Dr. Varro "Tip" Tyler** (1926-2001) to deliver the 25<sup>th</sup> Albert Ebert Memorial Lecture. Dr. Tyler's lecture notes provide a 1997 snapshot in time of the state of herbal medicine in the United States and illustrate his tireless efforts to enlighten the general public. He began the lecture by introducing basic principles about plants as drugs. He addressed the fact that while the American public was interested in herbs, the same field of study was highly neglected by scientists in the United States. Dr. Tyler attributed this to the

*continued on page 37*



LEFT: S.B. Penick, Asheville, North Carolina, Crude Drug Warehouse and Distribution Center, ca. 1930.



RIGHT: S.B. Penick & Company, Eastern Tennessee, Trucking Shipment of Crude Drugs Native to the United States, ca. 1934.

**As an interesting aside, in 1938 S.B. Penick & Company purchased the formulae, processes, inventions, personal property and assets from another pioneer in industrial pharmacognosy, the Lloyd Brothers Pharmacists Corporation, the manufacturers of the botanical-based "Specific Medicines" brand.**

continued from page 37



Harry Fong and Varro Tyler, 1997 Rho Chi Honor Society Lecture, Chicago, Illinois

**He addressed the fact that while the American public was interested in herbs, the same field of study was highly neglected by scientists in the United States.**

ways that drug laws and regulations have developed in the United States and Europe.

The Food and Drug Act of 1906 sought to control drug fraud. In 1938, the Federal Food, Drug, and Cosmetic Act was passed to assure drug safety. Tyler explained how later rounds of legislation, the 1962 Kefauver-Harris Amendments, were intended to secure drug efficacy. For the first time, manufacturers of drugs had to prove to the Food and Drug Administration that their drug products were effective. This requirement also applied to the majority of herbs. In lecture notes that appear in Dr. Tyler's archives, he discussed the reasons why herbs were not proven safe and effective by post-1962 evaluation standards.

In 1994, federal legislation allowed the retail sale of herbs labeled as "dietary supplements." Dr. Tyler voiced concern that the law did not provide any standards for herbal medicine quality control. Inspired by profits, manufacturers could disseminate inaccurate

**Tyler explained how later rounds of legislation, the 1962 Kefauver-Harris Amendments, were intended to secure drug efficacy.**

**For the first time, manufacturers of drugs had to prove to the Food and Drug Administration that their drug products were effective.**

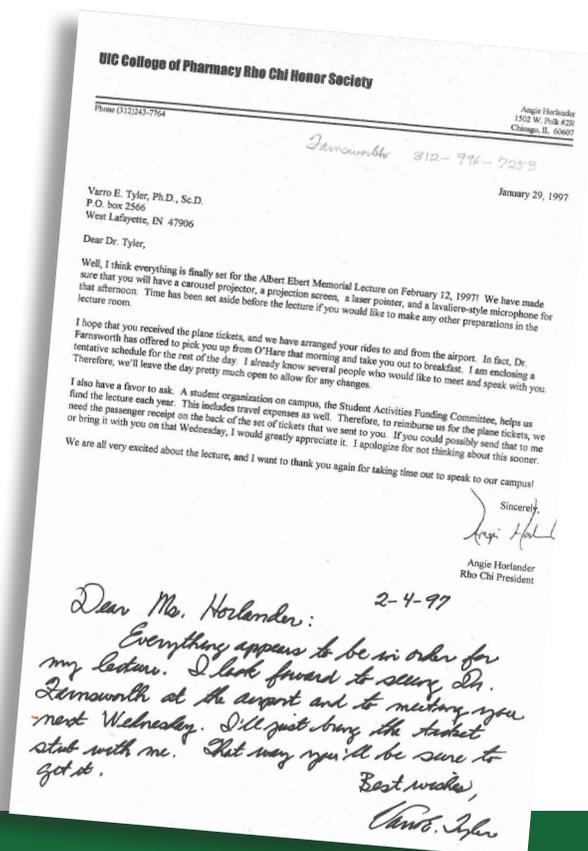
literature making outrageous beneficial health claims. He concluded his lecture with a discussion of ten potentially beneficial herbs and their applications: garlic; chamomile; echinacea; ginkgo; feverfew; ginseng; valerian; St. John's wort; saw palmetto; and cranberry. These are all well-known dietary supplements to the members of the ASP. Tyler's focus on what individuals should know about herbal medicine fit well with the lecture series goal of enlightening the UIC student body while keeping the interest of pharmacy students.

When asked about the photograph from the Tyler Archives displayed here, 1978 ASP President **Dr. Harry Fong** said, "I took a closer look and lo and behold, the picture was taken in my office! The clues are the clippings magnetized to the wall behind Tip... I hung those clippings opposite my desk as a proud father of children just getting into the 'Family Business' (the top clipping showed my daughter in an Ohio State Univ. MD/PhD program recruitment poster, and the lower clipping pictured my youngest son as a member of a NU Medical student outreach team). Tip was an excellent role model. I remember vividly sitting in the audience (my first ASP meeting) spellbound by Tip's Presidential Address as the very first ASP president. I was awed, but never had a thought that one day I'd have the honor of following him to that podium."

In the early 1960s, **Drs. Monroe Wall** and **Mansukh Wani** began work at the Natural Products Laboratory of the Research Triangle Institute in North Carolina. Their seminal work on the discovery of two chemotherapeutic agents, camptothecin from

continued on page 39

Varro Tyler, Rho Chi Honor Society, University of Illinois at Chicago, Tyler's handwriting



## From the Archives: Treasures from the ASP Archives

continued from page 38

*Camptotheca acuminata* and taxol from *Taxus brevifolia* is well-known among the Society's membership. Their laboratory worked with scientists from around the world in high-quality research providing independent and objective science-based solutions. The letter from Wani to Farnsworth, captured in the Farnsworth Archives, illustrates their contract work with the University of Illinois-Chicago regarding mass spectrum analysis of different plants from the Simaroubaceae family. The photographs highlight Wall's and Wani's achievements and recognition by the American Chemical Society's National Historic Chemical Landmarks Program.

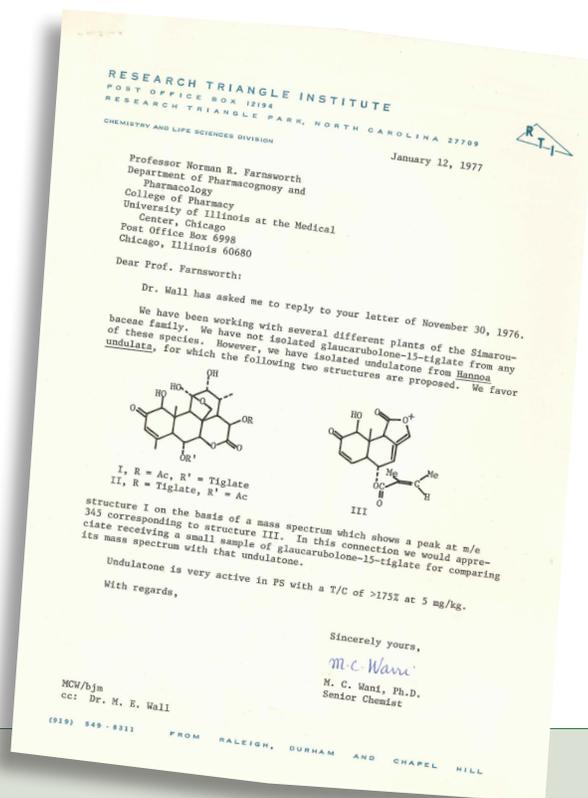
Unique archival records take many forms. Numerous types of materials are valuable to historians of science. Through emails, letters, diaries, photographs, unpublished writings, and manuscripts, researchers today and in the future will learn about the activities of the ASP organization and its members. The Lloyd Library archives is a distinct collection of scientific information valuable to natural products knowledge and new drug discovery.

Watch for information about donating materials to the ASP Archives in the next edition of *From the Archives*. ■



ASP Taxol Photograph, circa. 2000-2003

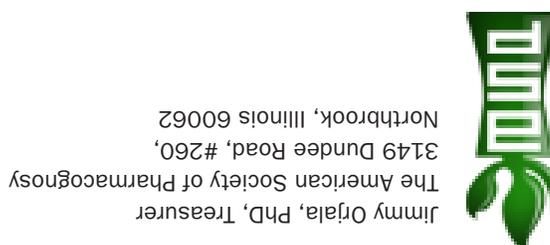
Letter from Mansukh Wani to Norman Farnsworth  
on behalf of Monroe Wall–Simaroubaceae family of plants.



### LITERATURE CITED

- 1 George M. Hocking Papers, Lloyd Library & Museum, S.B. Penick Series, ca. **1930**. S.B. Penick, Asheville, North Carolina, Crude Drug Warehouse and Distribution Center (collection undergoing archival processing).
- 2 George M. Hocking Papers, Lloyd Library & Museum, S.B. Penick Series, ca. **1934**. S.B. Penick & Company, Eastern Tennessee, Trucking Shipment of Crude Drugs Native to the United States (collection undergoing archival processing).
- 3 Varro "Tip" Tyler Papers, Lloyd Library & Museum, **1997**, Varro Tyler and Harry Fong, Rho Chi Honor Society Lecture, Chicago, Illinois, Box 19, Folder 12.
- 4 Varro "Tip" Tyler Papers, Lloyd Library & Museum, **1997**, Rho Chi Honor Society, University of Illinois-Chicago, Box 19, Folder 12.
- 5 Fong, H.H.S., email correspondence to Lloyd Library & Museum Archivist, Devhra BennettJones, 14 August **2019**, 1:24 p.m.
- 6 Norman R. Farnsworth Papers, Lloyd Library & Museum, *Correspondence Series*, **1977**. Letter from Mansukh Wani to Norman Farnsworth on behalf of Monroe Wall–Simaroubaceae family of plants (collection undergoing archival processing).
- 7 American Society of Pharmacognosy Collection, Lloyd Library & Museum, ca. **2000-2003**, ASP Taxol Photographs, Box 19, Folder 4.





## ASP Membership

### Full Membership

Full membership is open to any scientist interested in the study of natural products.

Current membership dues and *Journal of Natural Products* subscription rates can be found at [www.pharmacognosy.us](http://www.pharmacognosy.us).

### Associate Membership

Associate membership is open to students of pharmacognosy and allied fields only. These members are not accorded voting privileges.

Current membership dues and *Journal of Natural Products* subscription rates can be found at [www.pharmacognosy.us](http://www.pharmacognosy.us).

### Emeritus Membership

Emeritus membership is open to retired members of the Society who maintained membership in the Society for at least five years.

Current membership dues and *Journal of Natural Products* subscription rates can be found at [www.pharmacognosy.us](http://www.pharmacognosy.us).

### Honorary Membership

Honorary members are selected by the Executive Committee of the American Society of Pharmacognosy on the basis of meritorious service to pharmacognosy.

### Present Honorary Members are:

Dr. John H. Cardellina • Dr. David P. Carew, University of Iowa • Dr. John M. Cassidy, Oregon State University  
Dr. Geoffrey A. Cordell, University of Illinois at Chicago • Dr. Gordon C. Cragg, National Institutes of Health  
Dr. Harry H.S. Fong, University of Illinois at Chicago • Dr. William Keller, Nature's Sunshine Products, Inc.  
Dr. Ikhlas Khan, University of Mississippi • Dr. A. Douglas Kinghorn, Ohio State University  
Dr. Robert J. Krueger, Ferris State University • Dr. Roy Okuda, San Jose State University  
Dr. James E. Robbers, Purdue University • Dr. E. John Staba, University of Minnesota  
Dr. Otto Sticher, Swiss Federal Institute of Technology • Dr. Barbara Timmermann, University of Kansas  
Dr. Hildebert Wagner, University of Munich • Dr. Mansukh Wani, Research Triangle Institute

Additional information about membership may be obtained by writing to the Treasurer of the Society:

**Jimmy Orjala, PhD, Treasurer, The American Society of Pharmacognosy,**  
3149 Dundee Road, #260, Northbrook, Illinois 60062. Email: [asphcog@gmail.com](mailto:asphcog@gmail.com)