American Society of Pharmacognosy

Spring 2021

Discovering Nature's Molecular Potential

ASP Newsletter: Spring 2021, Volume 57, Issue 1

ASP 2021 Annual Meeting Canceled Due to Pandemic

By Edward Kennelly, PhD

For the second year in a row, the ASP annual meeting has been canceled due to the COVID-19 pandemic. The decision was announced in a letter to members by ASP President Nicholas Oberlies on February 8.

The 2021 meeting was scheduled to take place in Grand Rapids, Michigan on July 24-28, and the organizing committee had already planned a diverse group of invited speakers and cutting-edge research topics. Grand Rapids is now slated to be the venue of the 2025 annual meeting.

In his communication to members, President Oberlies expressed what a heart-wrenching decision this was, "Crafting this email makes me extremely upset, as I was so looking forward to seeing all of you in July. It is my great hope that you and your family members are doing well during this time of uncertainty."

Planning for ASP annual meetings involves many people and years of coordination. The main organizer for the canceled 2021 meeting was ASP member Dr. Arun Rajgopal. He worked closely with Scientific and Local Organizing Committees. All the members of these committees are thanked for their efforts, and as President Oberlies noted, "It's no fun to work this hard, only to pull the plug with just a few months to go."

Since the cancellation of the 2020 meeting slated for San Francisco, ASP has hosted a highly successful series of webinars. They are free for ASP members and students and can be accessed at www.pharmacognosy.us/natural-product-sciences-webinar/.

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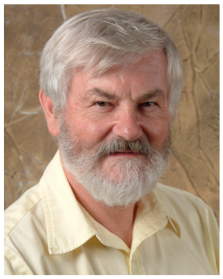

Hot Topics IN PHARMACOGNOSY

Chemistry and CoV-2 Treatments

By David J. Newman, DPhil

INTRODUCTION

Over the last eight or so months there have been a series of papers, some short, some long, covering what can be considered as four major topics: natural products, repurposing of approved drugs, use of old vaccines as potential methods of alleviating the effects of CoV-2, and an idea of what needs to be done in the future.

NATURAL PRODUCTS

On the basic natural product "front," a very recent review by the Gerwick lab[1] is an excellent discussion as to the potential of a large variety of natural products from all NP sources to be drug leads against a variety of RNA virus "types." This is a paper that should be read as it covers a multitude of potential "entry points" into these viruses and points to a number of natural-product "classes" and their de-

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***ASP Newsletter*: Spring 2021, Volume 57, Issue 1**

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Dr. Roberto G.S. Berlinck

Safer STEM

Dr. Mahabir P. Gupta

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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.
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Newsletter Staff

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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

We are now more than a year into the COVID-19 pandemic, and while new cases and variants continue to cause alarm, there is renewed hope with vaccinations and deeper knowledge of how the virus is spread. Here in New York we survived the first wave, but the city is still far from recovered and strangely quiet in some neighborhoods. The ASP continues to respond to this pandemic, and for a second year in a row, the annual meeting of the society has been canceled. ASP President Nick Oberlies, in a letter to members distributed in February, describes the difficult process that ultimately led to this decision. The ASP Executive Committee did consider holding an interim meeting in Fall 2021, as his letter mentions, but now has decided not to do that either. Although I think we all hope the worst will be over by this summer, there are still many unknowns in front of us. I do hope to see many of you at the 2022 annual meeting.

For the first time in over a decade of writing his "Hot Topics" column, Dave Newman is featured on the cover of the *ASP Newsletter.* His column always covers some of the latest breakthroughs in natural product research, and this time the focus is on COVID-19. I appreciate Dave's longstanding commitment to the *ASP Newsletter.* Natural products continue to provide useful therapeutics.

The *ASP Newsletter* Committee, headed by Michael Mullowney, have been actively looking into ways to publish selected *Newsletter* articles in a timely manner. We have developed a new work pipeline that we hope will allow some of the high-interest articles, like "Hot Topics," to be released prior to the publication of the entire *Newsletter*. I want to thank Michael, as well as ASP President Oberlies, for coming up with ways to get the *Newsletter* articles more widely distributed.

The *Journal of Natural Products*, under the new Editor-in-Chief Phil Proteau, has been implementing changes, big and small. After a long and successful tenure as associate editor, Daneel Ferreira is stepping down. I hope you will take a moment to look back at his important contributions to the journal over the years. The journal welcomes its first non-US-based associate editor, Roberto Berlinck, from Brazil. His research is in the field of marine natural products. Finally, a change in the outward appearance of the journal occurred in October 2020 with a newly designed cover. The previous cover was easily recognized by most ASP members with its green lettering and buff-colored border. We look at the first new cover, completely different than the old, and discuss with the corresponding authors their inspiration.

A *PLOS Biology* paper from 2020 attempts to rank the most productive life scientists. Although such rankings are fraught with subjectivity, the authors made a concerted effort to use multiple measures. With the help of ASP Business Manager Laura Stoll, we were pleased to find almost 50 ASP members on this list. In my resulting article, I highlight four ASP members that caught my attention for different reasons. I hope ASP members can draw some inspiration from these productive role models. ASP members continue to be honored in other ways, like Susan Mooberry and Ted Molinski, who each became AAAS Fellows recently. Finally, we were sad to see emeritus ASP member Mahabir Gupta passed away in late 2020. One of his former students, ASP member Angela Calderón, wrote a comprehensive remembrance of his career, much of it he spent in Panama.

Happy spring, and I hope the pandemic will subside this year and allow us to meet in person in 2022. In the meantime, consider taking advantage of the great ASP webinar series that is free for members and students. ■

ASP 2021 Annual Meeting Canceled Due to Pandemic

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American Society of Pharmacognosy

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www.pharmacognosy.us

Colleagues,

It's with a very heavy heart that I inform you that we are canceling the 2021 Annual Meeting of the American Society of Pharmacognosy. As you can imagine, this is due to the ongoing problems with COVID in the United States. Crafting this email makes me extremely upset, as I was so looking forward to seeing all of you in July. It is my great hope that you and your family members are doing well during this time of uncertainty.

However, you can expect further information on two other opportunities for us to 'convene' in 2021. First, we are in the midst of planning a series of virtual mini-symposia for the summer.

In addition, we are striving to plan an in person interim meeting, likely in the late fall of 2021. Both of these are in the early stages of development, so expect more information in the coming weeks.

Finally, I want to conclude by thanking Arun Rajgopal and his team that were organizing the 2021 meeting. It's no fun to work this hard, only to pull the plug with just a few months to go. They have graciously agreed to host the meeting in Grand Rapids in 2025, so we'll all get a chance to see this beautiful part of Michigan in the coming years. Thanks also go to our business manager, Laura Stoll, who has worked diligently to orchestrate this cancelation.

Sincerely,

Nick

Nicholas H. Oberlies
President, American Society of Pharmacognosy

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rivatives that could be potential leads, depending upon which viral pathogen(s) you wish to target.

Moving to looking at specific "targets" for natural products and their derivatives, scientists from Ulm and Essen Universities published a very interesting paper on peptide-based inhibitors of SARS-CoV-2 entry processes and also link back to SARS-CoV-1. These can include targets such as ACE-2, or proteases that activate proteases such as furin, transmembrane serine protease 2 (TMPRSS2) and cathepsin L.[2] Interestingly, griffithsin was not listed in this paper, nor in the Christy[1] paper, even though it was originally shown to inhibit coronaviruses. It should also be noted that back in 2007, a group from Brazil and Canada[3] identified a marine-sourced coronavirus protease inhibitor as esculetin-4 carboxylic acid methyl ester (**1**); the base carboxylic acid had not been identified as a natural product prior to this report.

Another very recent paper[4] from the same Mexican group referred to below gave more information on potential natural product structures that may uncover potential inhibitors of the SARS-CoV-2 main protease. They give some of the basic structures that are in their better hits, including molecules such as the angiotensin derivatives that would be expected from the binding characteristics of CoV-2. A lot more information is in their supplementary information which can be obtained easily.

One problem with natural products is trying to find databases of such compounds. Luckily in November of 2020, a Mexican group published a paper on fragment libraries and compound databases in the journal *Biomolecules*.[5] Although it uses the IDs from the databases accessed, since they are all open, the name/structure can be located relatively easily. In addition, a "close companion" to the later paper is the review presentation by Sorokina and Steinbeck in *Journal of Chemical Informatics* published six months earlier.[6] By using both of these, a substantial number of natural product-based molecules can be accessed.

REPURPOSING OF EXISTING DRUGS/ DRUG CANDIDATES

The concept of repurposing drugs or drug candidates is a well-known technique used in the hope of accelerating the drug approval process in the event that an existing entity will function in another disease. The rationale is that the toxicity and metabolism of the drug is known; all that must be shown is efficacy in the other disease in a relatively simple clinical trial.

There are two recent papers[7, 8] published in *Nature* as accelerated articles that have demonstrated how, by using very modern informatic techniques, drug candidates can be identified that may be of utility as leads to potential drugs against SARS-CoV-2.

In the first case,[7] a group led by Krogan cloned, tagged and expressed 26 of the 29 SARS-CoV-2 "targets" in human cells and then identified 332 human protein-protein interactions. From these, 66 "druggable" human proteins, 69 of the approximately 13,000 candidate compounds culled from two main sources were further investigated yielding "inhibitors of mRNA translation and regulators of sigma 1 & 2 receptors." Currently this paper has been cited over 550 times, is freely available and supplementary Tables 4 and 5 are the essential ones as they show the literature-derived (37 compounds, Table 4) and expert-identified (32 compounds, Table 5). Both are downloadable as Excel files with structures. A very significant proportion are either NPs or fall into the ND categories of Newman and Cragg.

In the second article,[8] which was received by *Nature* two days before the acceptance of the paper above, just under 12,000 compounds from the ReFRAME collection were assessed for their inhibition of virus replication in Vero E6 cells, leading to the identification of 100 molecules that had potential for inhibiting the virus. These were then further assessed in a number of secondary systems, leading to the identification of 13 that may well be of utility, as most already had moved into clinical studies. Currently this paper has been cited nearly 70 times. Their supplementary Table 3 gives the data for 100 compounds that are 40% active or higher in Vero E6 cells.

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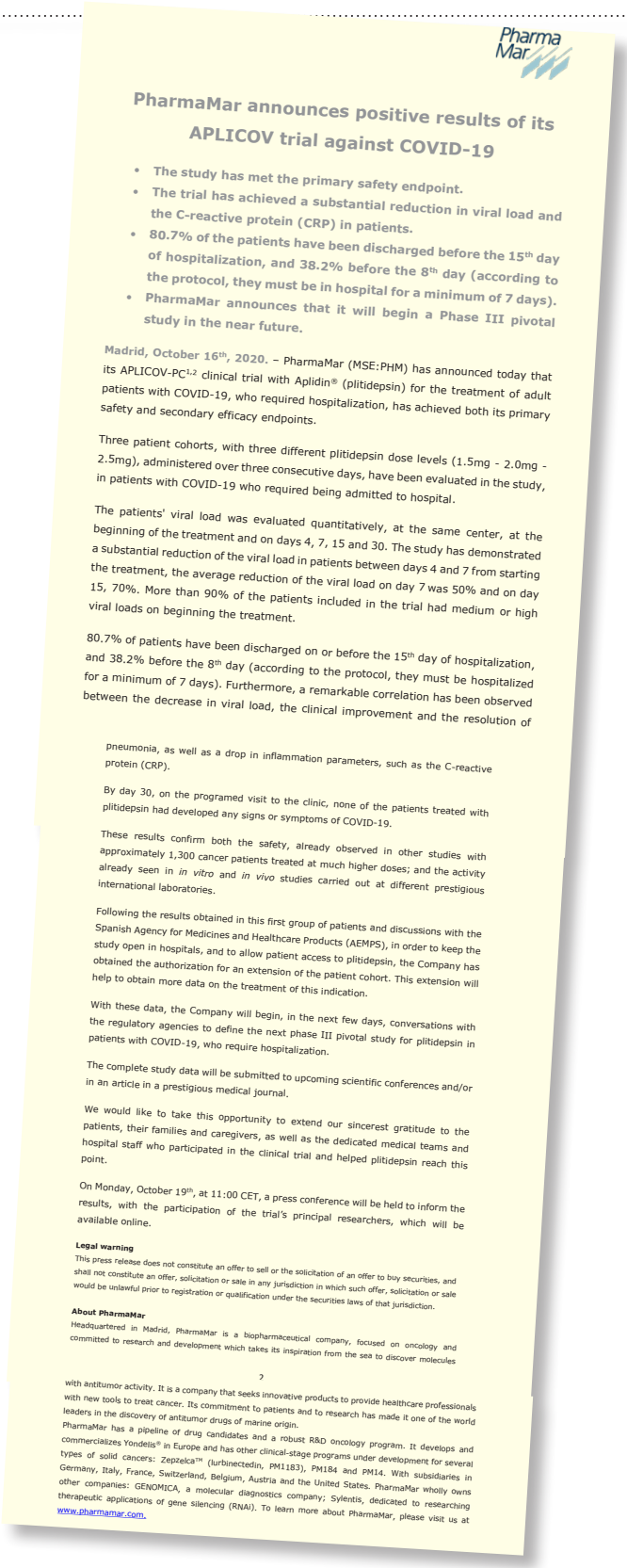
Although only names/code numbers and SMILES strings are given, a number are NDs. In their Table 4 they give information on their top 21 antiviral compounds. Again, there are a number of NDs and, as with the earlier paper, the complete paper can be freely downloaded.

An interesting paper on the same topic, but this time looking at only the repurposing of anticancer drugs, was published by a multinational group (Morocco, Italy, Canada, Portugal) with El Bairi as the lead author.[9] If one looks at their Table 1 which shows the current clinical trials for the agents identified again NPs and NDs are "present and correct!" Buried in this paper are significant comments on one well-known marine natural product under its trade name Plitidepsin (aka Aplidine) (**2**) and a small molecule, the modified rocaglate Zotatifin (**3**). What is very significant is that both of these compounds have an MoA attacking e1F4A.

The very interesting aspect of aplidine is that PharmaMar commenced clinical trials looking at toxicity with the aim of perhaps leading to another (repurposed!) use for this compound which has only been approved for multiple myeloma in Australia (late 2018). Normally I would not use the attached announcement from PharmaMar as a reference, but due to the potential of the current findings in ongoing clinical trials it should be recognized.[10] A full paper describing the efficacy of aplidine preclinically was published very recently by the Krogan group in *Science* and is yet another example of the amount of interest in discovering molecules from other diseases that can be reprogrammed.[11]

Another interesting aspect is that aplidine is also known as dehydrodidemnin B and the didemnins were first discovered by the Rinehart group using "AN ANTIVIRAL ASSAY." That these compounds had an effect on the e1F



PharmaMar announces positive results of its APLICOV trial against COVID-19

- The study has met the primary safety endpoint.
- The trial has achieved a substantial reduction in viral load and the C-reactive protein (CRP) in patients.
- 80.7% of the patients have been discharged before the 15th day of hospitalization, and 38.2% before the 8th day (according to the protocol, they must be in hospital for a minimum of 7 days).
- PharmaMar announces that it will begin a Phase III pivotal study in the near future.

Madrid, October 16th, 2020. – PharmaMar (MSE:PHM) has announced today that its APLICOV-PC[1,2] clinical trial with Aplidin® (plitidepsin) for the treatment of adult patients with COVID-19, who required hospitalization, has achieved both its primary safety and secondary efficacy endpoints.

Three patient cohorts, with three different plitidepsin dose levels (1.5mg - 2.0mg - 2.5mg), administered over three consecutive days, have been evaluated in the study, in patients with COVID-19 who required being admitted to hospital.

The patients' viral load was evaluated quantitatively, at the same center, at the beginning of the treatment and on days 4, 7, 15 and 30. The study has demonstrated a substantial reduction of the viral load in patients between days 4 and 7 from starting the treatment, the average reduction of the viral load on day 7 was 50% and on day 15, 70%. More than 90% of the patients included in the trial had medium or high viral loads on beginning the treatment.

80.7% of patients have been discharged on or before the 15th day of hospitalization, and 38.2% before the 8th day (according to the protocol, they must be hospitalized for a minimum of 7 days). Furthermore, a remarkable correlation has been observed between the decrease in viral load, the clinical improvement and the resolution of

pneumonia, as well as a drop in inflammation parameters, such as the C-reactive protein (CRP).

By day 30, on the programed visit to the clinic, none of the patients treated with plitidepsin had developed any signs or symptoms of COVID-19.

These results confirm both the safety, already observed in other studies with approximately 1,300 cancer patients treated at much higher doses; and the activity already seen in *in vitro* and *in vivo* studies carried out at different prestigious international laboratories.

Following the results obtained in this first group of patients and discussions with the Spanish Agency for Medicines and Healthcare Products (AEMPS), in order to keep the study open in hospitals, and to allow patient access to plitidepsin, the Company has obtained the authorization for an extension of the patient cohort. This extension will help to obtain more data on the treatment of this indication.

With these data, the Company will begin, in the next few days, conversations with the regulatory agencies to define the next phase III pivotal study for plitidepsin in patients with COVID-19, who require hospitalization.

The complete study data will be submitted to upcoming scientific conferences and/or in an article in a prestigious medical journal.

We would like to take this opportunity to extend our sincerest gratitude to the patients, their families and caregivers, as well as the dedicated medical teams and hospital staff who participated in the clinical trial and helped plitidepsin reach this point.

On Monday, October 19th, at 11:00 CET, a press conference will be held to inform the results, with the participation of the trial's principal researchers, which will be available online.

Legal warning

This press release does not consitute an offer to sell or the solicitation of an offer to buy securities, and shall not constitute an offer, solicitation or sale in any jurisdiction in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of that jurisdiction.

About PharmaMar

Headquartered in Madrid, PharmaMar is a biopharmaceutical company, focused on oncology and committed to research and development which takes its inspiration from the sea to discover molecules

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with antitumor activity. It is a company that seeks innovative products to provide healthcare professionals with new tools to treat cancer. Its commitment to patients and to research has made it one of the world leaders in the discovery of antitumor drugs of marine origin.

PharmaMar has a pipeline of drug candidates and a robust R&D oncology program. It develops and commercializes Yondelis® in Europe and has other clinical-stage programs under development for several types of solid cancers: Zepzelca™ (lurbinectedin, PM1183), PM184 and PM14. With subsidiaries in Germany, Italy, France, Switzerland, Belgium, Austria and the United States. PharmaMar wholly owns other companies: GENOMICA, a molecular diagnostics company; Sylentis, dedicated to researching therapeutic applications of gene silencing (RNAi). To learn more about PharmaMar, please visit us at www.pharmamar.com.

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system was known quite a while ago but not followed up on. The actual source of aplidine has not been reported, but the didemnins are definitively from a free-living marine microbe as demonstrated back in 2011 and 2012. Both series of compounds have been synthesized, and aplidine has a synthetic cGMP production system used by PharmaMar.

The rocaglate Zotatifin is a semisynthetic agent in clinical trials and was identified in the *Nature* paper by Gordon et al.[7] The antiviral data on this compound is referenced in El Bairi et al.[9] Interestingly, the full story of the synthesis of this compound under the code eFT226 was published in 2020 by Ernst et al.[12] The modified rocaglate CR-31-B(-) (**4**) also "fits the bill" as a CoV-2 inhibitor as shown by Muller et al.[13] This molecule was synthesized and resolved as part of a major synthetic effort published in 2012.[14]

OLD VACCINES

There was some discussion in the early literature referring to CoV-2 (currently there are multi thousands of references in PubMed related to this virus) from initial infection data levels that people who had been inoculated with BCG (Bacillus Calmett-Guerin) as an anti TB prophylactic might have some resistance to infection by CoV-2. Now comes the part where two completely independent groups came to the same conclusion, that this treatment either years ago, or currently, did not provide any obvious protection. The first paper was one that I was involved with together with some "colleagues from the past," and it was published online by *Letters in Applied Microbiology* at the beginning of August 2020, followed by a formal publication.[15] This was followed in late September 2020 by a "Letter in *PNAS*" by Arlehamn, Sette and Peters reporting the same, but without any citation to our earlier work.[16]

SUGGESTIONS FOR THE FUTURE

As a result of a request from the editor of *Chemical Society Reviews*, a "Viewpoint" article was put together by an international group led by Dorrington[17] at Rhodes University in South Africa. It was designed to provide some history on what had been done with other viral epidemics and to make suggestions as to what can be done "by scientists" to try to avoid the problems that have arisen with CoV-2. Obviously, this was not designed to provide a single blueprint but more to make people think. The paper is an Open Access one and can be read and commented on by anyone who so desires. ■

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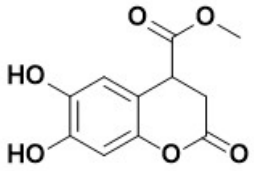
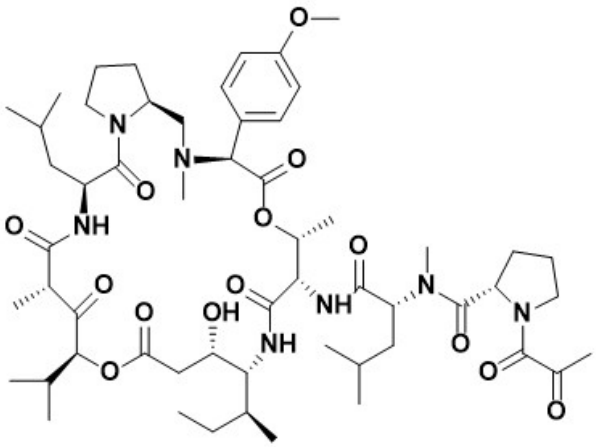
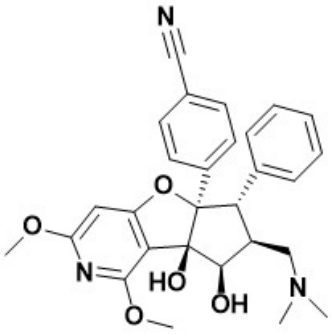
STRUCTURES



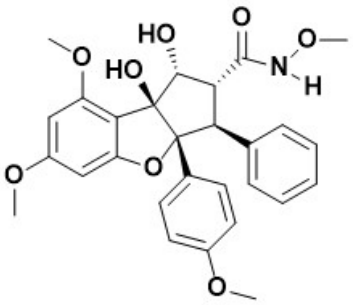
1. Esculetin-4-carboxylic acid methyl ester



2. Aplidine or Dehydrodidemnin B



3. Zotatifin (eFT226)



4. (+/-)-CR--31-B

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Diversity, Equity, and Inclusion Webinar Hosted by ASP

By Nadja Cech, PhD

On Thursday, November 12, 2020 the American Society of Pharmacognosy hosted a webinar titled "Fostering Diversity, Equity, and Inclusion in Scientific Research Groups." The recording is freely available at this link: vimeo.com/483614103. There were 127 participants from 33 countries. The heart of the event was the thoughtful, careful, and personal contributions provided by a panel of scientists with a range of experiences in academia.

Panel members included Luis Mejia Cruz, recent graduate from the MSc program at the University of North Carolina Greensboro, Dr. Katherine Duncan, associate professor in Marine Microbial Drug Discovery at the University of Strathclyde in Glasgow, Scotland, Mabel Gonzalez, PhD candidate at the Universidad de los Andes in Bogota, Elizabeth Kaweesa, PhD candidate at the Whitney Laboratory at the University of Florida, Dr. Brian Murphy, associate professor at the University of Illinois Chicago, Sophia Powells, clinical laboratory technologist at Aerotek, Dr. Renã Robinson, associate professor and Dorothy J. Wingfield Chancellor's Fellow at Vanderbilt University, and Dr. Sabah Ul-Hasan, bioinformatics postdoctoral scholar and lecturer at the Scripps Research Institute.

Dr. Nadja Cech, Patricia A. Sullivan Professor of Chemistry at UNC Greensboro, moderated the discussion, which began with the simple question, "What does an inclusive environment look like to you?"

Mejia Cruz set the tone for the discussion by pointing out the importance of our willingness to listen to each other, so that everyone has the chance to be heard. Duncan built on this idea by pointing out that there is a need not just to listen, but also to reflect and adapt. This idea of openness to reflecting, listening, checking in, adapting, and modifying our practices to become even more inclusive became a theme for the entire conversation.

As Kaweesa put it, "Inclusivity involves creating a sense of belonging…where everyone feels valued and part of a team."

Murphy added that it is essential to create an environment where people feel that they can learn safely and that differences will be respected.

The panel suggested that we have much to gain from creating inclusive environments in our laboratories. Gonzalez captured this idea eloquently. "I was born in one of the most megadiverse countries in the world, which is Colombia," she said. "I think that in the same way that diversity is important for life, it is also important to have cultural diversity in human communities."

Adding to this, Gonzalez pointed out that it is not enough, though, to bring people from diverse backgrounds into our laboratories. She suggested that we must truly take advantage of that diversity. Towards this goal, the panel provided a number of helpful suggestions for how to create a thriving, inclusive, creative environment in a research laboratory. Robinson started off by saying, "A true sense of belonging starts on day one by something as simple as getting people's names right. How do you pronounce your name? Is it an emphasis on the 'Mo'? Or is an emphasis on the 'Ma'?"

A few other helpful suggestions compiled from the conversation with the panel are as follows:

- Make sure that it is not just about science; reach out to get to know each other as fellow humans and to make time to talk about both life and science.
- Listen and let go of ego.
- Use our position of privilege (recognizing that all of us are privileged in various ways) to help

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This idea of openness to reflecting, listening, checking in, adapting, and modifying our practices to become even more inclusive became a theme for the entire conversation.

—Mejia Cruz

Diversity, Equity, and Inclusion Webinar Hosted by ASP

Be public and vocal about anti-racism and anti-ethnocentrism, especially as a principal investigator or senior lab member.

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others, by speaking up for others or providing a space for their voices.

- Invite others to participate in laboratory discussions, as presenters at events, or in celebrations/happy hours, social activities, etc.
- Take the time to learn people's names, and practice until we get them right.
- Be vulnerable (as the PI), break down barriers, and admit we do not have all the answers.
- Check up on people and make sure they are doing okay.
- Be public and vocal about anti-racism and anti-ethnocentrism, especially as a principal investigator or senior lab member.
- Be aware of campus resources (such as mental health, counseling, crisis response) and take the time to make members of the group/department aware of them. If the institution does not have these resources, encourage those in power to establish them.
- Whether you are starting out or a seasoned investigator, be intentional about the environment you are creating in your laboratory.
- Create the space for learning about topics that extend beyond the details of the scientific research, for example learning about and celebrating cultures and traditions outside the US, breaking the hegemony of English, or discussing topics related to diversity, equity and inclusion.
- In laboratory discussions, create space where everyone has a chance to speak. Sometimes this is best accomplished by going around the room (or Zoom) and giving all participants a chance to comment one by one.

The webinar concluded with a discussion about how important it is to continually check in and work towards creating a better environment for our students and colleagues, to be intentional and not get complacent. The panel acknowledged that sometimes conversations around topics like ethnocentrism, racism and sexism can be difficult, particularly for individuals who are not in a position of privilege, i.e., individuals from groups underrepresented in the sciences. These conversations are also an opportunity to build community and make the environment better for everyone.

Ul-Hasan pointed out that we as scientists should be well equipped to question the practices we employ when setting up and managing research laboratories. "An irony here is that as scientists we're constantly encouraging each other to critique each other's work," she said, "so, why is this subject so difficult for us to confront and consider? If anything, we should be some of the most equipped people in terms of the work we do to take criticism."

One of the listeners asked the panel how to address the problem that the work of creating change at academic institutions is often done by those who are already underprivileged by the structure of the system. Mejia Cruz and Powell responded to this question by turning it around, pointing out that we are all in posi-

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The panel acknowledged that sometimes conversations around topics like ethnocentrism, racism and sexism can be difficult, particularly for individuals who are not in a position of privilege, i.e., individuals from groups underrepresented in the sciences.

Diversity, Equity, and Inclusion Webinar Hosted by ASP

In Powell's words, "Kids are going to be very important for our future... we have to encourage them at a younger age to be interested in science."

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tions of some privilege and that we can give that to others, particularly the young generation of scientists. In Powell's words, "Kids are going to be very important for our future…we have to encourage them at a younger age to be interested in science."

Many who listened in on the panel expressed great appreciation for the time taken to have this conversation and commented that they left feeling encouraged by the insights shared by all of the panelists. Kaweesa summed up the conversation perfectly. "This is a journey, not a destination," she said. "Keep working on your craft, just as a musician would. It does not stop at just one video."

Many thanks to all those who took the time to participate in the webinar. We appreciate having all of our members of the American Society of Pharmacognosy on this journey with us. ■

"This is a journey, not a destination," she said. "Keep working on your craft, just as a musician would. It does not stop at just one video."

—Elizabeth Kaweesa

SOME ADDITIONAL READING ON THIS TOPIC CAN BE FOUND IN THE FOLLOWING RESOURCES:

1. Hofstra, B.; Kulkarni, V. V.; Munoz-Najar Galvez, S.; He, B.; Jurafsky, D.; McFarland, D. A. The Diversity–Innovation Paradox in Science. *Proceedings of the National Academy of Sciences.* **2020**, *117* (17), 9284. www.pnas.org/content/117/17/9284
2. Landis, B. Y.; Bajak, A.; de la Hoz, J. F.; González, J. G.; Gose, R.; Tibbs, C. P; Oskin, B. CómoSciWri: Resources to Help Science Writers Engage Bicultural and Bilingual Audiences in the United States. **2020**, *5* (10). www.frontiersin.org/articles/10.3389/fcomm.2020.00010/full
3. Larson, E. New Research: Diversity + Inclusion = Better Decision Making at Work. *Forbes*. **2017**. www.forbes.com/sites/eriklarson/2017/09/21/new-research-diversity-inclusion-better-decision-making-at-work/?sh=5e32f24d4cbf
4. Márquez, M. C.; Porras, A. M. Science Communication in Multiple Languages Is Critical to Its Effectiveness. **2020,** *5* (31). https://www.frontiersin.org/articles/10.3389/fcomm.2020.00031/full
5. Prescod-Weinstein, C. Decolonising Science Reading List: It's the End of Science as We Know It. https://medium.com/@chanda/decolonising-science-reading-list-339fb773d51f.
6. Sanford, M. S. Equity and Inclusion in the Chemical Sciences Requires Actions Not Just Words. *ACS Central Science*. **2020,** *6* (7), 1010-1011. https://pubs.acs.org/doi/10.1021/acscentsci.0c00784

Making STEM a Safer Place

By Alison Hughes, PhD Candidate

February 11 was International Day of Women and Girls in Science, a United Nations initiative actioning "full and equal access to and participation in science for women and girls, and further achieve gender equality." It was empowering to see so many women being celebrated, and celebrating themselves, for the work we are doing to break barriers and become the role models we wish we had. I sat down to listen to two incredible women, Dr. Mandë Holford and ASP member Dr. Marcy Balunas, talk about the exciting research they are doing in the field of natural products.

We have come a long way in progressing the participation and retention of women in science, but we still have a long way to go. In December 2020, *The Wall Street Journal* published the article "Is There a Doctor in the White House? Not if You Need an M.D." In this article, Joseph Epstein stated that it was "fraudulent, not to say a touch comical" that Dr. Jill Biden should use the title that she so rightly earned by obtaining a PhD in education. As if 2020 didn't have enough sticks to beat us all with, *Nature*, one of the publishing giants in science, released an article suggesting that "female protégés who remain in academia reap more benefits when mentored by males rather than equally-impactful females" and that "mentors benefit more when working with male protégés rather than working with comparable female protégés, especially if the mentor is female." Although this article was later retracted after a monumental backlash, it has still caused significant damage.

These examples show us why days such as February 11 and International Women's Day (March 8) are still needed. One of the fundamental structures that prevents women from reaching their potential in science is that our workplace is not a safe environment. To investigate this, the international team at Women in Ocean Science posed a survey to their community about the prevalence and reporting of sexual harassment. The full report was published (www.womeninoceanscience.com) on International Women's Day. While not surprising, the results are truly shocking with almost 78% of 980 participants saying they have experienced or witnessed sexual harassment in the workplace.

ASP President Dr. Nicholas Oberlies reflects on this and the #MeToo movement, which has raised awareness about sexual assault and harassment. "I read a quote by actress Rose McGowan who said, 'Usually where there is smoke there is an inferno, especially as Hollywood is concerned.' She was referring to harassment in movie making, but the idealist in me hopes the same is not true in scientific settings. Unfortunately, the realist says that it's still a problem in 2021, whether smoldering below the surface or right in front of our eyes, and we must all come together and confront this issue, head on."

Our survey was targeted at women across all levels in

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One of the fundamental structures that prevents women from reaching their potential in science is that our workplace is not a safe environment.

Making STEM a Safer Place

The reasons why women remain silent after experiencing or witnessing sexual harassment goes a long way to explain exactly what is wrong with our university and societal systems: the harasser has power, and the victim will be blamed.

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science: undergraduate students (16.9% of participants), postgraduate students (32.8%), volunteers/interns (5%), professionals (41.2%), and others (4.1%, including technicians). The most common form of sexual harassment was in the form of verbal remarks of a sexual nature, including jokes (87.9%), lustful staring (50.7%), and unwanted touching or physical contact (45.5%). And these violations are happening across the scientific sphere, at universities, in laboratories, and at conferences, with the highest occurrence during fieldwork exhibitions (45.5%). As a member of the American Society of Pharmacognosy, many of you will have been involved in fieldwork collection trips and even organised research exhibitions for sample collection and environmental monitoring. Fieldwork involves not only your core research group, which hopefully has established a relationship of respect and trust, but other research groups, staff, and supporters that are unknown to the women participating in fieldwork.

While in the United States Title IX, part of the federal civil rights law, is mandatory in educational institutes, it may not be for other groups that assist fieldwork. Many may see Title IX requirements as a box-ticking exercise and a boring seminar they must sit through while they sort through their inboxes or ponder their latest scientific curiosity from the lab. Many principal investigators and educators are not aware of the prevalence and impact of sexual harassment on their campus, and the reason for this is simple: sexual harassment is severely underreported. Only 16% of participants that experienced or witnessed sexual harassment reported the incident to the organisation or authorities. The reasons why women remain silent after experiencing or witnessing sexual harassment goes a long way to explain exactly what is wrong with our university and societal systems: the harasser has power, and the victim will be blamed. The majority (52.6%) of participants said they did not report because the harasser is in a position of power, 52.4% were concerned reporting would harm their career, and 41% feared they would be blamed for the incident. This is an all-too-common narrative, and personal anecdotes from survivors suggest that for a senior faculty member to be reprimanded for sexual harassment, a thesis of evidence must be gathered before university structures will even begin to consider disciplinary action. Even in cases where harassment is reported and/or proven, the survivor will also suffer as much if not more professional discourse as a result. Structures need to change from protecting perpetrators to believing survivors before we can ever truly convince women and girls that they have a rightful place in science.

ASP Diversity, Equity, and Inclusion Committee members Dr. Christine Salomon and Dr. Lesley-Ann Giddings raised the concern that many people are just not aware of how often sexual harassment is occurring on our campuses, in the field, and at scientific meetings. It is an incredibly challenging issue to tackle as those who have witnessed and experienced sexual harassment do not feel comfortable reporting it. Salomon says, “As scientists, mentors, teachers, and leaders we need to recognize that sexual harassment happens regularly, occurs at all professional levels and environments, and is vastly underreported. Misogyny and sexism are incredibly damaging and undermine the self-worth and scientific promise of their victims. The ASP Diversity, Equity and Inclusion Committee (DEI) is committed to highlighting these issues and providing resources and ideas for better supporting women, female-identifying, and non-binary people.” She rightfully highlights that this is an issue that is not solely experienced by cis women but also female-identifying, non-binary, and LGBTQ+ people within our community.

Giddings has remarked on how sexual harassment is inextricably linked with sexism and gender discrimination, that, until we have a more just environment, there will be those in positions to abuse power. She says, “At the center of sexual harassment is power, control, and devaluing an individual. When the work women do is not as highly valued as that of men, it implicitly gives people permission to be abusive towards women. Women are less likely to be invited to give talks at conferences, awarded tenure, and nominated for scientific awards. However, the light at the end of this tunnel is that the scientific community at large can change this by implementing policies that ensure all members are valued and equally represented.” ■

“At the center of sexual harassment is power, control, and devaluing an individual.”

ASP Members Mooberry and Molinski Named AAAS Fellows

By John Beutler, PhD

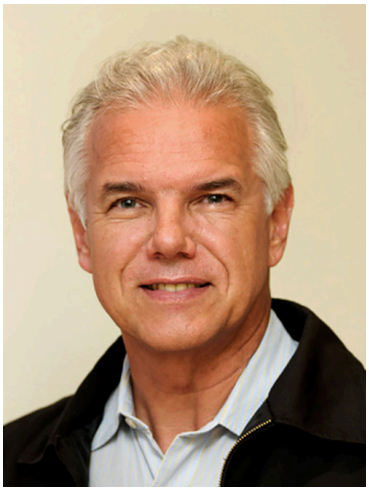
The American Association for the Advancement of Science (AAAS) has honored two members of the ASP this year by naming them as Fellows. Susan Mooberry, Professor of Pharmacology and Greehey Distinguished Chair in Targeted Molecular Therapeutics at the Department of Pharmacology at UT Health San Antonio, was nominated by the Pharmaceutical Sciences Section (S). Tadeusz (Ted) Molinski, Professor in the Department of Chemistry and Biochemistry and Skaggs School of Pharmacy & Pharmaceutical Sciences at the University of California San Diego, was nominated by the Chemistry Section (C). Both are former presidents and ASP Fellows.

"Congratulations to both Drs. Mooberry and Molinski," stated ASP President Dr. Nicholas Oberlies. "They both are active researchers, are mentors, regularly publish (and review) in the *Journal of Natural Products*, are former presidents of the ASP, and are excellent scientists. It's lovely to see active members of our society, people who regularly participate and serve, recognized by the larger scientific community."

In response to the recognition, Mooberry said, "It is a highlight of my career to be elected a Fellow of the AAAS for my research contributions in the discovery of microtubule targeting agents from diverse natural products. Our successes in this area would not have been possible without numerous collaborations with natural product chemists, botanists, and trainees over the past decades. It is rewarding to continue to collaborate with many of these individuals as their careers have progressed."

Above: Susan Mooberry
PHOTO: UTHSA PHOTO TEAM

Below: Tadeusz Ted Molinski
PHOTO: JANUSZ MOLINSKI



Molinski stated, "It's a great honor to be recognized by AAAS, a great society I've been a proud member of for 32 years."

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. Mooberry and Molinski follow a number of ASP members who have received this honor, including: Heinz Floss (1981), John Staba (1982), Jon Clardy (1985), John Cassady (1990), Ara der Marderosian (1991), K.H. Lee (1994), Jim McChesney (1995), Barbara Timmermann (2000), Sidney Hecht (2003), Doug Kinghorn (2006), Bill Fenical (2008), David Sherman (2008), Ben Shen (2011), Bill Baker (2014), Alice Clark (2014), Bill Gerwick (2017), and John Beutler (2019).

The ASP congratulates Drs. Mooberry and Molinski on this significant accomplishment. ■

"They both are active researchers, are mentors, regularly publish (and review) in the *Journal of Natural Products*, are former presidents of the ASP, and are excellent scientists. It's lovely to see active members of our society, people who regularly participate and serve, recognized by the larger scientific community."

–Dr. Nicholas Oberlies

Outstanding *Journal of Natural Products* Associate Editor Ferreira Steps Down

In addition to his role as an editor, Ferreira has had a long and distinguished academic career, and he is an outstanding scientist, educator, and administrator.

By A. Douglas Kinghorn, PhD, Cedric J. Pearce, PhD, Philip J. Proteau, PhD

As of the end of March 2021, our esteemed editorial colleague and friend, Dr. Daneel Ferreira of the University of Mississippi, stepped down from his long-held position as associate editor of the *Journal of Natural Products*. He served in this position since 2005, and before then he was assistant editor for a year. As editorial colleagues who have worked with him for more than a decade, we would like to pay tribute in this article to his tremendous contributions through his devoted editing activities for the journal over the last 15 years. It is no exaggeration to say that the journal's present status as a leading scientific natural products publication is due in no small part to Ferreira's superb input.

Dr. Daneel Ferreira

PHOTO: GUIDO PAULI

In addition to his role as an editor, Ferreira has had a long and distinguished academic career, and he is an outstanding scientist, educator, and administrator. From 2004 until his retirement in 2015, he was professor and chair of the Department of Pharmacognosy and research professor of the Research Institute of Pharmaceutical Sciences, School of Pharmacy, University of Mississippi. Previously, he was professor and head of Organic Chemistry (1986-1998) and chairperson of the Department of Chemistry (1994-1998), University of the Orange Free State (UOFS), Bloemfontein, South Africa. Ferreira received his university education in South Africa and was awarded his doctorate in organic chemistry in 1973 at UOFS under the supervision of Prof. D.G. Roux. During his academic training period, Ferreira spent some time as a postdoctoral associate in the laboratory of Nobel Laureate Sir Derek Barton FRS at Imperial College, London. He has a very extensive list of over 350 research articles in phytochemistry, inclusive of structure elucidation, biosynthesis, and synthesis, and these have appeared in top journals. In addition, he has published 23 chapters in books, four editorials, and holds two patents. He is recognized as one of the world's leading investigators in

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He is recognized as one of the world's leading investigators in the structure elucidation of complex plant proanthocyandins and is also a leading proponent of the use of electronic circular dichroism (ECD) spectroscopy to accurately affirm natural product absolute configurations.

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Moreover, Ferreira has collaborated widely with other colleagues, both nationally and internationally, in terms of using ECD spectroscopy to finalize natural product structures.

the structure elucidation of complex plant proanthocyandins and is also a leading proponent of the use of electronic circular dichroism (ECD) spectroscopy to accurately affirm natural product absolute configurations.

Ferreira is a very experienced educator and has supervised or co-supervised 46 Master's students, 37 PhD candidates, and 14 postdoctoral research associates, representing a major contribution to organic and natural products chemistry. Over 110 contributed presentations have been made at scientific meetings by Ferreira and his students and postdoctoral research associates. He has given several plenary lectures at meetings all over the world and has long served as an active journal reviewer for many different journals. He has been a member of the Editorial Advisory Boards of *Phytochemistry* and the *South African Journal of Science and Technology*. Ferreira served as president of the Phytochemical Society of North America in 2003-2004. Among the list of prestigious awards given to Ferreira are the Gold Medal of the South African Chemical Institute (1996); the Havenga Prize of the South African Academy for Arts and Sciences (1998); the Centenary Medal of the University of the Free State, South Africa (2004); the conferment of a Doctor of Science degree (*honoris causa*) of the University of the Free State (2008); the International Tannin Award at the 7th Annual Tannin Conference, Berlin (2010); the Phytochemistry Pioneer Award of the Phytochemical Society of North America (2020); and inclusion on the Stanford University/Elsevier/SciTech Strategies List of the World's Top 2% of Scientists (2020).

In addition to his editorial activities for *J. Nat. Prod.*, Ferreira has been a frequent contributor to the journal as an author. For example, in landmark back-to-back papers published in March 2019 for the special issue of the journal in honor of Drs. Rachel Mata and Barbara Timmermann, Ferreira, Christina Coleman and their co-authors reported on the oligosaccharides of the important botanical dietary supplement, American cranberry (*Vaccinium macrocarpon*). They described for the first time the anti-adhesion properties of cranberry arabinoxyloglucans, with the structures of both a heptasaccharide and an octasaccharide of this type being completely elucidated (*J. Nat. Prod*. **2019**, *82*, 589-605; ibid. 2019, 82, 606-620). In addition, Ferreira has played a major role in helping to determine new natural product structures with faculty colleagues, research staff and students in the Department of BioMolecular Science, School of Pharmacy and at the National Center for Natural Products Research, University of Mississippi. Many of the resultant papers have described specialized metabolites from organisms with interesting biological activities and were published in *J. Nat. Prod.* Moreover, Ferreira has collaborated widely with other colleagues, both nationally and internationally, in terms of using ECD spectroscopy to finalize natural product structures. For example, working with one of us (ADK), he solved for the first time the absolute configuration of several "caged xanthones" from species in the plant family Clusiaceae using the ECD technique, including the antitumor agent, (–)-gambogic acid (*J. Nat. Prod*. **2011**, 74, 460-463).

He brought with him to the job a profound organic chemistry knowledge, and he handled many papers on plant-derived compounds in which complex compound structure elucidation strategies were proposed by the authors.

In the following paragraphs, we will give our individual impressions of the skills of Ferreira as *J. Nat. Prod.* associate editor, gained over the many years each of us worked with him closely:

Doug Kinghorn: "When I was the editor-in-chief of the journal, I am incredibly thankful that Daneel agreed to take over from Alice Clark as associate editor, after she became a senior campus administrator at Ole Miss. He brought with him to the job a profound organic chemistry

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Outstanding *Journal of Natural Products* Associate Editor Ferreira Steps Down

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Not only is the quality of his editing truly outstanding, the volume of work that he undertakes is also very impressive.

knowledge, and he handled many papers on plant-derived compounds in which complex compound structure elucidation strategies were proposed by the authors. Daneel treated every paper that was assigned to him as if it were his own work, and he tried to make the published version the very best it could be. He was both highly meticulous and fair, and demonstrated a substantial amount of patience in his editorial work. Even though he was quite demanding of authors, many of them expressed their very great appreciation of his painstaking efforts on their behalf once their papers had appeared in *J. Nat. Prod.* This was especially true for authors from countries whose first language is not English. In addition, I had the pleasure of working with Daneel at a Younger Members Workshop on scientific writing, held at the ASP Annual Meeting in Portland, OR in 2017, and thought his advice to those present was inspirational. Simply put, our journal is extremely fortunate to have had the benefit of Daneel's expertise and personal qualities for so many years, and he will be very greatly missed. I wish him well for his well-earned retirement."

Cedric Pearce: "Daneel's reputation as a meticulous but generous editor for the journal preceded us meeting in person. I was also aware that he had worked at Imperial College with Prof. Sir Derek Barton, and so we had a personal link as I'd known Professor Barton both in the U.K. - my PhD supervisor at the University of Southampton, Prof Akhtar, was one of his students - and later at the CNRS natural products institute in Gif-sur-Yvette. Prof. Barton was known to be demanding of his students and would have been very happy that Daneel, whose productivity and work ethic is second to none, chose to be a post-doc in his lab. Skipping 30 or so years, it was my privilege to become an associate editor during Daneel's tenure, and I benefited from seeing firsthand the detail that he applied while taking a manuscript through the process of becoming accepted for publication in the journal. Not only is the quality of his editing truly outstanding, the volume of work that he undertakes is also very impressive. It is also my understanding that authors from countries whose primary language is other than English have been very grateful for Daneel's extensive editorial comments. I've been lucky enough to spend time 'after work' with Daneel, which I probably wouldn't have if our paths hadn't crossed as editors; he is the most generous, scholarly and humorous colleague you could have the pleasure to be with. Daneel's editorial eye is going to be missed by many authors, and I thank him and wish him well for the future."

Phil Proteau: "When I became an associate editor in 2008, I quickly learned that Daneel was a stickler for scientific details. Many authors who have interacted with Daneel will understand the correct 'relative and absolute configuration' as opposed to 'relative and absolute stereochemistry.' This was a distinction that I had failed to appreciate when I became an editor, but it is just one of many details that I have learned from him. Daneel has taught me that no matter how long one does this job, there is always room to learn more and to become more precise in how science is communicated. As I transitioned to the editor-in-chief role, it was reassuring to know that I had such an experienced associate editor to rely upon. I will miss our extended discussions at the annual ASP meetings, but I know that Daneel will always be a supporter of *J. Nat. Prod.* I wish him the best in his retirement."

Daneel, we bring you our very sincere thanks on behalf of all the *J. Nat. Prod.* authors you have served so diligently! ■

Daneel has taught me that no matter how long one does this job, there is always room to learn more and to become more precise in how science is communicated.

Berlinck Named *Journal of Natural Products* Associate Editor

By Alice Clark, PhD

The *Journal of Natural Products* editorial team recently welcomed Dr. Roberto G.S. Berlinck, Universidade de Sao Paulo, as its first international associate editor. Berlinck assumed his responsibilities in January 2021, joining Editor-in-Chief Phil Proteau and Associate Editors Joanna Burdette, Daneel Ferreira, and Cedric Pearce to oversee the review and publication of articles.

The *Journal of Natural Products*, copublished by ASP and the American Chemical Society, is the flagship ASP publication and the premiere journal for new scholarly publications in the area of natural products research, publishing in the form of full papers, communications, reviews, notes and book reviews.

Berlinck is a highly cited, internationally recognized scholar in the field of marine natural products, authoring more than 130 original peer-reviewed articles, many in *J. Nat. Prod.* Berlinck brings a wealth of expertise and experience to his position as associate editor. His research focuses on the discovery of pharmacologically active chemicals from marine organisms and understanding the biosynthetic pathways of biologically active secondary metabolites produced by fungi and bacteria.

Dr. Roberto G.S. Berlinck
PHOTO: NATIONAL CENTER FOR RESEARCH IN ENERGY AND MATERIALS

In 1998, Berlinck started the first Brazilian program to investigate marine microbial natural products and is widely known for his international collaborations. Additionally, he was the recipient of the Brazilian SEM-Sigma Pharma Award in 2000 and of the ASP Foundation Matthew Suffness Award in 2002. The addition of Dr. Berlinck to the editorial team ensures *J. Nat. Prod.* will continue its legacy of placing the stewardship of the journal in the hands of outstanding scholars who exemplify editorial leadership among scholarly publications.

Editor Proteau wrote, "Dr. Berlinck is a scientist who has a unique passion for all natural products. He has published articles on bioactive natural products representing a wide range of structure types from marine organisms, microorganisms and plants, has an interest in organic synthesis and biosynthesis, and is familiar with a wide range of experimental techniques and instrumental approaches. In essence, he has an ideal background to serve as an associate editor for the *Journal of Natural Products*."

Associate editors are the linchpin for scholarly journalistic excellence, responsible for assigning peer reviewers, evaluating the reviews to ensure fairness and accuracy, and final editing of the many articles published each year. Their commitment and service generate enhanced respect to the natural products discipline, as scholars from other fields look to the quality of this flagship journal as the primary indicator of the vitality, impact, and future of the discipline. With the addition of Berlinck as an associate editor, the *Journal* will continue to set the standard of excellence for scientific publications.

Berlinck noted, "To me, it is an honor to be a member of the *Journal of Natural Products* group of editors. As one of the leading journals on natural products sciences, I hope to contribute to maintain the journal's high publication standards."

The *Journal*, and members of the ASP, are direct beneficiaries of the commitment of its editors and editorial board. It takes equal measures of time, expertise, patience, integrity, and dedication to unwavering scientific standards to be an editor of the *J. Nat. Prod.* — all qualities routinely exhibited by Berlinck and the entire editorial team. As a recognized international scholar, Berlinck will continue to elevate both the *Journal* and, by extension, the ASP, illustrating the international reach and impact of the *Journal* and the value to society of understanding the science of natural products. ■

With the addition of Berlinck as an associate editor, the *Journal* will continue to set the standard of excellence for scientific publications.

Outward Changes to Flagship Journal

The *Journal of Natural Products* underwent a major change in cover design in the October 2020 issue (right), compared to the template that was used for the past 25 years (left).

COVER CREDIT: AMERICAN CHEMICAL SOCIETY

By Edward Kennelly, PhD

The *Journal of Natural Products*, the flagship publication of the ASP, has undergone a startling change in its outward appearance as of the October 2020 issue. Now, anyone who views the American Chemical Society (ACS) publication portal (pubs.acs.org) and looks for the journal's familiar 25-year classic cover design with its Kelly green logo, generous buff-colored boarder, and central illustration would be hard pressed to immediately pick out the publication.

The new editor of the *Journal of Natural Products*, Dr. Phil Proteau, announced in his January 2020 editorial for the journal, "The journal cover will be receiving an update in 2020, with a rollout targeted for the summer. The change in the cover will create an appearance similar to what is seen for other ACS journals. In addition, the front cover illustration will be changed quarterly instead of semi-annually to highlight more authors' work on the cover." The execution of the new cover was slightly delayed due to the COVID-19 pandemic.

The October cover artwork was based on the article entitled "Deuterium Residual Quadrupolar Couplings: Crossing the Current Frontiers in the Relative Configuration Analysis of Natural Products" with corresponding authors Drs. Philippe Lesot (University of Paris-Saclay, France) and Roberto R. Gil (Carnegie Mellon University, USA). Editor Proteau noted he worked with Book Review Editor Dr. Melany Puglisi-Weening to select the first new cover article, and they agreed that the cover art proposed by the authors "would make a nice splash for the transition, so we made the change."

This work reported by Lesot and Gil grew out of a fruitful collaboration that began in June 2018 working on artemisinin and strychnine. The research laboratory of Lesot and colleagues (ICMMO-LRMN) is unique in the world of anisotropic NMR since it uses a cryogenic deuterium probe on a 14 T NMR spectrometer, which has allowed important methodological and application developments

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The cover, designed by Lesot, first a chemist and then an NMR spectroscopist in oriented media, summarizes pictorially the use of deuterium residual quadrupolar couplings to help solve the structures of pharmaceutically important natural products like artemisinin.

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focused on the detection of deuterium atoms in natural abundance (DANA NMR).

The cover, designed by Lesot, first a chemist and then an NMR spectroscopist in oriented media, summarizes pictorially the use of deuterium residual quadrupolar couplings to help solve the structures of pharmaceutically important natural products like artemisinin.

The central figure is a representation of *Artemisia annua*, overlapping with an alignment tensor. The chemical structure of artemisinin is shown three times in a magenta circle illuminated by real storm lightning, and words describing the experiment appear around the edges of the circle, like "deuterium" and "anisotropic." The majority of the background is black with stars rotation trails as bedazzled with rainbow-colored helices that are festive, but not readily discernible. Lesot explained that they symbolize the helical polymer-based alignment medium used for this work, the homopolypeptide, poly–benzyl-L-glutamate (PBLG).

Composite photo of Lesot (left) and Gil taken at a 2008 meeting in Darmstadt, Germany

PHOTO PROVIDED BY: ROBERTO GIL

Gil was trained as a natural products chemist and is well-known to many ASP members for his research and teaching in the field of NMR structural elucidation. He has led NMR workshops for ASP, most recently at the Madison 2019 annual meeting. In a phone interview, Gil said, "Philippe and I were thrilled as well as honored that this pioneering work was selected for the cover while inaugurating the new design of *Journal of Natural Products* covers."

Gil's research, as well as Lesot's, has evolved into various fields over the years, but he noted, "Every time I have the chance to use a natural product to develop useful tools for structural elucidation, I am happy. Speeding up the transfer of technology from theory to practical use for natural product chemistry, like we described in this paper, is a continuous challenge."

Editor Proteau wrote that later this year, the *Journal of Natural Products* will transition from quarterly covers to monthly covers thanks to changes in workflow from the publisher, ACS. Proteau commented, "We decided that monthly covers will give more authors an opportunity to have their work highlighted." ■

"Every time I have the chance to use a natural product to develop useful tools for structural elucidation, I am happy. Speeding up the transfer of technology from theory to practical use for natural product chemistry, like we described in this paper, is a continuous challenge."

ASP Members Recognized Among Most Influential Scientists

By Edward J. Kennelly, PhD

(Gordon Cragg, PhD, contributed to this article)

A 2020 article in *PLOS Biology* of the 100,000 most influential scientists with regards to their publication citations includes at least 47 ASP members. Searches of those listed in the article by ASP staff found numerous familiar ASP names like many of the Fellows and ASP research award winners. Some of the ASP members listed are active now, and others trace back to the founding of the society.[1]

The rationale for creating this listing was provided by the article's coauthors: "Citation metrics are widely used and misused. We have created a publicly available database of 100,000 top scientists that provides standardized information on citations, h-index, co-authorship adjusted hm-index, citations to papers in different authorship positions and a composite indicator. Separate data are shown for career-long and single year impact. Metrics with and without self-citations and ratio of citations to citing papers are given. Scientists are classified into 22 scientific fields and 176 sub-fields. Field and subfield specific percentiles are also provided for all scientists who have published at least 5 papers. Career-long data are updated to end-of-2019." [1]

Those ASP members so-far identified that are listed in the top 10,000 using career-long data include Drs. George Robert Pettit, William Fenical, Jon Clardy, David Newman, Susan Horwitz, and Kuo-Hsiung Lee.

Below are expanded looks at a few ASP members who were identified.

HIGHEST RANKED OVERALL

Pettit is the highest ranked ASP member that has been identified thus far, and likely comes as no surprise to many veteran ASP members. Pettit's career in natural products spanned more than six decades, and his contributions to the field of new therapeutics for the treatment of cancer are recognized worldwide.[2] Pettit, who recently retired from Arizona State University after more than 50 years at that institution, worked on many natural products that were investigated clinically, including the dolastatins recently reviewed by ASP Fellow Dr. David Newman in this *Newsletter*.[3] As Newman detailed, dolastatin 10 advanced to clinical trials, and while it failed to become an approved drug, Pettit and his team synthesized the synthetic analogs (auristatins), and monomethyl auristatin E (MMAE) proved to be an invaluable warhead for a range of antibody drug conjugates (ADCs), several of which have been approved by the FDA for the treatment of a range of lymphomas, and a good number are in clinical trials against a wide range of cancers.

Dr. George Robert Pettit

PHOTO: ARIZONA STATE UNIVERSITY

ASP Fellow Dr. Gordon Cragg wrote in an email, "Prof. Pettit's research has focused on all aspects of natural products chemistry, including the isolation of bioactive agents, structural elucidation, biological evaluation, biosynthesis, and chemical synthesis. He can truly be regarded as one of the great pioneers and giants in natural products drug discovery, and he was among the first to explore the realm of marine organisms as a source of potential antitumor agents. His early research in this area blossomed into a marine natural products drug discovery program of exceptional productivity and achievement."

As stated by the late Prof. Carl Djerassi in the opening comments on the biography of Dr. Pettit by Robert Byars, "Pettit is one of the great heroes in the chemistry of marine natural products out of which he created a battery of anti-cancer agents not equaled anywhere."[4]

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ASP Members Recognized Among Most Influential Scientists

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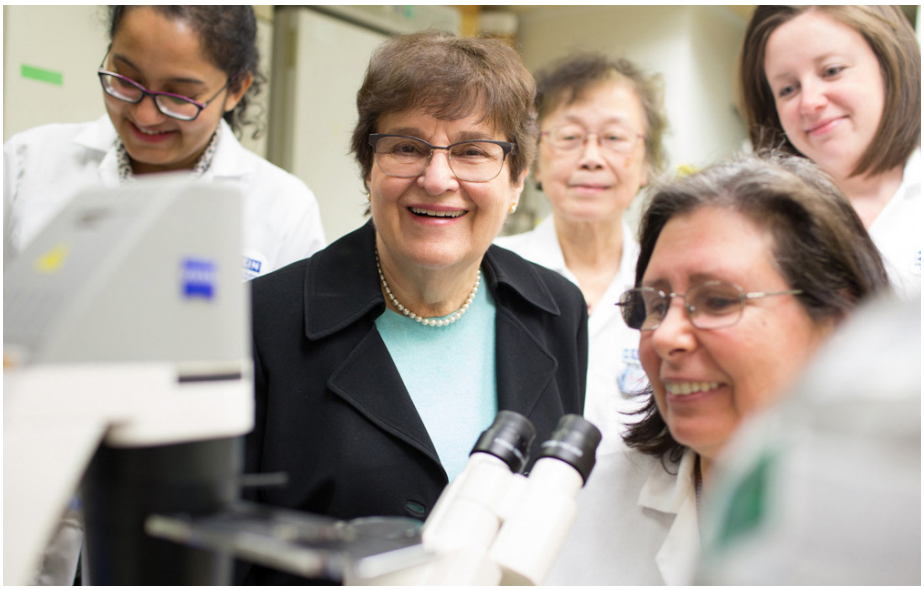
HIGHEST RANKED WOMAN

The top-ranked woman ASP member identified on this list is Dr. Susan Horwitz, who recently retired after decades of leading a cancer therapeutics group at the Albert Einstein College of Medicine. Horwitz is most closely associated in ASP with her groundbreaking work on the plant natural product paclitaxel (Taxol™) discovered by ASP members, the late Drs. Monroe Wall and Mansukh Wani. Her seminal studies leading to the discovery of the novel mechanism of action of paclitaxel were key to the decision by the National Cancer Institute to proceed with the development of this new and structurally complex molecule which was approved by the FDA in 1998 and is widely regarded as one of the most effective drugs in the cancer chemotherapy armamentarium.

When informed of this recognition, Horwitz wrote, "It was a surprise …that I was the most influential woman ASP scientist. The various rankings that different organizations apply to scientists have never impressed me, but I am proud that the communications from my laboratory have been published in highly respected peer-reviewed journals and pleased that the experiments can be repeated anywhere in the world. The latter is a tribute to the students and fellows who have collaborated with me in my laboratory."

In comments following this article, Horwitz provides some tips to colleagues about building a successful academic laboratory.



Dr. Susan Horwitz

PHOTO: JTORRESPHOTO.COM

FATHER AND SON

Among the 100,000 listed, a rare find is a father and son, both who have worked in natural products and both ASP members, the late Dr. Richard Moore and his son Dr. Bradley Moore. Richard Moore spent much of his career studying marine natural products at the University of Hawaii and was a renowned pioneer in the discovery of novel bioactive agents from cyanobacteria. His son is now a professor at the Scripps Institution of Oceanography, University of California San Diego, studying the biosynthesis of marine microbial natural products, microbial genomics and molecular genetic engineering.

Moore commented, "It's an absolute honor and privilege to be included on this list with my dad and so many other remarkable ASP members who have discovered and applied the chemical wonders of nature to better inform and protect the public."

When Moore was asked about his

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Dr. Richard Moore (left) and his son Dr. Bradley Moore

PHOTO PROVIDED BY BRADLEY MOORE

Floss' advice from 43 years ago still rings true today, and it is inspiring to see so many active ASP members included in the *PLOS Biology* assessment.

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work ethic, he wrote, "I'm sincerely inspired by my group members. Their varied interests, goals and infectious enthusiasm are so motivating to me. I love being challenged by them. My work ethic was indeed influenced by my dad who was so dedicated to his work. I learned from him how to focus and how to ask questions. I would be remiss if I did not also mention my PhD mentor Heinz Floss who was a tremendous influence on me at such a pivotal point in my training. He quietly taught me through example many of the qualities that I hold dear today in my work – excellence, rigor, and innovation. He also taught me the importance of independence and trust. I am forever grateful to him for shaping me to become the mentor that I am today."

Like Horwitz, Moore provided tips on productivity that focused on how to effectively manage an academic team comprised mostly of junior scientists. "My advice to a new PI would be to empower your group members to take ownership and responsibility for their projects. While it is tempting to swoop in and solve problems and micromanage, I have found that the biggest motivator of my group that has led to our productivity (and innovation) has been when they combine their talents, interests and goals to solve problems that they are intimately interested in. So, help them find projects that they find fascinating, provide them with all of the resources that they need, and then get out of their way and let the magic happen. In other words, keep your science interesting and motivating to you. The rest is then easy."

CONCLUSIONS

In a 1978 commentary by then-ASP President Heinz Floss, he expressed his shock that a recent survey of ASP members found that only about 20% were actively publishing in the peer-reviewed literature. He stated, "If we want Pharmacognosy to be respected, every one of us has to contribute to its development as a science by engaging in creative scholarly activity in this field."[5] Floss' advice from 43 years ago still rings true today, and it is inspiring to see so many active ASP members included in the *PLOS Biology* assessment. Anyone who wishes to search the *PLOS Biology* database can download it at data.mendeley.com/datasets/btchxktzyw/2.

TIPS ON BUILDING A PRODUCTIVE LABORATORY

By Susan Horwitz, PhD

Building a productive laboratory is not an easy task, requiring sustained hard work and the willingness to devote the many hours that are necessary. It should be undertaken only by those who truly love science and have a passion for their work. They must be able to attract and motivate the next generation of scientists, not an easy task today. In building your group, which need not be large, select potential laboratory members, not by where they received their degrees but rather by what they have accomplished and what they hope to accomplish in the future. Their commitment to integrity, which must be continually emphasized, is essential. Compared to other professions, one of the wonderful things about science is that there is room for a variety of people with unique characteristics, as long as they are compatible with the culture of the laboratory.

The head of the laboratory sets the tone of the group, making it clear that productivity is essential and expected, but this must be done in an encouraging and positive manner. You cannot expect a student to solve a problem that you have not been able to explain for the past ten years. It is up to the mentor, in consultation with the student, to select a project that is of interest to both and is at least partially solvable within a reasonable amount of time. An important and difficult task for a mentor is to inform a student that their project is not progressing well, and therefore it is time to move to a new project. Only the mentor has the experience to know when this time has come.

Today it is essential that new faculty develop meaningful collabora-

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Compared to other professions, one of the wonderful things about science is that there is room for a variety of people with unique characteristics, as long as they are compatible with the culture of the laboratory.

To be successful and build confidence, students must have the opportunity to present their research results before critical faculty and at national conferences.

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tions. It is almost impossible for one individual to have all the capabilities required to publish an outstanding paper in a competitive journal. It is necessary that your students are part of these collaborations, which start by developing an interactive group that learns from each other in an atmosphere where they are comfortable discussing their successes and failures. To be successful and build confidence, students must have the opportunity to present their research results before critical faculty and at national conferences. It is the responsibility of the mentor to be comfortable with the ability of a student to present their work orally and to prepare their results for publication. These are not easy tasks and may require extraordinary patience!

So, as I began this short note, let me repeat that building a productive laboratory is a most difficult task, but it can be extremely rewarding and stimulating, and it also should be fun! ■

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...building a productive laboratory is a most difficult task, but it can be extremely rewarding and stimulating, and it also should be fun!

In Memoriam:
Mahabir P. Gupta

By Angela I. Calderón, PhD

Professor Mahabir P. Gupta, 78, died on December 14, 2020 from lung complications after overcoming COVID-19. Gupta was a world-renowned pharmacognosist, noted for his pioneering research on ethnobotany, bioprospection, chemistry of natural products and drug discovery from tropical biodiversity in Latin America, particularly Panama. He is well known for his 2008 book, *Iberoamerican Medicinal Plants (Plantas Medicinales Iberoamericanas)*, which captured an example of his remarkable work of fostering international cooperation in natural drug discovery in Latin America, Spain, and Portugal.

Dr. Mahabir P. Gupta

As an emeritus member of the ASP, Gupta was highly regarded by many ASP members for his pleasant demeanor, deep knowledge of Panamanian flora and his outstanding ability to foster training of scientists in Latin America and international collaboration in natural drug discovery between the region and the United States, Europe and Asia.

ASP President Dr. Nick Oberlies commented, "Dr. Gupta was an example of a scholar and gentleman. While he is no longer with us in person, his influence will be felt for years to come via his training of a generation of scientists in Panama."

Mahabir Gupta was born in Gajsinghpur, India in 1942 and received his bachelor's and master's degrees in pharmacy from the University of Rajasthan and Banaras Hindu University, respectively. After working in India for two years, he continued his doctoral studies at Washington State University. Immediately after receiving his PhD degree, he was awarded an Alexander von Humboldt Research Fellowship which allowed him to work with ASP Honorary Member Professor Hildebert Wagner on drug discovery from plants at the University of Munich, Germany. He joined the College of Pharmacy of the University of Panama in 1972 where he dedicated his auspicious professional life to the advancement of pharmacognosy research in Panama and Latin America.

Dr. Ceferino Sánchez Jorquera, Emeritus Professor of Pharmacology, School of Medicine, University of Panama, became friends with Gupta when they met in 1972. He states, "Dr. Mahabir Gupta came to Panama as a recent PhD graduate from Washington State University and with postdoctoral work at the University of Munich as an Alexander von Humboldt Fellow. Soon he spoke Spanish fluently and became a magnificent teacher of pharmacognosy at the University of Panama, where, among his many accomplishments, he became Dean of the School of Pharmacy. He distinguished himself as an excellent and hard-working researcher, successfully obtaining research grants from international organizations and publishing intensively in several leading journals. Prof Gupta founded and led for many years the Center for Pharmacognostic Research on Panamanian Flora at the University of Panama (CIFLORPAN), a well-known research center and the cradle of a new generation of researchers. Prof. Gupta was totally oriented to international cooperation and became a

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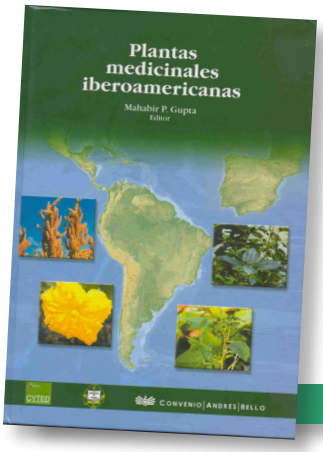

Gupta was a world-renowned pharmacognosist, noted for his pioneering research on ethnobotany, bioprospection, chemistry of natural products and drug discovery from tropical biodiversity in Latin America, particularly Panama.

In Memoriam: Mahabir P. Gupta

Dr. Gupta with his international collaborators at a symposium in Panama in 2019.

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leading expert in Latin America. He also published with scientists from many other countries. As a leading expert and researcher, Prof Gupta leaves an important legacy for pharmacognosy, and he will be sorely missed by his many friends and colleagues around the world."

As a pharmacy student at the University of Panama (1985-1990), I had the great opportunity to have Dr. Gupta as my undergraduate research mentor on the research project regarding the pharmacognosy of *Drymonia serrulata* used in Guaymi Traditional Medicine. This undergraduate research experience sparked my curiosity in pharmacognosy research, and I sought opportunities for graduate training. As a genuine mentor, Dr. Gupta encouraged me to apply for prestigious fellowships including Fulbright and Commission fédérale des bourses pour étudiants étrangers-Suisse to pursue Master and PhD studies in pharmacognosy in the University of Illinois at Chicago (UIC) and the University of Lausanne, Switzerland. After my PhD training in pharmacognosy under the guidance of Prof. Kurt Hostettmann, friend and long-term collaborator of Dr. Gupta, I joined the Center for Pharmacognostic Research on Panamanian Flora at the University of Panama

International CYTED training courses organized by Dr. Gupta at the University of Panama, above left with his collaborators, and in Bariloche, Argentina, below left.

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where I had the honor to work under the guidance of Dr. Gupta for several years before my postdoc in UIC and the beginning of my career in academia in Auburn University.

Gupta was an international coordinator of the Natural Products Drug Discovery Program of the Ibero-American Program of Science and Technology for Development (CYTED) during 1995-2005, and coordinator, Area of Health, CYTED 2011-2014, for 19 countries of Latin America, Spain, and Portugal with a network of over 1,300 scientists. Serving in this capacity, he organized many workshops to train Iberoamerican scientists by renowned international natural products scientists.

Drs. Susana Zacchino, Valdir Cechinel Filho, Esther del Olmo, and Arturo San Feliciano described the impact of Dr. Gupta's work in natural products research in Iberoamerica. "We wish to highlight the great open-heartedness of Prof. Mahabir Gupta, who compromised his personal life for improving the scientific level of many Ibero-American researchers, from his positions of international coordinator of the Fine Pharmaceutical Chemistry subprogram (1995-2005) and of manager of the Health Area (2006-2015) within the Ibero-American Program of Science and Technology for Development (CYTED). Prof. Gupta worked hard to promote and configure successful collaborative projects, integrating the experienced well-equipped teams and those with less resources and experience, and focused on the study and rational use of Latin American medicinal biodiversity. Such projects could not have been carried out without his extraordinary leadership, his great capacity for building interpersonal relationships, and his trust in networks and projects researchers, making them feel highly committed and happy for the developed collaboration. His great labor and personality inspired several recognitions, as of doctor *honoris causa* by University of the Itajaí Valley (Brazil), member of the Royal Academy of Pharmacy (Madrid, Spain), and others. His unexpected departure leaves an immeasurable gap in science, in society, and especially in his family and his countless friends across the five continents."

ASP Fellow Dr. Rachel Mata commented, "The sudden death of Professor Mahabir Gupta leaves an unfillable void in the Iberoamerican pharmacognosy community. He was an invaluable promoter of essential strategies for developing Latin American Pharmacognosy and Health Sciences when he was coordinator and representative of the Iberoamerican Program of Science and Technology for Development (CYTED). I had the privilege of working with him in this endeavor and witnessed his enthusiasm in promoting science in the region. Through the years, I was fortunate to attend several of the reunions he organized. He convened extraordinary meetings with noted scientists from Europe, the USA, Asia, and Latin America. I first met him many years ago, while planning my graduate studies in pharmacognosy in the USA. We kept, since then, an enduring friendship. It was always a pleasure to see him, exchange ideas, discuss world events, and share

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Dr. Gupta receiving an honorary doctorate at the University of the Itajaí Valley, Brazil.

Dr. Gupta, second from the left, and the president of UNIVALI, Dr. Valdir Cechinel Filho.

Prof. Gupta worked hard to promote and configure successful collaborative projects, integrating the experienced well-equipped teams and those with less resources and experience, and focused on the study and rational use of Latin American medicinal biodiversity.

In Memoriam: Mahabir P. Gupta

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good food and drinks. We often chatted over the phone or got in touch through e-mail, commenting on diverse issues, like family, profession, or our countries' news. I particularly remember our last chat on November 12, 2020, when he expressed his concern about Mexico's coronavirus situation. He was an excellent friend and distinguished colleague. Foremost, he was a pleasant and generous gentleman. We will miss him."

Gupta was the executive director of the INTERCIENCIA Association for the promotion of science in the Americas and was a TWAS Fellow and TWAS Council member for Latin America and the Caribbean. He was a recipient of an AAAS Award for International Science Cooperation and a National Research Excellence Award. Among other recognitions, Dr. Gupta received honorary doctorates from National University of the Peruvian Amazonia, Peru in 2005 and University of the Itajaí Valley, Brazil in 2014.

ASP member Dr. Matthias Hamburger described, "I have known Mahabir since the early 1980s. He was a young faculty member at the University of Panama while I was a PhD student in the Hostettmann group at the University of Lausanne. A collaboration was established, and I did part of my thesis on Panamanian plants. We stayed in regular contact over the years and in a continued scientific collaboration on plants of the Panamanian flora up to the present. Mahabir's contribution to the advancement of pharmacognosy in Latin America has been tremendous. In particular he facilitated the training of countless young scientists. And despite all his merits he remained a humble, self-effacing and friendly scientist. We all lost a great friend!"

ASP Fellow Dr. Gordon M. Cragg commented, "I was saddened to hear of the sudden passing of Prof. Mahabir Gupta whom I valued as a colleague and friend. Mahabir was a strong proponent of international collaboration, and in 1995 coauthored a paper with colleagues from Australia, Nigeria, Philippines, and the US on international collaboration in natural product drug discovery and development.[1] We collaborated over the years, mainly through the CYTED program established in 1984 to promote cooperation in science technology and innovation between Ibero-American countries, which he helped to coordinate. He was also involved in the early stages of a project focused on the discovery of bioactive agents from plants collected in Panama, first funded in 1998 by the International Cooperative Biodiversity Program (ICBG) which was initially sponsored by the National Institutes of Health, including the National Cancer Institute, and the National Science Foundation. The project initially included the University of Panama, Panama's National Secretariat for Science, Technology, and Innovation (INDICASAT), the Smithsonian Tropical Research Institute, and the University of Utah as collaborative partners, but was later expanded to include the study of endophytic fungi, marine algae, microbes, and marine invertebrates, and added collaboration with the University of California (UC) San Diego, UC Santa Cruz, Oregon State University, and several industrial partners. His promotion of international collaboration in the study of the rich bioresources of countries such as Panama will be a lasting feature of his many contributions to the natural products community."

Dr. Gupta receiving an award from the American Association for the Advancement of Science.

ASP Honorary Member Dr. Iklas Khan stated, "Dr. Mahabir Gupta will be missed by anyone whose life was touched by him. He was a trusted colleague, open for collaborations with anyone who wanted to promote science. I met him for the first time in the mid-1980s during my PhD when he visited Prof. Hildebert Wagner's lab in Munich and later had the opportu-

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"I particularly remember our last chat on November 12, 2020, when he expressed his concern about Mexico's coronavirus situation. He was an excellent friend and distinguished colleague. Foremost, he was a pleasant and generous gentleman. We will miss him."

—Dr. Rachel Mata

His promotion of international collaboration in the study of the rich bioresources of countries such as Panama will be a lasting feature of his many contributions to the natural products community.

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nity to work with him on a collaborative project developed between NCNPR and CIFLORPAN. I also had the opportunity to co-supervise a PhD student with him, and I came to know how dedicated and passionate he was in the advancement of students and young scientists. His scientific contributions and his legacy will live long. He will be missed as a colleague, friend and mentor."

Dr. Gupta was an active member of the Dietary Supplements Botanical Expert Committee, US Pharmacopeia, 2005-2010. Dr. V. Srini Srinivasan, former executive vice president and chief science officer, United States Pharmacopeia, described, "I have known Dr. Mahabir Gupta since 1990 when he was a professor at the University of Panama. In 1995, when the USP Convention passed a resolution to establish public standards for botanicals and their preparations in USP, I was given the responsibility for the newly formed subcommittee for natural products. During that time Dr. Gupta interacted with me closely and had extensive discussions with me on the choice of botanicals to be identified for standards development. By early 2000 I had encouraged Dr. Mahabir Gupta to offer his candidacy for election to the USP Experts Committee which he accepted and became an elected member of the USP Experts Committee on botanicals. Dr. Gupta was an erudite scholar in pharmacognosy and botanical medicines. He had published several books in Spanish on Latin American plants. He has more than 300 research publications in both English and Spanish and was a recipient of numerous awards including the Alexander von Humboldt Fellowship, AAAS International Science Cooperation Award, and the National Research Excellence Award, Panama. He was a consultant to WHO, UNIDO, and ICS Medicinal and Aromatic plants. His contributions to USP in the establishment of public standards for botanical raw materials and their preparations will always stand as testimony to this erudite scholar's enormous contribution to global public health, whose dependence of herbal products is well known. May his soul rest in peace."

Drs. Ceferino Sánchez, Angela I. Calderón and Mahabir P. Gupta at the 2nd International Symposium on Chemistry, Biology and Pharmacological Properties of Natural Products, Panama City, Panama.

Dr. Gabriel I. Giancaspro, vice president, Compendial Policy, United States Pharmacopeia, indicated that Gupta "was also a strong advocate for the inclusion of medicinal plants from Central and South America in the USP. His legacy continues as USP renewed its commitment to developing standards for medicines and dietary supplements derived from these plants."

ASP member Robin J. Marles, PhD, wrote, "The world has lost a great champion of Latin American pharmacognosy with the passing of Dr. Mahabir Gupta. I first met him when I was

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He has more than 300 research publications in both English and Spanish and was a recipient of numerous awards including the Alexander von Humboldt Fellowship, AAAS International Science Cooperation Award, and the National Research Excellence Award, Panama. He was a consultant to WHO, UNIDO, and ICS Medicinal and Aromatic plants.

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a PhD student at the University of Illinois at Chicago, and Dr. Farnsworth asked me to be Dr. Gupta's host while he was in Chicago as an invited plenary speaker for the 28th Annual Meeting of the Society for Economic Botany, held at UIC College of Pharmacy in 1987. Dr. Gupta treated me as a friend and scientific colleague instead of as a student gofer. After my graduation and return to Canada, he kindly maintained a correspondence with me over the subsequent 30+ years, providing advice and freely sharing his encyclopedic knowledge of Latin American medicinal plants. Every time we met at a conference, he greeted me warmly, keeping our friendship strong despite the fact that we lived on opposite ends of the continent. I know he had an affinity for Canada, too, frequently coming to visit his son in Toronto. In conclusion, I greatly valued his mentorship and friendship and can only wish that I could have spent even more time learning from him."

Dr. Gupta and his family.

Gupta will be remembered for his thorough work on Latin American plants with an emphasis on the ethnopharmacology of Panamanian plants, the evaluation of herbal medicines, and the study and utilization of tropical biodiversity as a source of lead compounds for drug discovery. He published 266 publications and more than a dozen books.

CIFLORPAN's current (Dr. Yelkaira Vásquez, Dr. Pablo Solís, Dr. Dionisio Olmedo, Prof. Ana Santana, Prof. Icela Barberena, Edith Madrid, Carlos Guerra, Alex Espinosa and Rosaura Jiménez) and former members, including me, are grateful for having the opportunity to work with an excellent mentor, boss and human being.

Dr. Gupta was an innate mentor as he was instrumental in the training of a number of Panamanian professionals in centers of excellence in pharmacognosy and related areas. The impact of Dr. Gupta's mentorship has influenced my professional career and led me to receive the Auburn University Provost's Excellence Award in undergraduate mentoring. My eternal gratitude to Dr. Gupta for his inspiration.He is survived by his loving wife, Olga, and their 3 children, Rajesh, Sanjay, and Purni. ■

Gupta will be remembered for his thorough work on Latin American plants with an emphasis on the ethnopharmacology of Panamanian plants, the evaluation of herbal medicines, and the study and utilization of tropical biodiversity as a source of lead compounds for drug discovery. He published 266 publications and more than a dozen books.

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New Members of ASP Spring 2021

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 11 full members and 36 associate members. We look forward to meeting you and learning more about you and your work.

American Society of Pharmacognosy

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Dr. Francois Chassagne
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Core Researcher

Dr. Nausheen Siddiqui
Benazir Bhutto Shaheed University
Lyari
Pakistan

Dr. Rokeya Sultana
Yenepoya Pharmacy College and Research Centre
India
Professor

Prof. Ummuhan Sebnem Doner
Freelance
Turkey
Scientist

Mr. Louie Delgado
Philippines Pharmacists Association
Philippines

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New Members of ASP Spring 2021

American Society of Pharmacognosy

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Dr. Francesco Fiorio
Urological Research Institute
Italy

Mrs. Courtney Kapczynski
University of North Carolina
at Wilmington
United States

Miss Tapanee Maibunkaew
University of Hawaii at Manoa
United States
Graduate Student

Mr. Ayorinde Ogundele
CSIR-NEIST
India

Mrs. Laura Schioppa
Université catholique de Louvain
Belgium
PhD Student

Dr. Oluwapelumi Adeyemi
University of Ilorin
Nigeria
Lecturer

Dr. Hua Deng
Morgan State University
United States
Research Associate

Ms. Na'Cara Harrison
Morgan State University
United States
PhD Student

Prof. Michael Hayden
University of Northwestern Ohio
United States
Professor

Dr. Juan Leon
University of South Carolina
United States
Assistant Professor

Dr. Jiangnan Peng
Morgan State University
United States
Assistant Professor

Ms. Naana Quagraine
Texas Tech University HSC SOP,
Amarillo
United States
Graduate Student

Dr. Olakunle Jaiyesimi
Georgia Institute of Technology
United States
Postdoctoral Researcher

Mr. John Adam Austin
Contra Costa College
United States

Ms. Tiara Butler-Smith
Maryland University of
Integrative Health
United States
Associate Scientist

Mr. Lee Goodloe
Howard University College of Dentistry
United States
DDS Candidate

Ms. Deidre Grogan
Morgan State University
United States
Student

Mr. Barrington Henry, Jr.
Morgan State University
United States
Research Assistant

Mr. Emilio Quarta
University of Hawai'I at Hilo DKICP
United States
Graduate Student

Mrs. R. Rajeswari
Adhiparasakthi College of Pharmacy
India
Assistant Professor

Dr. Tariq Sohail
Doctors Hospital and Medical Center
Pakistan
Orthopedic Surgeon

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**.
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.

ASP Natural Product Sciences Webinar
Bimonthly Zoom Seminars
Thursdays 4 PM ET / 1 PM PT
http://www.pharmacognosy.us/natural-product-sciences-webinar/

ACS Webinars
Every weekday 2 PM ET / 11 AM PT
https://www.acs.org/content/acs/en/acs-webinars.html

C&EN Webinars
Various Days and Times
https://cen.acs.org/collections/webinars.html

VIRTUAL
20th International Congress of the International Society for Ethnopharmacology
April 18-21, 2021
Thessaloniki, Greece
www.ethnopharmacology2021.org

CANCELED
American Society of Pharmacognosy 2021 Annual Meeting
July 24-28, 2021
Grand Rapids, Michigan
http://aspmeetings.pharmacognosy.us

American Society of Pharmacognosy

Jimmy Orjala, PhD, Treasurer
The American Society of Pharmacognosy
3149 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. David P. Carew, University of Iowa · Dr. John M. Cassady, Oregon State University
Dr. Geoffrey A. Cordell, University of Illinois at Chicago · Dr. Gordon C. Cragg, National Institutes of Health
Dr. Harry H.S. Fong, University of Illinois at Chicago · Dr. Ikhlas Khan, University of Mississippi ·
Dr. A. Douglas Kinghorn, Ohio State University · Dr. Robert J. Krueger, Ferris State University
Dr. Roy Okuda, San Jose State University · Dr. James E. Robbers, Purdue University
Dr. E. John Staba, University of Minnesota · Dr. Otto Sticher, Swiss Federal Institute of Technology
Dr. Barbara Timmermann, University of Kansas · Dr. Hildebert Wagner, University of Munich

Additional information about membership may be obtained by writing to the Treasurer of the Society:
Jimmy Orjala, PhD, Treasurer, The American Society of Pharmacognosy,
3149 Dundee Road, #260, Northbrook, Illinois 60062. Email: asphcog@gmail.com