



THE AMERICAN SOCIETY OF PHARMACOGNOSY

THE ASP NEWSLETTER VOLUME 44 ISSUE 1

In Memoriam: Dr. Richard E. Moore

by Drs. John Cardellina and Bradley Moore

On December 11, 2007, the field of marine natural products lost another icon, Professor Richard Elliott Moore. Dr. Moore passed away in Honolulu, Hawai'i, surrounded by his family, after battling multiple myeloma for many years and, more recently, pneumonia. His contributions to the field of natural products were huge, opening new fields of endeavor and helping to drive and exploit significant technological advancements.

ASP President Bill Baker, a graduate student at the University of Hawai'i in the early 1980s, recalls "Dick's imposing influence in the department, in the marine natural products community, and in the greater scientific arena of natural product based drug discovery".

Dr. Richard Moore was born in San Francisco in 1933, but moved a few years later with his American mother and English father to England. Just prior to England's entry into World War II, his mother, brother Philip, and he returned to the United States on the last American refugee ship, the USS Washington, out of England in 1940. Although the ship was stopped by a U-boat, it was allowed to continue its course for the United States. Dr. Moore's father remained behind in England until the end of the war.



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ASP Interim Meeting in Oxford, MS

by Dr. Troy Smillie

Greetings from Ole Miss! We would like to invite all ya'll to attend the 7th Annual Oxford International Conference on the Science of Botanicals and American Society of Pharmacognosy 4th Interim Meeting that will be held in Oxford, Mississippi, from April 12 to 16, 2008.

The conference is supported by a cooperative agreement between the National Center for Natural Product Research (NCNPR) and the Center for Food Safety and Applied Nutrition (CFSAN) of the United States Food and Drug Administration (FDA). This conference is also being co-sponsored by the Shanghai Institute of Materia Medica/Chinese Academy of Sciences (CAS), China, the Council of Scientific and Industrial Research (CSIR, India), and the Society for Medicinal Plant Research (GA).

Thanks to the distribution of information from all of these great organizations, we have over 200 registrants so far with 48 symposia speakers, seven contributed talks, and over 130 posters. The abstracts from these presentations will be published by *Planta Medica* as a special issue. The scientific program along with other information for the conference will be available on the conference website, www.OxfordICSB.org.

Due to the interest in this program, the hotels are filling fast and there may be slim pickings in Oxford as there are other events occurring in the area.

The nearest airport to Oxford is Memphis, Tennessee (MEM). Oxford is approximately 75 miles south of Memphis and a shuttle service is available on the registration website to get attendees to and from Oxford and Memphis. For those of you that wish to drive, directions are on the conference website.

Locally, the conference will provide a shuttle service to and from the hotels and conference center. Several people have asked if any of the

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Editor's Corner



In this issue of the *Newsletter*, we prepare for the Interim ASP Meeting in Oxford, Mississippi. This will be the fourth Interim ASP Meeting in the Society's history, and offers an opportunity for members unable to attend the 49th Annual Meeting in Athens, Greece, to get together in the United States. The *Newsletter* will cover both meetings and hopes that many ASP members will be able to go to one or both of them this year.

We were deeply saddened to learn about the passing of two greats in the field of natural products research in the last three months. Drs. Richard Moore and John Daly were ASP members and recipients of the Society's

Research Achievement Award in 2002 and 1997, respectively.

Dr. Moore, who passed away in December, was a giant in the field of marine natural products, and he will be greatly missed by ASP members. We send our condolences to his son, ASP member Dr. Bradley Moore, and his family. Dr. Brad Moore wrote a lovely summary of his father's life that he sent to me in a December e-mail; this served as the basis for a truly comprehensive obituary prepared by ASP member and former student of Dr. Richard Moore, Dr. John Cardellina.

We learned about the passing of Dr. John Daly just before the *Newsletter* was going to press. Dr. Daly's groundbreaking work on amphibian toxins is well known to members of the Society. Dr. Carole Bewley at the National Institute of Diabetes and Digestive and Kidney Diseases at the National Institutes of Health will help us remember Dr. Daly and his extensive research in the Summer issue of the *Newsletter*.

We were also saddened to learn of a fire in January at the University of Illinois College of Pharmacy (UIC). Although I am glad to report that no one was injured, the recovery of the damaged building will take some time as there was considerable soot and water damage. Our thoughts are with our pharmacognosy colleagues at UIC.

In our Spring issue of the *Newsletter*, we welcome new member, Dr. Harry Rosenberg, President of the University of Southern Nevada. In "Behind the Scenes in Pharmacognosy", we look at work in Dr. Sheo Singh's laboratory on platencin, an antibacterial compound isolated from *Streptomyces platensis*. Dr. Troy Smillie also invites us to Mississippi for some excellent Southern hospitality, and we discuss the best (and worst) ways to fly to Athens.

We hope your Spring season is productive and hope to see you at the Interim Meeting in Mississippi, and/or the Annual Meeting in Athens, Greece.

Clarifications: In the memoriam to Dr. Clifford Chang in our December, 2007 issue, it should read that he was a faculty member at the University of West Florida. Also, an additional woman ASP member, Dr. Georgia Perdue, has been identified as serving on the Executive Committee prior to Dr. Marilyn Speedie.

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.phcog.org/employment.html

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The contribution deadlines are:

Spring Issue	Feb.	15
Summer Issue	May	16
Fall Issue	Aug.	15
Winter Issue	Nov.	14

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In Memoriam: Dr. Richard E. Moore

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Dr. Moore grew up in the San Francisco Bay area, where he developed a strong interest in chemistry and geology. He graduated with a B.S. in 1957 and M.S. in 1959, both in chemistry, from the University of San Francisco and moved to the University of California at Berkeley for his doctoral work with the late Professor Henry Rapoport on the “Alkaloids of *Geissospermum velosii*”, a Brazilian tree rich in potent toxins used by native South Americans on their weapons.

After completing his Ph.D. work in 1962, he moved to the University of Hawai'i for postdoctoral work with the late Professor Paul J. Scheuer in the emerging field of marine natural products. In 1966, he joined the University of Hawai'i faculty as an assistant professor and quickly ascended through the academic ranks to full professor. He worked tirelessly on marine natural products and cultured cyanobacteria until his retirement in 2003.

Professor Moore's first National Science Foundation grant and his early independent research centered on the odor of seaweed. His group's contributions in this arena were nearly 200 new natural products, the vast majority of them containing 11 or less carbons, and early insight into the vast array of halogenated marine metabolites.

His early work at Hawai'i also focused on the chemical analysis of palytoxin, a potent toxin isolated from an exceedingly poisonous organism, ultimately identified as a coelenterate, from a small tide-pool near Hana, Maui. The Hawaiians referred to this organism as limu-make-o-Hana (the deadly seaweed of Maui) and, like the Brazilians with *G. velosii*, they used its exudates to poison spear-tips. He spent about 20 years of his early academic life on this problem, which required state-of-the-art analytical instruments that were found only at Stanford and Carnegie Mellon; thus, he had to travel extensively to the mainland during this period. The structural elucidation of palytoxin was a major achievement in the field of natural products chemistry due to its massive chemical structure.

At the time, palytoxin was the largest natural product structure not containing repeating units to be elucidated. Solving this extraordinary challenge required skillful microscale chemical manipulations and helped push analytical methods to new limits. The Moore and Hirata groups, working essentially independently, determined the structure of palytoxin concurrently in the early 1980s.

As the odor of seaweed project wound down, Dr. Moore developed an interest in the discovery of anticancer agents from blue-green algae (cyanobacteria). Initially, his group worked on field-collected blue-greens from Hawai'i and Enewetok. This effort discovered the unique fatty acid chemistry of this group of organisms and also uncovered a wealth of unique natural products, including the oscillatoxins, debromoaplysiatoxin, lyngbyatoxin, the malyngamides, and malyngolide. The latter compound has the distinction of being the marine natural product with the largest number of reported total syntheses.

Despite the considerable success of his first endeavors with field-collected blue-greens, Dr. Moore quickly realized the limitations of pursuing only natural populations, and began cultivation of cyanobacteria; this led to a long and fruitful collaboration with Dr. Gregory Patterson.

In reflecting on their enormously successful collaboration, Dr. Patterson commented that “...being an early adopter of mass culture to access cyanobacterial compounds paid huge dividends. Virtually everywhere we looked, novel and interesting structures with potent biological activity were available in quantities that made preclinical evaluation realistic.” They vigorously developed this new resource in drug discovery, and through the years the Moore group isolated and characterized a large collection of novel natural products, including hapalindoles, scytophycins, tolytoxins, fischerindoles, tantazoles, and the cryptophycin family of potent anticancer agents, active against a broad spectrum of solid tumors.

Preclinical development of this class of compounds in collaboration with Eli Lilly brought a semisynthetic analog to Phase II clinical trials. Dr. Yali Fu, a Program Officer at the National Cancer Institute (NCI), noted that “Professor Moore was one of the pioneers and world experts in exploring cyanobacteria as a source of antitumor agents. He had an exemplary record of achievements and enjoyed sustained NCI funding for 30 years, until his



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

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retirement in 2003. He also served as the Principal Investigator in a very productive National Cooperative Drug Discovery consortium funded by NCI."

Innovation was a hallmark of Professor Moore's research program throughout his career, and the cultured cyanobacteria period witnessed diversification of effort to include pharmacology, biosynthesis and genetics. One noteworthy example was his clever exploitation of the nitrogen fixing capability of cyanobacteria. Feeding experiments with simple, cheap ^{13}C and ^{15}N labeled precursors enabled him to utilize various two-dimensional NMR heteronuclear correlation experiments for both the elucidation of complex structures and their biosynthesis. His extraordinary discoveries in cultivated cyanobacteria have stimulated a rebirth of interest, and considerable new discoveries, in field-collected cyanobacterial mats.



Dr. Richard Moore (center) at his 65th birthday.

Former ASP President Dr. Bill Gerwick reflected that "Dick's work on cyanobacterial natural products, as well as his highly methodical scientific approach, were inspirational to my career. I will never forget a walk we once took on the beach at the Marine Natural Products Gordon Conference where Dick shared with me, in his normal taciturn style, 'the future of this field with cyanobacteria is in the genetics.' Clearly, I was listening!"

Professor Moore published 300 original papers, reviews and book chapters, and was inventor or co-inventor of more than 100 patents based on his group's unique discoveries.

Professor Moore's approach to training graduate students was decidedly 'old school', and clearly influenced by his own Ph.D. mentor's style. Many casual observers might think that Dr. Moore was only interested in NMR spectroscopy.

While he was undoubtedly one of the true masters of NMR analysis (as a graduate student, he created one of the first NMR spectral databases by recording proton NMR spectra of every compound in the Rapoport laboratory), he wanted his students to be solidly grounded in all aspects of classical organic chemistry, not just in structure elucidation; everyone was expected to do some wet chemistry on isolated natural products, whether degradation or derivatization or total synthesis. The diversity of activity observed and experience gained in the Moore laboratory has led his many students and postdocs into very diverse career paths; in fact, relatively few of his protégés have worked in traditional natural products research.

Perhaps Dr. Michael Kirkup, who earned his Ph.D. in 1980, best summarizes the experience of being a student of Dick Moore, "Although few of us realized it at the time, Dick's management style was one in which we were trained to think independently and to interface natural products chemistry with other disciplines. This was excellent training for entry into pharmaceutical research. When asked by colleagues in industry about my days in Hawai'i, I always felt they were expecting me to tell them how great the surfing was on the north shore. I always surprised them by saying 'How many other research groups do you know that allow you to collect and extract your own organisms, and isolate and identify novel compounds using classical (and sometimes non-classical) chemical techniques in conjunction with hands-on state of the art instrumentation, while at the same time prepare and perform your own assays for biological activity and do a total synthesis?' This was the 'soup to nuts' approach that Dick encouraged. It led to a fascinating career, for which I owe a large debt of gratitude to Dick."

Dr. Joe Barchi, who completed his Ph.D. in 1985, echoed those sentiments, "When I joined the Moore group, he was in the throes of determining the gross structure of palytoxin, and one may say he was a tad preoccupied. My project was to synthesize just about every degradation product from the palytoxin molecule, and essentially to have this done in my first 6 months. Suffice it to say that I failed miserably in attaining the target compounds in the projected timeframe, but I did come up with several that helped in the determination of the stereochemistry of this beast of a molecule. By then, the Patterson cultivation machine was in full 'bloom', and I subsequently went on to determine the structures of some interesting cyanobacterial natural products. This was followed by a project to develop simple, rapid methods to determine the stereochemistry of linear polyols,



Dr. Richard Moore (right) with Dr. Bill Fenical.

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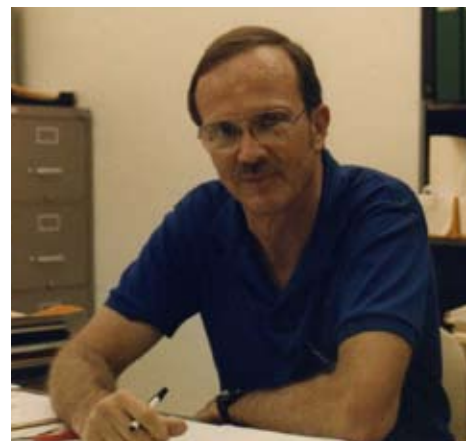
like those from palytoxin. Like others before me, I ran the gamut of work in natural products chemistry, from analog and partial synthesis to true collection and structure work, to methods development. Where else could I have gotten this breadth of training? Dick unwittingly had groomed me for a solid career in medicinal chemistry at the National Cancer Institute, for which I will be forever grateful.”

“The mid to late 1980s were an exciting time in my father’s laboratory as he began to probe the biosynthesis of his collection of fascinating cyanobacterial compounds”, said his son Dr. Bradley Moore, an ASP member and 2001 Matt Suffness Award winner, who completed his B.S. in 1988 at Hawai’i. “This period laid the foundation for his venture a decade later into incorporating biosynthetic technology in the generation of unnatural compound libraries. As an undergraduate student, I was very fortunate to be part of the early work, as I was forced to quickly become quite independent in the lab. During this time our relationship blossomed beyond father and son, and we became good friends, which was pretty cool. Who would know that I would be bitten by the biosynthetic bug and devote the next 20 years to the topic? I will be forever grateful to him for sharing his passion for science with me and exposing me at an early age to the possibilities of an academic life. It is interesting that the Moore Group has now shifted across the Pacific to the Scripps Institution of Oceanography in San Diego where I run my laboratory.”

Dr. Richard Moore tended to be quiet, serious, and focused on his research, but occasionally he revealed his sense of humor. In introducing one of his students for his Ph.D. seminar and defense, Dr. Moore noted that the student “had done a lot of work for someone who seemed to keep bankers’ hours.” However, he did draw the line at naming a natural product “polymethoxytylopothritoxin”, even though he laughed at the idea of others trying to pronounce this tongue twister.

Perhaps the most poignant moment in Dr. Moore’s career came during his award address upon receipt of the 2002 ASP Norman Farnsworth Research Achievement Award, when he showed a slide of his grandchildren and himself in a swimming pool and told the audience that “these are the natural products that I will be focusing on from now on.”

Dr. Moore and his young, growing family initially lived in upper Manoa Valley behind the university. The Moores later moved to Kahala, ostensibly because the family needed more space, but many thought it was so that Dick could run back and forth, literally, to the university as part of his training for the many marathons he ran. He is survived by Marilyn, his wife of 47 years, four children, Greg, Chris, Bradley and Lori, and nine grandchildren. Memorial services were held in Honolulu on Wednesday, December 19.



Dr. Richard Moore at University of Hawai’i.

Fire at the College of Pharmacy, University of Illinois at Chicago

by Amy Keller



On the morning of Saturday, January 19, 2008, a fire broke out at the College of Pharmacy building on the campus of the University of Illinois at Chicago (UIC). Although no injuries resulted, the 15-minute blaze did major damage to the structure before being extinguished by firefighters. Two laboratories were completely destroyed, and the damage from water and soot was considerable.

ASP President Dr. Bill Baker relates, “The ASP was saddened to learn of the fire in the UIC Pharmacognosy labs. While we were glad to hear that nobody was injured, the loss of samples and data from this laboratory that has contributed significant discoveries to the field will surely be hard to replace. We wish them swift repair to their facilities and recovery of all possible scientific materials. The ASP would be happy to help in any way we could.”

Honorary ASP Member Dr. Norman Farnsworth of UIC notes in an e-mail from February 3, 2008, “Luckily, the Pharmacognosy research areas received minimal damage, mainly water. Luckily no one was injured. Damage to the mass spectrometers seems to be considerable, and damage assessment is underway, but safety reasons preclude entering the building at this time. We hope to be back in the Pharmacognosy laboratories within a week or so.”

The ASP community wishes a quick return to normalcy for the UIC community.

ASP Interim Meeting in Oxford, MS

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hotels are near enough to the conference center to be considered “walking distance”. I would say no, unless you think between four and eight miles is your idea of “walking distance”. The weather in Oxford during April should be in the mid 60’s °F, 18 °C, with a chance of spring showers. If you do decide to take a walk, bring a light jacket and umbrella.

As for dining in Oxford, there are several venues to choose from. Whether it is fine dining at the Downtown Grill, City Grocery, L&M’s Kitchen & Salumeria, or 208 South Lamar to informal eating at Old Venice, Proud Larry’s, Ajax Diner, The Blind Pig Pub & Deli, Bouré, The Rib Cage, and The Jubilee, there is plenty to choose from. These are only a few selections from Oxford’s wide variety of dining options. Most of these establishments carry Mississippi’s finest micro brew, Lazy Magnolia. One thing that the thirsty traveler needs to be aware of while in Oxford is that the sale of alcohol is not permitted on Sundays, so plan accordingly.

On the subject of dining, there is a planned excursion to Memphis, Tennessee, on the afternoon of Monday, April 14, to the home of the blues, Beale Street. We plan on leaving Oxford by bus at 3 pm and arriving in Memphis at 4:30 pm, where people will be able to freely browse Beale Street for a while before arriving at a reserved dining hall at B.B. King’s restaurant for dinner and entertainment for the night. We will leave B.B. King’s by 9 pm to get everyone back to Oxford in time to get a good night’s rest. Be sure you sign up on the registration website for this event!

Come on down and enjoy some good ole’ Southern hospitality. For further information please contact Dr. Troy Smillie at ICSB@olemiss.edu or visit the website at www.OxfordICSB.org.



How I Will Get to the Land of Homer for 1.5 Grand

by Dr. Edward J. Kennelly

I have been reluctant to purchase my ticket for the Annual Meeting in Greece for some time now. There was never any doubt that I would attend, but forking over so much money so far ahead of the conference did not seem like a good use of resources.

The first step in my thought process was to decide if I would spend United States government funds from a grant to purchase the ticket. If so, my choices would be limited to United States carriers. Due to the Patriot Act, National Institutes of Health policy states, "U.S. flag carriers must be used to the maximum extent possible when commercial air transportation is available for travel between the United States and a foreign country or between foreign countries."

Luckily, I found two such carriers that have direct flights from New York to Athens: Delta and Continental. There is also a new direct flight on US Airways from Philadelphia. I am most familiar with the East Coast, but I believe there are direct flights from Detroit, Chicago, and other points.

I began last December to look on the internet to price tickets. I went to the usual sites, like Travelocity (www.travelocity.com) and Orbitz (www.orbitz.com), and began shopping around. I also contacted two travel agents in New York, recommended by a Cyprian friend: Cyprus Tours (800-221-8899) and Homeric Tours (800-223-5570, www.homerictours.com). Surprisingly, Homeric tours told me to wait until early 2008 to purchase at a cheaper price. They seemed to have a good selection of flights on Olympic Airlines.

Dr. Nick Oberlies, member of the 2008 Organizing Committee, has been monitoring www.kayak.com, which gives a digest of flight prices on all airlines and indicates if prices are going up or down. The \$1500 price per ticket has been pretty consistent for over three months now. You may try your luck with the Priceline negotiator (www.priceline.com), but with gas prices rising and the dollar falling relative to the Euro, it does not seem likely that prices will go down any time soon.

Some of the cheaper international airfares that I found on Travelocity included Swiss International Airlines, Air France, Olympic Airways, Alitalia, British Airways, Lufthansa, KLM Royal Dutch Airlines, and Iberia. Some people have recommended buying a ticket to a European capital, such as Rome, and finding one's way to Athens from there by some combination of rail, ferry, and/or air. I found tickets to Rome to be only marginally cheaper than tickets to Athens with taxes and fees often reaching 35% of the cost of the ticket! Also, in the post September 11th world, this is often more difficult to pull off (especially via air) than one may imagine.

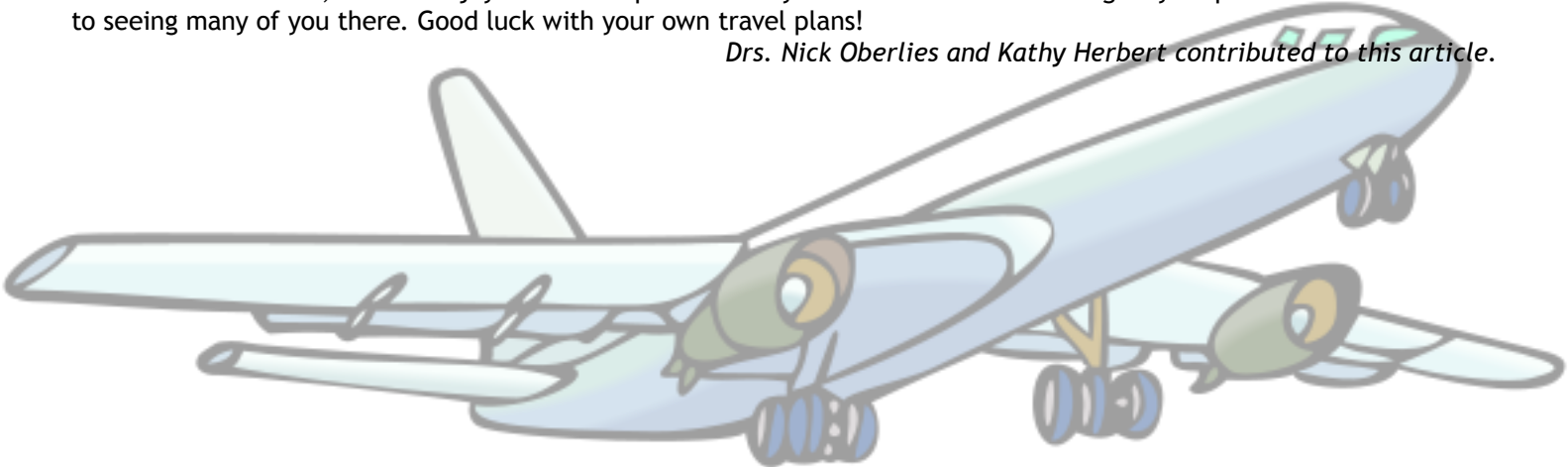
Many airline web pages have useful websites, especially if you are committed to a particular carrier. Delta, for example, identifies the lowest cost flight within one day of your travel date, and I found this function especially helpful since my travel days were somewhat flexible.

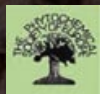
During this extended process, I received a mailing from American Express offering me a Gold Delta SkyMiles Card and 15,000 bonus miles if I became a member. It seemed like an offer too good to pass up. I ended up getting my first American Express card, using it to purchase my direct flight on Delta from JFK for just under \$1,500, and raking up some bonus miles. Dr. Kathy Herbert, wife of ASP member Dr. John Berger, reports that Continental Airlines offers their current Onepass members 25,000 bonus miles if they get their Mastercard. The trip itself will get you over 8,000 miles in a frequent flyer program.

Before buying the ticket, I checked on which seat to select at www.seatguru.com. This site gives you some indications about which are the better seats, and perhaps more importantly, which seats to avoid; being across from the restroom on a 10-hour flight may not be too pleasant.

All in all, the price for a ticket to Greece for the 2008 meeting will probably be in the neighborhood of \$1500 from eastern United States, but the enjoyment that I predict that you will have at the meeting may be priceless. I look forward to seeing many of you there. Good luck with your own travel plans!

Drs. Nick Oberlies and Kathy Herbert contributed to this article.





7th Joint Meeting of APERP, ASP, GA, PSE & SIF

NATURAL PRODUCTS

WITH PHARMACEUTICAL,
NUTRACEUTICAL, COSMETIC
AND AGROCHEMICAL INTEREST

**Athenaum Intercontinental
Athens Greece, 3-8 August 2008**

www.jointmeeting.2008athens.gr

Inauguration of the Historical Research Center, Lloyd Library

by Ms. Anna Heran



Mr. Mark Blumenthal (right) and Dr. W. Hardy Eshbaugh speak with an event attendee.

On Saturday, March 1, 2008, at a well-attended afternoon event, the Lloyd Library and Museum announced the inauguration of the Historical Research Center for the Natural Health Movement, in Cincinnati, Ohio. Two ASP members, Dr. A. Douglas Kinghorn, the Jack L. Beal Professor and Chair of Natural Products Chemistry and Pharmacognosy at The Ohio State University, and Mr. Mark Blumenthal, the Founder and Executive Director of the American Botanical Council as well as Editor and Publisher of *HerbalGram*, helped kick off the event together with Ms. Rosemary Gladstar, an herbalist and natural medicine entrepreneur

The combination of information presented by Dr. Kinghorn and Ms. Gladstar gave the audience a real sense of the breadth and depth of this important field of study. Their presentations covered its grassroots rebirth in the 1960s and 1970s to the modern day efforts to revitalize the scientific study of natural products for their medicinal properties. Mr. Blumenthal rounded out the picture with a look at a historical timeline of natural medicine, and stressed the importance of documenting this history.

Mr. Blumenthal's comments were built upon by the Lloyd's Archivist, Ms. Anna Heran, who stressed the need to document the movement in the modern era and the fact that both the archival and book collections the Lloyd already possesses are used in modern-day research. Notable examples are those of the Lloyd brothers, or the just-released for research Varro E. Tyler papers, the newly acquired papers of Robert Raffauf, and other similar collections. The real impetus behind the Research Center's existence is that the historic collections need to be preserved and cared for in a proper environment by trained professionals, as these collections can help guide the research of the future.

The book collection of the Lloyd is already incomparable and has often been described as a "mecca" for researchers, both from a scientific and grassroots herbalist perspective. With over 200,000 volumes of books and journals relating to the study of natural medicine and 1,000 linear feet of archival material, the collection is a real treasure. This collection presents the researcher with a wide variety of materials, not all strictly scientific, but from an array of sources and viewpoints, that contribute to a more complete picture of the field. The Lloyd will now be able to offer this to an even greater extent, documenting the players in the movement, both individuals and institutions, who have made the field of natural products what it is today.

The Lloyd Library extends its invitation to the people who really make this field what it is to consider depositing their papers, be they the collection of single persons or businesses or organizations within the field, at the Lloyd Library, a world class institution serving the world.



Ms. Rosemary Gladstar (left center) and Dr. Doug Kinghorn (right center) speak with guests following the lectures at the Lloyd.

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.

The 4th Interim Meeting of the American Society of Pharmacognosy and 7th Annual Oxford International Conference on the Science of Botanicals

University, Mississippi
April 12-16, 2008

www.oxfordicsb.net

The 49th Annual Meeting of the American Society of Pharmacognosy/ 7th Joint Meeting of AFERP, ASP, GA, PSE, and SIF

Athenaum Intercontinental Hotel
Athens, Greece
August 3-8, 2008

www.phcog.org/AnnualMtg/Athens.html

Society for Economic Botany: 49th Annual Meeting

Duke University, Durham, North Carolina
June 1-5, 2008

www.econbot.org/_organization_/index.php?sm=07|meetings_by_year/2008

Symposium on Medicinal Plants, Their Cultivation and Aspects of Uses

Ash-Shoubak University College
Ash-Shoubak, Jordan
October 15-16, 2008

please contact: Dr. Mazen A. Ateyyat
ateyyat@bau.edu.jo

Natural Products Discovery and Production II: Celebrating Successes of Traditional and Novel Cultures

Whistler, British Columbia, Canada
June 22-26, 2008

<http://engconfintl.org/8an.html>

The 50th Anniversary Meeting of the American Society of Pharmacognosy

The Sheraton Waikiki
Honolulu, Hawai'i
June 27 - July 2, 2009

www.phcog.org/AnnualMtg/ASP50poster.pdf

New Members of ASP

ASP would like to welcome the current new members of 2008. 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 domestic full members, one international full member, and six associate members. We look forward to meeting you and learning more about you and your work.

Full Members

Dr. Adewale Adio
Saskatoon, Canada

Dr. Hassan Amjad
Beckley, West Virginia

Feng Chen
Belmont, Massachusetts

Mr. Frank S. D'Amelio
Hauppauge, New York

Ms. Yadana Desmond
New York, New York

Dr. Susan Ensel
Frederick, Maryland

Dr. Serge Fotso
Corvallis, Oregon

Ms. Elisabeth Pilarinou
Tallahassee, Florida

Ms. Cassandra Quave
Miami, Florida

Dr. Harry Rosenberg
Henderson, Nevada

Dr. James Saunders
Dayton, Maryland

Dr. Ghee Tan
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Associate Members

Ms. Ayano Imai
Chicago, Illinois

Nafiseh Khosravi Dehaghi
Karaj, Iran

Ms. Anna Kochanowska
Oxford, Mississippi

Ms. Mariya Kolesnikova
Houston, Texas

Mr. Amir Wahba
Oxford, Mississippi

Laura Wright
Tucson, Arizona



Meet a New ASP Member

by Dr. Diane S. Swaffar

ASP welcomes many new members to the Society this year. We are now especially delighted and honored to actually welcome back a former member of the ASP, Dr. Harry Rosenberg. In addition to holding the position of University President, he is also Professor of Pharmaceutical Science and is the Founder of the University of Southern Nevada (USN). He also recently founded a new branch campus of USN in South Jordan, Utah. In addition to his top administrative role, he teaches biochemistry in the Doctor of Pharmacy Program. We are grateful to him for giving us the opportunity to get reacquainted with him after 25 years.

Why did you join ASP after not being a member for 25 years?

After all of my discussions with you and seeing your enthusiasm for the society, I must say that you have really piqued my interest in pharmacognosy again. I would really like to be up-to-date on what is going on in the world of pharmacognosy. Since I left the society in the early 1980s, I am sure that I have a lot of catching up to do.

Why did you leave the society then?

At that time, my research interests changed. I got involved in research on the secondary complications of diabetes.

What are/were your research interests in pharmacognosy?

When I was active in that area, I did what I call “aberrant synthesis”. Working with alkaloid biosynthesis primarily in cactus species, I would modify substrates with new functional groups and then determine enzyme specificity.

I know that you have had a very distinguished career as a researcher, academician, and administrator. Can you tell us how it all began?

Well, I obtained a B.S. in Biology from the University of Toronto. I received a B.S. in Pharmacy, Pharm.D., M.S., and Ph.D. in Biochemistry/Natural products from the University of Michigan. I began my academic career at the University of Nebraska, rising to the ranks of Professor. I then accepted a position as Pharmaceutical Sciences Department Chair at Campbell University after which I moved on to become the Dean at North Dakota State University College of Pharmacy. I then became the Founding Dean of the College of Pharmacy at Western University in Pomona, California, where I started an innovative block system of learning. As you know, I established the Nevada College of Pharmacy, now USN, and the rest is history!

What would you like to achieve through your membership?

As indicated earlier, I would like to know what is going on in the world of pharmacognosy and what kinds of research people are doing in that area. With my busy schedule, if time permits, I would like to become involved again in collaborations with our potential natural products researchers as we expand our research program.



Dr. Harry Rosenberg in the classroom.

Then with you as a new member, do you think that there would be a greater emphasis on pharmacognosy on both campuses?

Yes, I would anticipate that to be the case.

What do you like doing in your spare time?

When I have spare time, I really enjoy “wood turning”. I have turned wood into many mortars and pestles over the years. Although I am not that good at it, I also enjoy playing golf when I have the time.

Behind The Scenes in Pharmacognosy

Microbes Wage a Battle of Good and Evil

by Amy Keller

In the summer of 2007, the *Angewandte Chemie International Edition* published “Isolation and Structure of Platencin: A FabH and FabF Dual Inhibitor with Potent Broad-Spectrum Antibiotic Activity”, authored by Dr. Hiranthi Jayasuriya and collaborators, many of which are in the laboratory of ASP member Dr. Sheo Singh. Dr. Singh illuminates the hard work that goes into discovering novel antibacterial compounds of microbe origin at Merck & Co., Inc.

How did you become interested in antibiotic natural products and antibiotic-resistant bacteria?

Prevalence of drug resistant bacteria is increasing. Methicilli-resistant *Staphylococcus aureus* (MRSA) is certainly well known but other resistant bacteria are equally dangerous. According to the World Health Organization, the bacterial infections that contribute most to human disease are also those in which resistance is most evident such as diarrhea, respiratory tract infections, meningitis, sexually transmitted diseases, and hospital-acquired infections. The development of resistance to drugs commonly used to treat malaria is of particular concern, as is the emerging resistance to HIV drugs.

The structural diversity of natural products fascinated me. When working with natural products one does not know what kind of chemical structure one will discover. Natural products are a very productive source of drugs that save human lives. The structural diversity, potent biological activities, and the probability to become life saving drugs, is a very potent combination I see with natural products that continues to resonate with me. Merck has a long history of natural products and antibiotics research that include the discovery and development of imipenem in 1970s and many other antibiotics before that.

Treatment of drug resistant bacterial infection is a serious unmet medical need and Merck is committed to the discovery and development of novel antibacterials to fulfill this unmet medical need.

Who in your laboratory carried out the research?

Drug discovery is a highly complex operation performed by integrated teams. Discovery of platencin is no different. It was accomplished by a team of microbiologists, biologists, and chemists in two continents. Sample collection, microbiology and initial screening were performed in our laboratories in Madrid, Spain. Chemistry and biological evaluation were done in Rahway, New Jersey. The part of my chemistry team along with the biology champion, Dr Jun Wang is pictured in the photo.

Platencin was isolated from the fermentation broth of the microbial cultures by Dr. Hiranthi Jayasuriya supported by Mr. Kithsiri Herath. The structure was elucidated by Dr. Jayasuriya, Mr. Chaowei Zhang, and Ms. Debbie Zink with help from other members of the team.

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?

Platencin is produced by a strain of *Streptomyces platensis* and was discovered from soil samples collected in Spain. The soil sample was identified as a part of Merck’s discovery efforts in which we collect the soil and environmental samples throughout the world following the Convention of Biological Diversity treaty. The selection process is based on



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A portion of platencin discovery team: Dr. Hiranthi Jayasuriya, Ms. Debbie Zink, Mr. Chaowei Zhang (front row from left) and Dr. Jun Wang, Dr. Sheo Singh, Mr. Kithsiri Herath (back row from left).

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Behind The Scenes in Pharmacognosy

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geography and climate, but otherwise is random.

At the time of collection, we do not know whether the soil sample will provide anything worthwhile. It is after long and hard work that we discover a compound like platencin, with lots of failure in the way. We discovered platencin by screening approximately 250,000 extracts originating from nearly 83,000 microbial cultures.

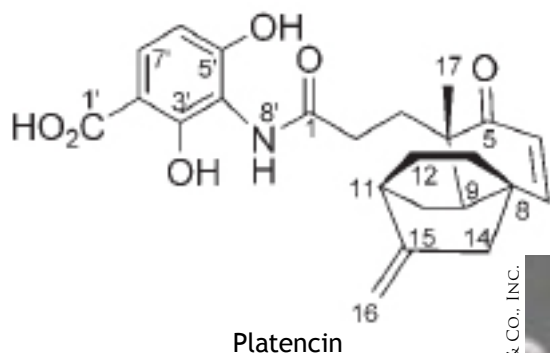
The biggest asset that enabled us to differentiate the extract containing platencin from others containing known antibiotics was the biological screening assay that we used for this discovery. The assay that was used for this discovery was a target-based whole cell differential sensitivity assay using antisense technology for target sensitization. This process allowed us to make the assay more sensitive to identify what we would have missed in the past and also allowed us to discover natural products with predicted mechanisms.

For natural products-based discovery one needs to have highly sensitive robust biological assays, diverse sources that will produce diverse chemical structures, and the capability and know-how to combine these to translate into fast isolation and characterization of structures of compounds and their biology. It has to be a highly integrated team approach that comprise of natural products chemists, microbiologists, biochemists, and other biological expertise. This was all in place for the efficient discovery of platencin.

Platencin is a novel natural product with unprecedented structural features and is a highly effective Gram-positive antibacterial agent. It inhibited growth of key pathogenic Gram-positive bacteria including MRSA- and other drug-resistant Gram-positive bacteria. It has a unique mode of action. It inhibited both FabF and FabH enzymes of bacterial fatty acid synthesis pathway. More specifically, platencin inhibits the acyl-enzyme intermediate, the second (condensation) step of the enzyme reaction. It showed in vivo activity against *Staphylococcus aureus*-infected mouse model.

What impact does this research have? How does this affect the world of natural products and the future treatment of bacterial infections?

The antibiotics we use today fall into one of only a few families, including erythromycins, tetracyclines and cephalosporins, to name a few. When bacteria develop resistance to one product, they usually develop quick resistance to other members in an antibiotic family. What is different about platencin is that it targets a process in the bacterial cell that no other currently available antibiotic targets. It inhibits the fatty acid synthesis which is essential for bacterial survival. The discovery of platencin and earlier report of discovery of platensimycin suggests that an untapped source for chemical diversity with huge therapeutic potential still remains in nature. Continued discovery of new molecules with new mode of action is the key to combat the bacterial resistance.



Platencin



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Streptomyces platensis

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Brief News From Washington



by Dr. Georgia Perdue

☞ Dr. Josephine Briggs was appointed Director of the National Institutes of Health (NIH) National Center for Alternative and Complementary Medicine (NCCAM). She told the NCCAM Advisory Council in early February that she is “very excited to be [at NCCAM] for this very complex job.” She “very much wanted the job for three reasons:” Her experience as a nephrologist provided her the realization that the “emphasis on the whole person is important as are people’s cultural beliefs.” Second, as a scientist she has a strong belief in the scientific method but is “concerned about dogmatic statements by scientists.” She has a “soft spot for tradition and wisdom of grandmothers.” Dr. Briggs also wanted the position because of her “love of NIH.” She missed the stimulation from and interaction with her former colleagues. She noted with pride that her oldest son, Martin Schermann, is at Scripps, La Jolla, California, working on his doctorate under Dr. Dale Boger on natural products chemistry. Dr. Briggs received her A.B. degree *cum laude* from Harvard-Radcliffe College and her M.D. from Harvard Medical School. From 1997-2006 she was director of the Division of Kidney, Urologic and Hematologic Diseases in the National Institute of Diabetes and Digestive and Kidney Diseases. These last 18 months she was a senior scientific officer at the Howard Hughes Medical Institute. Over the next six months Dr. Briggs plans to listen to NCCAM staff and Council members and then set forth some priorities, including one or two new initiatives for NCCAM. A very animated person, she was warmly welcomed. She and NCCAM’S late director, Dr. Stephen Straus, worked closely together on many projects.

☞ The National Cancer Institute (NCI) has established the Chemical Biology Consortium (CBC). According to NCI Director Dr. John Niederhuber, “the long-term view ... is to bridge the gap between basic scientific investigation and clinical research supported by NCI as a first step in re-establishing NCI as a world leader in the area of innovative cancer therapeutics discovery.” The CBC is to be an “integrated research cooperative [between] chemical biology and molecular oncology.” A cancer drug discovery group will be established on the scale of a small biotechnology company and focus on unmet therapeutic needs in oncology not presently addressed by the private sector. CBC is envisioned as a resource for academia and industry. The Rapid Access to Intervention Development (RAID) program will be a key player as will high-throughput screening.

☞ The final budget for NIH for FY 2008, signed December 26 by the President, is \$29.2 billion. NCI’s budget is \$4.797 billion; the budget for the National Institute for Allergies and Infectious Diseases (NIAID) is \$4.560 billion and NCCAM’s \$121.5 million. The FY 2009 President’s budget released in early February is essentially flat for NIH and includes a 5.7% increase for Food and Drug Administration (FDA).

☞ The paylines for R01 grants at the NCI will be at the 12th percentile; for new investigators it will be at the 19th percentile. Also, NCI will be introducing the Small Business Innovation Research (SBIR) Bridge Award, Phase II B, which will deal with the “valley of death problem,” -- the time between Phases I and II and product development. The applicant must have a venture capitalist who is willing to invest an appropriate amount. NCI will then invest accordingly. “This will allow us to invest in the very best because there will have been a rigorous review by the venture capitalist,” Dr. Niederhuber told the NCAB, adding, “NIH Director Elias Zerhouni is very excited about this.” A subcommittee of the NCAB will have an advisory role.

☞ Dr. Zerhouni told the NCAB meeting that the physical sciences, which had been shortchanged with funds for a long time, are now getting generously funded. “We need to promote all sciences, not one over the other, but that is the budget process.” Dr. Zerhouni said it is most important to sustain the number of research grants and new investigators “who are ready to come into the system.” He is passionate about the Bridge Awards which he considers the “life and blood of new ideas.” These awards support “vulnerable scientists,” who file first renewals. And, Dr. Zerhouni noted that NIH must not “flinch from funding new high-risk research. NIH should invest one to one and a half percent of its budget in this kind of research.”

☞ The recent Dietary Supplement and Nonprescription Drug Consumer Protection Act has gone into effect. It requires manufacturers and distributors of dietary supplements and OTC drugs to report all serious side effects etc. For more information see: www.fda.gov/OHRMS/DOCKETS/98fr/07d-0388-gdl0001.pdf The key sponsor of the bill was Senator Orrin Hatch (R-UT). Co-sponsors include Richard Durbin (D-IL), Tom Harkin (D-IA), Edward Kennedy (D-MA), John Cornyn (R-TX), and Michael Enzi (R-WY).

☞ Dr. Anthony Fauci announced that a new antimicrobial drug to treat drug-susceptible and drug-resistant tuberculosis (TB), SQ109, discovered by NIAID scientists in 1999 and licensed to Sequella, Inc., Rockville, Maryland, in March 2006 under a Cooperative Research and Development Agreement, has been granted orphan drug status by the FDA and the European Medicines Agency.

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