



# American Society of Pharmacognosy

ASP Newsletter: Summer 2022, Volume 58, Issue 2

Summer 2022

Discovering  
Nature's  
Molecular  
Potential

## 2022 ASP Annual Meeting: In Person After Three Years!



Historic downtown Charleston, South Carolina. PHOTO: WWW.CHARLESTON-SC.GOV

By Mark Hamann, PhD and Guy Carter, PhD

The 2022 ASP annual meeting will be held in person for the first time since the 2019 Madison annual meeting. The organizing committee is looking forward to welcoming everyone to Charleston from **July 23-28, 2022**. The meeting dates have been extended this year to accommodate more presentations and award lectures that did not take place due to cancellation of the 2020 and 2021 annual meetings as a result of the pandemic.

Please remember to register early since rates will increase after **June 30, 2022**. An impressive 330 abstracts covering a wide variety of topics have been submitted. NCCIH is providing registration waivers for 70 graduate students, postdoctoral fellows and early investigators. This clearly helped enrich the program in regard to participation of young scientists. The ASP Local Or-

ganizing Committee has agreed to provide the same registration waiver to students with a Ukrainian passport as a measure of the ASP's support for students and faculty from the Ukraine.

Owing to the large number of abstract submissions, a number of requests for oral presentations could not be provided. The organizing committee is extremely enthusiastic about the cutting-edge technologies to be presented at this year's conference by a group of newer investigators. The committee is highly confident that this meeting will provide a very engaging program with technologies and tools with applications for the next generation of natural product technologies. Several sessions will include petroleum replacement technologies as well as financing and capital for innovative ventures into this emerging field.

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**The organizing committee is extremely enthusiastic about the cutting-edge technologies to be presented at this year's conference by a group of newer investigators.**

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ASP Annual Meeting 2022



Otto Sticher



Mônica T. Pupo and Jon Clardy

## 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/)

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Spring: Feb. 15; Summer: May 15

Fall: Aug. 15; Winter: Nov. 15

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ISSN 2377-8520 (print)

ISSN 2377-8547 (online)



# Editor's Corner

## American Society of Pharmacognosy

By Edward J. Kennelly, PhD

**A**fter three years, the ASP annual meeting will once again be held in person. The COVID pandemic has led to the cancellation of the joint ICNPR 2020 meeting slated for San Francisco and the 2021 meeting in Grand Rapids, Michigan. So, after last meeting in person in Madison in 2019, ASP members and friends will have a wonderful opportunity to join together from **July 23-28 in Charleston, South Carolina**. The lead article for this issue of the *Newsletter* provides information about the speakers and social activities awaiting us, so please look it over, and read more about it at the meeting [website](#). The meeting has been extended a day compared to typical ASP meetings to accommodate more speakers. I look forward to seeing many of you in South Carolina.

The *ASP Newsletter* is trying to assess how to best serve and inform members, and so the Newsletter Advisory Committee, headed by Michael Mullooney, has created a survey to try to figure this out. What do you like? What don't you like? What is missing? We would value your opinions, as we continue to try to improve the *Newsletter*. Please take a few minutes to fill out the survey by clicking [here](#). We plan to discuss the poll's findings at the annual meeting, so try to complete it soon.

ASP Fellow and past ASP President Phil Crews was honored with a symposium at the University of California Santa Cruz where he has been a faculty member for over 50 years. A number of ASP members participated in this tribute that included more than 200 attendees. Please read a full account in Erin McCauley's article in this issue. We congratulate Phil on all he has done and further recognize his newest scientific achievement that is featured in the *Newsletter's* "Behind the Scenes" article. Phil recently published a *Journal of Natural Products* paper that explores the

impact of smoke taint on west coast wines. In addition to his love of marine natural products, Phil owns his own vineyard, and this article is a fascinating look at how natural disasters can impact plants (and people) in unexpected ways.

ASP Fellow Dr. Otto Sticher passed away recently. He spent much of his career at the Swiss Federal Institute of Technology in Zurich, but he interacted with many ASP members and was present at a number of annual meetings and served as a member of the *Journal of Natural Products* Advisory Board. His long and distinguished career in natural products research is remarkable.

As you consider the careers of some distinguished ASP members, I would encourage you to read about the founding of the ASP by Harry Fong and Gordon Cragg. As ASP marks its 63<sup>rd</sup> year, some asked if there were still any of the founding members alive. Harry and Gordon, along with considerable help from Lloyd Archivist Christine Jankowski, undertook the job of sorting out the 140 charter members that included 69 founding members. The only founding member still active in the society is Dr. John Staba. It is truly remarkable to look at the photo that provides the documentation of the founding members and see how much more diverse on many levels the society is today. I'm reminded of the important work that the ASP Diversity and Inclusion Committee does for the society, and I encourage you to read their article on managing inclusive excellence.

I hope you will read through all of the regular columns as well. Dave Newman's insights into the natural products literature are always helpful. I am enjoying all the information that Barbara Sorkin has been able to gather for her very insightful *Capital Communiqués*.

Have a great summer, and I hope to see many of you in Charleston...in person! ■

## 2022 ASP Annual Meeting: In Person After Three Years!

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**The committee is highly confident that this meeting will provide a very engaging program with technologies and tools with applications for the next generation of natural product technologies.**

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Please make your hotel reservations soon. Rooms at the Embassy Suites Hilton Charleston Airport Hotel and Convention Center have been secured for just \$159/night but are likely to run out. Some of the workshops on Saturday will be held downtown at the MUSC campus and others at the convention center. Richard Drake and Lauren Ball from MUSC will provide a tour of the institution's state-of-the-art MS and proteomics facilities. Workshop topics include MS-based proteomics and bioassays, NMR databases, DP4+ calculations, as well as a job fair. Barbara Sorkin from ODS along with her colleagues from NCCIH, NIGMS and NCI have kindly agreed to provide a highly informative workshop on grant-writing as well as upcoming funding priorities.

As a Monday afternoon and evening getaway, we would suggest a round of golf or day at the beach at Kiawah. This island-beach destination is about 30 minutes from the conference center and offers about 50 miles

of bike trails through the unique low-country forest and beaches rich with a diversity of unique species of birds, reptiles, and other wildlife. You can rent a bike in Freshfields Village and spend the afternoon biking to the sites and beaches as well as sampling the wine bars and restaurants. Just 10 minutes from the venue is Middleton Place, home of the oldest landscaped garden in the Americas with 100,000 azaleas and former home of Arthur Middleton, signer of the US Declaration of Independence.

We are looking forward to welcoming ASP members and friends to the Palmetto State and thank the abstract submitters for providing the material for a very intellectually stimulating meeting. For information regarding the meeting please see: <https://aspmeetings.pharmacognosy.us/>. For things to see and do after the scientific sessions please see: *Charleston Visitors Guide | Best Restaurants & Things To Do* ([charlestoncvb.com](http://charlestoncvb.com)). ■

**Workshop topics include MS-based proteomics and bioassays, NMR databases, DP4+ calculations, as well as a job fair.**

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### Speaker Spotlight

**M**arc Fetten from GreenGas USA will speak on the innovative applications of anaerobic bacteria and agricultural waste streams from McCall Farms to produce renewable natural gas (RNG) for local consumers, including Mercedes-Benz and Duke University, in their effort to achieve carbon-neutral status. It is estimated that by 2040 90% of the nation's natural gas will be generated from agricultural waste streams. Fetten is formerly with Bayer and has unique expertise in corporate development, pharmaceuticals and consumer health and agriculture products and has recently applied this expertise to RNG. The challenges of climate change and petroleum-based support for military regimes offer unique opportunities for innovators in natural products and renewable technologies interested in transforming the petroleum-based fine-, specialty-, and commodities-chemical industries to natural product-based technologies. The economic implications of this transformation are staggering and offer opportunities for species-diverse rather than petroleum-rich communities. ●



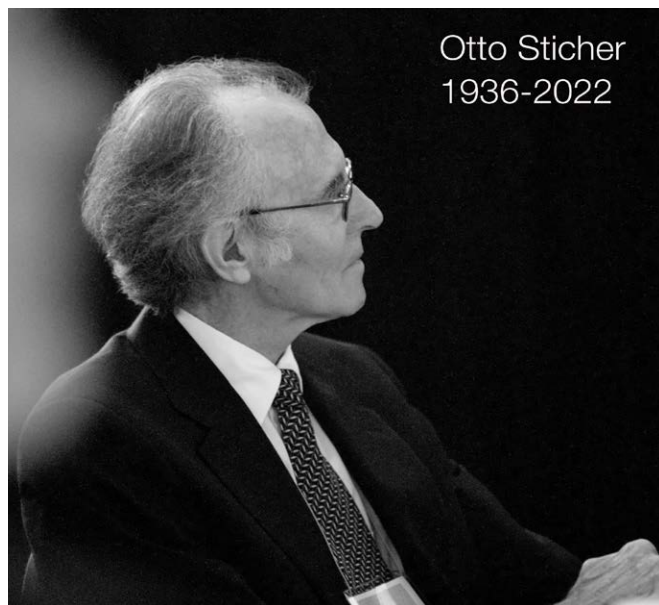
Marc Fetten

PHOTO: GREENGASUSA

**The challenges of climate change and petroleum-based support for military regimes offer unique opportunities for innovators in natural products and renewable technologies interested in transforming the petroleum-based fine-, specialty-, and commodities-chemical industries to natural product-based technologies.**

# In Memoriam: Otto Sticher

By Birgit U. Jaki, PhD, Jimmy Orjala, PhD, Guido F. Pauli, PhD, A. Douglas Kinghorn, PhD, and Harry H.S. Fong, PhD



Professor Dr. Otto Sticher

PHOTO: GUIDO F. PAULI

It is with great sorrow that we observe the passing of Prof. Dr. Otto Sticher, formerly of the Swiss Federal Institute of Technology, Zurich (ETH-Zurich), Switzerland, on March 11, 2022, at the age of 85. Sticher was a leading, internationally known pharmaceutical scientist who specialized in natural products research and was an outstanding mentor and teacher, close colleague, and great friend to scientists all over the world. He played a leading role in the development of our sister society, GA (Society for Medicinal Plant and Natural Product Research), to its current high-profile reputation. In addition, Sticher was a Fellow and Honorary Member of ASP, a member of the ASP Foundation Board, and an Editorial Advisory Board Member of the *Journal of Natural Products* (1994-2003). The March 2014 issue of the journal was dedicated to him.<sup>1</sup> With Miriam, his wife, he attended the annual meetings of ASP regularly, over a period of more than 25 years.

Sticher was awarded a degree in pharmacy from ETH-Zurich in 1962 and then received a PhD from the same institution in 1965, working under the supervision of Professor Hans Flück, and produced a dissertation of the essential oils of *Mentha* species. He performed postdoctoral work under Professor Hans Schmid at the University of Zurich and then returned to ETH-Zurich, where he became Privatdocent

**Sticher was a leading, internationally known pharmaceutical scientist who specialized in natural products research and was an outstanding mentor and teacher, close colleague, and great friend to scientists all over the world.**

in 1970, associate professor of pharmacognosy in 1972, and full professor of pharmacognosy and phytochemistry in 1979. He remained at this same institution in the Institute of Pharmaceutical Sciences of the Department of Applied Biosciences until his formal retirement in 2002.

Sticher had very broad research interests, involving not only the isolation and characterization of bioactive principles from medicinal plants<sup>2,3</sup> and marine organisms,<sup>4,5</sup> but also ethnobotany,<sup>6</sup> the quality control of phytomedicines,<sup>7-10</sup> and the separation of natural products.<sup>11</sup> He collaborated with numerous colleagues, from many different countries, on various structural types of specialized metabolites from organisms and, during his career, published about 400 scientific papers. He co-authored later editions of the major textbook *Pharmakognosie-Phytopharmazie*, including the 10<sup>th</sup> edition published in 2015.<sup>12</sup> In addition, he supervised more than 50 PhD students, as well as numerous postdoctoral fellows, and hosted many international visiting scholars.

Sticher received many awards and honors during his lifetime. He was president of GA from 1978 to 1984 and then became an Honorary Member of this society and received the Egon Stahl Award in Gold from GA in 2011. He was awarded an honorary doctorate from the School of Pharmacy, University of London in 2002 (now the School of Pharmacy, University College London, UCL). In 2017, Sticher gave the Norman Farnsworth Lecture at the College of Pharmacy, University of Illinois at Chicago, an all-day event of scientific discussion and collegial exchange on natural products research. He served as co-editor and as a member of the Editorial Advisory Board of *Planta Medica*, for which a special issue in honor of his 85<sup>th</sup> birthday was published in November 2021.

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## In Memoriam: **Otto Sticher**

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**“One of the most important things I learned from Otto Sticher is how to pair academic curiosity with Swiss diligence, a skill that has been beneficial throughout my career to this day.” – Birgit Jaki**

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**“Otto was a model scholar, very knowledgeable, dedicated and yet humble. His approach was an inspiration to all who interacted with him. He was always a gracious and friendly person.” – Jimmy Orjala**

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**Birgit Jaki** was Sticher's graduate student from 1996-2000. “I have very fond and happy memories of the four years I spent in Switzerland in his research group. Not only did he provide access to very generous resources, but we also had an environment where we all could thrive academically and personally. We had tremendous freedom and inspiration at the same time. One of the most important things I learned from Otto Sticher is how to pair academic curiosity with Swiss diligence, a skill that has been beneficial throughout my career to this day. Unforgettable are our botanical field trips in the Swiss Alps and the many ‘aperos’ we spent as a group of not just co-workers, but also as friends. The last time I met him in person was on Otto and Miriam's visit to UIC in 2017, and I am very grateful I had a chance to spend time with them in Chicago, a place with which he always seemed to have a deep personal connection.”

**Jimmy Orjala** was a graduate student at ETH-Zurich from 1989-1993 and senior assistant/lecturer from 1995-1997. “I am grateful for the time I spent with Otto. He was a great teacher, mentor, and friend. He provided an excellent research environment and gave me tremendous freedom to pursue my research under his guidance. Otto was a model scholar, very knowledgeable, dedicated and yet humble. His approach was an inspiration to all who interacted with him. He was always a gracious and friendly person. One of my favorite memories is of our plant collection trip to Papua New Guinea. We spent the days in the field collecting plants. Otto did not just supervise the collection but took part in all the hard parts (cutting down trees, collecting leaves, etc.). He really seemed to enjoy it despite the tropical heat. One of the highlights was in the evenings, where Otto, Miriam and I spent hours talking about science and life in general over a cold drink. I also fondly remember how all the young undergraduate and graduate students (including myself) always had a hard time keeping up with Otto during our annual botanical field trip in the Swiss Alps. He was always in the

lead. This to me is the perfect picture of his leadership in the field of pharmacognosy, at the forefront of natural products research.”

ASP Fellow **Guido Pauli** traces his connection back with Sticher to his time as a PhD student at the Heinrich Heine-University Dusseldorf in Germany, starting in 1989. Peter Junior, his advisor, held Sticher's phytochemical investigations of medicinal plants in high esteem, and also collaborated with Ihsan Çalis<sup>2</sup>, of Hacettepe University, Ankara, Turkey, and a regular visiting professor in the Sticher laboratory. “Otto was an exemplary pharmacognosist in various ways: he was a trained and practicing pharmacist, who was rooted in the ethnobotany of medicinal plants and maintained this connection throughout his life. He recognized and was keen to advance knowledge about the complexity of phytochemistry.”

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**Otto and Miriam Sticher with ASP Secretary and Honorary Member the late Bill Keller at the reception of the 2007 ASP Meeting in Portland, ME. Keller undertook a sabbatical period in Otto's laboratory at ETH-Zurich in the early 1990s.**

PHOTO: GUIDO F. PAULI



## In Memoriam: Otto Sticher

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istry-derived treatments. With regard to technologies and new scientific concepts, Otto worked on and to a good part defined the forefront of natural products research. From the perspective of a junior investigator, Otto was a highly accomplished scientist who was always approachable to anyone. He perpetuated the same remarkable supportive attitude my PhD advisor had told me about, and, by interacting with Otto over three decades subsequently, this was an exemplary academic and personal experience.”

ASP Fellow **Doug Kinghorn** spent the spring and summer of 1990 in the Sticher laboratory at ETH-Zurich, while on sabbatical from the University of Illinois at Chicago. “Although not being able to speak any German when in Zurich, this turned out not too much of an impediment, since everyone in the group was gracious enough to speak to me in English. This period was before the advent of e-mail, so it was possible to become quite deeply immersed in the local scientific environment, way of life, and culture. Since the scientific papers from Otto’s group were all written in English, I was asked to look over many of these before submission, and, in so doing, enhanced my editorial skills. My sabbatical period was a time of considerable travel, and, using Zurich as a base, I was able to visit via train Lausanne, Berne, and Munich to give seminars, as well as to attend the *Bonn BACANS* Meeting in Bonn, West Germany, in July 1990, of which the ASP was co-sponsor. My wife, Helen, joined me for the last month while I was in Zurich, and an unforgettable highlight was when one Sunday we were invited to travel by rail to the top of the



Sticher being inducted as an ASP Honorary Member by then ASP President Roy Okuda and Secretary the late Bill Keller at the 2007 ASP Meeting in Portland, ME.

PHOTO: GUIDO F. PAULI

Jungfrau Mountain in the Bernese Alps by Otto and Miriam. Overall, this sabbatical was a most enlightening part of my academic life, and I am very grateful indeed to Otto for the opportunity to visit Switzerland as a Gastprofessor. He was the epitome of what an academic pharmacognosist should be, and he influenced in a very positive manner the professional lives of many younger natural product scientists.”

ASP Honorary Member **Harry Fong** commented, “The news of Otto’s passing brought a profound sadness to me over the loss of a very good friend, and the world has lost a brilliant scientist and, more importantly, it has lost an exemplary human being. His untimely passing led me to reflect back in time to about 40 years ago on meeting Otto

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**“Otto was an exemplary pharmacognosist in various ways: he was a trained and practicing pharmacist, who was rooted in the ethnobotany of medicinal plants and maintained this connection throughout his life.”**

— Guido Pauli

**“He was the epitome of what an academic pharmacognosist should be, and he influenced in a very positive manner the professional lives of many younger natural product scientists.”**

— Doug Kinghorn

## In Memoriam: Otto Sticher

**“Warmth, sincerity, humility and humanity just oozed out of them both, so that becoming friends was a given.” – Harry Fong**

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and Miriam at one of the ASP meetings. Warmth, sincerity, humility and humanity just oozed out of them both, so that becoming friends was a given. I have many good memories of Otto (and Miriam). One memory that stood out took place in 1988. On learning of my plan for a ‘Family European Vacation,’ they prevailed on me to make Zurich as our first and last stop. On arrival at the Zurich Airport, we were greeted not only by Dr. Clemens Erdelmeier, Otto’s ‘Oberassistent’ (who had been a postdoctoral fellow in our group at UIC), but also by Otto, personally, and they transported us (in two cars) to our hotel! To complete the ‘Welcome,’ Otto and Miriam entertained us with a special home cooked meal at their house that evening! Otto also took a day off to accompany (with Dr. Erdelmeier) my family to visit the Jungfrau Mountain, as described by Doug Kinghorn. There were many other memories I have of them through the years before and since. Fast forward to 2017, I observed and appreciated their humanity and their valuation of friendship. The day after delivering the Norman Farnsworth lecture at UIC, Otto and Miriam, eschewing sightseeing opportunities, elected to travel by Greyhound Bus to West Lafayette, Indiana, to visit Ginny Tyler (the widow of ASP Founding President Varro Tyler) at her residence for a couple of days. Such a selfless

act! We already miss and will continue to miss Otto and are grateful for having had such an outstanding friend. Our lives have been enriched by this friendship.”

Sticher should be lauded also for his role as a superb educator of thousands of professional pharmacy students at ETH-Zurich. Very early in his career he spent two years as a manager of a pharmacy, at a time when extemporaneous dispensing of self-prepared medicines containing specified pure chemicals and natural product extractives was a major focus. He was an outstanding lecturer on many different topics in pharmacognosy and participated in personal oral examinations for each student enrolled. The research work that he did on the quality control of the ingredients of phytomedicines, as referred to above, continues to be directly relevant to pharmacy practice, highlighting the role of pharmacognosy in general pharmacy.

We extend our deepest condolences to Otto’s wife, Miriam, and to his other family members. Miriam was Otto’s traveling companion on their frequent trips to the US and also to many other destinations all over the world. He will be missed by his colleagues and friends as one of the great leaders in the field of pharmacognosy as well as for his first-class scholarship in natural products research. ■

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Miriam and Otto Sticher (top) with Bruce and Kurt Farnsworth, and George Aynilian, Harry Fong and Priscilla Farnsworth (below) at the 2017 Farnsworth Lecture of the UIC College of Pharmacy.

PHOTO: GUIDO F. PAULI



Birgit Jaki and Otto and Miriam Sticher in 2017 at UIC, meeting Jonathan Bisson, Mary Choules, and Edyta Grzelak of the Institute of Tuberculosis Research.

PHOTO: GUIDO F. PAULI



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**The research work that he did on the quality control of the ingredients of phytomedicines, as referred to above, continues to be directly relevant to pharmacy practice, highlighting the role of pharmacognosy in general pharmacy.**

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# Phillip Crews Symposium: Powered by Chemistry, Strengthened by Diversity

...homage to ASP Fellow Professor Phillip Crews, one of the key academics who pioneered marine natural product isolation and structure elucidation chemistry.

By Erin McCauley, PhD

**O**n Friday October 8, 2021, the University of California Santa Cruz (UCSC) came together to pay homage to ASP Fellow Professor Phillip Crews, one of the key academics who pioneered marine natural product isolation and structure elucidation chemistry. Two hundred enthusiastic participants attended the inaugural Phillip Crews Symposium to celebrate his prolific and productive research career as well as his commitment to mentorship, outreach, education, and community-mindedness.

Since starting his career at UCSC in 1971, Crews has contributed to over 250 publications, four patents, authored/co-authored six books, received numerous awards, and has given hundreds of invited talks. He has mentored 41 graduate students, 45 postdoctoral fellows, 15 international fellows, and over 200 undergraduate students. Crews also served as the American Society of Pharmacognosy vice-president and president, had a 2017 special issue of the *Journal of Natural Products* dedicated to his contributions in the field, and received the Paul J. Scheuer Award at the recent 2022 Marine Natural Products Gordon Research Conference.

In addition to his research accolades, he has been instrumental in advancing the accessibility and inclusion of diverse and underrepresented scientists in the biomedical fields. Crews spearheaded the ACCESS – Bridges to



Crews Symposium Presenters. Left to right: Drs. Phillip Crews, Alegra Eroy-Reveles, Laura Sanchez and Daniel Romo (not shown: Dr. Patrick Still).

PHOTO: JACK LEE

the Baccalaureate Program at UCSC in 1994. ACCESS's primary mandate is to improve the success and confidence of local community college students through mentoring programs. These include mini-research courses and an eight-week summer research institute where students are provided a stipend to receive hands-on training in UCSC labs to aid them in their future career trajectories. Over 3,000 local community college students have come through the ACCESS program in its 27-year history.

The symposium began with a poster session of approximately 30 undergraduate trainees from the ACCESS and UCSC STEM Diversity programs. Following this, Crews

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## Phillip Crews Symposium: Powered by Chemistry, Strengthened by Diversity

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was commemorated with four powerful presentations that intertwined the presenter's lived experiences with their scientific career trajectories. Prof. Daniel Romo (Baylor University) highlighted the impact of his Hispanic family and heritage and how it helped to establish his independent career. Prof. Laura Sanchez (UCSC) gave an inspiring seminar highlighting her research and personal journey starting from her time as a summer REU and graduate student at UCSC, through the years of her academic journey, culminating in her return to UCSC as an associate professor in the chemistry and biochemistry department.

Former Crews lab postdoctoral fellow Dr. Patrick Still (National Center for Complementary and Integrated Health/NIH) gave an impactful remote seminar about his family legacy in natural products pharmacognosy dating back to the 1800s and the impact that family history has had on his career aspirations. Prof. Alegra Eroy-Reveles (UCSC) walked us through her remarkable journey as a pre-college UCSC PREP student to her current position as the first associate teaching professor in the UCSC Department of Chemistry and Biochemistry. The symposium ended with four students being awarded the newly established Crews Fellowships. These fellowships continue Crews' legacy by providing UCSC undergraduate students from historically minoritized backgrounds funding to participate in research.

Overall, the inaugural Phillip Crews Symposium was a



Dr. Glenn Millhauser with the recipients of the Crews Fellowship.  
From left to right: Angelly Perez Alvarez, Crystal Garcia and Liem Pham  
(not shown: Samantha Fernandez).

PHOTO: JACK LEE.

great success. It highlighted the research and lived experiences of diverse voices in the field of chemistry and biochemistry, while celebrating Prof. Crews' lifelong commitment to research, mentorship, and community outreach. Crews' work has consistently shown the impact of the incredible research that can be achieved when it is "Powered by Chemistry, Strengthened by Diversity." According to former Crews lab member Sanchez, "Phil created a unique lab atmosphere where no one group of people were the majority such that every person's voice and opinion were heard at the table; this truly fostered innovative science when diverse perspectives are considered. Many of us did not realize we were historically excluded because of the environment he actively created and worked to foster." ■

**“Phil created a unique lab atmosphere where no one group of people were the majority such that every person’s voice and opinion were heard at the table; this truly fostered innovative science when diverse perspectives are considered. Many of us did not realize we were historically excluded because of the environment he actively created and worked to foster.”**

# American Botanical Council Excellence in Botanical Research Awards

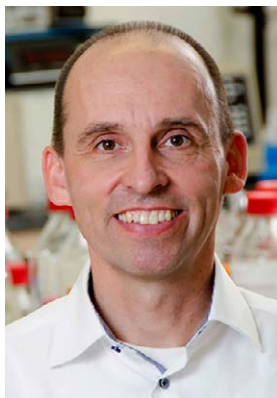
By Stefan Gafner, PhD

**T**he American Botanical Council (ABC) presented the **2022 ABC Norman R. Farnsworth Excellence in Botanical Research Award** to Dr. Guido F. Pauli and the **2022 Fredi Kronenberg Excellence in Research and Education in Botanicals for Women's Health Award** to Dr. Gail Mahady. Both researchers are from the University of Illinois at Chicago (UIC) and have been members of ASP. They were honored at the 17<sup>th</sup> Annual Celebration and Botanical Excellence Awards Ceremony of the ABC on March 9, 2022 in Anaheim, California.

ASP President Kerry McPhail commented, "The two research awards named here honor two past natural products scientists with dynamic personalities and pioneering legacies. Awardees Mahady and Pauli have both worked tirelessly to elevate natural product and botanical research through distinguished scientific accomplishments and professional contributions that embody the spirit of their respective awards."

ASP Fellow Pauli began working at the UIC College of Pharmacy in 2001, when he joined the faculty as a research professor in the Institute for Tuberculosis Research (ITR). He became a distinguished professor in 2017 and was named the Norman R. Farnsworth Professor of Pharmacognosy in 2019. He is also the associate director of ITR and the director of the Program for Collaborative Research in the Pharmaceutical Sciences, an internationally renowned research center for the study of biologically active natural products.

Among Pauli's most impactful research are the investigations into quantitative NMR to analyze natural products, the assessment of the residual complexity of isolates and extracts by NMR, and the application of centrifugal partition chromatography as a separation technique for natural products. As a co-director of UIC's Botanical Center, he was instrumental in the identification of the constituents responsible



ABOVE LEFT: Dr. Guido F. Pauli PHOTO: JOSHUA CLARK, UIC  
ABOVE RIGHT: Dr. Gail Mahady



for the estrogenic (and other) activities of hops, red clover, and licorice. Most recently, Pauli and a group of fellow researchers investigated the effects of cannabidiol on SARS-CoV-2 in human lung cells and mice.

The annual ABC Excellence in Botanical Research award, named in honor of the late professor Norman R. Farnsworth, is presented to an individual who has made significant research contributions in the fields of pharmacognosy, ethnobotany, ethnopharmacology, or other scientific disciplines related to medicinal plants. Farnsworth was an internationally renowned professor of pharmacognosy and one of the founding members of ASP.

The 2022 Kronenberg awardee, Mahady, is currently on the faculty of the Department of Pharmacy Practice in the College of Pharmacy. Previously, she was co-investigator at the UIC Center for Botanical Dietary Supplements Research, a US National Institutes of Health-funded center that investigates the safety and mechanisms of action of botanical dietary supplements used by menopausal women as alternatives to hormone therapy.

Mahady's research focuses on the chemistry and pharmacology of natural products, dietary supplements, and traditional medicines and their applications for women's reproductive health conditions. Her current interests include transcriptomics and proteomics of natural products in cancer, sarcopenia, and osteoporosis.

The ABC Fredi Kronenberg Award is named in honor of the late Dr. Fredi Kronenberg, who dedicated her professional life to the study of medicinal plants and phytomedicines for women's health conditions. She was a champion of integrative medicine and co-founded the Richard and Hinda Rosenthal Center for Complementary and Alternative Medicine at Columbia University — the first CAM program at an Ivy League school and the first government-funded CAM research and educational center. ■

**"...Awardees Mahady and Pauli have both worked tirelessly to elevate natural product and botanical research through distinguished scientific accomplishments and professional contributions that embody the spirit of their respective awards."**

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



# Taking Action: Managing Inclusive Excellence in Academia

By Lesley-Ann Giddings, PhD and Christine Salomon, PhD

**O**n Thursday, March 3, 2022 the American Society of Pharmacognosy (ASP) Diversity, Equity, and Inclusion (DEI) committee invited Dr. Rigoberto Hernandez to give a webinar on “**Managing Inclusive Excellence in Academia.**” Hernandez is the Gompf Family Professor of Chemistry in the Department of Chemistry at Johns Hopkins University and the director of the [Open Chemistry Collaborative in Diversity Equity](#) (OXIDE) program. The recording is freely available for ASP members under the events tab once logged into the ASP website. Hernandez’s presentation focused on implementing institutional reform to lower inequitable barriers faced by faculty from underrepresented groups. He discussed taking a “top-down” approach to addressing inequities in academia, specifically holding department heads and chairs accountable for improving faculty representation and climate within their departments.

Drs. Christine Salomon, associate professor, University of Minnesota, and Lesley-Ann Giddings, assistant professor of chemistry, Smith College, moderated the discussion, which began with Hernandez giving an hour-long presentation on his work with OXIDE. This program engages the chairs of chemistry departments to examine their professional culture to implement policies designed to create equity and inclusion within departments. These practices may encompass different solutions as there is no one size that fits all departments and institutions. Department chairs and institutions should take all risks (e.g., financial and professional) to identify barriers to inclusivity and equity and create solutions. He then went on to define diversity as being the “inclusion of the other,” eliminating out-and-in-groups. Outgroups were defined as any “other,” based on gender, race, ethnicity, disability, or sexuality.

OXIDE has focused on diversity and equity for underrepresented individuals in outgroups. Importantly, Hernandez emphasized that working towards lowering barriers for one group will ultimately lower barriers for everyone and decrease inequities between groups.



**Dr Rigoberto Hernandez**

PHOTO: ROB FELT, GEORGIA TECH

Hernandez provided clear recommendations for chairs (for a full list presented during several past OXIDE sponsored National Diversity and Equity Workshops, please visit the [OXIDE Diversity Solutions website](#)):

- Form a departmental diversity committee; develop and post a vision statement.
- Do not overburden URM faculty!
- Create mentoring programs for students and faculty.
- Conduct faculty searches broadly to attract the most diverse pool of candidates.
- Conduct regular lunch meetings to discuss departmental climate.
- Implement diversity surveys and assess programs through partnerships with OXIDE.

Although these recommendations and the presentation were geared toward departmental chairs in academia  
*continued on page 14*

**This program engages the chairs of chemistry departments to examine their professional culture to implement policies designed to create equity and inclusion within departments.**

**He then went on to define diversity as being the “inclusion of the other,” eliminating out-and in-groups. Outgroups were defined as any “other,” based on gender, race, ethnicity, disability, or sexuality.**

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demia, it is clear that these processes can also be used by managers and leaders in industry and other non-academic institutions. Faculty and students can also advocate for these initiatives to their department chairs and deans.

After his presentation, the webinar concluded with Hernandez answering questions from the audience. The following are questions asked by audience members and Hernandez's responses:

**Based on faculty demographics, how can we increase the number of underrepresented faculty at the associate level?**

**Are the low numbers due to faculty not getting tenure or are they leaving the academy?**

Once you become an associate professor, there are unwritten rules for being promoted to full professor. Faculty may be promoted after 2–5 years or 10 years. These numbers have declined because associate professors were likely promoted to full professors.

**Can you give an example of gender harassment as opposed to sexual harassment?**

There can be inequitable outcomes if you disproportionately assign specific tasks to one gender. For example, female students are assigned to clean and organize the lab, but the male students manage the computers, etc. When writing letters of recommendation, female students are described using words such as “reliable” and “organized,” based on having these roles in the

lab, whereas male students are described with adjectives associated with their research progress, widening gender inequities.

**Bias trainings do not seem to help enough. Do bias trainings have a place in addressing diversity, equity, and inclusion, or should we move past that?**

Bias is one of many barriers. Many people start and stop at bias when it is not the only topic to be discussed. So how can we make diversity training effective? We can recognize that part of the professional culture of chemistry is to attend a conference where experts give talks on select topics. Therefore, we can invite experts on social issues as well as those who are affected by these issues to meet with us in a workshop dedicated to finding solutions. Social science is hard, but social scientists know what they are doing. We need them to be part of the room to find solutions for everyone. Sometimes individuals may make uncomfortable comments during these DEI discussions, but we can address these issues with experts as they arise so everyone understands why the comment was wrong.

**How can we start conversations in departments with huge lagoons in diversity, equity, and inclusion initiatives?**

We have lagoons because the representation within

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**We need them to be part of the room to find solutions for everyone. Sometimes individuals may make uncomfortable comments during these DEI discussions, but we can address these issues with experts as they arise so everyone understands why the comment was wrong.**

### **Underrepresented faculty should not be overburdened. Departments should invite and pay people from the outside to be the voice that represents underrepresented groups to broaden the conversation.**

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the department is not diverse. However, there are ways in which we can increase diversity in small steps that will help make a difference. Underrepresented faculty should not be overburdened. Departments should invite and pay people from the outside to be the voice that represents underrepresented groups to broaden the conversation.

#### **Mentoring is such an important part of faculty retention. What can departments do to assess fair mentorship?**

Universities should develop an intentional mentoring plan that includes faculty mentors at different levels, across different departments, as well as beyond the institution, recognizing that no one person will be a perfect fit. Faculty who are coming from top schools are

already networked, accelerating their success. However, individuals outside of top schools are not networked, creating a barrier. Therefore, the solution is to create a national network across different institutions to level the playing field.

#### **We should not overburden underrepresented faculty with diversity, equity, and inclusion initiatives, but we want them to be part of the process. How can we involve them?**

Departments should pay underrepresented faculty to unburden them to participate. There are different ways of paying faculty. Departments can provide underrepresented faculty with additional research assistants and support staff or recognize the value of these activities when giving raises.

#### **We have organized a lunch session dedicated to inclusive mentoring on July 26, 2022.**

Thank you to everyone who took the time to participate in the webinar. We appreciate having all our ASP members continue this journey with us. The ASP DEI committee will be continuing these discussions at the annual ASP meeting in Charleston, South Carolina. We have organized a lunch session dedicated to inclusive mentoring on July 26, 2022 sponsored by Proctor & Gamble. Our speakers are Dr. Shanina Sanders-Johnson, an assistant professor of organic chemistry at Spelman College, and Dr. Marvella Ford, a professor of public health sciences at the Medical University of South Carolina. Sanders-Johnson and Ford will share with us their research findings and personal experiences as they relate to the mentorship of students and faculty. After their presentations, there will be a question-and-answer session, so please bring your questions. We look forward to seeing you there! ■

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### **Universities should develop an intentional mentoring plan that includes faculty mentors at different levels, across different departments, as well as beyond the institution, recognizing that no one person will be a perfect fit.**

# ASP Founding and Charter Members

By Gordon Cragg, PhD and Harry Fong, PhD

## Introduction

During the past few years, ASP members have witnessed the sad passing of several longstanding and prominent members of our Society, and questions have arisen as to who of past and current long-term members may truly be regarded as founding members of our Society. In addressing these questions, we have looked at available primary sources and interviewed ASP members.

As recorded in chapter one of the ASP History,<sup>1</sup> the “Constitution and By-Laws” establishing the American Society of Pharmacognosy (ASP) were unanimously approved at the business meeting of the Plant Science Laboratory Seminars (PSLS) held at the University of Illinois in Chicago (UIC), College of Pharmacy in August 1959.

The first annual meeting of the newly registered ASP was held in Boulder, Colorado from June 30-July 2, 1960, and the Society’s secretary (Frank Mercer) reported to the Executive Committee (EC) a membership of 137, with 131 active and associate members and six patron members (ASP History,<sup>1</sup> page 3, line 12). However, the primary goal of the 69 members who participated in the “birth” of the ASP at UIC in 1959 was to recruit and expand the Society’s membership, and a decision was made to forego designation of an official “ASP Founding Member,” and instead a membership designation of “ASP Charter Member” was established and assigned to all who had joined and paid their membership dues by July 3, 1960.<sup>1</sup>

The passing of longtime members Ralph Blomster,<sup>2</sup> David Carew<sup>3</sup> and Leonard Worthing<sup>4</sup> prompted ASP Honorary Member Roy Okuda to raise the question as to whether there were any ASP founding members still alive. Okuda’s question stimulated the assembly of an informal group of inquisitive minds to determine the identities of the primarily plant-oriented pharmacognosists and academic founders of the ASP who attended the 1959 PSLs meeting.

Figure 1: PSLs Founding Group Photo. University of Illinois 1959



1. Leila Amer, Grad. Student Univ. of Illinois
2. Kenneth Redmond, S. Dakota State College
3. Richard Doughty, Univ. of Kentucky
4. Rolf Westby, Eli Lilly & Co.
5. Carl Johnson, Univ. of Florida
6. Lynn Brady, Univ. of Washington
7. Hampton Hach, Med. Coll. S. Carolina
8. Joseph Bianculli, Univ. of Pittsburgh
9. Raymond VaderWyk, MCP, Boston
10. Frank Eby, Temple Univ., Phila.
11. Leo Sciacchetti, Oregon State College
12. Karlis Kazerovskis, Big Rapids Michigan
13. H.W. Youngken, Sr., MCP, Boston
14. Frank Slama, Univ. of Maryland
15. E.H. Djaio, Univ. of Texas
16. R.J. Marano, Fordham Univ.
17. N.M. Ferguson, Houston
18. Mrs. Maria Vallarta, Women’s Univ., Philippines
19. Marin Dunn, PCP, Phila.
20. Harold Hewitt, Univ. of Connecticut
21. C.C. Albers, Univ. of Texas
22. R.E. Brillhart, New Engl. Coll., Boston
23. Françoise Kelz, Columbia
24. Ann Koffler, Ohio Northern, Ada
25. Mrs. Ralph Bienfang, Univ. of Oklahoma
26. Mrs. Virginia Bailey, Wayne, Detroit
27. Mrs. Norman Tanner, Univ. of Utah

28. Maynard Quimby, MCP, Boston
29. Robert Stokes, Univ. of S. Carolina
30. Robert Leonard, Geo. Washington Univ.
31. Melvin Gibson, Washington State Coll.
32. Gunnar Gjerstad, Univ. of Texas
33. Dean Ferring, Loyola Univ., New Orleans
34. Maurice Andries, Univ. of Colorado
35. Franklin Cole, Idaho State College
36. Stephen K. Sim, Univ. of Toronto
37. F.A. Crane, Univ. of Illinois
38. D.P.N. Tsao, Univ. of Rhode Island
39. Heber W. Youngken, Jr., Univ. of Rhode Island
40. Byrl Benton, Drake Univ.
41. Frank O’Connell, West Va. Univ.
42. Herbert Jones, Univ. of Minnesota
43. Emmons E. Rosewe, College of the Pacific
44. Jack Beal, Ohio State Univ.
45. Frank J. Pokorny, Columbia Univ.
46. Clifton Lord, Southern Coll., Atlanta
47. Louis Zopf, Univ. of Iowa
48. George L. Webster, Univ. of Illinois
49. Paul D. Carpenter, Univ. of Illinois
50. E. John Staba, Univ. of Nebraska
51. Harold E. Bailey, Wayne State Univ., Detroit

52. Frank E. Bulda, St. John’s, Long Island Univ.
53. Leo J. Schermeister, North Dakota State Coll.
54. Earl B. Fischer, Univ. of Minnesota
55. Vartkes Simonian, Univ. of Arizona
56. Ralph Bienfang, Univ. of Oklahoma
57. Kenneth Stahl, Univ. of New Mexico
58. Stanislaus J. Smolenski, Univ. of Illinois
59. Stanley V. Susina, Univ. of Illinois
60. Phil Canafolmo, Washington, Univ. of Connecticut
61. David P. Carew, Univ. of Iowa
62. Ara G. Paul, Univ. of Michigan
63. Lee Schramm, Ohio, Univ. of Connecticut
64. Tracy G. Call, Sunkist Growers, Inc.
65. Kenneth Waters, Univ. of Georgia
66. W. Paul Briggs, A.F.P.E.
67. John Seibert, Eli Lilly & Co.
68. J. Gordon Duff, Univ. of Saskatchewan
69. Elmore Taylor, Saskatchewan, Purdue Univ.

70. Varro Tyler Jr., Univ. of Washington
71. Lloyd Parks, Ohio State Univ.
72. Edward P. Claus, Ferris, Big Rapids
73. Frank C. Mercer, St. Louis College
74. Austin Dodge, Univ. of Mississippi
75. Frank Jackson, N.E. Louisiana College
76. Ralph Blomster, Univ. of Pittsburgh
77. Norman R. Farnsworth, Univ. of Pittsburgh
78. James Caponetti, MCP, Harvard Univ.
79. Augustus DeMaggio, Rutgers, Univ.
80. Robert VanHorne, Univ. of Montana
81. Norman Tanner, Univ. of Utah
82. LeRay Anderson, Univ. of Wyoming
83. Ralph Voigt, Univ. of Illinois
84. Conrad A. Blomquist, Univ. of Illinois
85. LaVerne Hammer, Albany College of Pharmacy
86. Willis R. Brewer, Univ. of Arizona
87. Arthur E. Schwarting, Univ. of Connecticut
88. James E. Dusenberry, Univ. of Arkansas

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## ASP Founding and Charter Members

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### ASP FOUNDING MEMBERS: THE QUEST BEGINS

At least one living ASP founder E. John Staba, retired professor of pharmacognosy and medicinal chemistry at the University of Minnesota, was present at the 1959 PLS meeting when he was on the faculty of the University of Nebraska, and he appears as person #50 in the photo of attendees in the ASP History<sup>1</sup> (p.92) and shown in Figure 1. Staba, who had been a fixture for more than half a century at the ASP annual meetings, provided valuable insights on the 1959 founding meeting.

An invaluable source of information has been Ms. Christine Jankowski, archivist in charge of the ASP archives at the Lloyd Library and Museum, who has searched for relevant documents. From the many documents obtained from the archives, the numbered version of the photo of the attendees at the PLS at UIC in 1959 (Figure 1), together with a copy of then ASP Secretary Frank Mercer's 1960 membership report, provided the evidence needed to construct a roster of the ASP founding members. On counting the number of members listed in the copy of Secretary Mercer's report, 139 members apparently attended the 1960 meeting rather than the 137 reported in the ASP History<sup>1</sup> and mentioned above in the introduction.

### ASP FOUNDING MEMBERSHIP ANALYSIS AND RESULTS

An examination of Figure 1 showed the presence of 88 people at the PLS meeting. Invariably, however, it can be expected that a number of guests and/or accompanying persons will be present in such group photos; thus, in reality, not all of the 88 people are founding members of the ASP. Figure 1 is carefully annotated

with assigned numbers identifying each individual. An analysis of those names compared to the names listed in the 1960 membership report identified 66 potential founding members. As might be expected, one or more members of the founding group could have missed the photo shot for one reason or another. Indeed, Drs. Edson Woodward (chair of the 1959 PLS/ASP meeting) and Egil Ramstad, a member of the new ASP Constitution and By-Laws Committee, did not appear. In addition, as noted on page 3 and in Table 1 in Chapter 1 of the ASP History,<sup>1</sup> Drs. Earl B. Fisher, Heber W. Youngken, Sr. and John E. Seybert were selected as the first ASP Honorary Members (approved January 1961). Drs. Fisher and Youngken, Sr. both appeared in the PLS/ASP photo (Figure 1) and are regarded as founding members (numbers 28 and 69 (Table 1)). Dr. Seybert (number 52) did not appear in the photo, but, given his selection as one of the first ASP Honorary Members, he clearly was a prominent member of the pharmacognosist community. He has, therefore, also been designated as a founding member. Drs. Edson Woodward, Egil Ramstad and John E. Seybert have, therefore, been added to the "Founding" group, bringing its membership to 69, with their names listed in the upper section of Table 1.

As mentioned in the introduction, the 69 members who participated in the "birth" of the ASP at UIC in 1959 assigned ASP Charter Membership to all those members who had joined and paid their membership dues by July 3, 1960. Thus, all 139 members who attended the first ASP meeting in Boulder, Colorado on June 30-July 2, 1960, are regarded as charter members, and their names are included in Table 1 which lists a total of 140 names. The extra name in Table 1 is George L.

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**...the 69 members who participated in the "birth" of the ASP at UIC in 1959 assigned ASP Charter Membership to all those members who had joined and paid their membership dues by July 3, 1960. Thus, all 139 members who attended the first ASP meeting in Boulder, Colorado on June 30-July 2, 1960, are regarded as charter members...**

**The ASP was founded in 1959 by 69 professors of pharmacognosy and allied botanical scientists, whose research and academic interests mainly concerned medicinal plant-based therapeutic agents.**

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Webster (number 65) who attended the 1959 PSLs meeting (number 48 in Figure 1), but did not attend the 1960 meeting.

Thus, based on the above reasoning, we propose that there were:

- 69 ASP founding members who are included in a total number of 140 ASP charter members listed in [Table 1](#).
- 18 charter members were from foreign countries (Country/[Table 1](#) Numbers: Brazil/139; Canada/14, 53, 79, 96, 114, 138; Ethiopia/1; India/81; Iraq/78; Lebanon/70; Mexico/93; Pakistan/97,123; Philippines/61, 86; Singapore/134; Switzerland/131). Of these, four were founding members (numbers 1, 14, 53 and 61), and several were studying at US universities.
- 14 charter members ([Table 1](#), names bolded), including 13 founding members, went on to serve as ASP presidents in later years.

It is possible that one or two others may also have missed the photo op. However, their identities could not be determined based on the currently available evidence.

Should further convincing evidence emerge, these individuals' names should be added to the list.

### GROWTH AND IMPACT OF THE ASP

The ASP was founded in 1959 by 69 professors of pharmacognosy and allied botanical scientists, whose research and academic interests mainly concerned medicinal plant-based therapeutic agents. The founding members envisioned an active society of academic, industrial, and public sector researchers with broad scientific interests and expertise encompassing botanical, chemical, biological, pharmacological and clinical aspects of natural product derived drug candidates, coming together for the discussion and exchange of ideas, ultimately leading to the publication of results in a journal dedicated to the natural product discipline. Furthermore, they envisioned that the ASP would expand beyond the USA borders to include international membership of like-minded colleagues with expertise in various aspects of natural drug discovery and development.

The visionary goals of the founders have been met in several notable ways. *The Journal of Natural Products*, which succeeded *Lloydia* as the official journal of the Society in 1979, has advanced under excellent editorial leadership to become one of the leading journals devoted

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**The founding members envisioned an active society of academic, industrial, and public sector researchers with broad scientific interests and expertise encompassing botanical, chemical, biological, pharmacological and clinical aspects of natural product derived drug candidates, coming together for the discussion and exchange of ideas, ultimately leading to the publication of results in a journal dedicated to the natural product discipline.**

## ASP Founding and Charter Members

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to the natural products discipline, with a current impact factor of 4.01.

The significant expansion of the ASP membership, both on the domestic and international fronts, is illustrated in Figure 2. Where domestic and international affiliation information is available, membership numbers are recorded separately, with 1960 being the base year and 1961 used as the first “Growth and Internationalization” year. Where the nationality of non-USA members is known, the information is included in the lists below Figure 2, with the country name followed by the number of members (e.g., Canada/2).

The bar graph shown in Figure 2 illustrates the growth of the ASP from a core founding group of 69 plant-based pharmacognosists, 65 of whom were based in the USA, to a membership of 1043 in 2021, of which 416 hail from 72 nations other than the USA. Based on the 140 charter members in the year 1960, the ASP membership has grown by more than 600% since its founding. That the non-USA based members hail from 72 countries

other than the USA or its territories marks the ASP as a truly international and global scientific society. Of particular note is the number of African members which has risen from 3 in 1971 to 67 in 2021, with 44 being from Nigeria, the largest number from a single country other than the USA.

The total number of members varies somewhat from year to year, but, overall, the growth in membership reflects the importance of natural products to the drug discovery and development process.

### ACKNOWLEDGEMENTS

We are grateful to Roy Okuda who first raised the issue of the identity of ASP founding members and noted the presence of retired Professor E. John Staba in the photo of attendees at the 1959 PSLS meeting (Figure 1), and we greatly appreciate Prof. Staba’s valuable insights on the 1959 ASP founding meeting. ■

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**The bar graph shown in Figure 2 illustrates the growth of the ASP from a core founding group of 69 plant-based pharmacognosists, 65 of whom were based in the USA, to a membership of 1043 in 2021, of which 416 hail from 72 nations other than the USA.**

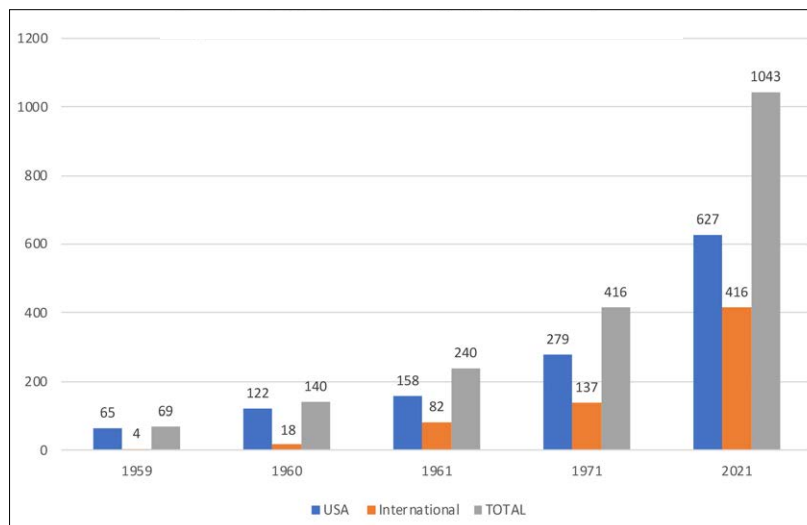
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- ASP Newsletter, Spring 2020, Volume 56, Issue 1, page 17.
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- ASP Newsletter, Fall 2021, Volume 57, Issue 3, page 20.

## ASP Founding and Charter Members

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**The significant expansion of the ASP membership, both on the domestic and international fronts, is illustrated in Figure 2 below.**



**Fig. 2 ASP Growth and Global Distribution**

### **1959 (3 countries/4 members)**

Canada/2; Ethiopia/1; Philippines/1

### **1960 (11 countries/18 members)**

Brazil/1; Canada/6; Ethiopia/1; India/1; Iraq/1; Lebanon/1; Mexico/1; Pakistan/2; Philippines/2; Singapore/1; Switzerland/1

### **1961 (34 countries/82 members)**

Australia/1; Belgium/1; Brazil/4; Canada/6; Czech Republic/1; Denmark/1; Egypt/3; Ethiopia/1; Finland/1; France/3; Germany/11; Greece/1; Hungary/1; India/10; Iraq/4; Italy/3; Japan/1; Korea, Republic/1; Lebanon/3; Madagascar/2; Malaysia/1; Mexico/2; Norway/1; Pakistan/1; Philippines/2; Poland/2; Singapore/1; Sweden/1; Switzerland/2; Sweden/1; Switzerland/2; Turkey/1; United Kingdom/4; Yugoslavia/2

### **1971 (37 countries/137 members)**

Argentina/2; Australia/2; Austria/1; Brazil/3; Canada/13; Czech Republic/4; Denmark/1; Finland/1; France/5; Germany/13; Ghana/2; Greece/5; Hungary/2; India/7; Iraq/1; Italy/6; Ireland/1; Israel/2; Japan/2; Korea Republic/6; Lebanon/1; Mexico/3; Netherlands/4; Nigeria/1; Peru/1; Philippines/3; Poland/2; Singapore/1; Spain/2; Sweden/2; Switzerland/7; Taiwan/6; Thailand/1; Turkey/2; Uruguay/1; United Kingdom/20; Yugoslavia/1

### **2021 (72 countries/416 members)**

Argentina/2; Australia/21; Austria/3; Bangladesh/4; Belgium/5; Benin/1; Brazil/21; Burkina Faso/1; Cameroon/3; Canada/25; Chile/3; China/12; Colombia/1; Costa Rica/1; Cyprus/1; Czech Republic/1; Denmark/4; Ecuador/1; Egypt/2; Eritrea/1; France/9; Germany/23; Ghana/1; Greece/3; Guatemala/2; Hong Kong (SAR, China)/5; Iceland/1; India/23; Indonesia/5; Iran/2; Iraq/2; Ireland/1; Israel/21; Italy/2; Jamaica/2; Japan/23; Jordan/1; Kazakhstan/1; Korea, Republic/10; Kuwait/1; Luxembourg/2; Malaysia/3; Mexico/18; Nepal/2; Netherlands/3; New Zealand/8; Nigeria/44; Norway/1; Pakistan/8; Panama/1; Peru/1; Philippines/7; Poland/2; Portugal/3; Reunion/1; Saudi Arabia/3; Senegal/1; Singapore/2; South Africa/5; Spain/1; Sri Lanka/2; Sudan/1; Sweden/2; Switzerland/5; Taiwan/5; Thailand/1; Togo/1; Trinidad and Tobago/1; Turkey/8; Uganda/5; United Kingdom/17; Zimbabwe/1

# Hot Topics in Pharmacognosy

## Miscellaneous Musings Derived from Current Papers



By David J. Newman, DPhil

*Interesting papers have “crossed my desk” in the May 2022 timeframe covering a variety of topics. It should be noted that since these are very recent, only “doi” information is available for reference.*



### AN EXCELLENT DISCUSSION ON THE RECOGNITION OF TARGETED COVALENT INHIBITORS (TCIS)

In his publication, Juswinder Singh<sup>1</sup> gives an excellent overview of the recognition by at least some of the pharmaceutical companies of the power of such agents, which were often thought (incorrectly) to have significant toxicity and thus would not be viable candidate structures to pursue.

From 2013 to 2021, the following eight antitumor drugs have been approved for human use. The six from 2013 to 2018 were listed in the latest Newman and Cragg review (covering up through September 2019)<sup>2</sup> and their definitions are shown in the fifth column in Table 1 below, with their structures shown in **Figure 1**, by their generic names.

Table 1

Year	Target	Trade Name	Cancer	N&C Code*
2013	EGFR	Afatinib	Lung Cancer	S*/NM
2013	BTK	Ibrutinib	Lymphoma	S*/NM
2015	EGFR	Osimertinib	Lung Cancer	S*/NM
2017	BTK	Acalabrutinib	Lymphoma	S*/NM
2017	HER2	Neratinib	Breast Cancer	S*/NM
2018	EGFR	Dacomitinib	Lung Cancer	S*/NM
2019	BTK	Zanubrutinib	Lymphoma	
2021	KRAS	Sotorasib	Lung Cancer	

NOTE: The S\*/NM category used in the table above denotes a synthetic molecule based on a natural product and mimics the original molecule in terms of its activity.

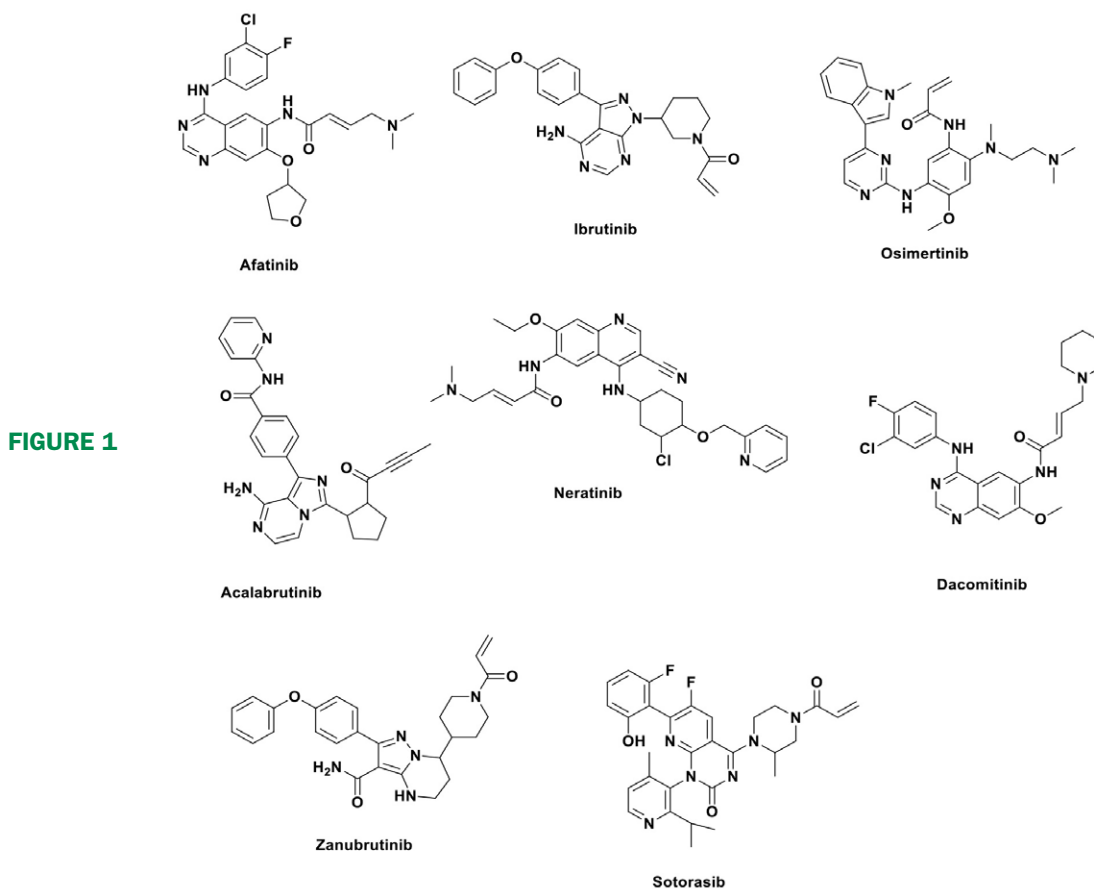
see **FIGURE 1** on page 22

Perhaps even more interesting, in addition to the eight recent antitumor drugs shown above in the table (FDA approved from 2013 to 2021), is that the supporting information in Singh's article shows the very wide variety of FDA-approved drugs numbering 117. A very significant number of the total structures shown are natural products, modified natural products or structurally derived from a natural product. The list includes such well-known agents as benzyl penicillin (Penicillin G, 1947) and even includes agents such as warfarin (1954), plus many more beta-lactam containing agents (penicillins and cephalosporins), dopamine analogues such as carbidopa, and boron-containing agents such as Velcade, that people may not have realized are covalent inhibitors when their actual mechanisms were determined.

In addition, this perspective has excellent “timeline” diagrams covering the discovery of both regular and covalent inhibitors against the following targets, EGFR, Her-2, BTK and KRAS, together with an excellent table showing the hepatotoxicity and hypersensitivity data for both approved TCIs and comparison reversible drugs. All in all, this is an excellent paper for people to use as a teaching tool in both pharmacy and medicinal chemistry classes.

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## IDENTIFICATION OF SOURCES OF CORAL TERPENOIDS

Moving away from drug discovery, there are two excellent and thought-provoking papers that were published back-to-back in the most recent issue of *Nature Chemical Biology* by groups led by ASP member Eric Schmidt at the University of Utah<sup>3</sup> and ASP Fellow Bradley Moore at Scripps Oceanographic Institution.<sup>4</sup> In these they reported the identification of the gene clusters that produced terpenoids in soft corals.

The Schmidt group demonstrated that the putative eleutherobin biogenetic gene complex was clustered in the animal chromosome and included the necessary cytochrome P450. This compound was one of the earliest investigated in the Moore report, and, interestingly, eleutherobin was first reported by the Fenical group at Scripps from a Western Australian soft coral<sup>5</sup> in 1997 and was one of the early compounds that mimicked palitaxol in its bioactivity.

The Moore report demonstrated the presence of a lineage of terpene cyclases that are present in all publicly available octacoral genomes, and they uncovered cryptic coral secondary metabolites, including the elisabethatriene synthase in the deep-sea coral *Paramuricea biscaya*.

Thus these, and possibly all terpene synthase-derived products isolated from octacorals, are not the products of “microbes” within the host but are in fact from ancient lineages of terpene cyclases that are part of the octacoral’s genetic makeup. Yes, back in the long ancient past, the prototype of these gene clusters might have been assimilated from bacteria, but today, they are integrated into the coral’s genome.

What the future holds when investigating other marine organisms for the presence of ancient terpenoid clusters will be very interesting as such clusters are well described in terrestrial bacteria.<sup>7</sup>

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### RELATIVELY SIMPLE ANTIFUNGAL AGENTS

The final paper is one reporting the synthesis of lipidated  $\gamma$ -peptides that have excellent in vitro and in vivo (murine) activities against human pathogenic fungi. It is a joint USA/China paper with contributions from scientists at the University of South Florida and at the Southwest University in Chongqing in the People's Republic of China.<sup>8</sup>

The basic structure used is shown in Figure 2, and the final tested structures effectively vary the length of the pendant amino side chains and the fatty acid used (as shown in Table 2). What is very interesting is that all of the molecules listed MW1-5 demonstrate MIC<sub>50</sub> in vitro values of between 2 and 8 micrograms per ml for *Candida species* that are resistant to fluconazole, with reasonable activities against other fungal species (in particular MW5).

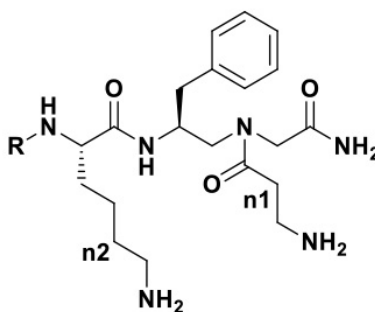
In fact, there is definite potentiation of the well-known azole drug fluconazole when using sublethal levels of MW5 when tested against strains overexpressing drug efflux pumps. Activity was also seen in a mucocutaneous candidiasis model where the fungus was fluconazole resistant, but when administered with MW5, the mixture demonstrated effective fungicidal activity.

Since the number of effective drugs against fungal infections in humans is highly limited, for example only very recently was a natural product derivative approved by the FDA, almost 20 years since the last NP-derived antifungal agent, these results with modified gamma-amino acid derivatives are significant. ■

Table 2

Code Name	n1	n2	R
MW1	1	1	Palmitic acid
MW2	0	1	Palmitic acid
MW3	1	1	Stearic acid
MW4	1	1	Oleic acid
MW5	1	0	Palmitic acid

FIGURE 2



MW1-MW5

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## ASP Elections 2022

By Amy Keller, PhD

The ASP elections were held this spring, and members elected three new officers, Drs. Tawnya McKee, Lesley-Ann Giddings and Skylar Carlson.

McKee will serve as vice president from 2022-2023. This is a one-year term followed by a one-year presidency from 2023-2024. Giddings will serve on the Executive Committee from 2022-2026, a four-year term. The new Executive Committee younger member is

Carlson who will serve from 2022-2024. They will all begin their duties at the ASP business meeting on July 28, 2022 during the Charleston annual meeting. There were no other items on the ballot.

In total, 42.6% of ASP members voted in this election, less than the 50.6% turnout in 2021. Thanks to all who cast their ballot, and best wishes to the new officers for a great term of service. ■



Dr. Tawnya McKee

PHOTO: NCI



Dr. Lesley-Ann Giddings

PHOTO: CAMILLE CLARKE



Dr. Skylar Carlson

PHOTO: SAVANNAH PIERCE





# Behind the Scenes in Pharmacognosy: Smoke Taint in American West Coast Wines



The CZU August Lightning Complex fire in northern Santa Cruz County, August 20, 2020 PHOTO: CAL FIRE CZU SAN MATEO-SANTA CRUZ UNIT

By Xiaoling Chen, PhD Candidate and Teal Jordan, MS

**F**ire and wine were the topic of an open access article in the March 2022 issue of the *Journal of Natural Products* entitled “Natural Product Phenolic Diglycosides Created from Wildfires, Defining Their Impact on California and Oregon Grapes and Wines.” Authors from the University of California Santa Cruz (UCSC), the SC Laboratories, and the University of California Cooperative Extension collaborated to study the impact that smoke from increasingly intense and frequent wildfires in the western United States is having on grapes and wine in the country’s most revered wine regions. Their research focused on forecasting wine quality using UHPLC and MS/MS to directly measure and quantify the bound phenolic diglycosides in grapes and wines that are indicators for smoke taint. In May 2022, we interviewed lead authors Dr. Phil Crews (UCSC) and Mr. Paul Dorenbach (SC Laboratories), who attribute the success of their research to both solid natural products chemistry and workflows but also to the tremendous sup-

port and inspiration from their regional winemaking community. The transcript of this interview has been edited for length and clarity.

### **How did you get involved in measuring smoke taint and working with SC Laboratories?**

**CREWS:** I got involved in this about five years ago, when all these fires were occurring. The situation was that growers and wineries were trying to collect, in some regards, insurance money to cover the loss [from the fires] and the potential loss of the crop. Some wines sell for a couple hundred dollars a bottle, so they don’t want to take a chance. If there has been smoke damage, releasing a wine could subsequently ruin their reputation. So, I was approached by some insurance companies to evaluate packages of data and give them an opinion as to whether the claims for damage to grapes and wines was valid.

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## Behind the Scenes in Pharmacognosy: Smoke Taint in American West Coast Wines



Phil Crews at UC Santa Cruz; Crews' own winery, Pelican Ranch, in Scotts Valley, California.

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**DORENBACH:** At SC Laboratories, we do mainly cannabis testing, but Phil came to us with this wine project. We have all the instrumentation, so it was the perfect match.

**Could you summarize the main concepts of your research project and contributions of your research for the understanding of smoke taint in wine?**

**CREWS:** I discovered that the analytics that was going on in the US [about smoke taint], up until about a year ago, simply measured the presence of volatile phenols in the grape juice or the wines. There are volatile phenols when a fire happens in a forest. If you smell and taste these, they're awful from a standpoint of the aromas and flavors, smokey, bitter, ashy, etc. The major compounds include guaiacol and 4-methyl-guaiacol. These are standard compounds that people would perhaps look for in a sensory evaluation and analytical experiment. You can have as many as 500 volatile phenols. So, these compounds [have been used] as markers to give us a sense as to whether there is potential damage to grapes or wine. During the fire, these compounds are created from the burning trees, and they're sequestered by the smoke. The smoke lands on the grapes and you have glycosyl-transferases that can take these compounds of the smoke and essentially form

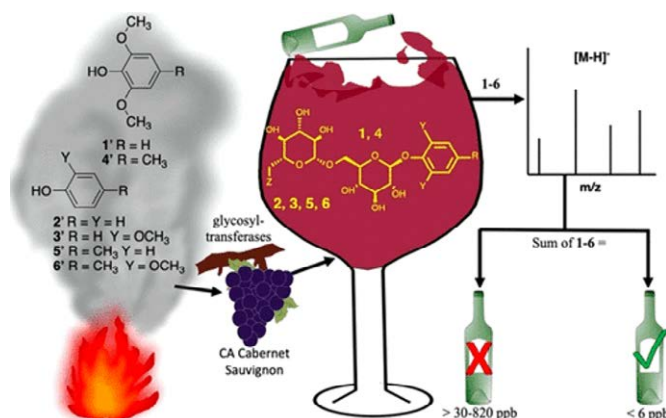
a glycosidic bond to the disaccharide. They can be sequestered in terms of parts per billion (ppb), 100 ppb of these compounds. And that's what Paul was able to do in terms of the magic of using the triple quad with the standards to get data.

As we can't measure all 500 [bound phenolic] compounds, we're just taking the six [biomarkers] to give us a sense of a projection. We accumulated several hundred samples, and I came up with the proposal that if you had the total ppb of the [representative] six bound phenolic compounds in Cabernet Sauvignon, if that is less than 6 ppb, you weren't going to have a smoke impact. This number meshed very well with samples we got from people that have not been impacted by a fire. Mild smoke impact is around 30 ppb and really heavy impact is greater than 800 ppb. We were able to take paired samples of, for example, 2019 Santa Cruz Mountains Cabernet Sauvignon (no fires) vs 2020 Santa Cruz Mountains Cabernet Sauvignon (impacted by the massive CZU fires). Paul and I have learned how to sample grapes, quickly make a measurement, and be able to forecast to a grower what's going to happen. The Australian Wine Research Institute has been doing this for quite a while. But the thing is, you can't send grapes to Australia, and so there was really no lab until a year ago that could do this.

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**Authors from the University of California Santa Cruz (UCSC), the SC Laboratories, and the University of California Cooperative Extension collaborated to study the impact that smoke from increasingly intense and frequent wildfires in the western United States is having on grapes and wine in the country's most revered wine regions.**

## Behind the Scenes in Pharmacognosy: Smoke Taint in American West Coast Wines



Left: Paul Dorenbach; Right: Chemical analysis of the impact of wildfires on wine.

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Now here's an interesting thing: it's the amount of smoke. It's the phenols in the smoke that have the impact, and they were able to drift [with the wind]. Two vineyards equidistant from a fire, one was not impacted by smoke taint, while the other one was heavily impacted because the wind was probably blowing that way.

### What was the most surprising or interesting finding that you took away from this project?

**DORENBACH:** I think it is interesting to have a good sense of how much smoke is really affecting your grapes. Someone might think that their crop is affected and they send it in and [the level of phenols] isn't super high. As our database grows, we'll start to get a better sense of that. One surprising thing was that the range could be really high. For a while, the maximum that we had seen was about 300 ppb, and then we got these other fire samples and they were closer to 800 ppb. So that gave us a sense of what the possible range is that we're looking at here.

**CREWS:** Firstly, one surprising thing was how generous people were in the winemaking community to share samples, and so we got samples from lots of different places. What made the project work is that people were generous in sharing Cabernet Sauvignon samples. We looked at over 20 American viticultural areas (AVA) with eight different varieties. Two more surprising things: Cabernet didn't vary from the baseline as a function of the AVA. In other words, the resident concentration of these compounds when there are no fires is the same no matter where the grape is planted, no matter what the cultivar is. People had wrestled with that question, but they didn't have any answers

to that. We generated a fantastic baseline for these eight varieties where we can now compare a fire year versus a non-fire year. Likewise, the baseline (grapes that are not impacted with smoke) from California Cabernet Sauvignon is different than the Australian baseline. That was a surprising thing. It was unexpected. The baseline for Australian Cabernet Sauvignon is about three times what the California baseline is, and there may be some other explanations to that. Third, people are still trying to learn how to use this information. That's where I think these data sets will be helpful. A winery will be able to decide what they want to do: do they want to sell off some of the grapes for bulk wine or do they create a second label that may not have the high quality? They've got to be careful because they don't want to ruin the quality of the label, but, up to this point, nobody was able to do this because they didn't have this kind of data. I wouldn't say it's a surprise, but it's been an interesting learning circumstance in terms of how to match the biomarker ppb with the sensory evaluation scores.

**DORENBACH:** I think the baseline we've generated is super valuable, and hopefully we'll just continue to add to it. The more samples that are in the baseline, the more comprehensive the range is. We found that the ideal is to have the pair: the exact grape from a year that was unsmoked compared to a year that was smoked. That's going to be the gold standard. If you can get those two sister samples, that'll give you the best idea of how much smoke was affecting your grape. But comparing it to a baseline average of the varietal, I think over time it'll be a good estimate as well.

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## Behind the Scenes in Pharmacognosy: Smoke Taint in American West Coast Wines

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**Did you get any big grants for this project? Or was this just made possible by wineries donating grapes, and your own labs? Was it entirely a community effort?**

**CREWS:** No. We just pulled people in from other projects to do this. And I think SC Laboratories was confident that maybe there'd be a business opportunity down the road, which I think there is. I was convinced that we could make an important scientific contribution because I didn't see this coming out of the other laboratories, commercial labs and other academic labs, because I was laser focused on looking at the direct measurement of these biomarkers.

**DORENBACH:** I would say that there definitely is a business opportunity, but there's also the community aspect. We just had the big CZU fire here, and we were able to get some winemakers who are really interested in this because of that fire to donate some samples. And it's been a mutually beneficial relationship where they get some free data, and we get to use their data to establish our baselines and increase our dataset and develop our method. It just worked really well.

**CREWS:** Let me also tell you a little story. I knew that the commercial labs were not doing it right, and I wanted to tell my friends here in Santa Cruz and other winemaker associations what the problems were. I wanted to try and get them to use their money wisely to get bioanalytics and using the money wisely was not measuring the free and the total. It was the bound compounds, the direct measurement. And I figured that if we could get that going, we could provide data that would be useful to people to help the small family wineries make the correct decisions. So, in fact, a lot of our samples came because people were grateful to the standpoint that two years ago when I gave them seminars, I pointed them in the right direction of what data to get and what data not to get. In fact, next month I'm going up to the Dry Creek Valley Wine Growers Association to give a talk.

**That's great. It sounds like your research has been really community driven. You started with community questions and you're benefiting communities, small wineries, and now you're disseminating that information through community talks.**

**CREWS:** And one of the things you might know is that our paper is open access. The reason we did that is I wanted everybody to be able to get it.

**DORENBACH:** I hope people use it!



**Mr. Dorenbach, since cannabis growers are having to deal with many of the same environmental issues as vineyard and winery owners, are you involved in any similar research looking at the effect of wildfire smoke on cannabis?**

**DORENBACH:** Yes, we are in the development stage of that. We have our standards, and we know the instrumentation that we are going to use. So it's a matter of developing that method, but it'll be measuring the free phenols because obviously there is no natural process of fixing them to sugars.

**Dr. Crews, do you have any advice for other people who are pursuing a career in science but perhaps have a very different passion that they also hope to blossom into a career, and how you can be successful on both ends?**

**CREWS:** That's hard. I don't have any advice. What I've always done in terms of science is I pick what I'm interested in and follow my heart. Actually, there's a parallel between the wines and sponge natural products chemistry. To do natural product chemistry, you have to be out in nature, so we're always out on expeditions. And one of the things that made the expeditions work is that I would ask all the PhD students, the post-docs and staff as we're going out to a tropical area to bring four bottles of wine in their wet suit, two in the arms and two in the legs. At the end of a long day of diving and then collecting and interrogating samples, we could then have a good meal with some vino. That would then set the stage for evening seminars. So, at any rate, I was lucky. I just found a way to combine, on many levels, our science, in terms of chemistry, biochemistry, enology and viticulture. ■

**I think the baseline we've generated is super valuable, and hopefully we'll just continue to add to it. The more samples that are in the baseline, the more comprehensive the range is.**

# Meet a New ASP Member

## Dr. Claudia Ospina Millán



**Dr. Claudia Ospina Millán** is our featured new member in this issue of the Newsletter. Ospina Millán is an assistant professor in the Department of Natural Sciences and Mathematics working with marine and terrestrial natural product discovery and development at the Inter American University of Puerto Rico, Bayamón Campus. We are pleased to officially welcome her to the ASP!

By Wendy Strangman, PhD

### What is your scientific background and what are your interests related to pharmacognosy?

I was born in Cali, Colombia. I received my BS degree in education in biology and chemistry from Universidad del Valle, Cali-Colombia in 1996 and continued graduate studies at the University of Puerto Rico in Rio Piedras in 1997. I completed my doctorate degree in organic chemistry in 2006, where I finished my thesis research with Professor Abimael D. Rodriguez in isolation, characterization, and biological evaluation of natural products. The chemical study of four Caribbean marine organisms (*Caulerpa racemosa*, *Agelas sp.*, *Briareum polyanthes*, and *Pseudopterogorgia bipinnata*) and of the plant *Nicotiana tabacum* culminated with the discovery of 35 new secondary metabolites from diverse structural families and the preparation of ten synthetic derivatives. This work has been published in diverse scientific journals and shows the extensive expertise that I have in isolation, purification, and structural elucidation of highly complex molecules such as terpenes and alkaloids from marine and terrestrial organisms. My professional experience includes working as a professor and researcher at the University of Puerto Rico in Cayey and Universidad Ana G. Méndez, Gurabo from August 2006 to August 2020. Since August 2020, I joined the Department of Natural Sciences and Mathematics of the Inter American University of Puerto Rico, Bayamón Campus.

I have been developing research projects in drug discovery, natural products, cancer, and medicinal plants. I have been in charge of training 32 undergraduate students from the departments of chemistry, biology and natural sciences. Our research results have been presented in local, national, and international forums (130 presentations) and published in a research notebook and peer-reviewed journals (14 publications).

### How did you hear about the ASP?

Since my graduate studies I knew of the existence of the ASP



Dr. Claudia Ospina Millán. PHOTO: ASHLEY LAUREANO

### Why did you decide to join ASP?

I decided to join the ASP this year. It is a highly recognized organization in the field of natural products and pharmacognosy. Through this organization I can establish collaborations.

### What would you like to achieve through your membership?

Encourage the participation of students from Puerto Rico in the association, participate in forums, webinars and establish collaborations.

### What other scientific societies do you belong to?

I also belong to the American Chemical Society.

### What do you like doing in your spare time – movies, activities, etc?

In my free time I like to travel and explore national and state parks. ■



# New Members of ASP Summer 2022

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 60 full members and 93 associate members. We look forward to meeting you and learning more about you and your work.

## FULL MEMBERS

**Dr. Deepa Acharya**

Corteva Agriscience  
United States  
Natural Products Scientist

**Dr. Kojo Acquah**

University of Michigan  
United States  
Postdoctoral Scholar

**Dr. Zulfiqar Ali**

University of Mississippi  
United States  
Senior Research Scientist

**Mr. Tyler Alsup**

University of Florida  
United States  
Graduate Student

**Dr. Bharathi Avula**

University of Mississippi  
United States  
Principal Research Scientist

**Prof. Elhadj Saidou Balde**

Institut de Recherche et de Développement de Plantes Médicinales et Alimentaires de Guinée  
Guinea  
Professor

**Ms. Barbara Ball**

Independent Research  
United States  
Self-employed

**Ms. Riya Bhanushali**

Georgia Institute of Technology  
United States  
Undergraduate Researcher

**Dr. Paula Brown**

BC Institute of Technology  
Canada  
Director

**Ms. Elise Burkhartmeyer**

United States  
Student

**Prof. Young-Won Chin**

Seoul National University  
Republic of Korea  
Associate Professor

**Dr. Trevor Clark**

Simon Fraser University  
Canada  
Postdoctoral Research Fellow

**Ms. Christina Davidson**

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Research Associate

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United States  
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Puerto Rico  
Research Assistant

**Dr. Cody Earp**

University of North Carolina, Greensboro  
United States  
Postdoctoral Associate

**Dr. Samson Ezea**

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Nigeria  
Senior Lecturer

**Dr. Evgenia Glukhov**

University of California, San Diego  
United States  
Staff Research Associate

**Mr. George Hanna**

Medical University of South Carolina  
United States

**Dr. Bandara Herath**

University of Mississippi  
United States  
Senior Research Scientist

**Dr. Melanie Higgins**

The University of Alabama  
United States  
Assistant Professor

**Ms. Tamara Jordan**

Simon Fraser University  
Canada  
Data Scientist

**Ms. Teal Jordan**

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United States  
Research Technologist and  
Laboratory Manager

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Republic of Korea  
Head, Natural Products Research  
Center

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University of Mississippi  
United States  
Postdoctoral Associate

**Dr. Neil Kelleher**

Northwestern University  
United States  
Professor

**Dr. Aswad Khadilkar**

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United States  
Associate Project Scientist

**Dr. Mohammad Khasawneh**

United Arab Emirates  
University  
United Arab Emirates  
Associate Professor

**Mr. Zachary Kohanov**

Virginia Tech  
United States  
Graduate Student

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South Africa  
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**Prof. Min-Won Lee**

Chung-Ang University  
Republic of Korea  
Professor

**Prof. Wook-bin Lee**

Korea Institute of Science and Technology  
Republic of Korea  
Senior Researcher

**Mr. Albebson Lim**

University of Utah  
United States  
Graduate Student

**Dr. Zhenjian Lin**

University of Utah  
United States  
Research Associate Professor

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## New Members of ASP Summer 2022

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**Mr. Austin Lowry**

Virginia Tech  
United States

**Dr. Venkat Macherla**

Enveda Biosciences  
United States  
Senior Director, Platform Chemistry

**Ms. Caitlin McCadden**

University of Florida  
United States  
Graduate Student

**Prof. Hosein Mohimani**

Carnegie Mellon University  
United States  
Assistant Professor

**Ms. Sogol Momeni**

The University of Alabama  
United States  
PhD Candidate

**Dr. Dhammika Nanayakkara**

University of Mississippi  
United States  
Research Professor

**Dr. Marsha Pierce**

Midwestern University  
United States  
Assistant Professor

**Mr. Matthew Pin**

Simon Fraser University  
Canada  
Data Scientist

**Dr. Alexandros Polyzois**

Rhodes University  
South Africa  
Postdoctoral Fellow

**Mr. Conor Pulliam**

University of South Carolina,  
Columbia  
United States  
Student

**Prof. Pei-Yuan Qian**

Hong Kong University of  
Science and Technology  
Hong Kong  
Professor

**Dr. Manuel Eduardo**

**Rangel Grimaldo**  
University of North Carolina,  
Greensboro  
United States  
Postdoctoral Associate

**Mr. Michael Recchia**

Simon Fraser University  
Canada  
PhD Candidate

**Dr. Liela Romero**

Baylor University  
United States  
Assistant Professor

**Dr. Daniel Romo**

Baylor University  
United States  
Professor

**Dr. Eric Schmidt**

University of Utah  
United States  
Distinguished Professor

**Dr. Javad Sharifi Rad**

University of Azuay  
Ecuador  
Professor

**Mr. Alex Swystun**

University of North Carolina, Wilmington  
United States  
Graduate Student

**Prof. Ian Tietjen**

The Wistar Institute  
United States  
Research Assistant Professor

**Mr. Ethan Underwood**

University of North Carolina, Greensboro  
United States  
Graduate Student

**Dr. Yan-Hong Wang**

University of Mississippi  
United States  
Principal Scientist

**Mr. Jason Williams**

University of California, Los Angeles  
United States  
PhD Student

**Dr. Priscilla Winder**

Florida Atlantic University  
United States  
Research Associate

**Dr. Jianping Zhao**

University of Mississippi  
United States  
Senior Research Scientist

## ASSOCIATE MEMBERS

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United States  
Graduate Student

**Mr. Adedimeji Adefabi**

University of Ibadan  
Nigeria

**Mr. Imraan Alas**

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United States  
PhD Candidate

**Dr. Vicky Anderson**

University of North Carolina,  
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**Ms. Savannah Anez**

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PhD Student

**Ms. Subha Arjunan**

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Virginia Tech  
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**Ms. Sarah Barr**

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**Ms. Bailey Bell**

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United States  
Graduate Student

**Ms. Sandra Bennett**

University of North Carolina, Wilmington  
United States  
Graduate Student

**Mr. Sonam Bhutia**

Dibrugarh University  
India  
PhD Scholar

**Mr. Benjamin Blackburn**

Virginia Tech  
United States  
Graduate Student

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## New Members of ASP Summer 2022

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**Dr. Claudia Boot**

Colorado State University  
United States  
Research Scientist

**Mr. Colby Borges**

University of North Carolina, Greensboro  
United States  
Undergraduate Research Scientist

**Mr. Nathaniel Brittin**

University of Wisconsin-Madison  
United States  
Graduate Student

**Dr. Emily Brown**

Florida Gulf Coast University  
United States  
Postdoctoral Researcher

**Mr. Alec Brundle**

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United States  
Student

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Research Assistant

**Ms. T'ea Cameron**

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United States  
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**Ms. Vildan Celiksoy**

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**Mr. Francisco Chacon**

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United States  
PhD Student

**Ms. Xiaoling Chen**

Pennsylvania State University  
United States  
Graduate Student Researcher

**Dr. Hyomoon Cho**

National Institutes of Health  
United States  
Postdoc

**Mr. Joshua Chukwu**

Teach for Nigeria  
Nigeria

**Dr. Valerie Clark**

USDA – ARS  
United States  
Research Chemist

**Ms. Ying Cong**

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United States  
Graduate Research Assistant

**Dr. Ericsson Coy-Barrera**

Universidad Militar Nueva Granada  
Colombia  
Assistant Professor

**Ms. Deeya**

Virginia Tech  
United States  
Graduate Student

**Dr. Ramadevi Devarakonda**

Ministry of Ayush  
India  
Former Consultant

**Prof. Fredyc Diaz-Castillo**

University of Cartagena  
Colombia  
Full Professor

**Ms. Sarah Dietrick**

University of South Florida  
United States  
Graduate Teaching Assistant

**Dr. Koushik Nandan Dutta**

NEMCARE Group of Institutions  
India  
Head of Department

**Mr. Chinedu Enegide**

Novena University, Ogume  
Nigeria  
Lecturer

**Mr. Nathan Ezzone**

The Ohio State University  
United States  
Graduate Student

**Prof. Andriy Grytsyk**

Ivano-Frankivsk National Medical University  
Ukraine  
Head of Department

**Mr. Daniel Icenhour**

University of Florida  
United States  
PhD Student

**Mr. Zohorul Islam**

University of Rajshahi  
Bangladesh  
Researcher

**Ms. Eunah Jeong**

Sookmyung Women's University  
Republic of Korea  
PhD Student

**Mr. Phil Kading**

Pharmacy School Schwentinental  
Germany

**Dr. Mays Khazem**

Damascus University  
Syrian Arab Republic  
Chief of Department of Pharmacognosy

**Dr. Quan Khong**

National Cancer Institute  
United States  
Postdoc

**Ms. Eunbin Kim**

Chung-Ang University  
Republic of Korea  
Graduate Student

**Prof. Ki Hyun Kim**

Sungkyunkwan University  
Republic of Korea  
Professor

**Ms. Yuka Koike**

Showa University  
Japan  
Postdoctoral Fellow

**Prof. Oleh Koshovy**

National University of Pharmacy  
Ukraine  
Professor

**Mr. Dinesh Kumar**

CSIR-IHBT, Palampur  
India  
Senior Scientist

**Ms. Lois Kwana Kyei**

Virginia Tech  
United States  
Graduate Student

**Mr. Zachary Lane**

University of Connecticut  
United States  
Graduate Student

**Ms. Colby Laws**

University of North Carolina, Greensboro  
United States  
Student

**Dr. Tae Hyun Lee**

University of Wisconsin-Madison  
United States  
Postdoc

**Dr. Ruibao Li**

Indiana University, Bloomington  
United States  
Postdoctoral Associate

**Ms. Katelene Soraia Lima**

Universidade NOVA de Lisboa  
Portugal

**Dr. Stella T. Lima**

University of North Carolina, Greensboro  
United States

**Ms. Charmaine Lindsay**

The Ohio State University  
United States  
Graduate Student

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## New Members of ASP Summer 2022

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**Dr. Koshi Machida**

Waseda University  
Japan  
Postdoc

**Dr. Balungile Madikizela**

South Africa

**Mr. Lewis Marquez**

Emory University  
United States  
Graduate Student

**Dr. Surya Nandan Meena**

Savitribai Phule Pune University  
India  
Postdoctoral Researcher

**Mr. William Mendoza**

University of Puerto Rico Medical  
Sciences Campus  
Puerto Rico  
PhD Student

**Ms. Candy Andreina Montaña Pérez**

Universidad Autonoma de Nayarit  
Mexico  
Student

**Mr. Fumiaki Nakamura**

Waseda University  
Japan  
Postdoc

**Ms. Jennifer Obike**

University of North Carolina, Greensboro  
United States  
Undergraduate Student

**Ms. Sofia Padilla-Mayne**

Universidad Nacional Autonoma de  
Mexico  
Mexico

**Ms. Huong Pham**

Sookmyung Women's University  
Republic of Korea  
PhD Student

**Ms. Karla Piedl**

Virginia Tech  
United States  
Undergraduate Student

**Mr. Hadi Pourhadi**

University of North Carolina, Greensboro  
United States  
PhD Student

**Dr. Jitin Rahul**

IIT Dhanbad  
India  
Assistant Professor

**Ms. Zarna Raichura**

Auburn University  
United States  
PhD Student

**Mr. Christopher Roberts**

University of Wisconsin-Madison  
United States  
Graduate Student

**Ms. Fridah Rotich**

University of North Carolina, Greensboro  
United States  
PhD Student

**Ms. Lisa Rusali**

University of Illinois at Chicago  
United States  
PhD Student

**Ms. Emily Schafer**

Siena College  
United States  
Student

**Ms. Seoyeon Seonu**

Chung-Ang University  
Republic of Korea  
Student

**Dr. Priyanka Sharma**

NIPER Guwahati  
India  
Research Associate

**Mr. Robert Shepherd**

University of North Carolina, Greensboro  
United States  
Graduate Student

**Mr. Suzudul Islam Shuvo**

Virginia Tech  
United States  
Graduate Student

**Ms. Emma Stowell**

University of Florida  
United States  
Graduate Teaching Assistant

**Mr. Zach Stryker**

University of South Carolina  
United States  
Graduate Student

**Ms. Youjung Sung**

University of Utah  
United States  
Graduate Research Assistant

**Dr. Janae Sweeney**

South Carolina State University  
United States  
Assistant Professor

**Ms. Kara Talbott**

University of the Pacific  
United States  
Graduate Student

**Ms. Korydwen Terrasson**

The Ohio State University  
United States  
PhD Student

**Mr. Charlie Tran**

Griffith University  
Australia  
PhD Candidate

**Dr. Takeshi Tsunoda**

Oregon State University  
United States  
Postdoctoral Scholar

**Ms. Miriam Velazquez**

The Ohio State University  
United States  
Undergraduate Student

**Ms. Empress Williams**

University of North Carolina, Greensboro  
United States  
Undergraduate Student

**Mr. Jake Wilson**

The Ohio State University  
United States  
Student

**Dr. Kiesha Wilson**

University of South Carolina School of  
Medicine  
United States  
Postdoctoral Scholar

**Ms. Caitlin Winner**

Virginia Tech  
United States  
Undergraduate Student

**Ms. Diqi Yan**

University of South Carolina  
United States  
Undergraduate Student

**Mr. Olalekan Yusuf**

University of Ilorin  
Nigeria  
Student

**Ms. Yi Zhao**

The City University of New York  
United States  
PhD Student



# Pharmacognosy Field Notes: Microbial Chemical Ecology in Diverse Brazilian Biomes



A view of the Amazon Forest from our boat. PHOTO: MÔNICA PUPO

By Mônica T. Pupo, PhD and Jon Clardy, PhD

**W**e had the privilege of jointly coordinating the first International Cooperative Biodiversity Group (ICBG) between Brazil and the US. It was co-funded, in an unusual binational collaboration, by the Fogarty International Center/National Institutes of Health (FIC/NIH) and São Paulo Research Foundation (FAPESP). The project was mainly focused on microbiomes of social insects such as fungus-farming ants and myrmecophytes and stingless bees, both of which harbor diverse collections of microbial symbionts. Our ICBG was designed to align the ecological functions of specialized metabolites from microbiomes with potential therapeutic applications. Brazil has the highest diversity of described insects in the world, and this diversity is spread over distinct and often unique biomes such as the Amazon Forest, Atlantic Forest, Cerrado (savanna-like), Pantanal (tropical wetlands), Caatinga (xeric shrublands), and Pampas (grasses). Collectively the biomes and microbiomes provide virtually boundless opportunities for natural products field and laboratory research. Until our

ICBG program there had not been any systematic in-country attempts to unravel the molecular mechanisms underlying insect-microbe interactions.

In the course of the ICBG, we collected insect colonies mainly in the Atlantic Forest at Itatiaia National Park (Rio de Janeiro State), Amazon Forest at Anavilhanas National Park and Ducke Reserve (Amazonas State), and in the transition area of Cerrado and Atlantic Forest at Vassunganga State Park and at the University of São Paulo campus at Ribeirão Preto (São Paulo State).

The most remarkable field work occurred in January 2017 at Anavilhanas National Park in the Amazon Forest. Anavilhanas is one of the biggest river archipelagos in the world with diverse forest formations. A group of 16 people, including PIs, postdocs, graduate students and technicians, nine from Brazil and seven from the US, spent a week in a lodge in Novo Airão, a small town at the end of the only road along the Rio Negro, for collections in Anavilhanas islands. Novo Airão is around 180 km northwest of Manaus, the capital of Amazonas State.

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**The project was mainly focused on microbiomes of social insects such as fungus-farming ants and myrmecophytes and stingless bees, both of which harbor diverse collections of microbial symbionts.**

## Pharmacognosy Field Notes: Microbial Chemical Ecology in Diverse Brazilian Biomes

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The members of the first ICBG between Brazil and the US. PHOTO: ROMARIO, THE DRIVER OF BOAT 2

**A group of 16 people, including PIs, postdocs, graduate students and technicians, nine from Brazil and seven from the US, spent a week in a lodge in Novo Airão, a small town at the end of the only road along the Rio Negro, for collections in Anavilhanas islands.**

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Members of the group flew from different places in Brazil and the US to Manaus, and then we traveled together in a rented shuttle to Novo Airão. Our lodge was right by the river, and what looked like the far shore was the first island of the archipelago. Rio Negro, which meets the Rio Solimões at Manaus to form the Rio Amazonas, reaches 12 miles wide in some points, and its height changes by 96 feet between wet and dry season. The black water of Rio Negro (“Black River”) is due to the humic acids from incomplete breakdown of phenol-containing vegetation. Due to the acidic pH of its water, Rio Negro is unsuitable for mosquito proliferation.

We hired a talented guide (nickname “Vermelho”), who grew up in the region and was also an experienced boat driver, to provide the daily commuting for collections and to keep us from getting lost in the islands. The group needed to be split to fit in the two small boats used for the maze-like and sometimes shallow waterways in the archipelago.

Access to the internet was sporadic and weak at the

lodge and unavailable elsewhere. Mobile phones were good for photography. Being cut off in that way imposed some hardships, but it also meant that it was easy to focus on collecting ant nests during the day and processing material at the lodge in the late afternoon and evening. Being largely disconnected from the outside world, along with the intense research focus and 24-7 small group dynamics, led to interpersonal connections between team members that continue to this day. Our daily boat trips provided a wonderful tour of the astonishing landscapes full of water, trees, and unusual animals – especially the *botos cor-de-rosa* (pink dolphins) swimming around the boats. The Amazon is often described as a “river of trees,” and we all learned what this meant in a visceral fashion.

Planning this trip took a long time and special logistics, since we would be far away from our laboratories and without most of the essentials needed for research on microbiomes. There was no space in the luggage for

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## Pharmacognosy Field Notes: Microbial Chemical Ecology in Diverse Brazilian Biomes



Back at the lodge processing the material collected during the day.

PHOTO: MÔNICA PUPO

Part of the team trying to navigate their boat through the “river of trees.”

PHOTO: MÔNICA PUPO



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unnecessary things. We packed lab supplies essential for the field work and preliminary isolation operations. These materials consisted basically of one stereomicroscope, a magnifying lens, lamps, Petri dishes (several prefilled with different autoclaved media), spatulas, Eppendorf tubes, Falcon tubes, wash bottles, and other small plastics and glassware. Not surprisingly, these things occupied most of the space in our baggage. We also ordered liters of absolute ethanol in Manaus. The remaining space in the luggage was filled with special outfits demanded by forest field work, such as long pants, long sleeves, hats, hiking boots, and, importantly, gaiters for snake protection.

Every morning, after breakfast, we filled our backpacks with snacks and water for the day, insect repellent, sunscreen, a raincoat, and tools for field work. We also carried a first aid kit for small accidents. The Amazon Forest is hot and humid, so there was no relief from the heat while we walked looking for ants along the small trails opened in the vegetation by our guide.

Professor Cameron Currie (University of Wisconsin-Madison), our collaborator in the ICBG, also joined this expedition. He had a lot of previous experience in sampling fungus-farming ants in Panama, Costa Rica, and other places. He taught the group how to locate ant colonies, to dig and collect subterranean fungal gardens, and to process the material still in the field to avoid contamination and loss of symbionts. The best way to locate attine ant nests is to spot an ant carrying plant material along a trail on the forest floor. Nests typically have an opening in the soil that leads to subterranean tunnels and chambers. We soon learned that some attine ants in the Amazon Forest establish their colonies under tree trunks fallen to the ground – there are lots of decaying trees in the forest. This is quite different from attine ants in the transition area of Cerrado and Atlantic Forest (São Paulo State), where the colonies are founded and established deeper in the more com-

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**The best way to locate attine ant nests is to spot an ant carrying plant material along a trail on the forest floor. Nests typically have an opening in the soil that leads to subterranean tunnels and chambers.**

## Pharmacognosy Field Notes: Microbial Chemical Ecology in Diverse Brazilian Biomes



A pink dolphin in the Amazon River. PHOTO: EMILY MEYERS



Weilan and Vermelho searching for an attine ant colony under a fallen tree. PHOTO: MÔNICA PUPO

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pacted ground. Another regional trait of such ants was observed in Itatiaia National Park (Atlantic Forest, Rio de Janeiro State), where attine ants frequently establish their nests on hillside slopes.

After locating an ant nest, careful digging in the soil allowed access to the fungal gardens in their subterranean chambers. Collecting was done with a spoon sterilized with a BIC lighter. Team members carefully collected the fungal garden, which was covered with worker ants, and transferred the material to Falcon tubes or plastic containers, depending on the amount of material. Specific codes identified the collector and the GPS coordinates to the respective nest. All the nests collected were stored in thermal boxes. Every day after the field work, we returned to the lodge – typically it was a one-hour boat trip each way – to start processing the material.

Cameron coordinated the “lab” work, which was conducted on improvised lab benches that had earlier in the day been our breakfast tables at the lodge. The collected

materials were transferred to plastic containers and allowed to stabilize for one or two days. These ants are amazingly organized; they soon start to clean the fungal cultivar inside the containers, separating the garbage from the fungal food. For initial bacterial isolation, ants’ exoskeletons were inspected using the stereomicroscope, scraped, and the bacteria plated in previously prepared Petri dishes. In a parallel workflow, ants were washed in sterile water, and the wash water was also plated. In a separate processing step at the lodge, fungal gardens were also plated for isolation of the specialized fungal parasite (genus *Escovopsis*) and the fungal cultivar (genera *Leucoagaricus* or *Leucocoprinus*). All the Petri dishes were kept for subsequent processing in our laboratories in the US and Brazil. One room at the lodge was designed to keep all material, and soon the beds and shelves were completely covered by the end of our stay.

Unexpected, and often humorous, events are hallmarks *continued on page 38*

**After locating an ant nest, careful digging in the soil allowed access to the fungal gardens in their subterranean chambers. Collecting was done with a spoon sterilized with a BIC lighter.**

## Pharmacognosy Field Notes: Microbial Chemical Ecology in Diverse Brazilian Biomes

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Drs. Mônica Pupo and Jon Clardy.

PHOTO: WEILAN MELO

A team member transferring material from a fungal garden to a Falcon tube. PHOTO: MÔNICA PUPO

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of field work. On the last day at the lodge in Novo Airão, an iguana jumped over the plated Petri dishes while we were packing all the stuff to return to Manaus. During one of many boat trips, one of the boats (with students and postdocs) had a mechanical problem and got lost from our boat. Our experienced guide “Vermelho” managed to find and rescue the broken boat, and we still had productive field work that day. Luckily, we didn’t have any snake accidents during our field work in the Amazon Forest, since we were very far from medical assistance.

The field work in the Amazon was a remarkable opportunity for scientific and personal growth. We collected valuable materials that have been the focus of our research ever since, and there are many interesting, possibly useful, results in the project’s future. We spent a short but intense time together immersed in the forest learning *in loco* the basic biology and ecology behind the

source of natural products. We had to be creative and versatile to do the initial experiments with the available “facilities” and conditions. We needed to be patient, collaborative, cooperative, and optimistic. We had the chance to talk with each other during the boat rides, field work, and lodge work, which contributed to establishing ties of friendship along with scientific partnerships. Brazilians had the privilege of learning from renowned and experienced scientists from the US, while Americans had the unique opportunity of experiencing the field work inside the Amazon Forest.

The biomes in Brazil are quite different in terms of vegetation, relief, climate, and animals, but they are equally astonishing in beauty and exuberance, and certainly full of chemically mediated interactions to be deciphered and possibly lead to the discovery of useful new natural products. We are eager for new adventures in the field. ■

**The biomes in Brazil are quite different in terms of vegetation, relief, climate, and animals, but they are equally astonishing in beauty and exuberance, and certainly full of chemically mediated interactions to be deciphered and possibly lead to the discovery of useful new natural products. We are eager for new adventures in the field.**

# 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, at [asp.newsletter@lehman.cuny.edu](mailto:asp.newsletter@lehman.cuny.edu).

A number of scientific conferences have been delayed or canceled due to the COVID-19 pandemic.

Please check with conference organizers about the status of any in-person conferences.

## **2022 ASP Annual Meeting**

**July 23-28, 2022**

**Charleston, South Carolina**

[aspmeetings.pharmacognosy.us](http://aspmeetings.pharmacognosy.us)

## **SIMB Annual Meeting and Exhibition**

**August 7-10, 2022**

**San Francisco, California**

[simbhq.org/annual/](http://simbhq.org/annual/)

## **ASP Natural Product Sciences Webinar**

**Bimonthly Zoom Seminars**

**Thursdays 4 PM ET / 1 PM PT**

[www.pharmacognosy.us/natural-product-sciences-webinar/](http://www.pharmacognosy.us/natural-product-sciences-webinar/)

## **2022 AOAC International Annual Meeting and Exposition**

**August 26-September 1, 2022**

**Scottsdale, Arizona**

<https://www.aoac.org/annual-meeting-exposition/>

## **C&EN Webinars**

**Various Days and Times**

<https://cen.acs.org/collections/webinars.html>

## **70<sup>th</sup> International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research (GA)**

**August 28-31, 2022**

**Thessaloniki, Greece**

[www.ga-congress.org](http://www.ga-congress.org)

## **Gordon Research Conference: Natural Products and Bioactive Compounds**

**The Function of Natural Products at the Interface of Chemistry and Biology**

**July 31-August 5, 2022**

**Andover, New Hampshire**

<https://www.grc.org/natural-products-and-bioactive-compounds-conference/2022/>



American Society  
of Pharmacognosy



# Capital Communiqués

Natural Product-related News from NIH and Beyond



By Barbara C. Sorkin, PhD

## INTERNATIONAL NEWS




The US and the United Arab Emirates (UAE) announced in February that they will seek between now and 2025 to increase funding for the [Agriculture Innovation Mission \(AIM\) for Climate](#) program they launched at the COP26. Funds will be sought from governments and non-government innovation partners.

## NEWS FROM THE US

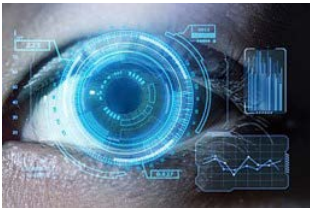
- ◆ The US House of Representatives passed the [America COMPETES Act](#) on Thursday, February 3. As of this writing the House and Senate are working to reconcile differences between it and the Senate's [U.S. Innovation and Competition Act \(USICA\)](#). The \$350 billion COMPETES includes a new National Science Foundation (NSF) directorate ([Technology, Innovation and Partnerships](#)), increases to NSF and the Department of Energy budgets, and regional innovation hubs. The bill also includes new visa policies for STEM students. [This Science article](#) takes a deeper dive into the bills.



- ◆  In February the White House announced that departing Office of Science and Technology Policy (OSTP) Director Eric Lander, who resigned after it was revealed he had been “reprimanded for bullying and demeaning women on his staff,” would be replaced by Francis Collins (who stepped down from the Directorship of the US National Institutes of Health (NIH) in December 2021) and Alondra Nelson. Nelson will serve as deputy assistant to President Biden and lead the OSTP, and Collins will serve as the President’s science advisor.

Dr. Francis Collins

- ◆ On May 10, 2022, Dr. Lawrence A. Tabak, the NIH acting director, [announced](#) that the [2022 Appropriations Act \(P.L. 117-103\)](#) makes reporting to NIH by NIH-funded institutions mandatory “when individuals identified as a principal investigator or as key personnel in an NIH notice of award are removed from their position or are otherwise disciplined due to concerns about harassment, bullying, retaliation, or hostile working conditions.”

- ◆  Also in P.L. 117-103: authorization of the establishment of the Advanced Research Projects Agency for Health ([ARPA-H](#)) within the US Department of Health and Human Services, the department that includes the NIH and Food and Drug Administration (FDA) among other agencies. “ARPA-H will support transformative high-risk, high-reward research to drive biomedical and health breakthroughs – ranging from molecular to societal – that would provide transformative solutions for all patients.”

- ◆ Dr. Robert Califf, most recently sworn in as FDA commissioner in February, has announced that, given the increasing prevalence of misinformation and the significant threat it poses to public health, the FDA will prioritize fighting misinformation. In a recent [interview with JAMA](#) Califf discusses some botanical products (opiates, tobacco) as well as misinformation.

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- ◆ From the [NIH Office of Scientific Workforce Diversity blog](#), “The COVID-19 pandemic-induced shift to online events has led to a growing body of research on the impact of virtual scientific convenings. A review of this literature suggests that an entirely or primarily virtual format can enhance meeting access, diversity, and climate.”



Madeline K. Albright

- ◆ Former Secretary of State Madeline K. Albright died on March 23, 2022. Albright advanced science and technology’s role in diplomacy by establishing the [Office of the Science and Technology Adviser to the Secretary of State \(STAS\)](#) in 2000, following a recommendation in a [1999 National Academy of Sciences report](#). The STAS office continues today to support the secretary of state on a wide variety of science and technology issues.

## NEWS YOU COULD USE

- ◆ Do you report inventions to iEdison? iEdison will move from NIH electronic research administration (eRA) to the National Institute of Standards and Technology (NIST) in summer 2022: [grants.nih.gov/grants/guide/notice-files/NOT-OD-22-100.html](https://grants.nih.gov/grants/guide/notice-files/NOT-OD-22-100.html)
- ◆ The new [NIH Scientific Data Sharing website](#) is now available. “[This new public-facing website will serve as a central portal for resources on NIH sharing policies](#). The site includes resources to help address questions such as which NIH sharing policies apply to a particular research project, how to share and submit data, how to access data from NIH-supported repositories, and more.
- ◆ [NIH Will Continue to Accept Preliminary Data as Post-Submission Material Through January 2023 Councils](#).
- ◆ [FY 2022 Fiscal Policies for Grant Awards](#): Funding Levels, Salary Limits, and Stipend Levels.
- ◆ When Instructions Conflict – Which One Wins? If the Funding Opportunity Announcement (FOA) language (yes, you should read it!) for the FOA you’re applying to conflicts with the [NIH Grant Application guide](#), what should you do? For the answer, please see: [NIH Extramural Nexus, April 2022](#).

## FUNDING OPPORTUNITIES

### NIH OFFICE OF DIETARY SUPPLEMENTS (ODS)

The ODS supports research to strengthen understanding of dietary supplements. The [Consortium Advancing Research on Botanicals and Other Natural Products](#) (CARBON) Program is a major collaboration between the ODS, the NIH National Center for Complementary and Integrative Health (NCCIH) and the NIH National Institute on Aging (NIA). The next receipt date for applications for awards for collaborative pilot research projects (in collaboration with one or more of the CARBON’s Botanical Dietary Supplements Research Centers) is September 30, 2022. Applications to [PAR 20-228](#), Pilot Projects Increasing the Impact of the NIH Centers for Advancing Research on Botanicals and Other Natural Products (PI2 CARBON) (R03 Clinical Trials Not Allowed), must be focused on potential effects relevant to human health of chemically complex natural products and/or the causal, molecular mechanisms underlying such effects.



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### US DEPARTMENT OF AGRICULTURE (USDA) NATIONAL INSTITUTE ON FOOD AND AGRICULTURE (NIFA):



The closing date is October 27, 2022 for applications to the [Agriculture and Food Research Initiative Competitive Grants Program Education and Workforce Development Program](https://www.nifa.usda.gov/sites/default/files/2022-03/FY22-AFRI-EWD-RFA-508.pdf): [www.nifa.usda.gov/sites/default/files/2022-03/FY22-AFRI-EWD-RFA-508.pdf](https://www.nifa.usda.gov/sites/default/files/2022-03/FY22-AFRI-EWD-RFA-508.pdf)

### NATIONAL INSTITUTE OF GENERAL MEDICAL SCIENCES (NIGMS)

The National Institute of General Medical Sciences (NIGMS) supports basic research that increases our understanding of biological processes and lays the foundation for advances in disease diagnosis, treatment, and prevention. NIGMS is interested in areas of technology development that support its [mission](#), and are not responsive to the mission of other disease-specific or organ-specific NIH Institutes or Centers.

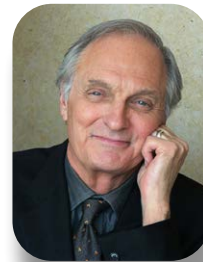
In early May 2022, NIGMS hosted a webinar to discuss its newly released FOAs that support the earliest stages of technology development, establishing feasibility/proof of concept and prototype validation, and do not support applications that address new biological questions:

- Technology Development Research for Establishing Feasibility and Proof of Concept (R21 – Clinical Trial Not Allowed; [grants.nih.gov/grants/guide/pa-files/PAR-22-126.html](https://grants.nih.gov/grants/guide/pa-files/PAR-22-126.html))
- Focused Technology Research and Development (R01 – Clinical Trial Not Allowed; [grants.nih.gov/grants/guide/pa-files/PAR-22-127.html](https://grants.nih.gov/grants/guide/pa-files/PAR-22-127.html))

The webinar is available for viewing and the updated Frequently Asked Questions are an excellent resource for interested individuals: [www.nigms.nih.gov/grants/R21-R01/Pages/NIGMS-Technology-Development-Programs-R21-and-R01.aspx](https://www.nigms.nih.gov/grants/R21-R01/Pages/NIGMS-Technology-Development-Programs-R21-and-R01.aspx).

### ODDS AND ENDS

- ◆ [Alan Alda on the importance of good science communication](#), with how-to pointers.



- ◆ [“From the Noggin to the Butt: Quirky Measurement Units Throughout Human History.”](#) Who knew that one part per million isohumulone is the standard for International Bitter Units? Hat tip: NIST blogpost contributed by ODS’ Adam Kuszak.



# From the Archives: Book Notes

When we think of scholarly donations, manuscripts and research reports frequently come to mind. But donations from esteemed researchers often include rare and hard-to-find or influential books from their personal collection. In this issue, we provide a glimpse of books that were once on the shelves of ASP members and have found a new home at the Lloyd Library & Museum.

By Christine Jankowski, MA

## NORMAN R. FARNSWORTH

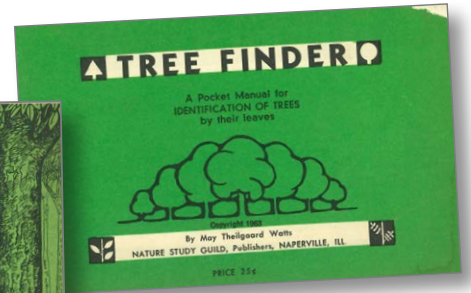
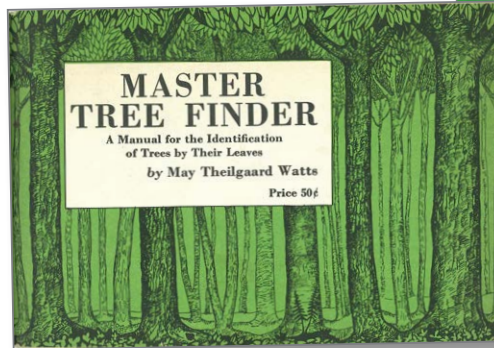
As we continue to process Norman R. Farnsworth's papers, books from his collection are being added to the Lloyd Library catalog. These books accompanied the donation of his papers and are related to topics of his research: natural medicine, traditional medicinal practices from across the globe, and topical health subjects including AIDS research and women's health.

Another subject Farnsworth collected was floristics. Many books in his collection focus on specific geographic areas of the United States, such as the agriculture of Illinois and the weeds of North Carolina. The classic nature guidebooks by May Theilgaard Watts also make an appearance in Farnsworth's library, including the first editions of *Tree Finder*, *Master Tree Finder* and *Flower Finder*. Watts was an American naturalist and educator who wrote and illustrated guidebooks to help everyone understand the nature that could be found in their backyard. These guidebooks are still in publication today, and, surprisingly, the Lloyd does not have these on our shelves!

## EMIL JOHN STABA

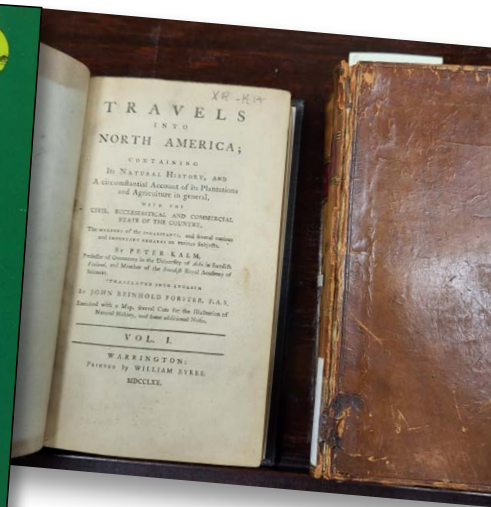
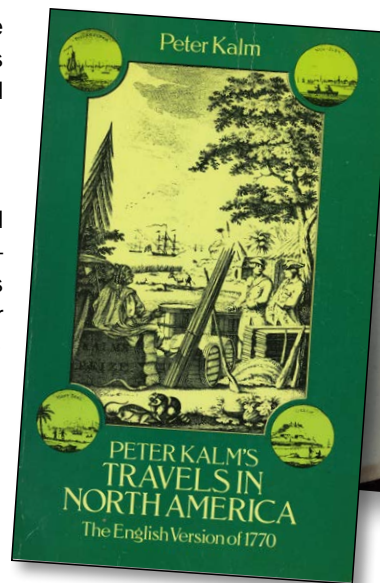
ASP Honorary Member Emil John Staba has donated his archival material to the Lloyd, and now it is growing even more. His initial collection consists of his manuscripts and papers related to his time as a professor of pharmacognosy at the University of Nebraska and the University of Minnesota and are available for researchers to peruse. Recently, Staba bolstered his existing collection by donating a small collection of books from his academic and personal library. Many cover topics on holistic remedies, Asian medicine and health practices, and histories on Native American tribes and medicine.

Included in this donation is a reprint of *Peter Kalm's Travels in North America*. The Lloyd enthusiastically accepted this 1987 Dover edition as the library already owns three volumes of his original translated accounts



ABOVE: Farnsworth's *Master Tree Finder* and *Tree Finder*.

from 1770! Kalm was a Swedish botanist who explored modern day Canada, New England and Mid-Atlantic states in search of seeds for herbs, trees and plants. He made observations of the environment and took notes on the wildlife found on his journey. This copy of his accounts makes a great reference for researchers interested in scientific explorations and early North American history.



ABOVE: Kalm's *Travels in North America*.

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## From the Archives: Book Notes

**All book donations are added to the library's catalog, where the donor is also noted. This expands access to those looking for a specific book, researching a topic, or pursuing biographical information on the original owner. Your books could be a legacy for future scholars! We encourage gifts from a diversity of donors.**

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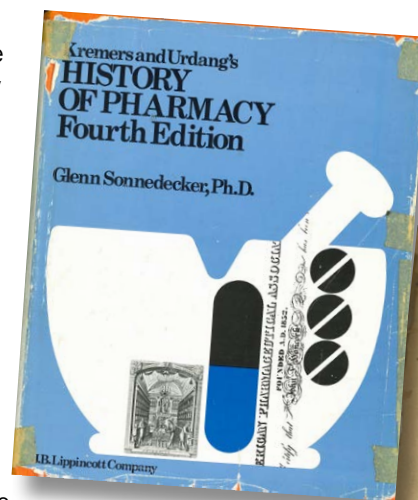
### GLENN A. SONNEDECKER

Many who have taken a pharmacy history course or have an interest in the history of pharmacy will most likely recognize this name: Glenn A. Sonnedecker. Sonnedecker was a pharmacist, a professor at the University of Wisconsin-Madison's School of Pharmacy, and the former director of the American Institute of the History of Pharmacy. He is perhaps best known for being the editor of *Kremers and Urdang's History of Pharmacy*. Sonnedecker donated to the Lloyd Library books he used for his research and ones that were gifted to him from times he spent abroad. Many of these books are written in foreign languages, like German, French and Italian, and focus not only on pharmacy history but related pharmacy ephemera and art as well.

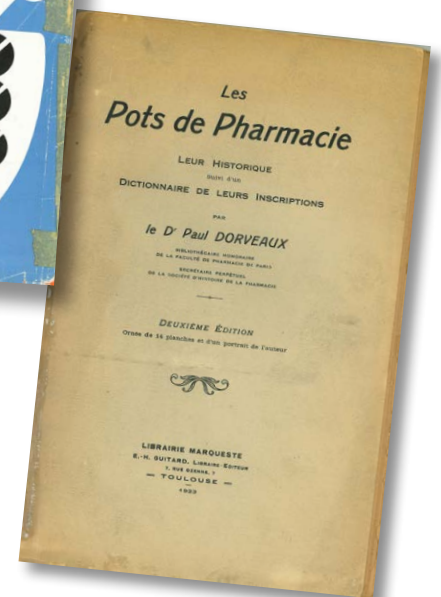
One book we are happy to add to our collection is *Les Pots de Pharmacie: leur historique suivi d'un dictionnaire de leurs inscriptions* by Dr. Paul Dorveaux. This unassuming tome from 1923 includes a dictionary that lists abbreviations found on jars and other vessels used in apothecaries and pharmacies which date back to the 15<sup>th</sup> century! In a note to the Lloyd Library, Sonnedecker expressed its value to history: "It remains the most authoritative and comprehensive reference source of the kind."

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Consider a donation to the Lloyd Library & Museum. Because of limited space we typically do not accept items that duplicate what we already own, and we have size limitations. Donated materials must fit within our collection scope, which includes nature-based medicine, medicinal history, and pharmacy. As with all materials donations, we require an inventory. For more information on the materials donation process, click [here](#). Contact archivist [Christine Jankowski](#) to discuss potential donations. ■

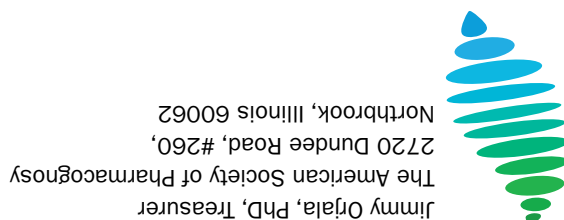


ABOVE: *Kremers and Urdang's History of Pharmacy*.



AT RIGHT: Dorveaux's *Les Pots de Pharmacie: leur historique suivi d'un dictionnaire de leurs inscriptions*.

**This unassuming tome from 1923 includes a dictionary that lists abbreviations found on jars and other vessels used in apothecaries and pharmacies which date back to the 15<sup>th</sup> century! In a note to the Lloyd Library, Sonnedecker expressed its value to history: "It remains the most authoritative and comprehensive reference source of the kind."**



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