American Society of Pharmacognosy

Summer 2023

Discovering Nature's Molecular Potential

ASP Newsletter: Summer 2023, Volume 59, Issue 2

2023 ASP Annual Meeting Fast Approaching

By Craig Hopp, PhD and Nandakumara Sarma, PhD

Have you registered yet? The 2023 ASP Annual Meeting is almost here! We are looking forward to hosting everyone on the outskirts of Washington, D.C. this year from July 22-26. The abstract submission window has closed and invitations for contributed talks have been sent. Much of the scientific program is now complete as you can see on the meeting website.

The organizing committee has endeavored to assemble a dynamic slate of speakers, including many people you may not have heard present at ASP before. The following symposia and scientific sessions represent the breadth of natural products interest areas and encompass the conference theme of Innovation through Interaction:

- Where Chemistry and Biology Meet
- Natural Products that Modify Macromolecular Interactions
- Old Molecules/New Purposes
- Microbiome/Probiotics Interactions
- Bridging the Gap: Collaborations with Predominantly Undergraduate Institutions
- Public/Private Partnerships
- Unique Environments
- Fungal Biosynthesis and Chemodiversity
- Who's Your Partner: Symbiosis and Natural Products
- Cannabis and Cannabinoids
- Recent Advances in Traditional Herbals —Quality/Authenticity and Analysis
- Natural Products and Infectious Diseases

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The Capitol, The Washington Monument and the Lincoln Memorial Reflecting Pool, Washington, D.C.
PHOTO: OLEKSANDR DIBROVA: ADOBE.COM: DIBROVA

American Society of Pharmacognosy

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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/

Newsletter Staff

Contribution deadlines

Spring: Feb. 15; Summer: May 15
Fall: Aug. 15; Winter:Nov. 15

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Editor's Corner

American Society of Pharmacognosy

By Edward J. Kennelly, PhD

It is exciting to once again be preparing for an in-person annual meeting. While the COVID pandemic impacted ASP activities since 2020, our gathering in the greater Washington area promises to be a wonderful opportunity to meet up with ASP members and friends once again. The organizing committee has written a helpful article about what to expect from the meeting, and this is our lead for the summer issue of the *Newsletter.* I hope to see many of you in person in a matter of weeks.

In this issue we feature a profile of ASP Business Manager Laura Stoll. One of Laura's major duties for ASP is leading the organizational team for the annual meeting. I had the pleasure of first meeting Laura when I was part of the 2012 ICNPR organizing committee. This was the largest gathering ASP had ever organized, and Laura, along with the ASP treasury team, did an amazing job. I am glad we have this opportunity to focus on her important contributions to ASP over many years. Some newer ASP members may not know that Laura comes from an important ASP family — her father served as ASP treasurer for decades, and her family often attended annual meetings.

I am greatly indebted to our regular columnists, including Dave Newman ("Hot Topics in Pharmacognosy"), Christine Jankowski ("From the Archives"), Barbara Sorkin ("Capital Communiqués"), and Wendy Strangman ("Meet a New ASP Member"). These committed ASP members volunteer their time to contribute valuable content to the *Newsletter*. I hope you take time to read these informative articles.

I am writing this from Guiyang, China where I am traveling with my collaborator Prof. Chunlin Long, along with my 90-year-old mentor, Prof. Memory Elvin-Lewis, and my nephew Ryan. In 1978, Memory's husband, Prof. Walter Lewis, traveled to China for a ginseng conference and wrote a fascinating account of this early visit to modern China in the *ASP Newsletter*. Armed with this information, we were able to retrace part of Walter's trip and also explore other different areas of mainland China. For me it has been great to return to China after three years of COVID-related travel restrictions and to meet up with colleagues and friends from Minzu University and beyond. It has also been quite wonderful being able to bring Memory to mainland China for the first time ever to experience the biodiversity, ethnic cultures, ultramodern infrastructure, and, most of all, the kind and caring people I have gotten to know over the past 15 years collaborating with Minzu University.

Have a great summer, and I hope to see many of you soon in Maryland! ■

2023 ASP Annual Meeting Fast Approaching

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The Saturday workshops on July 22 include the following topics with presentations and panel discussions to help inform your research:

- Botanical Drugs: A Regulatory Approach on How FDA Reviews a Botanical Application
- Biochemical and Biophysical Assay Design for Natural Product Discovery Campaigns
- Current Topics in Botanical Safety
- Fungal Identification Using Molecular Tools
- Public Speaking for Scientists

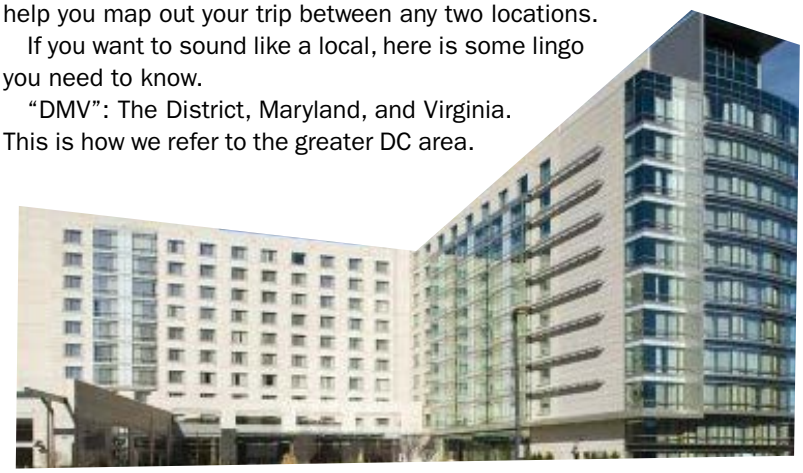
In addition to the always exciting scientific program, we also have an array of social events for your enjoyment. The highlight will be the trip to Smokey Glen Farm which is sure to have great food and an array of games and activities. The Younger Members Committee have reserved Pinstripes across the street from the hotel for an evening of bowling, bocce, and beer.

And, of course, there are endless things to see and do outside of the meeting. The area across the street from the conference hotel is a new district known as Pike and Rose. It is packed with restaurants, bars, and shopping. Beyond that, DC is home to the world-famous Smithsonian Museums and the National Mall which are free to visit. If you are a baseball fan, the Washington Nationals will be playing the Giants and Rockies at home that week.

A few pro tips as you plan your travel to the DC area. You will want to get a Metro card if you intend on taking public transportation at any point during the meeting. If you have an iPhone you can avoid having to get the physical card by adding a SmarTrip card to your Apple Wallet. The North Bethesda Marriott is accessible by Metro from either Reagan National Airport or Dulles Airport, but it is about 30 minutes faster from Reagan National. The Metro has a nice website that will help you map out your trip between any two locations.

If you want to sound like a local, here is some lingo you need to know.

"DMV": The District, Maryland, and Virginia. This is how we refer to the greater DC area.



The Smithsonian Museum

"Beltway": The local term for Interstate 495 which encircles DC. It is typically a snarled traffic mess and is to be avoided at almost all times of the day.

"Metro": This is the DC public transit system. It is used as a verb, as in "I'm going to Metro to the game."

"Red Line": The DC Metro system is organized into color-coded lines (red, yellow, green, blue, orange, and silver). The North Bethesda Marriott Hotel is steps away from the North Bethesda Metro stop on the red line. The red line will also take you into DC, just a few blocks from the National Mall.

The ASP annual meeting presents a wonderful opportunity for interested companies to network with about 600 attendees through exhibits of their product offerings and sponsorship of the meeting's events. The career fair and young member events at the annual meeting are also opportunities to hire talent.

We are looking forward to welcoming ASP members and families to the 2023 annual meeting for an intellectually stimulating opportunity for innovation through interaction! We encourage you to register early and book your hotel room at the meeting venue, Bethesda North Marriott Hotel & Conference Center. ■

SEE YOU IN JULY!

Bethesda North Marriott Hotel & Conference Center

Meet ASP Business Manager Laura Stoll

By Vanessa Nepomuceno, PhD

Laura Stoll

Growing up as the child of the late ASP Honorary Member and Treasurer Dr. David Slatkin definitely shaped Laura Stoll's view of the society. She fondly recounted how her father was passionate about the society and interacting with his ASP family, and she seems to clearly share this sentiment. The society means a lot to her personally, and being ASP business manger is not just an ordinary job for her. In a way, this is a part of her father's legacy that she continues. Kind and family oriented, Stoll spoke very warmly about working for the ASP.

Stoll had a unique path towards working with the ASP. Her career actually began in theater. She attended Ithaca College in upstate New York. Though her degree is in theatre arts management, most of her educational course work was in business. She told me that "working in theater management gave me a creative edge, but I felt I was well equipped for the role."

Stoll remained in New York for five years after graduating with her BFA, working as a general manager on and off Broadway. Many fall in love with the glamour of big city life in New York but that was not the case for Laura. "I broke my ankle, and I lived in a three-story walk up!" she laughs. Due to her injury, she moved out of New York and began working as a purchasing manager at Midwestern University in Illinois, closer to family.

In 2005, Laura began working for the ASP, helping her father, then ASP Treasurer Dr. David Slatkin, part time as an assistant. When Dr. Guido Pauli took over as treasurer, he lobbied to have her work full-time. Her position was approved in 2014, and she has been a vital part of the ASP ever since.

Adjusting to this newly created position had its challenges. Serving as business manager is Stoll's full-time role, but that is not the case for ASP members who juggle professorship in addition to working for the society. It can be difficult to coordinate with people across different time zones with hectic schedules. Yet, she finds it rewarding and enjoys that the most: people coming together from all over. "Everyone has a full-time job or other responsibilities, and I do help them get to the important tasks they want to accomplish for ASP. I help keep ASP organized and moving forward as a society so everyone can fulfill their mission."

She fondly recounted how her father was passionate about the society and interacting with his ASP family, and she seems to clearly share this sentiment.

Stoll with her late husband, Scott, and children, Molly and Matthew.

When asked about her typical workday, Stoll says it varies, which keeps things interesting. "A day could include supporting committees via meetings and tasks that help the committees progress in their goals, day-to-day budgeting, bookkeeping/accounts payable/accounts receivable, membership processing and responding to questions from members, maintaining [the] membership system, executive committee support, maintaining the documents for ASP, supporting the ASPF (award committees, donations, etc.), aiding in website updating and meet

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Meet ASP Business Manager Laura Stoll

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ing website creation and content updates, ballot preparation, meeting planning with the organizing committee, [and] handling logistical items for [the annual] meeting."

That's not all. Stoll also serves as an ASP meeting planner and is a part of the Conference, Corporate Relations, and Tellers Committees. Needless to say, she is always hard at work for the ASP. In fact, she has been a top contributor to the society for nearly two decades. She works from home to be able to be more present with her two children, Molly and Matthew. When she is not working, Stoll dedicates herself to her family. She jokingly calls herself "Mom's Uber," shuffling her children to their various after school activities.

Working for the society for so many years comes with countless, fond memories. So, what are the highlights for Stoll? Her answer is simple: meetings where she and her dad were both in attendance. Slatkin was committed to the ASP and considered members of the ASP not just colleagues, but family. "It was very important to him to be deeply involved with the ASP."

She recalls sitting at the dining room table helping her dad send out mailings for ASP like the newsletter. Her children have had a similar rite of passage by helping with and attending annual ASP meetings. She is also really looking forward to seeing everyone again at this year's meeting.

Laura Stoll has been diligently working for the ASP for almost 19 years. Her contributions have been crucial and are priceless. Without her, the ASP would not be the same! ■

Stoll (right) with Drs. Birgit Jaki and Guido Pauli at an ASP annual meeting.

Stoll having some fun with volunteers at the 2019 ASP annual meeting in Madison, WI.

Slatkin was committed to the ASP and considered members of the ASP not just colleagues, but family. "It was very important to him to be deeply involved with the ASP."

Khan Named AAAS Fellow

By John Beutler, PhD

The American Association for the Advancement of Science (AAAS) has honored ASP Fellow Iklas Khan with election as an AAAS Fellow. AAAS fellows are elected by individual sections, and Khan's award was made by the Pharmaceutical Sciences Section (S).

The award was made to recognize Khan's scientific work on the analysis of herbal supplements, both in elucidating the structures of the molecules responsible for the biological activity of the supplements and quantifying them. His work extends into the biology of the plant and its biomedical impact, including both toxicology and therapeutic efficacy. He has made particularly notable contributions to the science of ashwagandha, *Cannabis*, *Damiana, Ephedra*, ginseng, *Ginkgo*, green tea, licorice, *Moringa*, propolis, and many less familiar plant-derived supplements.

Dr. Iklas Khan

PHOTO: OLE MISS COMMUNICATIONS

These efforts have had a major impact on public health, providing data and methods directly applicable to regulation of supplements by the FDA, quality control by manufacturers, and offering scientific insight into what is a very fraught commercial landscape. He has been the key organizer of the International Conference on the Science of Botanicals, hosted in Oxford, MS for almost 20 years. This meeting has been an important venue for presentations and discussions between herb industry leaders and scientists. Khan received the 2011 ASP Tyler Prize in recognition of his significant contributions to the field of botanicals.

Since 1874, AAAS fellows have been elected annually and are recognized for their extraordinary achievements in the advancement of science. Their fellowship is a lifetime honor.

Other current ASP members who have been elected AAAS fellows include Drs. Bill Baker (2014), John Beutler (2019), Jon Clardy (1985), Alice Clark (2014), Ara der Marderosian (1991), Bill Fenical (2008), Bill Gerwick (2017), Sidney Hecht (2003), Doug Kinghorn (2006), James McChesney (1995), Susan Mooberry (2020), Ted Molinski (2020), Valerie Paul (1996), Ben Shen (2011), David Sherman (2008), John Staba (1982), and Barbara Timmermann (2000). Congratulations to Dr. Khan and all other ASP members who have been honored by AAAS! ■

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Taking Action: A Perspective on Diversity, Equity, and Inclusion

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

On Thursday, March 23, 2023 the American Society of Pharmacognosy (ASP) Diversity, Equity, and Inclusion (DEI) committee invited Dr. Malika Jeffries-EL to give a webinar on "**A Perspective on Diversity, Equity, and Inclusion**." Dr. Jeffries-EL is an associate professor in the Department of Chemistry and Division of Materials Science and the associate dean of the Graduate School in Arts and Sciences at Boston University. The recording is freely available for ASP members under the events tab once logged into the ASP website. Jeffries-EL's presentation focused on implicit bias and how it played a role in the outcomes of several case studies related to diversity, equity, and inclusion in academia. She provided insight into good practices for DEI efforts and touched on issues of race, ethnicity, ageism, sexism, ableism, and various forms of bias.

Drs. Eduardo Caro-Diaz, assistant professor at the University of Puerto Rico, and **Elizabeth Kaweesa**, postdoctoral fellow at the University of Illinois at Chicago, moderated the interactive 90-minute discussion. The presentation began with definitions of diversity and DEI and why they are important. Jeffries-EL highlighted how diverse perspectives improve products and services for everyone. The tangible benefits include improved creativity, innovation, better decision making and problem solving, employee retention, higher engagement, and increased revenue. However, our sector lacks diverse voices, as there are significantly fewer students of color attaining science, technology, engineering, and mathematics (STEM) bachelor's degrees. Jeffries-EL noted that while these percentages of students of color are increasing, the overall United States population and number of students identifying as two or more races is also increasing, making it hard to monitor the number of students of color attaining STEM degrees. Nevertheless, any increase would still be disproportionately lower compared to their white counterparts according to data from the National Academies of Sciences (https://doi.org/10.17226/25038), especially in mathematics and physics. On the other hand, women are making tremendous gains in STEM degree attainment at the bachelor's and doctoral levels in academia. While this has not manifested itself at the professoriate level, where women represent around 35% of faculty, the numbers are increasing.

Dr. Malika Jeffries-EL

PHOTO: SHELLY DAVIS

Dr. Jeffries-EL stated that "a failed diversity model is one where you bring in people from different walks of life, but you expect them all to adapt to the status quo when they get there." This is exemplified in academia where underrepresented minorities (Blacks, Hispanics, and Indigenous scientists) remain disproportionately represented in the faculty while they represent much larger fractions of the overall United States population, which is indicative of systemic issues. She provided the following guidelines to start DEI initiatives that could begin to address these problems below:

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Jeffries-EL's presentation focused on implicit bias and how it played a role in the outcomes of several case studies related to diversity, equity, and inclusion in academia.

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Jeffries-EL noted that while these percentages of students of color are increasing, the overall United States population and number of students identifying as two or more races is also increasing, making it hard to monitor the number of students of color attaining STEM degrees.

- Align your efforts with the goals of the organization
- Consider invisible factors of diversity
- Have good communication about DEI efforts
- Set standards, goals, and deadlines
- Make the case for the importance of DEI
- Lead by example
- Reassess and readjust periodically

The interactive webinar featured audience participation through sharing examples of implicit bias and discussing case studies. The audience also weighed in on good practices to promote diversity in the workplace. Suggestions included using rubrics and anonymous scoring/ranking systems for evaluating candidates (student admission/faculty searches), developing guidelines for representation goals, inviting people at different career stages rather than just senior, well-established faculty, and articulating and developing an effective faculty retention plan. Jeffries-EL also emphasized the need for accessibility for all and addressing this need in the early stages of planning event logistics. The webinar ended with Jeffries-EL reminding the audience of how we can move forward by focusing on the concepts of equity (i.e., accommodating people with the supports they need) while moving towards justice (addressing the root causes of inequity and removing systemic barriers).

At the conclusion of the presentation, Jeffries-EL responded to audience questions:

How can we respond when an institution says they are committed to DEI efforts but shrugs when the applicant pool is not diverse?
Jeffries-EL encouraged the audience to hold the hiring committee accountable. She suggested approaching senior faculty to hold the committee accountable and encouraging leaders to conduct multi-year searches that focus on attending conferences, canvassing, and recruiting diverse candidates a full year before the deadline to ensure a diverse candidate pool.

Do you have any recommendations to discuss DEI in our research labs? How can we set the tone to establish lab culture?
Jeffries-EL recommended having a "DEI moment" where group members rotate and discuss an issue from the literature, news, or social media. The principal investigator can set the tone to do the first DEI moment and others can follow by example.

There seems to be a gender gap in tenure. Could you comment on what limits women from advancing in the tenure track?
Jeffries-EL said that we are bringing in a lot of women at the graduate and postdoctoral levels, but there is major drop off between postdoctoral and tenure track positions and that the culture of the work environment can affect this. If we improve the culture for the smallest populations, we improve the culture for members of all populations.

What practices can we implement to prevent diversity fatigue?
Jeffries-EL said that we don't have to do everything, and that instead we can be an idea generator and empower others to do the work. She suggested that people should also ask for compensation and help for their efforts.

Thank you to all who participated in this webinar. The ASP DEI committee will be continuing these discussions at the annual ASP meeting in Rockville, Maryland. We have organized an interactive session dedicated to diversifying the scientific workforce on July 25, 2023. Our speakers are Dr. Pamela Tamez, chief officer for scientific workforce diversity at the National Institutes of Health, and Dr. Debra Joy-Perez, chief equity officer at the United States Pharmacopeia. We look forward to seeing you there! ■

Dr. Jeffries-EL stated that "a failed diversity model is one where you bring in people from different walks of life, but you expect them all to adapt to the status quo when they get there."

2023 ASP Elections

Dr. Joseph Betz

Dr. Christine Salomon
PHOTO: BRIANNA KOPKA / B2 PHOTOGRAPHY

By Amy Keller, PhD

ASP election results have been finalized, and the membership has elected two new officers. Dr. Joseph Betz will serve as vice president from 2023-2024. This is a one-year term itself, followed by a one-year presidency from 2024-2025. Dr. Christine Salomon will serve on the Executive Committee from 2023-2027, a four-year term. These new members will officially take up their duties at the business meeting on July 22, 2023, held at the ASP annual meeting. ASP constitutional changes to Articles VI and VII were also approved. In total, 38.9% of our membership voted in this election, less than the 42.6% turnout in 2022. Best wishes to the new officers for a productive term of service.

Thanks to everyone who participated in the 2023 election as either candidates or voters. ■

Calderón Recognized by Panamanian Pharmacy Association

By Edward Kennelly, PhD

ASP member Dr. Angela Calderón has been recognized by the Panamanian Pharmacy Association as a recipient of the Female Scientist Pharmacist Research Excellence Award presented in Panama City, Republic of Panama on January 6, 2023.

Calderón is an associate professor in the Harrison College of Pharmacy's Department of Drug Discovery and Development. She has been a member of ASP since she was a graduate student at the University of Illinois at Chicago, College of Pharmacy.

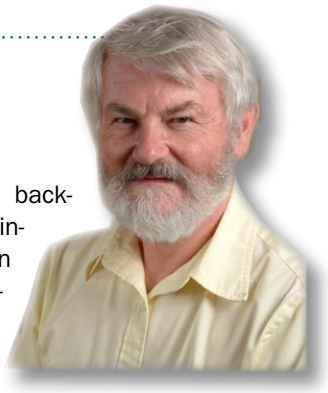
"It was an honor to receive this recognition of my scientific achievements in natural products research and pharmacognosy from a professional association in my home country where I was an active member when I practiced as a pharmacist. Also, I was thrilled to see that the Panamanian Pharmacists Association gave tribute to Women in Science. I take special joy in elevating the performance of female students and recognize how strong mentoring influenced my own career path. This recognition renews my commitment to serve as a role model to students from underrepresented groups in our field."

Calderón was one of five recipients in the inaugural class of this award, presented in Panama City. The ASP sends Calderón congratulations and best wishes! ■

Calderón poses with her award from the Panamanian Pharmacy Association.

Hot Topics in Pharmacognosy

Indirubins, Ancient and Modern Aspects



By David J. Newman, DPhil

Over the last 20 plus centuries, the "indigo color" known in the West as **Tyrian purple** and in the East as part of traditional Chinese medicine (TCM) and other medicinal treatises, 6,6'-dibromoindigo (**1**), is possibly the earliest known pigment, and the color is claimed (but see later) to be the oldest known pigment. Originally isolated from shellfish of the Muricidae and Thaisidae molluscan families, there are reports in the West of evidence of usage going back to the 13th century BCE with a process described by Pliny in the 1st century CE.[1]

From a "modern pharmacological aspect" of the over 500 identified human kinases, two classes have been explored in detail, cyclin-dependent kinases (CDKs) and glycogen synthase kinase 3 (GSK-3). Starting in the early 2000s, Meijer and his colleagues explored the effects of indirubin derivatives on a multiplicity of CDKs and GS3Ks, modeling these compounds within the ATP binding pocket of these kinases. In 2004, this group demonstrated the potential of these compounds to inhibit the ATP binding and identified a number that had IC_{50} values in the submicromolar range, though congeners were effectively inactive.[2] Of the number synthesized and tested, the simple indirubin-3-oxime (**2**) stood out, with IC_{50} values in the 22 to 180 nM range depending upon the kinase. This paper also shows the space fitting of (**2**) in the ATP-binding cleft of GSK-3.

Contemporaneously with the 2004 Meijer paper was one from the Eisenbrand group in Germany giving a much more descriptive background to the use of "indigo" as a treatment in TCM.[3] This was also recognized by the Meijer group in a report in *Nature Cell Biology*[4] covering indirubin as the active principle of a Chinese antileukemia treatment.

Originally isolated from shellfish of the Muricidae and Thaisidae molluscan families, there are reports in the West of evidence of usage going back to the 13th century BCE with a process described by Pliny in the 1st century CE.[1]

In 2009, the Meijer group reported[5] their syntheses to include nitro, halogen, oxime or amino functionalities in the basic 6-indirubin analogues demonstrating that submicromolar activities could be seen in kinase assays, but these activities did not translate into *in vitro* activities against tumor cell lines, though no leukemia lines were reported. The substitution patterns shown in (**3, 4**) demonstrated activities against isolated kinases ranging from 0.10 to 1 micromolar (kinases tested were CDK1, CDK5, GSK3 and CK1).

There was then what might be considered "an hiatus" in reporting work with indirubin-based agents as *in vitro* or *in vivo* leads until a new report from Greek and American researchers in a paper in the *Journal of Natural Products* in 2016.[6] By working with an in-house collection and screening against wild-type and imatinib-resistant T315I mutant CML cells, they identified eight analogues of 6-bromoindirubin and reduced the number to one, where a di-HCl salt of a substituted oxime derivative was active at low nanomolar levels (MLS-2384; **5**). From docking studies, this derivative might well have an unusual binding pattern and is the first derivative of a natural product to inhibit both wild-type and imatinib-resistant T315I mutant Abl kinases, thus extending the activities from the earlier CDK information.

Following on from the 2016 *JNP* report, a Chinese group worked from the TCM data on indirubins as treatments in Danggui Longhui Wan. By taking the base structure of indirubin 3'monoxime (**2**) and the HDAC inhibitor vorinostat (**6**), Cao et al.[7] synthesized a large number of combined agents with compound 8b (**7**) being the one that stood out, with significant activities in

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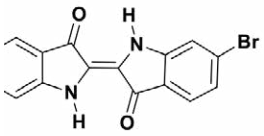
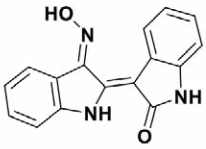
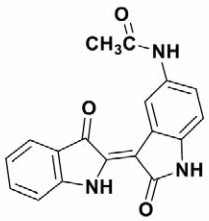
STRUCTURES



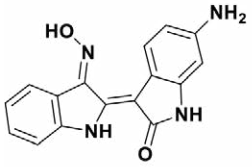
6,6'-dibromoindigo



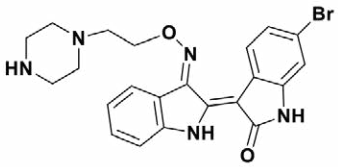
2. Indirubin-3'-oxime



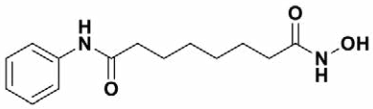
3. 5-substituted indirubin



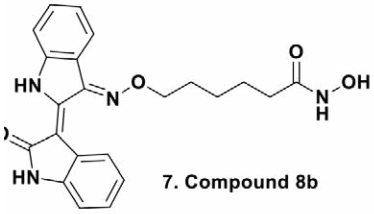
. 6-substituted indirubin



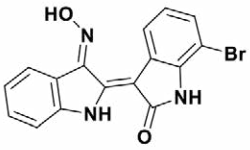
5. MLS-2384 (di-HCl salt)



6. Vorinostat



7. Compound 8b



8. Compound 5aa

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the 27 to 276 nanomolar activities against CDK2 to 6 and 129 nM activity against HDAC6, ten times less active than vorinostat. However, since these are nM levels, the activities are excellent, though in contrast to vorinostat, there was no activity against HDAC1-3 for compound 8b (**7**).

Last year, there was a very interesting paper that opened up a new potential area for indirubin-3'-monoximes as antibiotics. In a paper in *RSC Advances*[8] Yang et al. demonstrated reasonable antibiotic activities for a series of indirubin-3'-monoximes. Though this was effectively all *in vitro* studies, except for some mouse skin irritation experiments, there was interesting data on potential synergy of some of the molecules with levofloxacin against a multiple drug resistant *S. aureus* and s potential result that compound (**8**) may have another mechanism of action by causing an increase in bacterial membrane permeability in *S. aureus*. Though there was some low-level cytotoxicity seen, further ex-

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Last year, there was a very interesting paper that opened up a new potential area for indirubin-3'-monoximes as antibiotics. In a paper in *RSC Advances*[8] Yang et al. demonstrated reasonable antibiotic activities for a series of indirubin-3'-monoximes.

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periments demonstrated a potential as a lead for bacterial infections on skin.

Thus, from two ancient sources, mollusks in the Eastern Mediterranean Sea (and perhaps from related areas) going back to the 13th Century BCE and TCM reports based on plants probably dating back to similar times, the utility of the indirubin molecule has ranged from medicine to imperial robes. In recent years, the realization that microbes can produce indigo as well as act as "mediators" in the fermentation of indigo-precursors in plants is now well defined.[9]

However, the indirubins, both natural and synthetically modified, have now shown potential as kinase inhibitors, but none have entered clinical trials, though many derivatives have been tested and there is anecdotal evidence of utility in TCM for leukemias. The recent report of antibacterial potential may help "resuscitate" this class of bioactive molecules in areas where there is a definitive need. What is of interest is that these agents can be easily synthesized from natural product sources, without the requirement for fermentative infrastructure and/or problematic recovery from natural sources. ■

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Meet a New ASP Member

Dr. Vanya Petrova

Dr. Vanya Petrova *is our featured new member in this issue of the* Newsletter. *Dr. Petrova originally joined the ASP while receiving her PhD with Professor Edward Kennelly at Lehman College, part of the City University of New York (CUNY) system. She then transitioned to an industry position at Janssen Pharmaceuticals. Petrova is now a full-time lecturer in biology at LaGuardia Community College where she is able to embrace her passion for teaching and mentoring the next generation. Her scientific interests merge mass spectrometry-based metabolomics studies with bioassays in medicinal plant natural products research. We are pleased to officially welcome Dr. Petrova back to ASP!*

By Wendy Strangman, PhD

What is your scientific background?

I got my start in pharmaceutical research shortly after finishing my BS from Georgetown College, KY in the laboratory of Dr. Gregory Graf at the Drug Discovery Division of the University of Kentucky. There I had the pleasure of learning different molecular biology techniques related to lipid metabolism and to meet wonderful scientists and friends.

My interest in ethnobotany and drug discovery channeled my desire to research plants' medicinal qualities. In the laboratory of my PhD advisor, Dr. Edward Kennelly, I was able to explore methods of separating, analyzing, and identifying bioactive compounds from Vaccinium berries, including blueberries and cranberries. I combined metabolomics and chemical profiling with bioactivity screening by testing fractions and compounds for their anti-inflammatory potential in a lung injury model under the supervision of our collaborator, Dr. Jeanine D'Armiento, at Columbia University.

Dr. Vanya Petrova on a whale watching cruise in Boston.

PHOTO: MIROSLAV VELCHEV

Next, I switched gears as an opportunity to work at Janssen Pharmaceuticals came along. The experience gave me insights into various career options and an opportunity to witness effective collaboration and project management techniques. I also realized the importance of big data analysis across disciplines.

These various involvements have led me to my current role as a biology lecturer at LaGuardia, which allows me to stay connected to research while having a more direct impact on

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I combined metabolomics and chemical profiling with bioactivity screening by testing fractions and compounds for their anti-inflammatory potential in a lung injury model under the supervision of our collaborator, Dr. Jeanine D'Armiento, at Columbia University.

Meet a New ASP Member: Dr. Vanya Petrova

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In addition to teaching, I am designing class projects that use health-related datasets to equip students with transferable skills such as teamwork, data analysis, and communication.

my students' lives and aspirations. In addition to teaching, I am designing class projects that use health-related datasets to equip students with transferable skills such as teamwork, data analysis, and communication. Finally, I try to instill in students a growth mindset as many come from disadvantaged backgrounds and often give up after their first failure. I show them how I learn from constructive feedback and always strive for making my lectures more understandable and relatable. Although difficult at times, learning from our mistakes is a valuable opportunity to improve, persevere, and achieve our goals.

How did you hear about the ASP?
I was a member of ASP as a graduate student in the laboratory of Dr. Kennelly, who is also the *ASP Newsletter*'s editor in chief. So, I was also actively involved in the organization of the largest gathering of natural products researchers ever held in the United States, ICNPR 2012, hosted by ASP.

Why did you decide to rejoin ASP?
I learned about the ASP webinar series, and I wanted to reconnect with the community.

What would you like to achieve through your membership?
In the past, ASP has provided me with fantastic opportunities to keep abreast of innovative research in natural products as well as meet amazing scientists along the way.

What other scientific societies do you belong to?
I am also a member of the Phytochemical Society of Europe.

What do you like doing in your spare time – movies, activities, etc.?
My hobbies involve making surroundings beautiful, whether it be outdoors (gardening) or indoors (interior design). I also like to take trips with my family, preferably to places that have large bodies of water.

Is there anything else you would like other ASP members to know about yourself?
I am very excited that the field of pharmacognosy has blossomed in recent years in my very own, native town in Bulgaria under the leadership of Dr. Milen Georgiev, who I met in ICNPR 2012 in New York City. It is a small world!

I am very excited that the field of pharmacognosy has blossomed in recent years in my very own, native town in Bulgaria under the leadership of Dr. Milen Georgiev, who I met in ICNPR 2012 in New York City. It is a small world!

New Members of ASP Summer 2023

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 55 full members and 81 associate members. We look forward to meeting you and learning more about you and your work.

FULL MEMBERS

Mr. Youssef Alomari
Saudi Arabia

Miss Mitzchilouise Baylosis
Canada

Mr. Benjamin Blackburn
United States

Ms. Sarah Bonitatibus
United States

Mr. Williamjosh Brown
United States

Dr. Amitabh Chandra
United States

Ms. Swarnali Chatterjee
United States

Mr. Yong Beom Cho
Republic of Korea

Dr. Ryan Cohen
United States

Mr. William Crandall
United States

Dr. Amila Dissanayake
United States

Dr. Serge Fobofou
United States

Miss Harman Gill
Canada

Dr. Nora Gray
United States

Dr. In Jin Ha
Republic of Korea

Mr. Jae Sang Han
Republic of Korea

Mr. Daniel Hughes
United States

Dr. Jungmoo Huh
United States

Prof. Dae Sik Jang
Republic of Korea

Dr. Komal Kalani
United States

Mr. Isaiah Korostil
United States

Mr. Draco Kriger
United States

Prof. Jong Hwan Kwak
Republic of Korea

Miss Haeun Kwon
Republic of Korea

Prof. Hyo-Jung Kwon
Republic of Korea

Prof. Dongho Lee
Republic of Korea

Prof. Jinwoo Lee
Republic of Korea

Dr. Meeyoung Lee
Republic of Korea

Dr. Cuiying Ma
United States

Dr. Claudia Maier
United States

Dr. Neha Malhotra
United States

Prof. Anna Mapp
United States

Dr. Maria Monagas
United States

Dr. Olumayokun Olajide
United Kingdom

Dr. Maria Orfanoudaki
United States

Dr. Sung Chul Park
United States

Mr. Michael Pasquale
United States

Ms. Jessica Pepe
United States

Prof. Jakub Piwowarski
Poland

Dr. Leena Pradhan-Nabzdyk
United States

Miss Fatimah Qassadi
United Kingdom

Ms. Libby Sahadeo
United States

Prof. Sang Hee Shim
Republic of Korea

Dr. Jonathan Singh
New Zealand

Ms. Emma Smith
United States

Dr. Daniel Sweeney
United States

Mr. Samuel Tanoeyadi
United States

Dr. Oleg Tsodikov
United States

Dr. Yurry Um
Republic of Korea

Dr. Heather Walker
United States

Dr. Xiao Wang
United States

Dr. Yunyi Wang
United States

Dr. Chin Piow Wong
Japan

Prof. Chia-Hung Yen
Taiwan

Dr. Yeong-Bae Yun
Republic of Korea

ASSOCIATE MEMBERS

Mr. Abdulrahman Abdullateef
Nigeria

Prof. Aderonke Adepoju-Bello
Nigeria

Dr. Mai Ahmed
Egypt

Dr. Nneka Akwu
South Africa

Mr. Tahir Ali
United States

Dr. Omowunmi Amao
Nigeria

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New Members of ASP Summer 2023

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Miss Evelyn Andrade
United States

Ms. Elise Ballash
United States

Mr. Abubakar Salisu Barau
United States

Mr. Charles Blackburn
United States

Dr. Peter Blanco Carache
United States

Mr. Trevor Bush
United States

Mrs. Rose Campbell
United States

Ms. Aysegul Caskurlu
United States

Miss Ines Castro
United States

Mr. Edwin Chavez Santana
United States

Ms. Yukyung Choi
Republic of Korea

Mr. John Conger
United States

Miss Gabriela DePaula
Brazil

Mr. Christian Espinoza-Barrios
United States

Mr. Kurt Farnsworth
United States

Mrs. Su Farris
United States

Dr. Brandon Gines
United States

Ms. Sajan Green
United States

Dr. Perihan Gurbuz
Turkey

Mr. Jorge Hernandez Garcia
United States

Ms. Oli Horyn
United States

Mr. Thanh-Hau Huynh
Republic of Korea

Mr. Eric Jackson
United States

Miss Hyeon-Jeong Jeong
Republic of Korea

Mr. Sangwook Kang
Republic of Korea

Ms. Gertrude Kanyairita
United States

Dr. Faham Khamesipour
Iran

Dr. HyeJin Kim
Republic of Korea

Miss Hyun Jeong Kim
Republic of Korea

Ms. Jaekyeong Kim
Republic of Korea

Dr. Niranjan Koirala
Nepal

Mr. Fadil Kaan Kuran
Turkey

Prof. Jong-Soo Lee
Republic of Korea

Ms. Kyungha Lee
Republic of Korea

Prof. Sullim Lee
Republic of Korea

Dr. Hao Li
United States

Dr. Yanru Li
United States

Mr. Vijay Macha
India

Mr. Michael Madden
United States

Ms. Arvie Grace Masibag
United States

Mr. Matthew Menkart
United States

Ms. Stephanie Mota
United States

Dr. Ruth Muchiri
United States

Miss Sara Neiheisel
United States

Dr. Florence Nkemehule
Nigeria

Dr. Roberta O'Connor
United States

Dr. Temitayo Ohemu
Nigeria

Miss Ifeoluwa Ojetade
Nigeria

Miss Adedotun Oluwatuyi
Nigeria

Mr. Melvin Osei Opoku
United States

Mr. Lincoln Palsgrove
United States

Ms. Lily Peng
United States

Dr. Wilmer Perera
United States

Ms. Hoan Tam Pham
United States

Ms. Keyara Piri
United States

Ms. Ana Ponce
United States

Prof. Rita de Cássia Ribeiro Gonçalves
Brazil

Miss Rocío Rivera Rodríguez
United States

Mr. Zijian Rong
United States

Miss Raima Sen
United States

Dr. Armel Jackson Seukep
Cameroon

Mr. Arvind Sharma
India

Dr. Holly Siddique
United Kingdom

Dr. Bianka Siewert
Austria

Ms. Betelhem Sirak
Ethiopia

Prof. Alexander Skhirtladze
Georgia

Ms. So-Ri Son
Republic of Korea

Prof. Lloyd Sumner
United States

Mr. Getnet Tadege
Ethiopia

Ms. Destini Thornton
United States

Dr. Dieu-Hien Truong
Vietnam

Miss Immaculata Unegbu
Turkey

Mrs. Miaomiao Wang
China

Dr. Wen-Chi Wei
Taiwan

Dr. Sunmin Woo
United States

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. 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**.

2023 ASP Annual Meeting

July 22-26, 2023

Rockville, Maryland

aspmeetings.pharmacognosy.us

ASP Natural Product Sciences Webinar

Bimonthly Zoom Seminars

Thursdays 4 PM ET / 1 PM PT

www.pharmacognosy.us/natural-product-sciences-webinar/

C&EN Webinars

Various Days and Times

cen.acs.org/collections/webinars.html

71st International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research (GA)

July 2-5, 2023

Dublin, Ireland

www.gadublin2023.com

American Society of Pharmacognosy

Gordon Research Conference: Natural Products and Bioactive Compounds

July 30-August 4, 2023

Andover, New Hampshire

www.grc.org/natural-products-and-bioactive-compounds-conference/2023/

31st International Symposium on the Chemistry of Natural Products / 11th International Congress on Biodiversity

October 15-19, 2023

Naples, Italy

www.iscnp31-icob11.org

Gordon Research Conference: Marine Natural Products

March 10-15, 2024

Ventura, California

www.grc.org/marine-natural-products-conference/2024/

International Congress on Natural Products Research (ICNPR 2024)

July 14-17, 2024

Kraków, Poland

www.icnpr2024.org

Capital Communiqués

Natural Product-related News from NIH and Beyond

By Barbara C. Sorkin, PhD

GLOBAL NEWS: OPEN ACCESS IN EUROPE (FROM AAAS)

- The European Union has provisionally accepted a draft position on article processing charges (APCs) that would completely remove author fees from open-access publishing.
- The Spanish Parliament recently approved a four-year plan to make all federally funded research open and accessible. With a budget of €23.8 million a year, the plan aims to make paywall-free scientific publishing the default and make federally funded data accessible to all.

NEWS FROM THE US

- **Updates from the National Institute of Standards and Technology (NIST)**

The NIST **Dietary Supplements Laboratory Quality Assurance Program** (DSQAP) is a collaboration between NIST and the NIH Office of Dietary Supplements (ODS).

At the Oxford International Conference on the Science of Botanicals in April the NIST DSQAP team:

- Presented several posters, including an overview of their Cannabis Laboratory Quality Assurance Program, and
- Provided in-depth information on how to interpret DSQAP results, read technical recommendations, and improve measurement capabilities as well as presenting the results of their DSQAP Exercise 1 in which the participating labs analyzed:
  - withanolides in *Withania somnifera* (ashwagandha);
  - vitamins B_1, B_2, B_3, B_5, B_6, B_7, B_9 and B_{12} in liquid and powdered drink mixes;
  - ash, carbohydrates, fat, protein, solids, starch, total dietary fiber, calories, niacin, vitamin K1, Cr, Mg, I, Na, K, As, Cd, Cu, Zn, Se, I, S, Hg, phenolics and per- and polyfluoroalkyl substances in kelp;
  - phenolics in green tea.

Cannabis

When the results are published, a link to the digital object identifier (doi) assigned to the report will be added to the NIST DSQAP website.

DSQAP Exercise 2 will begin material shipments soon. Studies include toxic elements in eleuthero and ginger extracts, β-carotene in saw palmetto and multivitamin tablets, fatty acids in fish oils, and marker compounds in black cohosh and ginger-containing materials.

- You can read more about DSQAP here.
- To receive email announcements for upcoming Exercises, create an account on the QAP HUB site.

NIST, in collaboration with NIH ODS, continues to produce **reference materials** to support the natural products and dietary supplements communities. Up next: development of kava (*Piper methysticum*) reference materials.

To search for other NIST SRMs click here.

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UPDATES FROM NIH

- Submissions to the NIH Institutional Excellence in DEIA Prize competition are being accepted from now to September (2023). NIH will award up to ten prizes of $100,000 each to higher education institutions that demonstrate a commitment to creating cultures of inclusive excellence and enhancing Diversity, Equity, Inclusion and Accessibility (DEIA) in the biomedical and behavioral research enterprise. See here for more information on eligibility, judging process and criteria, and how to submit an entry.
- Have you ever submitted and/or reviewed an NIH Ruth L. Kirschstein National Research Service Award (NRSA) application? The NIH has proposed changes to the NRSA application and review process with the goals to 1) allow peer reviewers to better evaluate the applicant's potential and the quality of the scientific training plan without undue influence of the sponsor's or institution's reputation, and 2) ensure that the information provided in the application is aligned with the restructured criteria and targeted to the fellowship candidate's specific training needs. The NIH sought input until June 23 on the proposed changes via a Request for Information. See NOT-OD-23-110 to provide input.

Ruth L. Kirschstein, MD
PHOTO: NIH

- The special exception that allowed applicants to submit a one-page update of preliminary data as post-submission material with NIH (and some other Agency) grant applications expired when the COVID Public Health Emergency officially ended on May 11, but you may still be able to submit post-submission preliminary data. Going forward, NIH is revising the standard post-submission material policy to allow a one-page update with preliminary data to be submitted as post-submission material for Type 1 (new competing) R01, R21, or R03 applications, including resubmissions, as long as the funding opportunity used for submission allows preliminary data in the application. See NOT-OD–23-106 for details.

NEW NIH-SUPPORTED RESOURCES

- Questions about how to submit an NIH grant application? Check out this infographic developed by the NIH Center for Scientific Review (CSR).
- What to do if your NIH application was "not discussed"? This is such a common question that the NIH Office of Extramural Research (OER) has a podcast on it. You will find lots of other useful information on the NIH OER website.
- Wondering where in your grant application budget to put costs related to compliance with the new NIH Data Management and Sharing policy? OER provides the answer here.
- Many interventions of interest to a range of NIH Institutes, Centers and Offices (ICOs), including botanicals and other dietary supplements, are reported to enhance resilience. Findings from an expert panel convened by members of the NIH Office of Dietary Supplements Resilience & Health Studies Program and of the Department of Defense Consortium for Health and Military Performance on future research on dietary supplements for resilience and immune function have been published and are also discussed in a podcast, "Under the Magnifying Glass: Immune Supplements." Resilience is among the priority areas of a number of NIH ICOs that are represented in the Trans-NIH Resilience Working Group. This group defines resilience as encompassing the capacity to resist, adapt to, recover, or grow from a challenge.

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- New botanical and natural product resources supported by the NIH Office of Dietary Supplements:
- The newly released ODS Reference Materials Search Tool provides a platform to identify certified reference materials relevant to chemical analysis of dietary supplements, foods, and other natural products. Users can search for individual characteristics (e.g., specific botanicals, phytochemicals, or nutrients) as well as compare chemical constituents and composition across multiple related reference materials.
- New calibration solution certified reference materials available from MilliporeSigma with support from NIH ODS:
  - Echinacea phenolic mix: 1,3-dicaffeoylquinic acid; caftaric acid; chicoric acid; chlorogenic acid; echinacoside
  - Echinacea isobutyl amide mix: dodeca-2E,4E,8Z,10E/Z-tetraenoic acid isobutylamide; dodeca-2E,4E-dienoic acid isobutylamide
  - β-Sitosterol
  - Ashwagandha dietary ingredients mix: withaferin A; withanolide A; withanolide B; withanoside IV; withanoside V
  - Withanone
  - 12-Deoxywithastramonolide
- New natural matrix reference materials available from NIST with support from NIH ODS:
  - Ground kudzu (*Pueraria montana* var. lobata) rhizome
  - Kudzu (Pueraria montana var. lobata) extract
  - Kudzu-containing solid oral dosage form

FUNDING OPPORTUNITIES

- The National Institute of General Medical Sciences (NIGMS) has announced the publication of the Maximizing Investigators' Research Award (MIRA) for Early Stage Investigators (ESI) Notice of Funding Opportunity (NOFO), PAR-23-145. This NOFO welcomes applications from eligible Principal Investigators who are NIH-defined ESI investigators at the time of submission and whose proposed research is within the NIGMS mission. Please review the new NOFO, our MIRA webpage, and the Feedback Loop Blog for details and updates.

  ESI MIRA-related questions can be directed to Dr. Sailaja Koduri, program director in the NIGMS Division of Pharmacology, Physiology, and Biological Chemistry and program contact for the Maximizing Investigators' Research Award (MIRA) for Early Stage Investigators.

Dr. Sailaja Koduri
PHOTO: NIH

ODDS AND ENDS

- Group speak: If you say a mass of gravitational physicists, a superposition of quantum physicists, a cluster of computational scientists, and a distribution of statisticians, what do you call a group of pharmacognosists? Of natural products chemists?

  Favorite responses sent to the author will appear later.

- History of pharmacognosy: Translated from the 10th century Anglo-Saxon, the herbal recipe is "Make an eyesalve against a wen: take equal amounts of cropeleac and garlic, pound well together, take equal amounts of wine and oxgall, mix with the alliums, put this in a brass vessel, let stand for nine nights in the brass vessel, wring through a cloth and clarify well, put in a horn and at night apply to the eye with a feather." Harrison, et al. reported in *mBio* in 2015 that the preparation demonstrated antibiotic activity against *S. aureus* biofilms. doi:10.1128/mBio.01129-15.

From the Archives:
ASP Conference Swag

By Christine Jankowski, MA

Conferences provide one with the ability to travel and meet with peers, learn new ideas from various presentations and symposiums, and potentially visit a new place. All aspects are both rewarding and enlightening. In addition to planning materials, meeting minutes and reports for annual meetings, the ASP Collection also holds objects related to those conferences from over the past thirty years. Here are some conference souvenirs, or "swag," from annual meetings that can be found in the ASP's collection housed at the Lloyd Library and Museum.

TOTE BAGS, 1997 AND 1998

Who does not have a tote bag commemorating a conference? The Lloyd has two in the ASP's collection: one from the 1997 annual meeting in Iowa City, Iowa and the other from the 1998 annual meeting in Orlando, Florida. Both are made of canvas and feature the ASP logo with the names and dates of the conferences in shades of green. The 1998 canvas features a fun border with images synonymous with Florida including a palm tree, alligator, manatee, sun and flamingo! Undoubtedly, totes like these were used to carry meeting materials and any other purchases made during the respective meetings.

GOLD COINS, 2009

To commemorate the 50th anniversary of the ASP, these gold medallions were produced. One side has "50th Anniversary" embossed in between laurels and the other side features the ASP logo of a monogrammed mortar and pestle, encircled with the society name and years. They are about the size and weight of a US silver dollar. Dr. Bob Krueger of the ASP Foundation ordered 2,000 coins, which were given away to the attendees at the 2009 annual meeting in Honolulu, Hawaii.

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From the Archives: ASP Conference Swag

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NOTEPADS, 1992

The 33rd annual conference was held in Williamsburg, Virginia in 1992 and highlighted the themes "Drugs of Abuse" and "Applications of Biotechnology in Natural Products Research." These notepads were created for any notes warranted from symposiums. Not only do the papers feature the conference name, date, and location, but they also feature an image representing the historic Governor's Palace located in Colonial Williamsburg.

DECK OF CARDS, 2006

Technically, we do not have this physically in our collection, but we do have images to help illustrate! For the 47th annual meeting in Washington, DC, commemorative playing cards were produced. Each individual card featured a picture of a past ASP president or prominent member, such as Harry H. S. Fong on the four of diamonds and Alice M. Clark on the seven of spades. They were given away to attendees, but extras were sold for $5.00 a deck. Dr. Gil Belofsky is pictured left reviewing the cards at the conference.

Do you have any conference memories to share or add to the ASP Collection? Contact Lloyd Library and Museum Archivist Christine Jankowski at ***cjankowski@lloydlibrary.org*** with your story.

Some attendees of the annual meeting at the University of Iowa, 1997.

Jimmy Orjala, PhD, Treasurer
The American Society of Pharmacognosy
2720 Dundee Road, #260,
Northbrook, Illinois 60062

Full Membership

Full membership is open to any scientist interested in the study of natural products.
Current membership dues and *Journal of Natural Products* subscription rates can be found at **www.pharmacognosy.us**.

Associate Membership

Associate membership is open to students of pharmacognosy and allied fields only. These members are not accorded voting privileges.
Current membership dues and *Journal of Natural Products* subscription rates can be found at **www.pharmacognosy.us**.

Emeritus Membership

Emeritus membership is open to retired members of the Society who maintained membership in the Society for at least five years.
Current membership dues and *Journal of Natural Products* subscription rates can be found at **www.pharmacognosy.us**.

Honorary Membership

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

Present Honorary Members are:

Dr. John H. Cardellina · Dr. Alice M. Clark, University of Mississippi · Dr. Geoffrey A. Cordell, University of Illinois at Chicago
Dr. Gordon C. Cragg, National Institutes of Health · Dr. Harry H.S. Fong, University of Illinois at Chicago
Dr. Edward J. Kennelly, Lehman College, CUNY · Dr. Ikhlas Khan, University of Mississippi
Dr. A. Douglas Kinghorn, Ohio State University · Dr. David J. Newman
Dr. Roy Okuda, San Jose State University · Dr. James E. Robbers, Purdue University
Dr. E. John Staba, University of Minnesota · Dr. Barbara Timmermann, University of Kansas

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