THE AMERICAN SOCIETY OF PHARMACOGNOSY

The ASP Newsletter Volume 46, Issue 4

NASA

The oil slick as seen from space by NASA's Terra satellite on May 24, 2010, on the Gulf of Mexico near the Mississippi River Delta.

The Deepwater Horizon Oil Spill: Impacts on Natural Products Resources

by Dr. Bill Baker

Editor's Note: On April 20, 2010, an explosion on the Deepwater Horizon rig released an estimated five million barrels of oil before the rig's leaser British Petroleum was able to cap the well in late summer, according to the New York Times*. The* Times *calls this spill the "largest accidental spill in history," and the* Newsletter *asked ASP members what effect this contamination in the Gulf will have on the future of marine natural products. ASP members Drs. Bill Baker and Amy Wright respond.*

The Gulf of Mexico has traditionally supported a thriving industry in a number of fisheries, including popular catches such as shrimp, lobster, snapper, and grouper. Effects of the Deepwater Horizon oil spill on those industries was immediate and of indeterminate duration, but the real untold story may lie in the ecology of the benthic and shoreline communities.

For nearly three months, the Gulf of Mexico suffered the onslaught of some 75,000 barrels, approximately 12 million liters, of oil per day, much of which remains long after the flow was capped in early August. To be sure, the Gulf of Mexico has an endemic oil-degrading microbial community, evolved to thrive on benthic oil seeps. Some reports suggest that natural oil seepage is significant, perhaps as much on an annual basis as the

continued on page 3

IN THIS ISSUE WINTER 2011

FEATURES

DEPARTMENTS

EDITOR'S CORNER

As I write this Editor's Corner, much of the United States is blanketed with subzero temperatures, and it seems appropriate to be putting to bed our Winter issue of the *Newsletter.* These colder months are also a wonderful time to start planning a trip to sunny San Diego, the site of the 2011 Annual Meeting of the ASP. The meeting, entitled "Natural Products: New Waves of Innovation," includes a diverse range of topics from chemical synthesis to new frontiers in marine natural products. The 2011 organizers colorfully describe the scientific and social activities in this issue. I hope to see everyone at the Paradise Point Resort from July 30 to August 3, 2011.

Our lead article deals with one of the worst environmental accidents in United States history: the British Petroleum oil spill in the Gulf of Mexico. Past ASP President Bill Baker writes about the impact of this spill for marine natural products research. While there was no apparent evidence of the spill during the ASP Annual Meeting in Tampa, Florida, last summer, many members were acutely aware that the spill was impacting marine life in the Gulf waters. In addition to Dr. Baker's article, Dr. Amy Wright also wrote about the spill and how she has been involved in monitoring the Gulf to attempt to ascertain its impact on marine life.

Keeping with the theme of natural disasters, Ms. Anna Heran looks into the ASP Archives, and discusses some ways in which the Society has reacted to past environmental incidents. Another regular column is Dr. Georgia Perdue's News from Washington. In Meet a New ASP Member, Dr. Thomas Lee tells about his work at PepsiCo, and hobby making intricate objects from paper through the ancient art of origami.

In the midst of all this, Assistant Editor Amy Keller successfully defended her thesis, and will soon be moving back to her home state of Colorado. She will continue to work for the *Newsletter* for a little while more. Congratulations Amy, and good luck as you begin your job search.

Finally, although summer 2012 seems like a long time from now, we hope many people will be able to join us in New York City from July 29-August 1, 2012 for this Annual Meeting. The Local and Scientific Organizing Committees of this international joint meeting have been working hard securing the venue and developing the scientific program.

Here at the *Newsletter*, we wish you a healthy and happy holiday season, and productive new year!

Dr. Edward J. Kennelly

EMPLOYMENT SERVICE

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

For more information see the services website.

www.pharmacognosy.us/?page_id=163

NEWSLETTER STAFF

Edward J. Kennelly, Ph.D.
Editor-In-Chief

Amy C. Keller
Assistant Editor

Nancy Novick
Design & Production

The contribution deadlines are:

Spring Issue Feb. 15
Summer Issue May 18
Fall Issue Aug. 18
Winter Issue Nov. 17

Please send information to:

Edward J. Kennelly, Ph.D.
Editor In Chief, *ASP Newsletter*
Department of Biological Sciences
Lehman College, CUNY
250 Bedford Park Blvd. West
Bronx, NY 10468
718-960-1105

asp.newsletter@lehman.cuny.edu

continued from page 1

Deepwater Horizon well produced daily. This oil-degrading community is expected to decompose much of what remains on the sea floor, but particulate and dissolved oil in the water column that must diffuse and evaporate, as well as tar balls washed ashore, will remain in one or another of the nearby biomes for some time.

Besides economically important fishes, the Gulf of Mexico supports thriving invertebrate, sea grass, and mangrove communities, and the only coral reefs in the continental United States lie just a tide-change away on the far side of the Florida Keys. The vulnerability of these communities to dispersed oil is clearly concentration dependent, but the toxicity of crude oil to both the macro- and micro-organism communities insures that significant impact has undoubtedly already occurred, and makes it unlikely that Gulf biodiversity will ever return to its pre-spill dynamic.

The impact of such a disaster on natural products research is significant. While much of the shallow-water macroorganism community of the Gulf has been subject to at least minimal chemical evaluation, the microbial community is only now being investigated. Sea grass, mangrove, and other marine-margin endophytes, known to be rich sources of chemodiversity, are largely unstudied while both shallow- and deep-water invertebrate-associated microbial fauna are the subject of a number of current studies by researchers worldwide. Not to minimize the potential loss of chemodiversity from the better studied macroorganism fauna: the dynamics of a stable marine ecology insures new chemodiversity through inducible and evolutionary pathways such that future ecteinascidin- or didemnin-class metabolites, for example, are at risk from loss of biodiversity.

Some areas of the Gulf, especially those in the vicinity of marine labs such as Galveston, Cedar Key, Tampa Bay, Long Key, and Key Largo, have ongoing marine ecology studies, including some focused on invertebrate and algal chemical ecology. While this baseline research will be key to understanding the overall impact of the Gulf oil spill, that was never the objective of the research. Rather, an understanding of population distributions, species interactions, and similar ecological phenomena were the objectives. Sadly, many of those long-term data sets may now conclude, and new studies begun, in response to a new biodiversity dynamic that may take decades to reach an equilibrium similar to what existed prior to the failure of the Deep Water Horizon platform.

Whether the invasive and/or replacement communities bring new chemodiversity with them remains to be seen, but we cannot compensate for the loss of existing natural products resources. ■

ASKING DR. AMY WRIGHT

What impact will the recent Gulf oil spill have on your research and that of natural products research in general?

Our research group has explored a number of deep-water sites in the Gulf of Mexico and around southeast Florida and have found many deep- water coral reefs and hard bottom habitats that have abundant communities of invertebrates useful in natural products research.

The organisms we have collected at these sites have yielded many new natural products including lasonolide A and leiodermatolide, two potent cytotoxic agents. In July, our group participated in an expedition funded by the NOAA Cooperative Institute for Ocean Exploration and Technology to conduct pre-impact assessments on invertebrate communities around Florida (**cioert.org/flosee/**). At that time we saw no visible signs of oil impacts in the areas we explored.

We did not work within the areas where the oil plume was present and other Researchers, Dr. Charles Fisher at Pennsylvania State University, University Park, Pennsylvania (**live.psu.edu/tag/Oil_Spill**), have reported impacts on the invertebrates living in habitats close to the Deep Horizon Spill site.

We hope to go back to the sites studied this summer and assess impacts after a year of possible exposure. One good thing is that it appears that the oil did not enter the loop current and so the extremely rich sites that we have explored in the Florida Keys and Eastern Florida appear to have been spared. We hope to confirm this next spring. ■

"Natural Products: New Waves of Innovation" 2011 Annual Meeting of the ASP

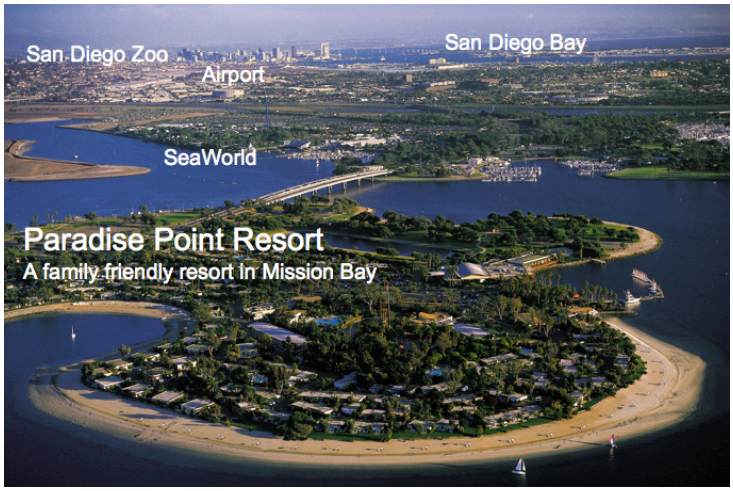
by Dr. Bill Fenical

The scientific and local organizing committees cordially invite the ASP membership to join us for a scientifically stimulating and personally rewarding 2011 Annual Meeting of the ASP. The meeting will take place from July 30-August 3, and the ASP will return to the fabulous Paradise Point Resort in beautiful Mission Bay, San Diego. Paradise Point Resort was the site of ASP's Annual Meeting in 1994, and provided a beautiful venue for the entire family to enjoy.

The Annual Meeting is organized along a fairly typical weekly schedule for ASP meetings, but with a uniquely San Diego flavor. For example, the opening Saturday night reception will be outdoors on a private beach at the resort with beach seating, bonfires, tiki torches, and appetizers and refreshments, adjacent to a solid walkway and grass lawn area providing safe access for all participants.

On Sunday evening, there will be a featured event at the stunningly beautiful Scripps Institution of Oceanography Birch Aquarium with catered food and refreshments. Monday night will be open for participants to explore San Diego restaurants, and following tradition, Tuesday afternoon and evening will also be open for recreational activities. Wednesday afternoon will have a single session devoted to ASP award winners including the ASP Research Achievement Award plenary lecture. The annual business meeting will complete the afternoon, and the Annual Banquet will follow dockside at the Sunset Ballroom at the Resort.

The conference site, the Paradise Point Resort, is located on its own island in the middle of Mission Bay, and has amazing facilities for recreation and relaxation, as well as superb conference facilities. This is truly a comfortable and safe hotel accommodating the entire family. There are no high-rise rooms at Paradise Point, but instead very convenient one-story, separate rooms, and many of them have beach access. Paradise Point is located just a few minutes by taxi from the San Diego International Airport. Activities at Paradise Point include boat rentals from their private dock, several swimming pools, tennis courts, putting golf course, and bicycle rentals. The Resort is very close to Pacific Beach, a lively beach area famed for its nightlife, surfing and body surfing. Of course, other San Diego attractions, such as SeaWorld, the San Diego Zoo, The "Old Town" and "Gas Lamp" areas, and many other attractions found along the San Diego Harbor.



Please see www.paradisepoint.com for details.

Each morning of the conference will feature two plenary lecturers, followed by three parallel sessions for invited speakers that will further develop themes initiated in the morning. The committee has worked diligently to develop a scientific program that both reflects the interests of the local committee, and that will broadly appeal to the membership of the Society. Plenary lecturers include Dr. Sarah O'Connor, MIT, Dr. Craig Crews, Yale, Dr. Roberto Kolter, Harvard, Dr. Chris Walsh, Harvard, Dr. Jörn Piel, University of Bonn, Dr. Julia Kubanek, Georgia Tech, Dr. Phil Baran, Scripps Research Institute, and Dr. Veronika Butterweck, University of Florida. Featured topics will include genetic engineering of natural product pathways in plants, mechanism of action of natural products, botanical drug development, chemical ecology, microbial biosynthesis, "omics" approaches to natural product discovery, new frontiers in marine natural products, and synthesis of natural products. Additional invited oral symposia will focus on natural products from Mexico and Central America, biotechnology companies, new methods in natural products, and traditional Chinese medicines. Afternoons will feature three parallel sessions for contributed oral talks with poster sessions scheduled for Sunday and Monday in the late afternoon.

Three workshops will be offered and run consecutively on Saturday, July 30. One will feature "New Methods in Mass Spectrometry," a second on "Improving Bioassay Quality and Reporting,"and a third on "New Applications of NMR to Natural Products Structure Elucidation."

Registration will begin shortly and will be accessible at the website **www.ASP2011.com**. There will be discounts for early registration. Finally, on behalf of the Organizing Committee, we look we look forward to hosting the ASP in 2011 and showcasing our beautiful San Diego environment to the ASP and their families. ■

Organizing Committee:

Dr. Bill Gerwick (co-chair)
Dr. Bill Fenical (co-chair)
Dr. Brad Moore (co-chair)
Dr. Pieter Dorrestein
Dr. Lena Gerwick
Dr. Paul Jensen
Dr. Ted Molinski
Dr. Alban Pereira-Badilla
Dr. Irma Soria-Mercado
Dr. Mike Burkart
Dr. Yu-Ling Yang

New ASP Award Honors Dr. John Daly

by Dr. Rick Fitch

As a celebration of the late ASP member Dr. John Daly's life and spirit of adventure, the ASP Executive Committee and Grants and Awards Committee have approved the John W. Daly Field Collection Award in his honor. A proposal drafted by Daly colleagues and ASP members Drs. Rick Fitch and Kirk Manfredi was presented to the Executive Committee of the ASP at the recent Annual Meeting in July, 2010, in Tampa, Florida. It was approved earlier this year and the first award will be given in 2012. As the name implies, the award will support field work associated with obtaining organisms for study. John was dedicated to the mentoring and support of young scientists. The award is intended to support talented students, postdoctoral fellows, and early stage researchers with travel and other collection-related expenses.

Dr. John Daly

The application process will be very similar to existing grants and information will be posted on the ASP website soon. The first award will be in the amount of $1,000, donated by Drs. Fitch and Manfredi for the first year. They will be spearheading a fund raising campaign to endow the award through the ASP foundation. As with several other awards given by the ASP, funds are provided by donors to the ASP Foundation Award Fund and dues notices and the online dues payment system will allow donors to designate funds for the award. It is anticipated and hoped that friends and colleagues of John as well as those interested in supporting young pharmacognosists will contribute to the fund. Support from corporate donors is also being sought.

ASP member Dr. John W. Daly passed away in 2008 from pancreatic cancer. A session was held in his honor at the 50th Anniversary ASP Annual Meeting in Honolulu, Hawai'i, in 2009. John was one of the most well-known and prolific scientists in the area of bioactive natural products. He was both a chemist and pharmacologist, having received his Ph.D. in organic chemistry from Stanford University in 1958 under Dr. Richard Eastman. He spent the remainder of his career at the National Institutes of Health, initially in the laboratory of Dr. Bernhard Witkop as a postdoctoral fellow and later as the founder and chief of the Laboratory of Bioorganic Chemistry in what is now the National Institute of Diabetes and Digestive and Kidney Diseases.

John was passionate about both natural products and pharmacology, being most well-known for his work on bioactive alkaloids from amphibians, particularly the brightly colored poison-dart frogs of the neotropics. John was passionate about field work and collected at every opportunity. His collaborators commented about how at home John was in the field, likely a product of his childhood spent in the Oregon woods. In all, John authored or co-authored over 700 papers in chemistry, ecology, and pharmacology, including 22 in the *Journal of Natural Products*, one a comprehensive review describing over 800 amphibian alkaloids. John was also active in the ASP, serving on numerous committees and on the editorial board for the *Journal of Natural Products* and received the ASP Research Achievement Award in 1997.

The John W. Daly Field Collection Award is intended as a tribute to a man who spent his life in the wilderness and in the laboratory in search of new and interesting compounds. In this business where we are often accused of engaging in fishing expeditions, John demonstrated that good fishing can be very productive. It is hoped that he would think this award to be a fitting testament to that ethic. ■

ASP Award Deadline for 2011 Awards: February 15, 2011

by Dr. William Jones

The application deadline for the majority of American Society of Pharmacognosy awards is February 15, 2011. Each year, the ASP and ASP Foundation work together to provide a number of grants and awards that recognize achievement, fund research, and assist with the cost of travel to present research at the ASP Annual Meeting. These awards are given on a competitive basis, after review of the applications. Additional information and specific details concerning these and other ASP awards can be found on the ASP Grants and Awards page and linked pages (**www.pharmacognosy.us/grants-and-awards**).

Most awards and travel grants are contingent on the acceptance of a research presentation at the Annual Meeting by the Scientific Program Committee, and are presented after completion of the recipient's presentation. Also, please note that the ASP Awards and Funds Committee now has a dedicated e-mail address for submission of applications and correspondence about awards (aspgrantsandawards@gmail.com).

AWARDS FOR ACTIVE MEMBERS:

Travel Grants for Active Members consist of $600 to help enable active ASP members who are within the first five years of earning their PhD to travel to an ASP Annual Meeting and present the results of their research.

The **D. John Faulkner Award** is available for active members who meet the criteria for the Travel Grant for Active Members and are within five years of their first independent appointment (e.g., Assistant Professor or equivalent position in industry or government). The award consists of an engraved plaque and $1,000 to assist with travel expenses to the ASP Annual Meeting. Applicants for the Travel Grant for Active Members who meet the criteria will be considered for this award, and need not submit a separate application, but should indicate the initial date of their appointment.

The **Research Starter Grants** are research grants from $2,000 to $5,000 available for active members in the first eight years after earning their PhD and in the first five years of their first independent career appointment.

The **Matt Suffness (Young Investigators Symposium) Award** recognizes ASP members early in their careers who have already made significant contributions to the field of natural products. The award consists of complimentary registration for the Annual Meeting and $1,000 to help offset the costs associated with travel to the meeting. Recipients are selected from the pool of suitable nominations received by the February 15 deadline. Self-nominations are not allowed.

AWARDS FOR STUDENTS:

The **Lynn Brady Travel Award, David Carew Student Travel Award, and General Travel Grant for Graduate Students** are for graduate students under the supervision of an ASP member. These awards are in the amount of $600 to help cover the cost of travel to the ASP Annual Meeting. The most outstanding applicants receive the travel awards. Other top ranking applicants will receive the General Student Travel Grants as funds allow.

The **ASP Student Research Awards** recognize graduate and undergraduate students who have done outstanding research in natural products, and who are working with a member of the ASP. The award consists of an engraved plaque, a $500 cash gift and up to $1,000 assistance with expenses to present the paper at the annual meeting. Applicants for the Student Research Award who are working in colleges or schools of pharmacy are encouraged to provide the required certification letter from the student's Dean or Registrar to be considered for the Kilmer Prize as well.

The **Kilmer Prize** is administered and supported jointly by the American Pharmacists Association (APhA) and the ASP. This award has no society membership requirements on either the applicant or their supervisor. The Kilmer Prize consists of a gold key, complimentary registration, $300 from the APhA, and up to $700 from the ASP.

The **ASP Undergraduate Research Award** consists of a stipend of $2,000 to the student and $500 to the advisor to help defray the costs of the research. There are no limitations on the type of research to be conducted other than that it should be in the area of natural products, and the faculty advisor must be a member of the ASP.

Dr. Farnsworth Featured in University of Illinois, Chicago, *Pharmacist* Newsletter

by Ms. Amy Keller

The recent issue of the University of Illinois (U.I.C.), Chicago, *Pharmacist* newsletter features an article about the life and work of ASP founding member Dr. Norman Farnsworth entitled, "The Baron of Botanicals." The article does a wonderful job capturing Dr. Farnsworth extensive career and boundless enthusiasm for medicinal plants.

Dr. Farnsworth mentions, "There's so much potential for botanicals. Of the 300,000 plants on earth, only a handful has been studied." His extensive field experience is described as well as the work of the UIC Botanical Center. The article is not all business, however, and describes colorful stories told of Dr. Farnsworth, including legends of his cigars, love of specific seafood, and a particular shrunken head.

Dr. Norman Farnsworth

This issue of the *Pharmacist* also features an article on the work of alumni and ASP members Drs. Nam-Cheol Kim and Will Jones. Both senior scientists at Kraft Foods, their work for the company is centered around health and wellness. News about ASP member Dr. Guido Pauli is also included in the *Pharmacist*, as Dr. Pauli was recently elected to the United States Pharmacopeia's Expert Committee on Dietary Supplements for 2010-2015. ■

For all these articles, please see the *Pharmacist*, Fall 2010, volume 34 (3), **www.uic.edu/pharmacy/alumni/uic_pharmacist.php**.

Pharmanews Honors ASP Member Dr. Remesh Panday

by Ms. Amy Keller

In the October issue of *Pharmanews* (**www.pharmanewsltd.com**), ASP Member Dr. Remesh Panday is featured in the column, "Personality of the Month." The article describes Dr. Panday's work as chairman and president of the GDP Ayurvedic University (GDPAU), a non-profit in Brunswick, New Jersey, and their collaboration with the National Institute for Pharmaceutical Research and Development (NIPRD).

Pharmanews highlights Dr. Panday's successes in natural products and drug development, mentioning his development of the fermentation-produced antibiotic vancomycin while CEO of Xechem International Inc. The article continues to note Dr. Panday's success with developing nine new paclitaxel analogs, as well as a prescription herbal drug Nicosan™, used in treating sickle cell disease.

In response to *Pharmanews*' question regarding what motivates Dr. Panday, after acknowledging that the query was complicated, he responded, "I count myself lucky to be in the United States, which is still one of the best countries in the world. I believe that there are so many other individuals who may be as good or even better than I am, but who did not get similar opportunities. I am determined to help the less privileged or less fortunate individuals who may not have these necessary opportunities."

Dr. Panday continued to discuss his experience in getting a Ph.D. in natural products, his journey behind making vancomycin, and how his hard work and tenacious attitude led to the formation of Xechem. After finding a facility to partner with in the actual production of the compound, vancomycin was made and the business venture became a success.

In 2001, Dr. Panday's lab was visited by Dr. Turner Isoun, the former Honorable Minister of Science and Technology of Nigeria. Dr. Isoun was impressed and formally invited Dr. Panday to Nigeria. During the visit, Dr. Panday became acquainted with NIPRD and their herbal preparation for sickle cell disease. From this preparation, Dr. Panday's company developed NICOSAN™ in partnership with NIPRD, and eventually the preparation received Orphaned Drug Designation from the United States Food and Drug Administration.

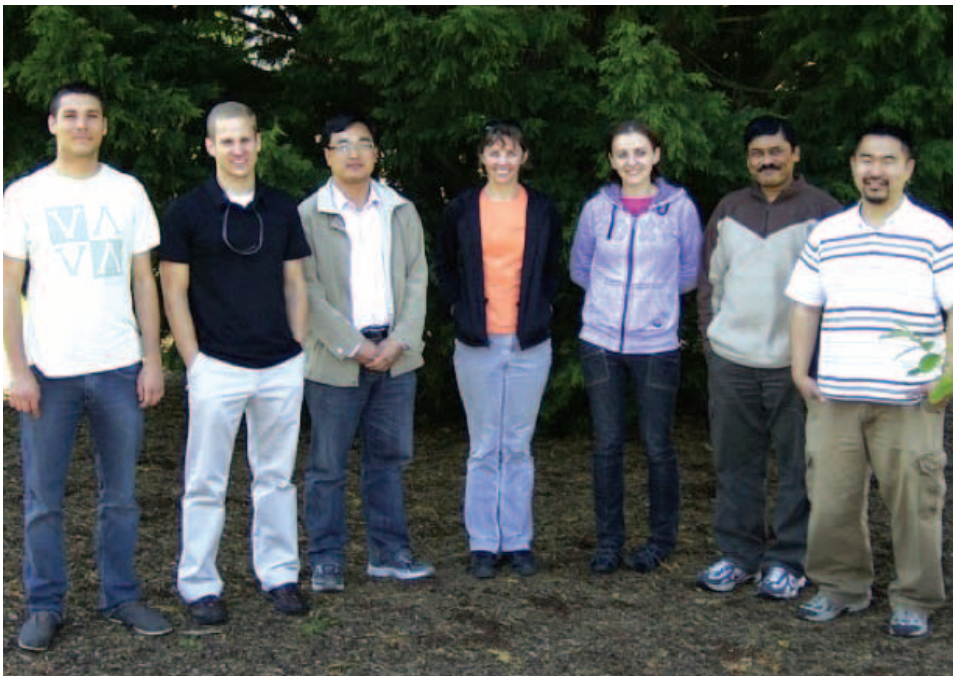
Although Dr. Panday has since left Xechem, he continues to work with Nigeria and his current projects include herbal preparations for diabetes, and investigating potential antimalarial plants. Dr. Panday closes with optimism, mentioning that "I do want to build Nigeria's reputation in the herbal and pharmaceutical industry. We look forward to partnering with more Nigerian researchers and practitioners in achieving these goals."

The full article can be found in *Pharmanews*, October 2010, volume 32 (10), pg. 38. ■

Behind The Scenes: Changing the "Culture" of Weed Control

by Ms. Amy Keller

The recent issue of the Journal of Natural Products *included an article from ASP member Dr. Kerry McPhail and her team entitled, "4-Formylaminooxyvinylglycine, an Herbicidal Germination-Arrest Factor from* Pseudomonas *Rhizosphere Bacteria."* The Newsletter *interviewed Dr. McPhail, who took time out of her busy schedule to tell us more about this exciting research on pseudomonad bacteria. Please read the full article in the* Journal of Natural Products, *2010, 73, 1853-1857.*



DR. JONGTAE YANG

The McPhail Team: Mr. Oliver Vining, Mr. Chris Thornburg, Dr. Dahai Zhang, Dr. Kerry McPhail, Ms. Justyna Sikorska, Dr. Murali Thimmaiah, and Dr. Tak Suyama.

How did you become interested in pseudomonad bacteria?

As a research assistant professor, I had become aware of agricultural research in Dr. Joyce Loper's laboratory on the Oregon State University (OSU) campus in Corvallis, Oregon, that highlighted the complexity of plant-pseudomonad interactions. Thus, I was hooked when I was approached for help with molecular structure elucidation by Professors Emeriti Donald Armstrong and Dallice Mills, professors of Botany and Plant Pathology at OSU, who presented an intriguing story of a mystery bioactive component in the culture filtrate of certain pseudomonad strains! Unexpectedly, the short structure elucidation project I anticipated turned into a long-term collaboration once the chemical class of the structure was revealed.

Who in the laboratory carried out the research?

I performed the structure elucidation of the germination-arrest factor (GAF) by NMR and MS, and the capillary NMR work on the library of *Pseudomonas* isolates. Professor Emeritus Don Armstrong carried out the original GAF purification and also the enzyme assays with D- and L-amino acid oxidase. United Stated Department of Agriculture (USDA) biologist Dr. Mark Azevedo developed the grass seed (*Poa annua*) assay, and cultured and tested the original *Pseudomonas* WH6 strain for isolation and purification of GAF, as well as the library of pseudomonad isolates. Graduate student Chris Thornburg prepared some Pseudomonas WH6 cultures. Graduate student Justyna Sikorska helped to troubleshoot the capillary NMR probe system on occasion. In addition, postdoctoral associate Dr. Murali Thimmaiah has been working on the chemical synthesis of GAF analogs for biosynthetic studies and biological activity testing.

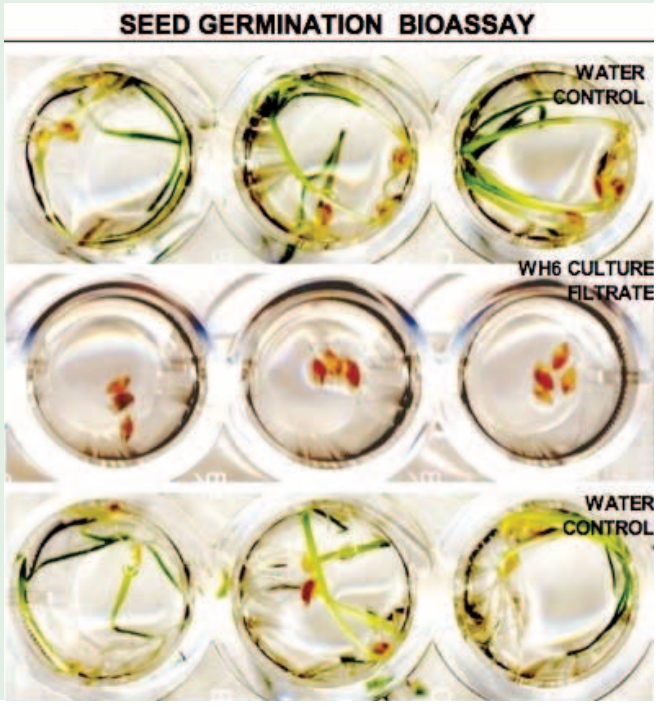
Could you provide a brief explanation of the work and results in your own words? In what way are the data in your paper new?

This project to look for potential herbicidal biocontrol agents or natural products was originally initiated in response to the appearance of diuron-resistant weed grasses and also to restrictions on field burning in Oregon. Thus, pseudomonad rhizosphere bacteria were isolated and selected for their ability to arrest germination of annual bluegrass weed (*Poa annua*) seeds. The herbicidal action observed was remarkable because exposed

continued on page 9

LEFT
A typical *Pseudomonas* culture bottle.

RIGHT
***Poa annua* seed germination assay.**



DR. MARK AZEVEDO

continued from page 8

seeds started to germinate before their growth was arrested irreversibly.

In contrast, most herbicides that act on weed seeds are "pre-emergent" in that they prevent the seeds from germinating at all. In addition, the growth of established grass plants and germination of the seeds of broadleaf plant species (dicots) were not affected. The germination-arrest factor (GAF) responsible for this developmentally-specific herbicidal action was purified after an extended effort to isolate it intact from the culture filtrate of *P. fluorescens* WH6. This highly polar, rather labile small molecule was finally assigned as 4-formylaminooxy-vinylglycine on the basis of NMR spectroscopic and mass spectrometric data. D/L-amino acid oxidase assays on culture filtrate extracts were used to establish the L configuration of GAF, which is both tedious to purify continually and not readily accessible via chemical synthesis.

The aminooxyvinyl motif is very unusual and this is the first report of an aminooxyvinylglycine in the English language natural products literature. The oxyvinylglycine motif of GAF suggested that related compounds may exhibit similar herbicidal (and other previously unrecognized) activities. It also suggested that the mechanism of action of GAF is to inhibit pyridoxal phosphate-dependent enzymes, as seen for other vinylglycines. Finally, culture filtrates from the USDA collection of soil bacteria were screened using the grass seed germination assay, analytical TLC, and capillary NMR spectroscopy to show that GAF is secreted by all other herbicidally-active rhizosphere bacteria in our collection. This profiling of isolates was facilitated by the simplicity of the culture filtrates; GAF is fortunately secreted by pseudomonad bacteria grown in minimal culture media, and these could be analyzed with minimal processing.

What impact does this research have on agriculture or natural products in general?

Grass seed production is a mainstay of Oregon agriculture. The need for alternatives to field burning as a means to control annual weed grasses that contaminate crop grasses has been emphasized since 1969, the year of "Black Tuesday" when the Oregon State Board of Health received thousands of health-related complaints about smoke from the field burning.

What is a favorite nonscientific activity of your lab?

Mine is summer lunch-time sandwiches outside our building near the neighboring field of horses! Otherwise, the students seem to enjoy finding and posting lab cartoons to reflect current events!

What is your lab's motto?

Expect the unexpected!

What is your greatest extravagance in the lab?

New NMR tubes for 700 MHz! ■

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.phcog.org. If you have a conference or event you would like mentioned, please send us relevant information, including any graphics or appropriate fliers, at asp.newsletter@lehman.cuny.edu.

241st ACS National Meeting & Exposition

Anaheim, California

March 27-31, 2011

www.acs.org

NatPharma: Nature Aided Drug Discovery

Napoli, Italy

June 5-9, 2011

www.nadd2011.org

52nd ASP Annual Meeting

Paradise Point Resort, San Diego, California

July 30-August 3, 2011

www.pharmacognosy.us

The 7th European Conference on Marine Natural Products

Stromstad, Swedish West Coast

August 14-18, 2011

www.fkog.uu.se/7ecmnp/

59th International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research (GA)

Antalya, Turkey

September 4-9, 2011

www.ga201.org

The International Chemical Congress of Pacific Basin Societies (Pacifichem 2011)

Kohala Coast, Hawai'i

December 10-14, 2011

www.pacifichem.org

53rd ASP Annual Meeting

New York, New York

July 28-August 1, 2012

www.pharmacognosy.us

New ASP Member, Dr. Thomas Lee

by Ms. Amy Keller

ASP continues to welcome several new members to the Society as the year closes. We are pleased to feature one of our newest members, Dr. Thomas Lee. Dr. Lee is a research fellow in sweetener technology at PepsiCo in Valhalla, New York. We are grateful to Dr. Lee for giving us the opportunity to get more acquainted with him.

How did you hear about the ASP?

I heard about the Society through graduate school studies and academics as well as from ASP member Dr. Douglas Kinghorn.

Why did you join ASP?

I would like to expand my work and research.

Do you belong to any other scientific societies?

I belong to the American Chemical Society and the Institute of Food Technologists.

What are your current research interests in pharmacognosy?

I am interested in functional natural products for beverages and foods.

What is your scientific background?

I have a Ph.D. in Medicinal Chemistry from the University of Rhode Island. My industrial experience includes pharmacology, organic synthesis, ingredient technology, and food science.

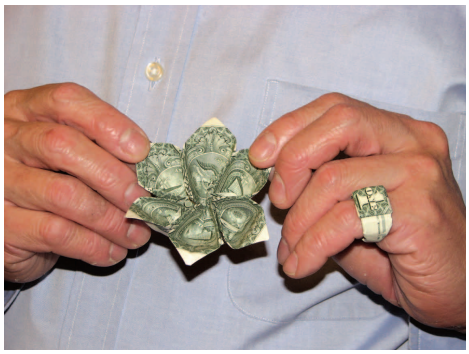
What would you like to achieve through your membership?

I would like to serve as a bridge between academia and the consumer product industry towards the inclusion of more healthful natural products in beverages and foods.

What do you like doing in your spare time?

I enjoy gardening, origami, and Sudoku. ■

Dr. Thomas Lee



Some of Dr. Lee's origami creations.

New Members of ASP 2010

ASP would like to welcome 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 five domestic full members, two international full members, and three associate members. We look forward to meeting you and learning more about you and your work.

ACTIVE MEMBERS

Dr. K. M. Gangotri
Jodhpur, India

Mr. Mark Grimaldi
Albany, Georgia

Dr. Thomas D. Lee
Valhalla, New York

Dr. Scott W. Martin
Holladay, Utah

Dr. Sesselja Omarsdottir
Reykjavik, Iceland

Dr. Bela Peethambaran
Philadelphia, Pennsylvania

Dr. Michael D. Southall
Skillman, New Jersey

ASSOCIATE MEMBERS

James C. Robertson
Ashland, Oregon

Taryn E. O'Neill
Saint John, New Brunswick, Canada

Wei Gao
Chicago, Illinois

Brief News From Washington

by Dr. Georgia Perdue

➢ The National Institutes of Health (NIH) Office of Dietary Supplements and the National Center for Complementary and Alternative Medicine (NCCAM) jointly funded the following **five Botanical Research Centers**, each with its own emphasis, for five years at $1.5 million each per year. (1) Pennington Biomedical Research, Louisiana State University Center, Baton Rouge; P. I., William Cefalu, M.D., *Botanicals and Metabolic Syndrome*, including artemisia and St. John's wort; (2) University of Illinois-Chicago, already supported for 10 years; P.I., Norman Farnsworth, Ph.D., *Botanical Dietary Supplements for Women's Health*. The safety of black cohosh and licorice, already used as dietary supplements, will be studied; (3) University of Illinois-Urbana-Champaign; P.I., William Helferich, Ph.D., *Botanical Estrogens: Mechanisms, Dose and Target Tissues*, includes currently used wild yam, soy and dong quai; (4) University of Missouri; P.I., Dennis Lubahn, Ph.D., *Center for Botanical Interaction Studies*, including elderberry and garlic; (5) Wake Forest University Health Sciences, Winston-Salem, North Carolina; P.I., Floyd Chilton, III, Ph.D., *Center for Botanical Lipids and Inflammatory Disease Prevention*, study subjects include "molecular mechanisms by which botanical oils, such as borage oil, may prevent or affect disease…." Please see the NCCAM website for more details.

➢ Important points of interest from **NCCAM Director Dr. Josephine Briggs' report** at the September NCCAM Advisory meeting: more four-year grants than two-year grants will now be funded; the *Strategic Plan*, due out early next year, will stress a greater focus on real world effectiveness research, communication, a need to understand more fully the mechanisms of action of natural products and determine if the intervention is efficacious. "The more we know about the mechanism of action the better we will be able to do clinical trials," said Dr. Briggs. "Before we move to clinical trials we will need information on biological markers and how effective these interventions are in a real world setting." NCCAM is also developing a list of priorities for funding R34s.

➢ At the December 9, 2010, meeting of the NIH Advisory Committee to the Director (ACD), Dr. Francis Collins excitedly announced the creation of a new **National Center for Advancing Translational Sciences**, which will not require new monies. It is to be a "hub" for the development of more effective technologies and their dissemination by supporting people and programs. He believes this is the "right time to take bold action to transform the nation's translational enterprise" adding, "we are faced with unprecedented scientific opportunities and an urgent need for new therapies. NIH has an opportunity to move forward in a more integrated way, to develop new tools and fresh approaches, and to turn these discoveries into health advances." It should be up and running in October 2011, assuming Congress approves and the Secretary of Health and Human Services concurs. A director for the center will be sought from the private sector. This will not impact translational research at NCI or National Institute of Allergy and Infectious Diseases (NIAID). He envisions tapping four high-throughput centers for small molecules, half of which he believes could move into development. Dr. Collins said that NCI's Rapid Access to Interventional Development (RAID) program will be very valuable in providing promising compounds and preclinical analysis. Biologics will also be included. Please see **www.feedback.nih.gov** for more information. Stay tuned.

➢ Also at the ACD meeting, Dr. Maria Freire, President, Albert and Mary Lasker Foundation, reported on the two-year efforts of the **Therapeutics for Rare and Neglected Diseases (TRND)** working group aimed at speeding up the development of new TRND drugs for which no financial incentives currently exist. Her group includes members from industry and foundations. There are incentives to form collaborations to move compounds to development, to identify and address drug development hurdles, and to look at drugs already available which could be used for TRND. The Food and Drug Administration (FDA) is "intensely interested." She expects many therapies to be a combination of drugs, and that medicinal chemistry will be important in this effort. The project's focus will include drugs for schistosomiasis, sickle cell disease and chronic lymphocytic leukemia (see www. trnd.nih.gov). Applications for a second round of funding are due in April, 2011. Dr. Freire anticipates this effort to be fully operational by October, 2012. Dr. Collins added that NIH will provide technology to projects as needed, and this effort could be included in the new translational center. Also, projects coming to TRND and the new center could be handed off to industry partners. The TRND committee, which will be expanded as needed, will help with the new translational center.

➢ Look for updates on the NIH website dealing with **Enhancing Peer Review** based on a report given at the ACD.

➢ At his first National Cancer Advisory Board (NCAB) meeting, National Cancer Institute (NCI) director Dr. Harold Varmus, as always very informal and unorthodox, told the members, "I am wearing a tie [but no coat] for the first time in some weeks… just to show my respect for this group…." In his "informal chat" Dr. Varmus outlined his current vision for the NCI and some of his goals. He believes this is a very opportune moment to run NCI

continued on page 14

continued from page 13

because "the chances of really making tremendous advances in the control of cancer are remarkable. I like being at the helm when remarkable things take place." Dr. Varmus wants to create a **center for cancer genomics** and one for **global health**. In this latter area he believes cancer has been neglected in the world health efforts. At his first, even more informal, meeting with the Board of Scientific Advisers a few weeks later, Dr. Varmus expanded a bit on the global health center saying he is actively seeking a director who would also look at other United States agency programs "to take advantage of other efforts … already underway in poor African countries where over two-thirds of cancer deaths occur…." He told the NCAB that he dismantled NCI's Executive Committee and remade it into two entities, Scientific Program Leaders and Office of Director staff, because "it was too big for my taste." He believes NCI needs both R01 grants and mega-projects, and that the clinical trials need a "course correction," referring to the Institute of Medicine (IOM) report. His new deputy, Donald Lowy, M.D., former Laboratory Chief and Head, Signaling and Oncogenesis Section, Laboratory of Cellular Oncology, was described by the director as [NCI's] "a most distinguished intramural investigator… who is responsible for the design of a vaccine which is one of the great tools in cancer prevention, a theme I hope will be important in my administration." "We have to think about therapies in a new way." He sees the **cancer genome atlas as the signature program of NCI**. Stay tuned.

➢ NIAID director Dr. Anthony Fauci told his Advisory Council that **a new compound, NITD609, a spiroindolone**, developed by an international team of researchers, including Elizabeth Winzeler, an NIAID grantee, is showing **promise as a new malaria drug**. He said "the compound… appears to target a parasite protein not attacked by any existing malaria drug and has several other desirable features." The eight-year partnership between The Novartis Institute for Tropical Diseases (NITD) and the Singapore Economic Development Board is aiming to develop small molecule drugs for dengue fever, tuberculosis, and malaria. Dr. Fauci added, "this research is… an example of successful collaboration between government-supported scientists and private sector researchers." The compound was discovered when 12,000 purified natural product compounds were screened in an ultra-high throughput robotic screening technique customized to detect compounds against *Plasmodium falciparum*. **Medicinal chemists** at NITD synthesized the compound. The scientists found that while NITD609 worked faster than older malaria drugs, **artemisinin still works more quickly**. Dr. Elizabeth Winzeler is affiliated with The Scripps Research Institute and Genomic Institute of the Novartis Research Foundation, LaJolla, California.

➢ At the December NCAB meeting, a draft of the long awaited **NCAB Ad Hoc Working Group Report: To Create a Strategic Scientific Vision for the [NCI] and to Review Progress of the [NCI]** was presented. This was prompted by the 40th anniversary of the Cancer Act. The four co-chairs, Drs. Bruce Chabner, Harvard University, Philip Sharp, MIT, Robert Ingram, Pharma and Biotech and Mr. William Goodwin, Banking and Philanthropy, joined by 25 members from academia and industry, focused mainly on a review of NCI's progress over the last 10 years and how it should move forward. "We will have to be more efficient in what we do [considering the state] of the economy," said Goodwin. Key areas for "change" in the recommendations deal with: a). Industry, the major source of drugs,-NCI relations—"do not spend money when industry can do it;" b). Clinical trials – "rapidly implement the IOM report;" c). Intramural research, and cancer prevention; d). NCI's Frederick Operation – form an advisory committee to advise and evaluate; e). Training; f). More integrative cancer research; g). Cancer centers; h). SPOREs program and i). Comparative effectiveness research. Dr. Sharp noted "we tried not to be prescriptive but identify opportunities for change." The NCAB unanimously accepted the report. The final is due out by February. Dr. Varmus, who is already looking at some of the recommendations, noted he wants **intramural investigators to interact and consult with the pharmaceutical industry without compensation** so as to help industry gain from the wisdom and knowledge the investigators would provide in drug discovery and development. Stay tuned.

➢ The FDA approved the microtubule inhibitor **Halaven,®** eribulin mesylate, a derivative of Halichondrin (see previous issue), to treat metastatic breast cancer.

➢ Funding from the Bill and Melinda Gates Foundation of $10.7 million to the non-profit Institute for One World Health will allow the production of a **semisynthetic artemisinin**.

➢ FDA has given Vancouver-based iCo Therapeutics Inc., fast track approval for iCo-009, an oral formulation of Amphotericin B, to treat the fatal **visceral leishmaniasis**, a disease caused by parasitic sand flies which affects 12 million people worldwide.

➢ The anti-cancer drug **Taxotere,®** which has been on the market for 14 years, can now be produced as a generic drug according to a recent court decision.

➢ At the groundbreaking for the new **NCI office building**, which will house 2,200 employees (see previous column), Dr. Varmus boasted of showing up in his "bike clothes" accompanied by neatly dressed Maryland governor, Martin O'Malley, and other dignitaries, because he said "he was making a point that exercise is good… and that NCI will buy bicycles for its employees…." Relocation of the entire staff from the Executive Plaza office buildings, Rockville, Maryland, and other office personnel, will occur in early 2013. No staff from the NIH Bethesda campus will be moved. As of now, some of the amenities planned for employees include a fitness center, a full service cafeteria, a coffee bar, and auditorium.

Brief News From Washington

continued from page 14

➢ NIH director Dr. Francis Collins announced the appointment of **Dr. Lawrence Tabak as NIH principal deputy director.** For the last 10 years, Dr. Tabak was director of the National Institute of Dental and Craniofacial Research.

➢ Congress passed a law creating another NIH institute from what was a center: the **National Institute on Minority Health and Health Disparities**.

➢ The rumors of the formation of another NIH institute for addiction and substance abuse by subsuming the two separate institutes, drug abuse and alcohol abuse and alcoholism, were confirmed by NIH director Dr. Francis Collins in mid-November. A task force will review all NIH programs dealing with these areas and submit a detailed reorganization plan to Dr. Collins in mid-2011. Stay tuned.

➢ According to NIAIDs Dr. Fauci, 28 cases of **locally acquired dengue hemorrhagic fever** were identified in **Key West, Florida in 2009**; this year cases were also found in **Broward County, Florida**. This disease is endemic to the Caribbean, particularly Puerto Rico. For more than 10 years NIAID intramural researchers have tried to develop a vaccine.

➢ **FDA and NIH will award close to the $10 million,** $94 million from NIH and $950,000 from FDA, over the next three years to support **research in regulatory science**. The projects include nanoparticle research to deliver drugs, a heart-lung model to test the safety and efficacy of drugs, and innovative clinical trial design and a novel strategy to predict eye irritation. This effort is part of the NIH-FDA Joint Leadership Council (see previous column). The FDA is establishing an **Office of Science and Innovation**, within the Office of the Chief Scientist, to oversee this endeavor. ■

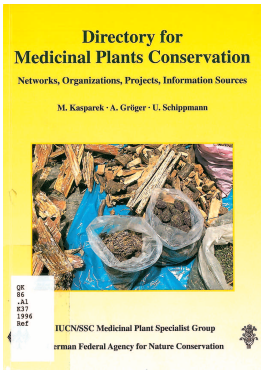
From the Archives

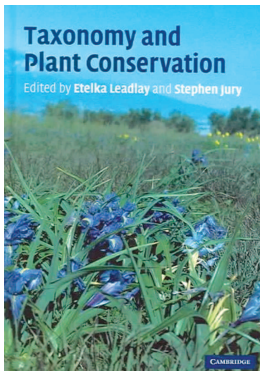
by Ms. Anna Heran

In keeping with this issue's feature article on the Gulf oil spill, I had hoped to present you with some information on a past such disaster, and searched for ASP mentions of the Exxon Valdez oil spill in Alaska in March of 1989, almost 22 years ago. There was no mention of it specifically any materials from ASP in the Lloyd Library's possession.

However, I did note some interesting news items in the Summer and Winter *Newsletters* for 1989, as well as an item in the Business Meeting Minutes for the 1989 meeting held in San Juan, Puerto Rico. On the back page of the Summer 1989 *Newsletter* is a single column article about ASP member Dr. Gordon H. Svoboda and his then recent return from England where he met with Prince Philip for a fund-raiser for the rain forests. The fund-raiser kick-off was a one-day conference highlighting the problems there with habitat loss, then calculated at about 2,000 acres per day, due to farming and development. Additionally, Dr. Svoboda's concern was loss of medicinal plant resources that could never be recovered.

Later in this same year, in the Winter 1989 *Newsletter*, there is another small news item. ASP voted unanimously to support the United States House of Representatives Bill HR 4335, The National Biological Diversity Conservation and Environment Research Act. This bill was designed to help prevent the loss of biological diversity through extinction of both plant and animal species. And, importantly, the bill was part of a program to conserve endangered species of medicinal value.





The last item related to this can be found in the New Business section of the Business Meeting Minutes of the 1989 Annual Meeting. The final new business item was the report on ASP's donation of $5,000 to the International Union for the Conservancy of Nature and Natural Resources (IUCN). Though there was some confusion about how and when the funds were to be spent, nonetheless, ASP was intent on supporting the work of this organization and being part of the conservation efforts around the world, an impulse which must certainly have gotten a greater push from everyone's knowledge of the disaster of the Valdez.

For those interested in the topic of conservation, as a general field of study, the Lloyd Library is an excellent resource. Not only do we have archival materials that relate to the topic, but the monograph collection holds over 400 titles on this subject, a great many specifically dealing with medicinal plant conservation.

And, as we collectively focus on the disaster still unfolding in the Gulf, it is heartening to know that ASP and its members have been active advocates for conservation and responsibility for so many years and that it continues to focus on both the science and the source of the science. ■

David J. Slatkin, Ph.D, Treasurer
The American Society of Pharmacognosy
3149 Dundee Road, #260,
Northbrook, Illinois 60062

ASP Membership

Full Membership

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

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. Arnold R. Brossi, National Institutes of Health · Dr. David P. Carew, University of Iowa
Dr. John M. Cassady, Oregon State University · Dr. Geoffrey A. Cordell, Natural Products, Inc.
Dr. Gordon C. Cragg, National Institutes of Health · Dr. Norman R. Farnsworth, University of Illinois at Chicago
Dr. Harry H.S. Fong, University of Illinois at Chicago · A. Douglas Kinghorn, Ohio State University
Dr. James E. Robbers, Purdue University · Yuzuru Shimizu, University of Rhode Island
Dr. David J. Slatkin, Chicago State University · Dr. E. John Staba, University of Minnesota
Dr. Otto Sticher, Swiss Federal Institute of Technology
Dr. Hildebert Wagner, University of Munich · Dr. Mansukh Wani, Research Triangle Institute

Additional information about membership may be obtained by writing to the Treasurer of the Society:
David J. Slatkin, Ph.D, Treasurer, The American Society of Pharmacognosy,
3149 Dundee Road, #260, Northbrook, Illinois 60062. Email: asphcog@aol.com