PSNA News

Phytochemical Society of North America
Sociedad Fitoquímica de América del Norte
Société Phytochimique de L'Amerique du Nord

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President's Message

Clint Chapple

By any measure, the 2005 meeting of the Phytochemical Society of North America at the Salk Institute was an outstanding success… excellent scientific program with great colleagues in a beautiful location. Nevertheless, and as I outlined in my last letter to the members of the PSNA, I believe that our Society is at a crossroads, and based upon my discussions with other members of the PSNA Executive and Advisory Committees while at the La Jolla meeting, it is clear that most of them share this view.

What issues face the PSNA?

Our membership is not at critical mass for a number of reasons including the retirement of senior members among other factors. Indeed, our membership is not increasing at a time when plant biochemistry research is flourishing. Attrition of our membership can also be attributed to changes in federal funding priorities which have, over the past decade, turned away from some of the more traditional aspects of phytochemistry in favor of more molecular or integrative approaches. An additional and largely self-imposed problem is that there is a high turnover rate of Executive Committee members prescribed by the PSNA Constitution, and limited opportunities for involvement of membership in society affairs. This has made the organization of society meetings burdensome for the organizers and has resulted in limited long term planning of meetings. This lack of advanced meeting scheduling has in turn led to limited meeting attendance. Finally, the PSNA has a specialized focus within the broader arena of plant chemistry and biochemistry and does not have a well-defined agenda with regard to the promotion of the science of its members. As a result, the society has a low degree of visibility among a broader community of plant biochemists, and is not widely recognized as an influential force among funding agencies. All of these issues must be dealt with, and dealt with quickly, for the PSNA to become a vibrant society.

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2006 July 8- 12
Oxford, Mississippi

2007 Chicago, Illinois

2008 Banff, Canada

The Phytochemical Society of North America

The Phytochemical Society of North America (PSNA) is a nonprofit scientific organization whose membership is open to anyone with an interest in phytochemistry and the role of plant substances in related fields. Annual membership dues are U.S. $40 for regular members and $20 for student members. Annual meetings featuring symposium topics of current interest and contributed papers by conference participants are held throughout the United States, Canada, and Mexico. PSNA meetings provide participants with exposure to the cutting-edge research of prominent international scientists, but are still small enough to offer informality and intimacy that are conducive to the exchange of ideas. This newsletter is circulated to members to keep them informed of upcoming meetings and developments within the society, and to provide a forum for the exchange of information and ideas. If you would like additional information about the PSNA, or if you have material that you would like included in the newsletter, please contact the PSNA Secretary. Annual dues and changes of address should be sent to the PSNA Treasurer. Also check the PSNA website at www.psna-online.org for regular updates.

PSNA Membership Drive

The PSNA Executive Committee would like to invite all members of the society to participate in our first membership drive. In order to maintain a vibrant society, we must all get involved and encourage those interested in the society to join. You may be surprised to find those working around you that are not aware of the PSNA and its mission. The annual PSNA membership dues remain remarkably low when compared to those of similar societies, so please encourage your friends and colleagues to join the PSNA!

The PSNA Mission Statement

The objectives of the society shall be to encourage and stimulate research into the chemistry and biochemistry of plant constituents, their effects upon plant and animal physiology and pathology, and their industrial importance and utilization, and to encourage and stimulate communication of these interests among members by providing a forum for the presentation, discussion and publication of scientific research for the advancement of science and promotion of the common welfare.

Please photocopy the membership application enclosed in this newsletter and distribute it directly to those interested parties, individuals, departments, and groups.

Info on the 2006 PSNA Meeting

A proposed schedule can be found on page 12. The meeting details are being worked out and the current information is posted on the PSNA website. We hope to have registration, abstract submission and hotel details available soon.

(President's Message, continued from Page 1)

How can the PSNA make advances?

There are a number of readily-identified ways in which the PSNA can be re-invigorated. First, I believe that we must increase the appeal of our society to a broader community while maintaining the interest of our current members. Second, we must identify one or more "mission(s)" for the society so that our members, their students, the broader community of plant scientists, and the federal funding agencies recognize a greater benefit and impact of the PSNA. Finally, we need to recognize that we must train our students in all aspects of plant biochemistry, ranging from natural products chemistry to genomics and ecology to structural biology. The PSNA should play a role in that effort by continuing to provide a yearly meeting at which our students can be fully immersed in these diverse aspects of plant chemistry and biochemistry.

What strategies have been discussed by the PSNA Executive Committee?

All of the ideas listed above have been the focus of intense discussion among the members of the PSNA Executive and Advisory Committees. Although not all conversations resulted in unanimity, a clear majority supported each of the following initiatives.

First, we must modernize our business procedures and update the Society's constitution and by-laws. Our current constitution is outdated and prevents the Society from responding rapidly and effectively to issues that arise between meetings. Although the PSNA membership will be asked to vote on further revisions to the constitution and by-laws in the upcoming year, the first step in this initiative was accomplished at the PSNA business meeting in La Jolla where the members present unanimously voted in favor of the following two changes to the PSNA constitution:

Resolution to change the Article IX of the PSNA Constitution

- *from:* Section 2. All business requiring action by the membership shall be transacted at a Business Session which shall be scheduled by the Executive Committee during the Annual Meeting.
- *to:* Section 2. All business requiring action by the membership shall be transacted at a Business Session which shall be scheduled by the Executive Committee during the Annual Meeting, or through electronic voting following dissemination of necessary informational materials to the membership.

Resolution to change the Article XII of the PSNA Constitution

- *from:* Section 2. The establishment or amendment of such Bylaws shall require a simple majority vote of the membership.
- *to:* Section 2. The establishment or amendment of such Bylaws shall require a simple majority vote of the ballots returned by the membership following an electronic ballot.

Our second challenge is to expand the Executive Committee to involve more members, distribute workload, and take on additional challenges. Currently, the bulk of the work of the society falls on the shoulders of only five people: the President, the Treasurer, the Secretary, the Editor-in-Chief, and the annual meet-

ing organizer. This situation is less than optimal for at least two reasons. First, the work load associated with these positions sometimes results in items on the Society agenda not being dealt with as quickly as might be desirable. Second, and more importantly, it means that a larger proportion of our membership does not have the opportunity to contribute to PSNA activities, thus decreasing their sense of ownership of their Society. To remedy this situation, the PSNA Executive Committee will soon be recommending new positions be embodied in the constitution that will provide opportunities for more members to become involved in, to name a few, meeting organization, web site operation, new member recruitment, and outreach opportunities such as the AraCyc editor positions described in this issue of the PSNA newsletter by Sue Rhee. This mission would add substantial impact and visibility to the Society and will help to recruit additional members.

Third, with the expiration of our current contract with Elsevier for the publication of Recent Advances in Phytochemistry, it is an opportune time to re-evaluate the impact of the Society's publication strategy. Although many people enjoy the book series, its sales have been flagging in recent years. Further, as promotion and tenure committees and grant panels focus increasingly on citations and impact factors, it is reasonable to question whether we are placing our members' excellent manuscripts in the most high profile and high impact outlet when we ask them to contribute to Recent Advances in Phytochemistry.

Finally, we must redefine the breadth of focus of the society to capture the interest of a broader group of plant chemists and biochemists. Over the years, there has been attrition in the ranks of natural products chemists attending the PSNA meetings. Many apparently feel that the meetings have come to have too strong a focus in the area of molecular biology. These perceived divisions and lack of visibility seem particularly unfortunate at a time when efforts in metabolomics would greatly benefit from the skills of natural products chemists, and when molecular insights into the genes and enzymes involved in natural product synthesis are shedding new light on how the structural diversity of this group of compounds arises. At the same time, the perceived focus in molecular approaches has failed to bring to the Society new members from this area of plant biochemistry and molecular biology, possibly due to the somewhat outdated term "Phytochemical" in the name of the society.

As a first step toward redefining our Society, the Executive Committee will soon ask the membership to vote on a proposal to rename the "Phytochemical Society of North America" the "International Society for Plant Chemistry and Biochemistry (ISPCB)". Although some of our membership will ask "What's in a name?", and others may feel very comfortable with the current name of the Society, I believe that the proposed name change is significant. First, science is an increasingly international endeavor, and by defining the Society as an international society, we will be able to draw upon a broader membership (not to mention the possibility of exciting future meeting venues!). Second, by specifying both chemistry and biochemistry in the moniker of the Society, we would be articulating a commitment to research on both the phytochemicals that plants produce and the genes and enzymes required for their production. Third, considering that most aspects of plant biochemistry are relatively poorly served by existing societies and meetings, I believe that including "biochemistry" in the Society's name will attract a broader population of plant biochemists to become members.

I look forward to a spirited discussion among the membership on these and other issues of concern to the PSNA.

Secretary's Message

Mark Berhow

Another year has gone by and I am still finding it difficult to keep organized and get newsletters out on a timely basis! Oh, well. I do need members (or non members) to send me material so we have something to print! At the 2005 meeting in La Jolla, the executive committee continued the discussion of issues concerning the future of this society. Changes are coming and we will need the input and volunteer time of our membership to keep this society up and running. A key component will be to publish a regular newsletter, so we will need contributions from the membership.

The website has finally been overhauled and I continue to post items on the site as I get them. Two important things we can do for our membership is to post upcoming meeting information and links for meetings that are generally or specifically related to plant phytochemistry and post position openings. If anyone has information on meetings and positions, please send them to me at webmaster@psna-online.org.

Information on the 2006 PSNA meeting is included with this issue and will be posted on the website. Please consult the website for the latest updates.

An important role for PSNA for metabolic databases MetaCyc and AraCyc

What are MetaCyc and AraCyc?

MetaCyc* is a metabolic database whose aim is to become a universal repository of experimentally defined biochemical pathways. Developed in a collaborative effort between Carnegie Institution of Washington (Carnegie) and SRI International (SRI), MetaCyc in its most recent release (version 9.5) contains information on over 500 organisms. This database, which contains a wealth of information on pathways, reactions, enzymes, genes and compounds (visit http://www.metacyc.org/MetaCycOverall.shtml for an overview), is being used as a reference database allowing the computational generation of species-specific databases using their annotated genome in conjunction with the PathwayTools Software Suite developed by SRI. Thus the metabolic architecture of *Arabidopsis thaliana* has been predicted in the **AraCyc*** database developed by Carnegie. Since its inception AraCyc has been refined through manual curation by Carnegie curators. This curation effort has focused on the removal of inappropriate pathways (such as predicted pathways leading to the biosynthesis of compounds that do not exist in *Arabidopsis*), the ongoing addition of missing pathways (simultaneously added to MetaCyc) and updating of existing pathways. In its present version (version 2.5) 86% of AraCyc's 197 pathways have been validated (the 14% remaining have been predicted to exist but not yet experimentally ascertained), many of which remain to be fully refined with pathway descriptions, enzyme information and literature reviews.

A role for PSNA

The immense task of incorporating the entirety of plant metabolism knowledge into MetaCyc and AraCyc befalls on just three curators at Carnegie. They review the literature to assess the validity of pathways, and to gather enzyme information on as many species as possible. PSNA, by its very nature, is a perfect complementary partner and a primary beneficiary of these resources. Under the energetic leadership of PSNA President Clint Chapple, PSNA members have offered assistance in enriching and refining MetaCyc and AraCyc. We are actively seeking members wishing to join our editorial board. Those members will be asked to review pathways whilst acting as permanent contacts making the link between Carnegie curators and specialists in the field. Additionally, we will soon organize a first curation jamboree over a few days where 2-3 scientists will be invited to come to Carnegie at Stanford to review/curate their favorite pathways. Most importantly, we would like to encourage PSNA members to submit pathway/enzyme comments, pathway suggestions, report mistakes or send requests to incorporate any material resulting from their own research or of general interest to the plant research community at large. For this purpose, a form has been made available **online** which allows users to submit a variety of request directly to **Carnegie curators**. We are looking forward to hearing from you.

Useful links:
MetaCyc: http://www.metacyc.org/
AraCyc: http://www.arabidopsis.org/tools/aracyc/
Pathway submission form: http://www.arabidopsis.org/info/pathway_submission.jsp
Carnegie curators: curator@arabidopsis.org

PSNA Annual Meeting Business News

August 1, 2005
Mark Berhow, PSNA Secretary

President Clint Chapple opened the meeting and outlined the meeting agenda. He noted that the PSNA is facing some significant changes over the coming years and urged all members to get involved with the organization to carry it through these changes to make a stronger, more vigorous organization.

2005 Meeting: Meeting chair Joe Noel noted that this meeting has gone fairly smoothly. Between donations and registration fees, the meeting committee has raised about $47,000. He estimates that the meeting will have about $40,000 in expenses, depending on the invited speaker expenses. After getting off to a slow start, the meeting planning and execution went well.

Recent Advances in Phytochemistry (RAP) series: Editor in Chief John Romeo noted that this will be our fortieth year of publication. The series was started to fill a void in phytochemical literature and has seen the participation of the leaders in the field including Eric Conn, Tony Swain, and Jeffery Harborne. The book series has changed publisher a few years back with a requirement that the PSNA guarantees the sale of 75 units each year. While the books

have generally sold well to libraries, we have had problems in recent years selling our obligated books to our own members. The publisher has typically sold from 500 to 1000 copies of each volume we have released.

2006 Meeting: Charles Cantrell and Daneel Ferreira are organizing the 2006 meeting which will be held at the University of Mississippi campus in Oxford, MS July 8-12, 2006. The organizers have looked at the meeting dates for other organizations and these dates have the least conflicts with other meetings. Oxford is home to strong natural products research programs by the University and by the USDA. The host committee also includes Franck Dayan, and Daniel Cook. The goal is to have a very diverse program of topics to attract the most interest in attendees as possible. The idea for this meeting is to not have a single overall theme as we have had for past PSNA meetings. Local hotels, bed and breakfasts will be able to accommodate 100-120 people expected to attend the meeting. Oxford is about 80 miles SE of Memphis, TN, which is the nearest major airport, and a shuttle from the airport would be about $80 per person. Local transportation to and from the meeting to the hotels should not be a problem. Local attractions include the Faulkner home, the University, and Memphis. The committee is working on the finalization of the program and should have thing wrapped up soon.

Treasurers Report: Charles Cantrell noted that a full report will appear in the next newsletter this fall. There has been a slight decrease in the funds in the PSNA investments and this has decreased interest revenue. In general, there has been an overall decrease in total membership over the past few years.

Nomination Committee: The leadership committee was not overwhelmed by nominations for president. In light of the lack of candidates, it was proposed that Clint Chapple stay on another year as PSNA president. Charles Cantrell has served his three years as Treasurer. The nominating committee put forward two nominees for Treasurer. After some discussion, the committee was asked if they could narrow their nominee down to one name.

Secretary Report: Mark Berhow has completed the transfer of duties from the past Secretary Peter Facchini. He has published one newsletter and has completed the transfer and revision of the PSAN website at www.psna-online.org. The organization needs volunteers top submit articles and notifications for posting in the newsletter and on the website. He noted that we would like to have four newsletters a year, but two would probably be email only.

Other business:

Clint Chapple led a general discussion on the state of the Phytochemical Society of North America and some proposed changes to foster membership growth and participation. He noted that the PSNA was an excellent source of information on phytochemical research; the meetings were small and allowed for good interaction among the attendees. The meeting symposia published as RAP have been a valuable contribution the literature and the meetings have been well attending by graduate students. However, the membership has been declining and is not at a good critical mass. Plant biochemistry research is flourishing both in terms of interest and funding around the world, but the PSNA is not attracting the participation it should be. The recent problems in dealing with executive committee turn over and long term planning of the annual meetings. The society needs better management of these critical functions within the group. The PSNA lacks a clearly defined mission, has low visibility among the broader community of plant related research.

Dr. Franck E. Dayan New PSNA Treasurer

Dr. Franck E. Dayan was elected to a three year term as the Society Treasurer by electronic ballot in December. He replaced Charles Cantrell who held the position for the past three years.

Franck is currently a Research Plant Physiologist with the USDA-ARS Natural Products Utilization Research Unit in Oxford, MS. He was born June 25, 1965 in Lyon, France and received a B.S. in Biology with Chemistry minor from Stephen F. Austin State University (Texas) in 1988. Subsequently, he obtained his MS degree in Botany with a minor in Statistics from this same university in 1992. He received his Ph. D. in Botany with Biochemistry minor from Auburn University (Alabama) in 1995. His thesis work focused on the mode of action of phytotoxins that inhibit porphyrin synthesis in plants. This research led to the elucidation of selectivity between weeds and

crops. He was a postdoctoral fellow in Dr. Stephen O. Duke's laboratory from 1995 to 1997 and joined the staff of the Natural Products Utilization Research Unit as a permanent research scientist in 1998. His research is multifaceted and includes the isolation and characterization of phytotoxic natural products (in collaboration with chemists Drs. Cantrell and Rimando), the discovery of novel target sites in plants that can be used to develop novel herbicides, and the biosynthesis of plant natural products (in collaboration with molecular biologist Drs. Baerson, Cook and Pan). This work is focusing on sorgoleone, an allelochemical produced by the roots of sorghum, but it also includes the biosynthesis of lipid resorcinols in rice. This work provides the fundamental information that was needed to identify the genes involved in order to manipulate the pathway. He is senior or co-author of 96 non-abstract scientific publications that include 51 peer-reviewed scientific articles, 1 US patent granted and 1 pending, 13 reviews in scientific journals, 28 book chapters and 4 reviews published in international conference proceedings. He has been invited to numerous international conferences to present his work. He serves on the planning committee for the 2006 meeting of the Phytochemical Society of North America. He also serves on the Herbicide Resistance Committee of Weed Science Society of North America and as an associated editor for Weed Science. He was the recipient of the USDA-ARS Early Career Research Scientist of the Year in 2001 and received a commendation from the Mississippi Legislature (House Resolution 63) in 2001 for his accomplishments.

2005 PSNA Meeting Awards

2005 PSNA Student Travel Awards

Diego Cortes, Virginia Tech
Chris Fraser, Purdue University
Starla Kiser, East Tennessee State University
David Liscombe, University of Calgary
Ann Patten, Washington State University
Anthony Qualley, Purdue University
Suqin Shao, University of Western Ontario
Clarice De Azevedo Souza, University of British Columbia
Christy Strong, East Tennessee State University
Jing-Ke Weng, Purdue University
Yue Yang, University of Michigan

Best Poster Award (Ph.D. student)

Winner: Jing-Ke Weng, Purdue University
First runner up: Yue Wang, Salk Institute
Second runner up: David Liscombe, University of Calgary

Best Poster Award (Post-docs who are relatively recent Ph.D.s)

Winner: Dinesh Nagegowda, Purdue University
Runner up: Michel Auldridge, Salk/ University of Michigan

Best Poster Award Recent Ph.D. 2005

Dinesh Nagegow

I was born in Mandya, a small town in south India. Biology has always fascinated me and has remained my favorite subject right from my school days. My interest in plant biology has its roots in my *alma mater*, the University of Agricultural Sciences, Bangalore, India, where I did my undergraduate and graduate studies in Agriculture.

By the time I finished my B.Sc. I had made up my mind to pursue a career in plant biology. I joined the Biotechnology Department at the University of Agricultural Sciences, Bangalore, India, for my masters where I worked with Dr. Ramanjini Gowda on the transformation of the glucanase-chitinase gene into tobacco plants. After completion of my M.Sc. in 1998, I worked as a Research Associate in the same lab on a project entitled 'Development of transgenic cantaloupes producing edible vaccine against rabies'.

In 2001, I was offered a PhD fellowship from the University of Hong Kong where I joined Dr. Mee-Len Chye's lab in the Department of

Botany. For my PhD, I worked on molecular and biochemical characterization of *Brassica juncea* 3-hydroxy-3-methy-glutaryl-CoA synthase, an enzyme involved in the mevalonate pathway of isoprenoid biosynthesis. During this period I had an opportunity to carry out part of my research at Professor Thomas Bach's lab in IBMP, Strasbourg, France. As part of my PhD program I attended the Plant Biology meeting in 2003 held in Honolulu, Hawaii, where I briefly met Dr. Natalia Dudareva and was very much impressed with the work in her lab on the regulation of floral scent emission.

After obtaining my PhD in 2004, I joined Dr. Natalia Dudareva's lab as a post-doctoral fellow in the Department of Horticulture at Purdue University, West Lafayette. I am currently working on the molecular and biochemical characterization of genes involved in snapdragon and petunia floral scent formation.

The poster I presented in this meeting was on 'characterization of a bifunctional terpene synthase from *Antirrhinum majus* (Snapdragon) catalyzing the formation of a sesquiterpene, nerolidol and a monoterpene, linalool'. Plants release diverse blends of volatile compounds that play crucial roles in pollinator attraction, defense and communication. Terpenoid compounds are one of the major constituents of plant volatiles. Snapdragon flowers emit a sesquiterpene, nerolidol derived from farnesyl diphosphate (FPP) in addition to three geranyl diphosphate (GPP) derived monoterpenes, myrcene, ocimene and linalool. Of the monoterpenes, genes encoding myrcene and ocimene have been characterized. In order to isolate the genes encoding linalool and nerolidol we did a detailed search of the *Antirrhinum* petal specific EST library that resulted in isolation of a cDNA (designated as *AmNES*) that has a high similarity to known sesquiterpene synthases. RT-PCR analyses of RNA from different floral tissues revealed that *AmNES* is highly expressed in upper and lower petal lobes with negligible expression in green tissues. Its expression begins in 1 day-old flowers and peaks on the 4th day postanthesis remaining relatively stable until day 10 and then decreasing slightly. For functional characterization, we expressed AmNES in *Escherichia coli* as C-terminal $(His)_6$-tagged protein. Subsequent purification and characterization showed that it requires Mg^{2+} as a divalent metal cofactor for its activity and it catalyzes the formation of nerolidol and linalool from FPP and GPP, respectively.

This work was supported by National Science Foundation (MCB-0212802) and Fred Gloeckner Foundation.

Best Poster Award Graduate Student, 2005

Jing-Ke Weng

I was born in Hangzhou, China in 1981, at the time when China began to open its door to the world and started to adopt the One-Child Policy due to the intense pressure from steady population growth. Therefore, like other Chinese children who were born at the same time, I have witnessed the dramatic change in life quality and style, while living under the pressure of high expectations from my parents over the last twenty four years. My father, Huan-Xin Weng, is a professor in geology and environmental sciences. During my childhood, he often brought me with him on all sorts of field trips to see the spectacular landscapes and geological architectures that nature has created. He always inspired me with his scientific stories about continental drift, volcano formation, paleoclimate changes, dinosaur extinction, and so on. My mother Hai-Yan Chen is a government officer. She loves reading and guided me into the field of ancient Chinese literature and philosophy from an early age, from which I have benefited a great deal.

I got my BS degree in biotechnology from Zhejiang University, a prestigious university in China. My undergraduate life was intense, but joyful. Besides studying for the courses required by my department, I got many opportunities to learn things outside of the classroom. In my junior year, I participated in a project in my father's lab, working on engineering organic iodine into various vegetables by applying iodized fertilizer, as an alternative to iodized salt for human iodine intake. In my senior year, I moved on and joined Dr. Ji-Zeng Du's neurobiology lab to study the influence of the intermittent hypoxia on the learning and memory in postnatal mice for my bachelor thesis. Besides science, I also studied classical music and classical guitar intensively in my spare time and performed in many local concerts.

I traveled to the US in 2003 and joined the Plant Biology Program at Purdue University. Now I'm working in Dr. Clint Chapple's lab as a doctoral student. My research project focuses on studying the evolution of lignin biosynthesis and the phenylpropanoid pathway in *Selaginella moellendorffii*. My inter-

est in this topic was piqued by the fact that although syringyl (S) lignin is often regarded as being restricted to angiosperms, it is also found in some lycophytes, including *S. moellendorffii*. My goal is to elucidate the molecular mechanism and the evolution of this phenotype. I started this project with an *S. moellendorffii* EST sequencing project to take an initial survey of its transcriptome and to search for candidate genes that may play key roles in synthesizing S lignin in *Selaginella.* The EST resource as well as the recent release of the whole genome shortgun sequences of *S. moellendorffii* by the JGI has greatly facilitated my work. To date, I have cloned candidates for the *S. moellendorffii* homologs of the three phenylpropanoid P450s that are involved in lignin biosynthesis, including a homolog of CYP84A1, a gene that is essential for S lignin synthesis in *Arabidopsis*. I'm now in the process of testing the functional equivalence of both the coding region and the cis-regulatory region of the *S. moellendorffii* phenylpropanoid P450 candidates by cross-species complementation of *Arabidopsis* phenylpropanoid mutants. These candidate genes will also be expressed in yeast and assayed for catalytic activities toward potential substrates *in vitro*. I believe that this project will provide important information for better understanding the evolution of phenylpropanoid pathway in vascular plants.

When I'm not in the lab doing experiments, I enjoy doing the tango, gardening, and traveling around the country. I love my graduate school life: doing the research that I like and experiencing a different culture in the same time. Here I would like to take this opportunity to thank Clint for his guidance and the NSF for funding my research project.

Treasurer's Message

Franck Dayan
Thursday, January 11th 2006

I wish you all a happy and successful New Year for 2006.

I am starting to learn how to use Access 2003 to manage the society's membership roll. Dues notices have been be mailed, so please send in your renewals promptly. Our yearly membership fee is a quite reasonable $40. Please continue to support the PSNA.

We are offering our Recent Advances in Phytochemistry Volumes 34, 35, 37, 38, 39 are available at special discount prices for a limited time.

Purchase any two books for $160 (20% off)
Purchase any three books for $210 (30% off)
Purchase any four books for $240 (40% off)
Purchase all five books for $250 (50% off)
Please contact me at psnatreasurer@yahoo.com if you are interested in any of these options.

THE 2006 PHYTOCHEMICAL SOCIETY OF NORTH AMERICA MEETING

July 8th-12th, 2006
Oxford, Mississippi
Prelimary Program

The annual Phytochemical Society of North America Meeting will be held from July 8th-12th, 2006 at the University of Mississippi. Located approximately 60 miles south of Memphis, Tennessee, Oxford is a small southern community with a population of 12,000 permanent residents and 10,000 university students. Visitors will enjoy Oxford's unique Southern charm, flourishing art community, and historic square with its eclectic mix of posh boutiques, art galleries, and restaurants. Trace the steps of many well known writers who have proudly called Oxford home, including William Faulkner, Willie Morris, and John Grisham, or enjoy the great outdoors by exploring Sardis Lake, one of many State Parks, or the lushly landscaped Ole Miss campus.

The organizing committee has an exciting program planned this year, with many meals and outings included in the registration. They have put together a total of six symposia, encompassing a broad range of disciplines from plant chemistry and biochemistry. Please notice the preliminary program of symposia topics and plenary speakers outlined below. This year, the organizing committee will be accepting contributed papers to help fill the available slots in each symposium. If you would like to be considered for a short talk, please indicate so when submitting an abstract.

Natural Product Biosynthesis and Biochemistry
Dr. Norman Lewis
Dr. Tony Kutchan

Natural Product Synthesis
Dr. Mitchell Avery
Dr. David Kingston

Natural Product Isolation, Structure Elucidation, and Methods for Analysis
Dr. William Reynolds
Dr. Rachel Mata

Herbal Products and Nutraceuticals
Dr. Jim McChesney
Dr. Iklas Khan
Dr. Mahmoud ElSohly

Metabolic Engineering of Natural Products
Dr. David Gang
Dr. Sanja Roje

Discovery and Development of Natural Products for Pest Management
Dr. Steven Duke
Dr. Jonathan Gershenzon

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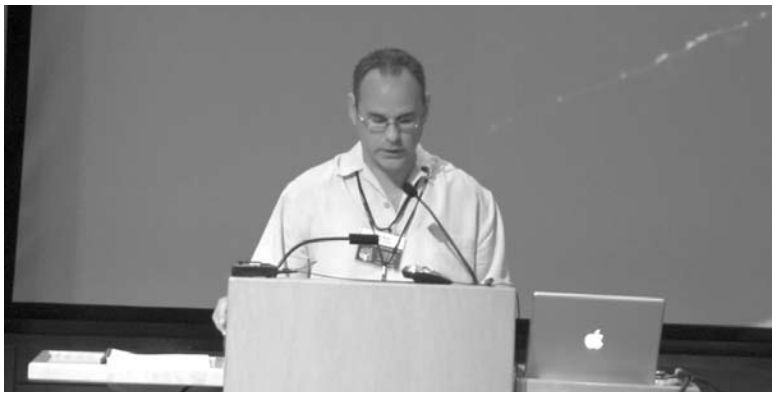
2005 PSNA Meeting attendees



Joe Noel, 2005 Meeting Organizer

Recent Advances in Phytochemistry Series
Order Form for Volumes 34 to 39

Recent Advances in Phytochemistry is now published by Elsevier. Under the new contract, a 50% discount on symposium volumes sold to members and attendees of our annual meeting is available when our Treasurer submits a bulk order at the time of submission of the volume for press. Because the cost of symposium volumes has exploded in recent years, this savings to members is considerable!

THE SOCIETY COMMITS TO PURCHASING 75 COPIES OF EACH VOLUME. Any books not sold at pre-publication prices can still be ordered directly from the treasurer, but price includes shipping costs. Once the 75 copy supply is sold, orders will be directly through Elsevier at a 40% discount to members. You support the Society by purchasing our volumes! Please renew or begin your subscription now!! All prices are in US dollars!

Volume 39	Chemical Ecology and Phytochemistry in Forest Ecosystems PSNA Member Price if order placed by January 31, 2005 = $90.00 After January 31st, 2005 price will be $100.00
Volume 38	Secondary Metabolism in Model Systems PSNA Member Price (part of PSNA 75 copies purchase) $100.00
Volume 37	Integrative Phytochemistry: from Ethnobotany to Molecular Ecology PSNA Member Price (part of PSNA 75 copies purchase) $ 100.00
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Membership Application

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May we include/link your directory/homepage information on the PSNA website? Yes/No

Research Interests (circle up to 4 items):

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B. Alkaloids
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F. Flavonoids
G. Glucosinolates
H. Lignans
I. Lipids
J Nitrogen compounds
K. Nucleic acids
L. Organic acids
M. Phenolics
N. Pigments
O. Quinones
P. Stilbenes
Q. Sugars/polysaccharides
R. Sulfur compounds
S. Terpenoids
T. Vitamins
aa. Biochemistry/physiology of herbicides
bb. Enzymology
cc. Cell wall chemistry
dd. Chemotaxonomy
ee. Biotechnology techniques
ff. Plant-insect interactions
gg. Plant-microbe interactions
hh. Plant-plant interactions
ii. Chemical reactions/organic synthesis
jj. Biochemistry of secondary interactions
kk. Fungal metabolism
ll. Growth regulators products
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nn. Industrial applications
oo. Structure identification
pp. Marine natural compounds
qq. Medicinal chemistry
rr. Membrane structure/function
ss. Molecular/immunological
tt. Nitrogen fixation/metabolism
uu. Pharmacology/pharmacognosy
vv. Plant pathology
ww. Plant genetics
xx. Recognition-cell surface
yy. Tissue/cell culture
zz. Toxicology of natural
OTHER: _____

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PSNA News

Phytochemical Society of North America
Sociedad Fitoquímica de América del Norte
Société Phytochimique de L'Amerique du Nord

Volume 45, Number 2 November 2006

Open Letter to Phytochemical Society of North America Membership: A Call to Action

Norman Lewis, PSNA President

Foreword and Welcome:

I would like to begin this Fall 2006 PSNA Newsletter by warmly thanking Daneel Ferreira, Charles Cantrell and Franck Dayan for the superbly organized and highly successful PSNA meeting held in Oxford Mississippi from July 8 to July 12, 2006. On behalf of all of the membership, congratulations and thanks! The richness of the meeting was not only in terms of the far-reaching breadth of phytochemically related studies being carried out currently by our membership, but it also allowed us to fondly remember and recognize (at the PSNA banquet) the remarkable work of some of the early pioneers in the Society: Stewart A. Brown, Nikolas (Klaus) Fischer, as well as the late Jerry McClure and G.H. (Neil) Towers.

I would thus urge you to please read on and recall your own memories of this wonderful meeting. If you were unable to attend, however, then read on anyway to obtain a glimpse of the richness of this year's gathering. One great strength of the annual PSNA meetings is their Gordon Conference-like nature, where it is readily possible to have the opportunity for detailed, substantive, interactions. Indeed, this format has long been the basis for the lasting success of this Society. Moreover, this year, the PSNA membership present at the Oxford Meeting made it very clear that is the style of meeting preferred.

Nevertheless, PSNA faces a number of challenges and opportunities as we move forward into the future. In this newsletter, I propose a path to solving many of these issues, most of which are structural, while retaining our unique identity and strengths. Of these issues, the most pressing at this time, is to increase our PSNA membership numbers. Accordingly, this newsletter marks the launching of the first PSNA Membership Drive, and WE NEED EACH OF YOUR HELP ON THIS! We are delighted to announce that the New Membership Committee charged with this task consists of Klaus Fischer (Chair), Franck Dayan, and Rachel Mata. Let me thank each of them for their willingness to do this.

Getting Back on Track: Like many of you, I have recognized that the Society is currently in crisis, but am now only fully understanding the extent. I have committed myself to lead the Society this coming year and the *next*, albeit with a certain corrective course in mind. In order to do this effectively, I had asked the membership to vote on a one-time 2-year Presidency in order to have sufficient time to get the Society

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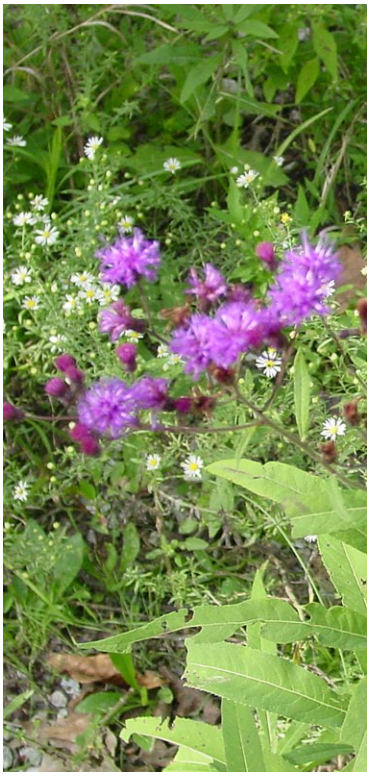

The Phytochemical Society of North America

The Phytochemical Society of North America (PSNA) is a nonprofit scientific organization whose membership is open to anyone with an interest in phytochemistry and the role of plant substances in related fields. Annual membership dues are U.S. $40 for regular members and $20 for student members. Annual meetings featuring symposium topics of current interest and contributed papers by conference participants are held throughout the United States, Canada, and Mexico. PSNA meetings provide participants with exposure to the cutting-edge research of prominent international scientists, but are still small enough to offer informality and intimacy that are conducive to the exchange of ideas. This newsletter is circulated to members to keep them informed of upcoming meetings and developments within the society, and to provide a forum for the exchange of information and ideas. If you would like additional information about the PSNA, or if you have material that you would like included in the newsletter, please contact the PSNA Secretary or visit our website at www.psna-online.org. Annual dues and changes of address should be sent to the PSNA Treasurer. Also check the PSNA website for regular updates.

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PSNA Membership Drive

The PSNA Executive Committee would like to invite all members of the society to participate in our first membership drive. In order to maintain a vibrant society, we must all get involved and encourage those interested in the society to join. You may be surprised to find those working around you that are not aware of the PSNA and its mission. The annual PSNA membership dues remain remarkably low when compared to those of similar societies, so please encourage your friends and colleagues to join the PSNA!

PSNA Mission Statement

The objectives of the society shall be to encourage and stimulate research into the chemistry and biochemistry of plant constituents, their effects upon plant and animal physiology and pathology, and their industrial importance and utilization, and to encourage and stimulate communication of these interests among members by providing a forum for the presentation, discussion and publication of scientific research for the advancement of science and promotion of the common welfare.

Please photocopy the membership application enclosed in this newsletter and distribute it directly to those interested parties, individuals, departments, and groups.

PSNA Goal:

To encourage and stimulate research in the chemistry and biochemistry of plant constituents, their effects upon plant and animal physiology and pathology, and their industrial importance and utilization.

President's Letter *(Continued from page 1)*

back on track. What faces us cannot be done in one year. Thus, I would ask each of you to carefully consider the action items contemplated, and to become involved in re-energizing the Society. We can, and will, get back on track, and will turn the current situation around, with your help. Let all of us, however, thank Clint Chapple for what he has done to this point in leading PSNA.

Society's Mission and Emphases: As many of you may know, I have been a member of PSNA for more than two decades, attending my first meeting in Asilomar, California, at the urging of the then, and actually only dually elected PSNA president, G. H. Neil Towers. I was immediately struck by the camaraderie of the Society, and of its wide interests which ranged from plant chemistry/biochemistry, medicinal plants, pharmacology, chemical ecology, and so forth, to the then fledgling interests in molecular biology/genetics, etc. The meetings have also generally followed a Gordon Conference-type format. This scientific breadth and this meeting format has been, and continues to be, a major strength of PSNA.

For myself, I was, and remain, intrigued by the remarkable and diverse forms of plant species, numbering in the hundreds of thousands, that produce such fascinating arrays of molecules, many of complex and intriguing chemical structures. Indeed, these phytochemicals represent the very essence of life itself: for example, it is they that provide much of the basis of our diverse foodstuffs, it is they that give the natural hues and colors of our environment that we so fondly admire, as well as affording the fragrances, tastes and smells that many of us relish. It is also phytochemicals that provide a considerable number of the drugs that humanity depends upon, and it is they that are important sources of our fiber and structural material supplies. Although still largely unexplored, we are also continuing to slowly gain an appreciation of the value of this phytochemical "currency", and of the resulting complex (bio)chemical interactions that involve them both within and between species—indeed, it is these interactions that represent the very essence of life.

Phytochemistry is thus a quite remarkable area of study, whose "tentacles" extend to literally every field of science and human endeavor. Since the beginnings of the Society in 1961, many of us thus became drawn together by these common interests and were captivated by the remarkable phytochemical diversity. This resulted in an eagerness in us to understand how such complex molecules are formed, what their structures are, what roles they play in the environment, or in medicine, and so on. In short, phytochemistry is ***not*** a "barren" study of a single organism, but instead is a field devoted to understanding life's wonderful bounty. Accordingly our missions are diverse: for example, they range from the study of complex (bio)chemical mechanisms, to genetics, to the understanding of factors controlling plant produce quality/quantity and so forth. It is a very broad and a very exciting field.

In spite of this optimism, we would all do well to remember the words of the late, naturalist Dame Miriam Rothschild, who was known personally to many members of the PSNA and PSE. She cautioned that science has now "become illiterate, isolated and over-specialized." Her own studies, by contrast, drew remarkable general public attention to the natural world, and her legacy should also serve as a reminder of the exciting work that lies ahead in all of the fields of phytochemistry—as life's mysteries are unraveled. It

is our obligation to bring these new discoveries to light, and for the benefit of humanity.

PSNA traces its origins back to 1961, when it began as the Plant Phenolics Group of North America. Its history was thus mainly built upon the study of complex plant "secondary" phytochemicals. Indeed, much of what we now know today about plant biochemical pathways (e.g. protein/enzyme function) began with the toil of these pioneers, of which many are or were Society members. The Society has since expanded its interest to other areas, such as in the emerging approaches utilizing bioinformatics, metabolomics, genomics, proteomics, structural biology, as well as from the remarkable advances in chemical characterization/synthesis, etc. In short, the pioneering spirit of PSNA is as evident today in the Society as it was at the beginning, albeit in more diverse scientific ways than before.

PSNA Challenges and Opportunities: Essentially all of the challenges facing PSNA are structural, and require both a full and sustained commitment by the Society—both within the general membership, and more specifically from the dedicated, committed, involvement of its Executive Officers. Over the course of the last few months, several PSNA members have thus brought to my attention various discussion points (action items) that are now receiving full attention. Some of these are briefly summarized below and include 1) the PSNA Constitution; 2) the PSNA name; 3) PSNA elections; 4) PSNA financial stability and sustainability; 5) PSNA annual publications; 6) PSNA membership; 7) PSNA newsletters/web pages and visibility; 8) PSNA annual meetings, including scope, organization and planning; 9) PSNA interactions with related societies; 10) identifying mechanisms to sustain and encourage the professional development of the PSNA student body, as well as identifying formal means to appropriately honor the extraordinary achievements of the membership (from service to science).

1) PSNA Constitution: The Constitution and By-laws need to be updated and revised, in order to meet the changing emphases and thrusts of the Society. Earlier, I sought PSNA membership majority approval to move forward on this. More specifically, duly elected Executive Officers (see below) were charged with providing a revised (draft) Constitution, with full membership input, then obtaining a majority agreement by the PSNA membership, and ratifying same by November 1, 2006.

Action Taken: A draft revised constitution was prepared by Clint Chapple. At the July 2006 meeting, a New Constitution Committee was established. It will shortly complete its recommendations, and these will be forwarded to the PSNA membership by November 15, 2006 (target date), for ratification.

2) PSNA Name: Given the quite large number of structural issues that emerged, I recommend that any proposals to initiate a name change currently be tabled. There are many successful societies whose names do not necessarily adequately reflect the society's depth and range of interests. I have proposed that for the time being we retain the PSNA name, by which it is known worldwide. PSNA does, however, need to "remarket" itself to more effectively embrace the different sub-disciplines and scope of the membership. This has already successfully been done for both journals, Plant Physiology and Phytochemistry, i.e. without need for a name change.

The opportunity thus now exists for PSNA to capitalize on its distinct interest areas (e.g. chemistry, molecular biology, biochemistry) and to "market" these in a way that the Society membership can build upon. I previously sought and obtained PSNA membership majority approval to move forward on this. Duly elected Executive Officers would thus be charged with developing an effective means to ***visibly*** enhance these different discipline areas, and to obtain majority agreement on how to move forward in these areas over the next 5 years. Date for completion: 31 December 2006. This then gives an additional year and a half to build on these areas.

3) PSNA Elections: This is another serious structural issue facing PSNA membership, and I sought and obtained PSNA membership majority approval to move forward on this as well. The PSNA Constitution ***requires*** that nominations are solicited by the membership and that election of Officers be completed two months prior to the Annual Meeting. Previously, for the Office of President (held for 1 year only), only two names are to be forwarded for voting, and which are dependent upon general membership votes. However, there were no elections since 2003. Nor were nominations sought for the position of President in 2004 and 2005, or within the required timelines for 2006. An analogous situation existed for the Office of Vice-President. No nominations have been sought since 2003 until earlier this year.

I thus proposed to the membership that this matter be quickly and efficiently dealt with: I have agreed to serve two years to correct these structural issues, and proposed that Dr. Mark A. Bernards and Dr. Peter Facchini successively follow in the positions of (Vice)-President Elect (2006/2007) and (Vice)-President Elect (2007/2008), respectively. By next year's annual meeting, nominations would then be sought for Vice-President Elect (2009). This will ensure continuity.

Duly elected PSNA Executive Officers will then be charged with

meeting timetables for elections, and helping to ensure membership participation. Thereafter, (from Summer 2006 onwards), nominations and elections will be able to follow the original PSNA Constitution procedures. These can be accessed at http://www.psna-online.org/PSNAoldweb/toc.html.

Action Taken: Begin solicitation of nominations by email to Secretary (or any officer) of the PSNA. The Secretary will collate the nominations and present them to the executive committees. See nomination form in this issue of the newsletter, which will also be posted on the PSNA website.

4) PSNA Financial Stability/ Sustainability: Recent decisions, made without much general input from the PSNA membership, have resulted in an elimination of sources of revenues, specifically publication royalties. There has also been a substantial decline in membership revenues. I propose to have the PSNA Executive expeditiously re-evaluate this matter, as PSNA had considerable visibility through its publications, which has now perhaps been lost. I would propose, therefore, that both the PSNA Treasurer and (past) PSNA Editor-in-Chief are charged to assess the financial projections and financial needs for PSNA for the next 10 years, and to assess this with and without a royalty stream. With this information, the PSNA Executives can then begin to develop an appropriate and realistic financial plan for Society growth, with input from the membership.

Date for completion of financial plan: December 1, 2006, with implementation phase until the end of the 2nd year of the PSNA Presidency.

5) PSNA Annual Publications: PSNA has had a long history of publishing Recent Advances in Phytochemistry as an annual publication. Until now, this has given considerable visibility to the Society, although no impact factors were associated with the publication. To my understanding, RAP had mixed results in terms of generating royalty income, and consequently this year PSNA moved to publishing a Special Issue of Phytochemistry (no royalty) and eliminated RAP.

I proposed that a 10-year plan be developed by the Executives to address the question of future PSNA publications, that a new committee be set-up for same, that the recommendations made therein be ratified by the general membership, and that PSNA move forward aggressively on identifying a suitable long-term publication outlet. *Phytochemistry* is now currently the only publication officially associated with PSNA at present.

Action Taken: This coming year the first volume of a New Series entitled "Advances in Plant Biochemistry and Molecular Biology" (APBMB) by Elsevier has been launched, with both myself and David Nes, the chief editors. Additionally, this year selected (peer-reviewed) papers from the PSNA meeting will be published in an upcoming issue of *Phytochemistry*. These two developments will both reflect PSNA involvement and leadership.

6) PSNA Membership: This has precipitously fallen since 2000. I proposed setting up a membership recruitment committee comprising of at least 4 individuals, some drawn from the general membership. The goal will be to double our current membership within 2 years, and to develop a plan to increase numbers to 600-800 or so by 2010. This should be an achievable goal.

Action Taken: Membership committee formed (see below), and Membership Drive launched.

7) PSNA Newsletter/Web Pages/ Ballots: Currently, the PSNA Secretary is charged with all of these responsibilities, and has done yeoman work in each of these areas. In other societies, however, there are specific committees and/or individuals for each responsibility. I proposed that we immediately restructure these responsibilities, to enable the Society to meet all of its newsletter, web page and balloting needs in an even more interactive manner with the general membership.

Action Taken: Restructuring in place, with a new committee assembled to take on the different responsibilities, by December 31, 2006. The period until the end of the 2-year Presidency will then bring Society matters back to a regular, anticipated, schedule.

8) PSNA Meetings: Because of the current electoral lapses, upon election of President (2006), a proposed Vice-President (2006/2007) and a proposed Vice-President Elect (2007/2008), we will develop a plan to identify the location, scope and organization of meetings for 2007-2010. Thereafter, each year the PSNA will have a mandate to maintain an active 5-year meeting plan/ organizing committee.

Action Taken: PSNA meeting for 2007 is being organized, and information will be forthcoming shortly. Contacts are out to discuss meeting venues between now to 2013 (including the 2011 PSNA 50th anniversary).

9) Interaction of PSNA with Related Societies: Upon election of President (2006), (Vice)-President (2006) and (Vice)-President Elect (2007), each for two years duration, I would propose that a new committee be formed to develop appropriate ties with foreign societies (e.g. PSE, etc.) in order to consider joint meetings, dual memberships, etc. Specifically, we will involve key members of related societies worldwide to do this.

Timeline: December 1, 2006. The period December 2006–July 2008 will aggressively build on these interactions.

10) Recognition: In recent years, there has been a notable lapse at PSNA meetings, in honoring the achievements of its membership and that of other scientific contributors. I proposed that an Award Committee now be formed, and with a timeline for formation of November 1, 2006. The purpose will be to ensure that outstanding contributions are recognized appropriately on an annual basis.

Action Taken: Recognition of Neil Towers and Jerry McClure's scientific accomplishments/service, and to Stewart A. Brown and Nicholas (Klaus) Fischer for their recognition as PSNA Pioneers.

Together, we will get the PSNA back on track. I have agreed to lead PSNA from 2006–2008, and will continue to be involved until our goals are achieved. Thank you.

2006 Meeting of the PSNA at Oxford, Mississippi

Mark Berhow

The 2006 Annual Meeting of the Phytochemical Society of North America was held at the Yerby Conference Center on the campus of The University of Mississippi in Oxford, Mississippi from July 8th to July 12th. The meeting was hosted by the National Center for Natural Products Research, The University of Mississippi Department of Pharmacognosy, and the USDA-ARS Natural Products Utilization Research Unit. The organizers were Franck Dayan, Daneel Ferreira, Charles Cantrell, and Daniel Cook. The meeting had five major themes for the speaker program instead of one overriding theme. The organizers limited the number of invited speakers and instead mixed in speakers selected from contributed papers, along with the invited Neish young scientist speakers. I thought this was an excellent idea to make a good connection with the people that regularly attend this meeting. By integrating the contributed papers and broadening the themes covered in the meeting, we had a more diverse set of presentations that better covered the broad range of research interests of the society, but all centered on plant natural products.

The first set of talks was natural product synthesis and biosynthesis. The invited speakers were Norman Lewis from Washington State University, who spoke on the factors affecting the formation and accumulation of biologically active plant phenolics, such as lignans, chlorogenic acid, and the biopolymer, lignin, Toni Kutchan now at the Danforth Research Center, who reported recent developments in opiate alkaloid biosynthesis in poppy plants, David Kingston from the Virginia Polytechnic Institute and State University, who discussed the structure function analysis of the biosynthesis of taxol, and Mitchell Avery from the University of Mississippi, who summarized the progress made towards the total synthesis of pseudolaric acid B.

The second theme was natural products isolation, structure elucidation, and methods for analysis. The invited speakers were William Reynolds of the University of Toronto who discussed overcoming problems in natural products identification by NMR, and Rachel Mata

of the Universidad Nacional Autonoma de Mexico reported on the evaluation of natural products with calmodulin inhibitor properties.

The third theme was discovery and development of natural products for pest management. The invited speakers were Jonathan Gershenzon from the Max Planck Institute for Chemical Ecology who described engineering plants for enhanced chemical defenses for managing insect pests and Stephen Duke from the USDA ARS NRUPU lab who discussed discovery and development of plant natural products for pest management.

The fourth theme was metabolic engineering of natural products. The invited speakers were David Gang of the University of Arizona, who talked about the control of aromatic metabolism in sweet basil, and Sanja Roje of Washington State University who discussed the exploration and engineering plant one-carbon and folate metabolism.

The fifth theme was herbal products and nutraceuticals. The invited speakers were Mamoud El Sohly of the University of Mississippi who discussed the marijuana research project, Ikhlas Khan of the University of Mississippi who described marker compound related research work, and James McChesney of Tabestry Phamaceuticals and Chromadex who addressed some current commercial issues with plant natural product sources vs. synthetic pharmacology.

The organizers hosted a wine mixer on Saturday evening and a banquet at the Oxford University Club on Tuesday evening. The poster session was held in the Thad Cochran National Center for Natural Products Research and afforded us a chance to see this tremendous research facility. A great tour of William Faulkner's home at Rowan Oak and the University of Mississippi Medicinal Plant Gardens rounded out the extra ac-

Norman Lewis and Phytochemical Pioneer Stewart Brown

Phytochemical Pioneer Nikolas Fischer and Charles Cantrell

Xing-Cong Li

Scott Simeon

Fabricio Medina-Bolivar

Mary Magnotta

Daniel Vassao

Reuben Peters

Dylan Levac

Damien Guerra

Steven Ralph

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Kevin Walker

Lukasz Kutrzeba

tivities for the meeting attendees. On Tuesday night the organizers hosted the society banquet at the Oxford University Club. Entertainment was provided by the Jones Sisters, and the banquet featured a fond recollection of the phytochemical research achievements and life of Professor Neil Towers, whose widow (Elizabeth) was in attendance. The society also recognized the contributions of Dr. Stewart A. Brown and Dr. Nikolaus Fischer to the PSNA and phytochemical research.

The award winners for this meeting were:

Neish Awards

Kevin Walker
Michigan State University
Xing-Cong Li
University of Mississippi
Fabricio Medina-Bolivar
Arkansas Biosciences Institute
Reuben Peters
Iowa State University
Steven Ralph
University of British Columbia

Best Poster Awards
Lukasz Kutrzeba
University of Mississippi
Jin Nakashima
Noble foundation

Student Travel Awards
Graduate
Scott Simeon
Arkansas State University
Oliver Corea
University of Western Ontario
Dylan Levac
Brock University, Ontario
Mary Magnotta
Brock University, Ontario
Daniel Vassao
Washington State University
Undergraduate
Damien Guerra
Washington State University

The meeting was a great mix of talks and as usual with these meetings we had a good opportunity to interact. While the management of the Society is undergoing some restructuring at the moment (see business news for more details), progress was made in discussing these issues and formulating a plan to move forward. I feel this meeting continued the tradition of outstanding presentations to a small group of participants, with good participation by the attendees in discussing the challenges and opportunities facing the society in the future. Also of interest to me was the opportunity for the host institution to showcase their research programs. This was supported by 12 presentations and posters from the research groups at the University of Mississippi. Altogether, a great meeting! Thanks again to the organizers!

PSNA Business Meeting Report

Sunday July 9, 2006 Yerby Convention Center, University of Mississippi.

The business meeting was opened by past president Daneel Ferreira. Daneel noted that this is a crucial meeting for the PSNA. The society is in disarray, and it is time to stop the bus and change direction to keep the membership from deteriorating. We need to restructure the society and sort out the issues that need to be addressed. PSNA is pretty much run by five people who have to do all the work, the presidents, the treasurer and the secretary. This has made it difficult to recruit new officers to serve the society due to the large work load that the society requires from its officers. A key new change is to develop a series of new committees to divide up the workload of the society. This will get more people involved in the society, divide up the jobs and bring in more participation of the younger scientists. He urged the membership to be open and frank about thrashing out what we need to do to bring changes that are needed. The agenda was then presented.

It was announced that Norman Lewis was elected President of the society. Franck Dayan assumed the Treasurer position in January, Mark Berhow is beginning his third year as Secretary. Officers and executive committee members not present at the meeting were past President Clint Chapple, editor-in-chief John Romeo, and the president elect who was elected but has not yet confirmed his acceptance of the position.

The treasurer's report was given by past-treasurer Charles Cantrell and treasurer Franck Dayan. The report is provided at the end of this report. Charles noted that there was a large drop in finances between 2004 and 2005. This was in part due to the required purchase of 75 copies of both the 2004 and 2005 RAP books by the society in 2005, with no increase in income that year. The 2001 meeting hosted by the Noble Foundation in Oklahoma City resulted in a sizable donation back to the society, and the subsiquent meetings have generally not generated revenue for the society (Exept for the 2006 meeting, which has generated a return). Still the society has been slowly losing capital over the past five years. The major expenses for the society has been the purchase of 75 copies of RAP for the society to sell and between $5000 and $15000 towards the annual meeting. The RAP expenses are generally recovered with royalties and page charges returned to the Society. In theory, the annual meeting should cover its own expenses, but the society has traditionally provided the funds for the Neish speaker awards, the student travel awards and the best poster awards. Our liquid assets are basically the same as they were in 2000, which means that we are losing ground on income. It should be noted that the dues have not changed in a number of years, at $40 per year membership is quite a bargain in comparison to other societies. Franck Dayan who became the Treasurer in January has been work-

ing to consolidate all our liquid cash accounts into a single bank. Our membership stands at 230 of which 130 have actually paid their dues for 2006. He noted that we are losing returning members, down from 370 or so in 2001. Franck noted that the society needs to be serious about both membership recruitment and retaining membership to keep the society dynamic. While he has sent emails to the existing membership, this is just preaching to the choir, we need to expand our recruitment efforts beyond our current membership. He suggests that a list of university departments and research centers in the USA and the world to make regular contacts about our society and its annual meeting to recruit new members.

The secretary's report covered the newsletter and website. The templates are all done for both the newsletter and website, what is needed now is content. Currently we are mailing one newsletter a year and it would be good to increase our mailings to two or even four a year. The website is easily modified and new content can be added. But, again, material needs to be submitted by the membership for posting on the site.

The Publications report covered how we plan on publishing our proceedings. As of last year our contract with Elsevier for *Recent Advances in Phytochemistry* (RAP) has ended. For this meeting the organizers have made an agreement with the Journal *Phytochemistry* to produce a special edition that will cover the proceedings of this meeting. The question is now how to proceed from here. Our constitution stipulates that our proceedings must be published, but does not specify how. RAP has given a solid publication for the society, but its impact does not seem to be as high. Is it time to reconsider this approach? The articles are not often referenced in other papers. The theme approach that has been followed at the meetings has focused the talks and has excluded the broader range of research interests of all the society, which may kept some scientists from attending the meeting if the topic was not of interest to them. The contract with Elsevier required the society to purchase 75 copies of the book at a discount, but we generally have not been successful in selling these books to recover our investment of $7500. The society has tried a number of methods to get our membership to buy these books, but generally has not been very successful and we still have a number of copies remaining for the past years. The question was raised as to what do we want to do with our published proceedings, make money or have impact? By publishing in *Phytochemistry* we will raise the level of impact and raise the visibility of the society by publishing in a peer-reviewed journal. We also lose the monetary obligation we currently have with the book publication. The point was raised that the publication of a book could still be pursued, with a new contract and a phytochemical emphasis, but again a focus would be required on a topic. By going the journal route, we can cover a variety of topics, we can involve our younger scientists. The journal route still requires a lot of work by the volunteer editors, they must select authors from the presenters, select reviewers, and prepare editorials. Norman Lewis said that *Phytochemistry* would be interested in continuing this partnership with PSNA for the foreseeable future as long as the PSNA provides the editorial help in the preparation of the issues. The participants at the meeting supported continuing the journal approach for publication of the proceedings.

Next the group discussed the proposed name change of the society. Clint Chapple, president of the society proposed that we change the name as away of revitalizing the society. Daneel Ferraira suggest that we hold off on a name change until we take care of reorganizing the workings of the society. Other members expressed a concern that the current name does not accurately reflect the diversity of the society. Objective II of the constitution actually states these broad objectives of the society, so the secretary will make that paragraph more prominent on the PSNA website and newsletters. There is a disconnect between the name and what the society covers in its meetings. It was discussed that a name change will give a better description of the societies interests. Others noted that more profound problems in the society organization and function have contributed to the low profile of the society and fixing those would increase participation regardless of the name. We need to emphasize the multidisciplinary interests of the membership of the PSNA and continue to expand this to make all researchers working on plant natural products, whether on functionality, biochemistry, analysis, or genetic regulation, excited about coming to these meetings. We also need to make a concerted effort to get students and younger scientists more involved with participation in the society. After much discussion, it was apparent that this is an issue that still needs to be addressed and should not be dropped.

In concert with the proposed name change, Clint Chapple has also prepared a number of proposed changes to the constitution. These changes should be evaluated and we need to move forward to get those changes incorporated in the constitution. Daneel Ferreira proposed that a committee be established to get these changes organized exclusive of the name change and present these changes to the membership as soon as possible to get this taken

care of. This motion was made, seconded and approved.

The executive committee then proposed a major re-organization in how the society will conduct its affairs by proposing the establishment of several new committees to divide up the chores of the society and to begin the process of membership and meeting recruitment. It should be emphasized that this is a proposal, and that the executive committee is very interested in receiving suggestions for changes in the committee organization and most importantly the participation of as many members who are willing to help do a job.

What is hoped that the committee members will discuss what the committee should accomplish, recruit new members as appropriate, and reach out to the general membership for help and suggestions. The Secretary will solicit reports from these committees for publication in the newsletter and an annual report will be filed for the next annual meeting. It is hoped that these committees will act quickly to get things up and running and accomplish some key objectives before the next meeting. The Executive Committee Proposed the following committees with the following volunteers to serve on the initial organization. The Executive committee would like to give these committees the freedom to develop their our objectives and agenda.

The NEW PSNA Committees

Membership and Society Advancement: charged with development membership recruitment and expanding the exposure of the society to research groups and other societies. Klaus Fischer (Chair), Treasurer Franck Dayan, Rachel Mata, and President Elect.

Website Committee: charged with overseeing the building of the content of the website and expanding its usefulness to the membership. Charles Cantrell (Chair), Secretary Mark Berhow, Cecile Bertin, Steven Ralph

Newsletter Committee: charged with expanding the content of the printed and electronic society news. Secretary Mark Berhow (Chair), David Schulz, Daneel Cook

Awards and Recognition Committee: charged with overseeing the selecting and judging of the existing society awards, the Neish speakers, the student travel awards, and the best poster awards, as well as proposing recognition awards for those contributing to the goals of the society. David Gang, Past President, Celia McIntosh

Proceedings & Publications Committee: Charged with overseeing the arrangements for a venue for the publication of our proceedings, and working with the meeting organization committees to select and review chapters or articles for the proceedings. The head of the committee will be the Editor-in-Chief, and will be expanded as neccesary. G.K. Jayaprakash volunteered to serve on the committee. Jim Saunders was also nominated as one who would be interested in serving on this committee

Future Meetings Committee: charged with identifying venues for future meeting and selecting or arranging for the formation of a local organizing committee. President Norman Lewis (Chair), Bhirma Patil, David Gang.

The arrangements for the 2007 meeting will be circulated shortly. The original plan was for a 2007 Joint meeting with American Society of Plant Biologists in Chicago July 7-11, but this will likely not occur for a variety of reasons . A new meeting plan is being worked out and should be arranged by the end of this year. 2008 Calgary/Banff Canada 2009 2010 potential joint meeting with the American Society of Pharmacognosy, 2011 location in Canada, 2012. This will be a major concern in the coming year to settle locations.

Constitution and Bylaws Committee: charged with evaluation the current proposed changes to the constitution by Clint Chapple and presenting them to the membership within this calendar year: Daneel Ferreira (Chair), and Cecilia McIntosh.

Also discussed were the formation of two other committees, which were not formally established, but should be. The PSNA needs volunteers to serve on these committees to get them established.

Name Change Committee: charged with the evaluation of the current proposed name change and work in conjunction with the Changes to the constitution committee.
Actin taken: None.

Young Scientists Committee: charged with recruiting and advancing the functional role of students and post-docs in the society.

The executive committee feels the establishment and function of these committees will galvanize the society. But we need to get things done and not postpone things to the next meeting. It is going to take a commitment from all our members to contribute to these committees and get things moving. This is an opportunity to build bridges for direct communication between research groups with an interest in plant natural products and to get younger scientist more involved with function of this society.

Jerry McClure

In Memoriam: PSNA President (1976) and Treasurer (1970-72)

JERRY W. McCLURE, Professor Emeritus of Botany at Miami University, passed away on Thursday, April 25, 2006, at Fort Hamilton Hospital. He had been a regular contributor to Phytochemistry for several decades, and was much liked by all.

Jerry McClure was born on May 3, 1933, in Floydada, Texas, and took pride in having gone from a depression-era cotton farm and a one-room school to becoming an internationally recognized scientist. He enjoyed traveling the world, laughter, and people; he never met a stranger and he always had a great story to tell. Literature and music were also important to him; he often quoted from Shakespeare to the writings of Heinlein.

Barely 16 years old when he graduated from Crosbyton, Texas, high school, he initially entered Wayland Baptist College where he was offered a music scholarship in voice. The next year, however, he transferred to Texas Tech University, where he earned a degree in Agronomy in 1954. Following military service in the U.S. Air Force from 1955 to 1959, he returned to Texas Tech, where he received an M.S. in Agronomy, and subsequently obtained his Ph.D. in Botany from the University of Texas, Austin, 1964; some of his Ph.D. research results were published in *Nature*.

Following his formal training, he joined the Miami University faculty in 1964, and attained full professorship in 1973. In 1972, he also became the first recipient of the Sigma Xi Outstanding Researcher of the Year award, and throughout his career, he received numerous National Science Foundation and U. S. Department of Agriculture grants to fund his research, until retiring in 2001.

Professor McClure received both an Alexander von Humboldt Foundation Senior U.S. Scientist Award from the West Germany government and a Fulbright Foundation Honorary Research Fellowship award to work as a visiting professor at Ruhr-Universitat, Bochum, Germany with Meinhart H. Zenk and Georg G. Gross. During this time, he also gave more than 30 invited lectures in the U.K., Belgium, Netherlands, Poland, USSR and East Germany.

In 1982, he was named a Distinguished Visiting Scientist at Texas Tech University, and the following year received the Heinrich-Hertz research award in Dusseldorf, West Germany, and the Gordon Research Conferences organizing award. Later, in 1987, he was an invited visiting scholar at the University of Nairobi, Kenya, and at the same time, worked with the Richard Leakey group and National Museums of Kenya. Before returning to Miami University in the fall of 1987, he presented invited lectures in Addis Ababa, Ethiopia; Asmara, Eritrea; Nanning and Guilin, Peoples Republic of China.

Professor Jerry McClure also tirelessly served our profession: he was Treasurer of the Phytochemical Society of North America from 1970-72 and later President in 1976, serving on many committee's and advisory positions. He was also the Chair of the Physiological Section of the Botanical Society of North America, and his other responsibilities included being a member of the Council for International Exchange of Scholars, Life Sciences; on the screening committee for Fulbright Awards; on the screening committee of the Woodrow Wilson National Fellowships Foundation, Ohio and Michigan region, and more.

His grasp of the scientific literature related to secondary natural products in plants was astounding, particularly as it related to plant phenolics. Not only could he cite virtually all publications in the natural products area, he would often provide you with personal anecdotes of the authors of these papers which sometimes involved sampling local beverages. Throughout his long career he would meet regularly with his research students and outline numerous research projects, experiments, or suggest papers that they should read. As the students returned with results he would always be ready with additional ideas and suggestions, and was very understanding when some of the more independent grad students would modify or ignore his previous advice, as long as they got good results. He encouraged industriousness and initiative from his students and is remembered by all that worked for him as a mentor, advocate, and friend.

He and his wife Frances were Danforth Faculty Associates; Presidents of the McGuffey Laboratory School PTO and the Community Service Program for Foreign Students (COSEP) Oxford; and regular helpers for Meals on Wheels. He was president of the Society of Miami Emeriti, 2005-2006, as well as a member of the Oxford Men's Club and the Oxford United Methodist Church. In addition to his wife Frances, his friend and partner for more than 52 years, he is survived by two daughters, Rachel (David) Pierce, Houston, Texas, and Martha (Mark) Gibbins, Monroe, Ohio; his sister, Margaret (Wayland) Jones, of Texas; three grandsons, aunts

and uncles, numerous cousins, colleagues, friends, and five students who received support from or lived with the McClure's as they pursued their education. According to his wishes, his ashes were scattered in the pasture on the family farm where he grew up and where he developed his first interests in the natural world.

Frances McClure (spouse)
1106 S. Locust Street
Oxford, OH 45056

James A. Saunders
Director, Molecular Biology, Biochemistry & Bioinformatics (MB3)
Professor, Department of Biological Sciences
Department of Chemistry
Towson University

Pioneers of Phytochemical Research

Dr. Stewart A. Brown

The recent recognition by the PSNA of my pioneering career in phytochemistry may indicate pioneering genes, if such exist, in my genome. These would date from the early nineteenth century when my great-great-grandparents emigrated from Belfast to the wilds of what was then Upper Canada, about 45 km north of Lake Ontario, and literally carved a home and farm out of the forest primeval. If so, these genes have been expressed on several occasions during my career.

My Interest is Established Early

My interest in phytochemistry took root shortly after the Second World War at Michigan State, where I was Richard U. Byerrum's first graduate student, doing a Master's thesis on a seed enzyme. Biochemistry was then taught as a predominantly static subject, and I recall my excitement at first reading Baldwin's *Dynamic Aspects of Biochemistry*, the first text I'd seen that examined in detail the many biochemical pathways of microbial and animal metabolism. By the time I had to choose a PhD thesis topic Dick Byerrum had become quite keen on plant metabolism, and in fact studied it for the rest of his career. I decided to work under him on a plant biosynthetic pathway. As biosynthesis in plants was a subject in its infancy, this was pioneering work, but the elegant groundbreaking tracer studies on photosynthesis by Melvin Calvin's group were pointing the way to the future in this area, and I was eager to get on board. We decided to seek evidence for transmethylation in plants, a reaction then only recently established in animals, and began studies with ^{14}C on the origin of the methyl group of nicotine in tobacco, my one and only foray into alkaloids. We found its methyl carbon to originate from the methyl carbon of methionine, demonstrating this reaction in plants for the first time.

Lignins in Saskatoon

In 1948 the National Research Council of Canada had opened its Prairie Regional Laboratory (PRL) in Saskatoon, Saskatchewan for the announced purpose of research in chemurgy, the development of new industrial products from agricultural wastes, and such research was indeed done for over 30 years. But NRC's president was Ned Steacie, and PRL's director Aleck Ledingham, both of whom most wisely allowed their subordinates a very long leash, and two of the PRL sections were headed by the rising young carbohydrate chemist Raymond Lemieux, and prominent microbial biochemist Arthur Neish, who both had strong commitments to basic research. When in 1953 Lemieux's group achieved the first chemical synthesis of sucrose, emphasis on fundamental investigations was firmly established. About 1950 one

of Lemieux's chemists, John Stone, had begun preliminary work on the biosynthesis of lignin with $^{14}CO_2$, probably owing to a perceived chemurgical connection, and they decided that to continue they needed a plant biochemist. I was appointed to that position in 1951, a green PhD and the first plant scientist to join the PRL. Little did anyone then appreciate, certainly not I, the pioneering significance of that appointment: it was the beginning of a metamorphosis that would result in the complete conversion of the institution to plant science by the early 1980s, when the PRL became the Plant Biotechnology Institute (PBI). When Stone left the PRL not long afterwards I continued the lignification work, which was moved under Neish's wing. But I also digressed briefly into the carbohydrate field, studying the formation of cellulose from ^{14}C-glucose and working out procedures for the chemical degradation of glucose and xylose to determine ^{14}C distribution.

Cambridge Interlude

In 1955 I began a year's postdoctoral leave in Sir Alex Todd's laboratory in Cambridge, to enhance my knowledge of organic chemistry. I was assigned to work not in his major area of nucleotides but on the structure of aphins, pigments of red aphids. Involved as well in this thankless project was another of Todd's postdocs, Eddie Haslam; thus of all those who made a career in phenolics research, Eddie is my earliest acquaintance. Todd was sidetracked in this aphin research, seeking evidence for a postulated structure that later proved incorrect. I once took a solution of the pigment to London trying to get a spectrum by the new technique of NMR on one of Varian's demonstration instruments. We failed on that try, but it was this approach, combined with the success by another member of the group in cleaving the pigment into two identifiable fragments, that led later to the eventual elucidation of the correct structure.

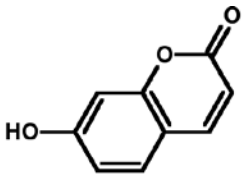
Back to Lignification

Back in Saskatoon, seeing that I had been making progress on the lignin front, Art Neish, too, had begun to feel the excitement of phytochemical research. He switched fields, and with Ledingham's support persuaded the NRC to establish a new plant biochemistry section at the PRL and to extend the facility to accommodate it. Neish was the first head of this new section, which made a number of important contributions to several areas of phytochemistry. Among other interests he collaborated with me on lignin biosynthesis for about four years, and we established that lignins were derived from shikimic acid, the first demonstration of its role in plants. (In the early sixties Neish moved to the NRC's Atlantic Regional Laboratory in Halifax, where he studied the biochemistry of ocean plants until his untimely death at 57 from cancer in 1973.) Also working with me on lignification, for a very productive two years, was Takayoshi Higuchi who, after his return to Japan, won highest honours for many distinguished contributions to lignin chemistry and biochemistry.

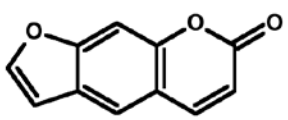
My group worked on the reactions between carbon dioxide and the coniferyl and sinapyl alcohols found in Karl Freudenberg's Heidelberg laboratory to be the building blocks of lignins, seemingly polymerizing randomly. We established with ^{14}C radiotracer techniques the reaction sequences involving phenyl- and 4′-hydroxy-phenylpyruvic acids, phenylalanine and tyrosine, cinnamic acid, and cinnamic acids oxygenated variously at ring positions 3, 4 and 5, that led eventually to Freudenberg's lignin building blocks. Work about this time in Eric Conn's laboratory, where enzymes then identified as phenylalanine and tyrosine ammonia lyases were discovered, filled in major missing steps of these pathways. We had noted species differences in the utilization of phenylalanine and tyrosine, with grasses alone having the ability to convert the latter to lignin. This was explained by the finding that tyrosine ammonia lyase activity, now believed to be localized on the same protein as that against phenylalanine, is confined almost exclusively to grasses.

Interest in Coumarins

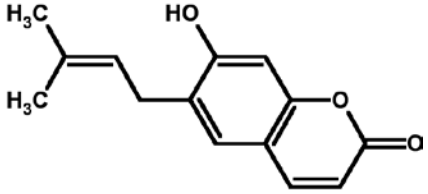
In the late fifties I had begun to investigate the biosynthesis of coumarin and its 7-oxygenated derivatives structurally based on 7-hydroxycoumarin, umbelliferone. (For structures of coumarins see the Figure.) This subject had hardly yet been explored, although there had been preliminary studies by both Conn and a German group of which Heinz Floss soon became a part and made important contributions. Neil Towers, then at McGill University, spent the summer of 1958 with me and we made a good start studying coumarin itself, which actually commonly occurs bound as a glucoside in intact cells. Later I studied lavender, which elaborates both coumarin and the *O*-methylated umbelliferone, herniarin. ^{14}C feedings indicated a pathway branched at cinnamic acid: its *o*-hydroxylation leading to coumarin and *p*- to umbelliferone, via 2,4-dihydroxycinnamic acid, and by implication to its vast range of derivatives. Umbelliferone can thus be considered the potential precursor of almost all coumarins, as only a few lack 7-oxygenation.



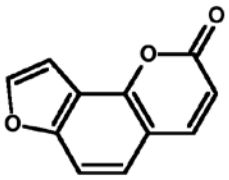
Umbelliferone



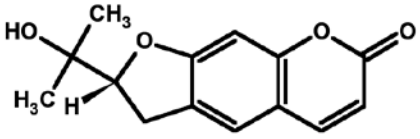
Psoralen



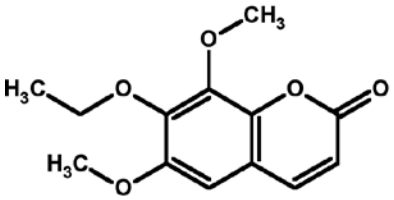
7-Demethylsuberosin



Angelicin



(+)-Marmesin



Puberulin

A New Society is Born

Memorable during this period was an overland journey in 1961 with five of my PRL colleagues to Fort Collins, Colorado, where I gave a paper in a symposium Gestur Johnson had organized on plant phenolics. It was during this meeting that the Plant Phenolics Group of North America, the PSNA's precursor organization, first saw the light of day, with Simon Wender as its first president, and Vic Runeckles, who probably more than anyone else can be regarded as the instigator of the PPGNA, as secretary-treasurer, a post he held for five years. I served as its third president, and the PSNA honored me with a life membership in 1981.

A Move to Academe

My next pioneering venture came in mid-1964, when I left the PRL to return to my home province of Ontario and join the faculty of Trent University, being newly built from scratch in Peterborough. It was an exciting challenge, but an ultimately rewarding one, as this institution before long built itself a high reputation for teaching, and became the most research-intensive of the predominantly under-graduate Canadian universities. However, the move inevitably meant a setback in my research, as for over two years I had neither the time nor any laboratory facilities. It soon became evident that in such a new and small institution there would not be, at least in the short term, the luxury of conducting research on a variety of projects, and that my program would have to be more selective. I therefore chose to abandon studies on the exasperatingly amorphous lignins in favor of the beautifully crystalline coumarins. Fortunately others with more persistence later probed lignification to increasing depths, with the major advances made by Norman Lewis and his associates continuing to be of great significance.

Furanocoumarins to the Fore

When we had permanent laboratory facilities at Trent I was able to get back to serious work on coumarins, now with increasing attention to the furanocoumarins occurring particularly in the Umbelliferae and the Rutaceae. We at Trent, with several other new Ontario universities, had been allowed only limited graduate studies – a grievous handicap. To this day the department offers no independent PhD program and I never had a PhD student, but as I did have a succession of postdoctoral fellows and visiting scientists, it was possible to make some reasonable progress. As well, soon after moving I collaborated very successfully for several years with a young phytochemist, Warren Steck, who had taken my place at the PRL, and who in the 1980s became the first director of the newly formed PBI.

Warren and my group, which then included visiting professor Mohammed El-Dakhakhny from Alexandria, continued tracer experiments on pathways to several coumarins. We examined principally the linear furanocoumarins, based on psoralen, in *Ruta graveolens* and *Pastinaca sativa*, but also did limited studies on their angular isomers, based on angelicin, in *Heracleum lanatum*. Both types were formed from umbelliferone, and we found the isopropyldihydrofuranoid compounds marmesin (the (+)-isomer) and columbianetin to be the respective intermediates, clearly suggesting prior isoprenylation at positions 6 and 8 of umbelliferone, respectively. Subsequent tracer work indicated that 6-dimethylallylumbelliferone, demethylsuberosin, was intermediate between umbelliferone and marmesin, and the angular analogue osthenol between umbelliferone and angelicin. Evidence also surfaced that in the furanocoumarins further ring oxygenation follows elaboration of the furan ring. After I had spent a year's sabbatical with John Staba in Minneapolis to study cell culture techniques, some of this work was done with the use of *R. graveolens*

cell cultures by Douglas Austin, a postdoc from Glasgow.

On this basis enzyme investigations were undertaken. In the early seventies Brian Ellis, who had joined me for a year's postdoctoral study, identified and characterized the dimethylallyl transferase of *R. graveolens* that substituted a five-carbon prenyl sidechain at the 6-position of umbelliferone, the first step in the pathway from this general precursor of complex coumarins to the linear furanocoumarins. Daljit Dhillon further purified and characterized this enzyme, and found evidence for a chloroplast association. I had also gotten back to my PhD thesis area, trans-methylation, and my colleagues Joan Thompson and Satish Sharma identified and characterized the methyl transferases mediating the formation of the 5- and 8-methoxypsoralens bergapten and xanthotoxin. We completely separated these two transferases on affinity columns through Satish's expertise in this technique, deriving in the process important information on the reaction mechanism – a compulsory—ordered sequence in which the enzyme first binds to the methyl donor *S*-adenosyl-methionine, inducing a binding site for the specific phenolic substrate.

A Break for Writing

Jesús Méndez of Santiago de Compostela in Spain had worked with me for a year investigating pathological aspects of phenolic metabolism in tomato plants with crown gall tumors. In the late seventies he proposed to organic chemist and coumarins specialist Robert Murray at Glasgow a monograph on the chemistry and occurrence of the natural coumarins. As they thought such a work would benefit by inclusion of biochemical aspects, they asked me to participate. The result, published in 1982, was a Wiley monograph *The Natural Coumarins: Occurrence, Chemistry and Biochemistry*. Although the book enjoyed rave reviews and has proved a very useful reference to specialists, it had disappointing sales – an expensive volume in a potentially very limited market.

Greater Simplicity?

Our studies had not neglected the simple coumarins. Many of these are poly-oxygenated in various patterns, raising intriguing speculation about the order in which substitution occurs in the biosynthetic pathways. Evidence has firmly established the precursor role of umbelliferone for this class of coumarins, as for furanocoumarins. I showed that 6,7-dihydroxycoumarin (aesculetin) in chicory and 7-hydroxy-8-methoxycoumarin (daphnetin) in *Daphne mezereum* were derived from this general precursor. Work on this class of coumarins, as on others, encounters the difficulty that many oxygenation patterns are elaborated only by tropical or subtropical species to which access is difficult in icy Canada, absent an established botanical garden nearby. However in the early eighties we collaborated with Douglas Rivett of Rhodes University to study the pathway to a 6,7,8-trioxygenated simple coumarin, puberulin, one of only 22 of this pattern then known to exist, in *Agathosma puberula*, a South African species. Extensive tracer studies coupled with identification of intermediates in extracts by mass spectrometry supported a pathway from umbelliferone successively involving 6-hydroxylation, 6-*O*-methylation, 8-hydroxylation, 8-*O*-methylation and finally 7-*O*-prenylation.

Regretfully I was never in a position to investigate the molecular biology involved and look for the genes corresponding to the known enzymes. By the time this was indicated I was nearing the end of my career, and in addition this type of research was simply not possible in a small university, at least then. This aspect was left for others to pursue.

A New Partner and a Shift in Emphasis

In 1986 I had been joined at Trent by a Polish botanist and cell physiologist with strong phytochemical leanings, Alicja Zobel of Warsaw University, whom I had met at the joint phytochemical meetings organized by Chris van Sumere in Ghent two years earlier, and who wanted to spend a year as a visiting scientist in North America, split between my laboratory and Geza Hrazdina's at Cornell. On Halloween of that year she became my wife, and we continued a scientific collaboration that lasted until my retirement from research in 1993. With her botanical background she was interested in localization of coumarins within the plant and the immunological location of their biosynthetic enzymes, areas I had never touched.

One of our first discoveries arose from her investigation of coumarins on leaf surfaces. Work on waxes elsewhere had employed organic solvent extraction, which we tried, to remove surface compounds, but Alicja had an inspiration to test brief extraction with almost-boiling water to melt these surface waxes, and we were astonished to find that this removed orders of magnitude more furanocoumarins than did the solvents. The hot water had released coumarins embedded in the waxy epicuticular layer, but without damaging the cell membranes. In some plants, especially *R. graveolens*, the amount on the surface exceeded that within the cells. This shed new figurative light on the photophytodermatitis long known to be due to

contact with linear furanocoumarin-bearing plants followed by exposure to UV radiation. It had always been assumed that the leaves of the plant had to be crushed to produce this dermatitis, but our work showed that, at least in some cases, merely brushing the leaf surfaces is sufficient. Alicja has also obtained preliminary evidence of the toxic principle of poison ivy, erushiol, on the leaf surface. She and I enjoyed a productive seven years and co-authored 18 publications dealing with various aspects of localization of coumarins, and the influence on it of UV radiation and other environmental factors, including pollution. But as my role in this work was mainly supportive, and she has published reviews covering it, space considerations do not permit me to do so here.

* * * * * *

Now that I am long retired I, like probably all researchers, can envisage in hindsight things that I'd have liked to do or should have done. However one has to stop sometime, I maintain my interest in the PSNA, and there is plenty to do in my former fields of research to keep many people busy for a long time to come. I wish them every success!

Executive Meeting Notes

Mark Berhow, Secretary

1) New President will be Norman Lewis: new president-elect will be Peter Facchini. The issue of a two-year term needs to be approved/discussed and Peter needs to agree to this as well. Vince DeLuca will contact Peter to see if he will agree to this. Also the problem of changing the constitution to accommodate this should be addressed.

2) Current Meeting information: We had 130 registered attendees and 13 invited speakers. We had 4 invited Neish speakers, we gave two $250 best poster awards and six travel awards. The travel awards were based on distance traveled and number of awards needed.

3) Finances: In 2005 we paid for both 2003 and 2004 books that our society sells. In general we have been losing money over the past year with low dues payments and no book sales. Each meeting the PSNA bears the expense of Niesh speakers and the travel awards about $5500. We expect an attendance of about 100-130.

4) Business meeting agenda: President report, treasurer report, secretary report, editor report, new business, changes to the constitution

5) Treasurer update: We are in the process of consolidating all our accounts in one bank and closing out all our other accounts. Membership gets two notices before they are dropped from the list. Current membership has 130 paid dues from a current membeship of about 260.

6) The executive committee is recommending that we form some new committees to divide up duties and increase membership. Awards and Recognition Committee Membership Committee & recruitment & advertising Website Newsletter Future Meetings Proceedings Committee

7) Daneel Ferreira noted that the members of the executive council need to respond to emails concerning getting these changes done.

8) The Executive Committe expressed their appreciation to John Romeo for his long term commitment as Editor in Chief of RAP. PSNA needs to determine what form our proceedings will take from here on out, either RAP or in a Journal or both.

9) PSNA needs to assemble a list of departments and research centers to send regular recruitment flyers and email information. This should be tied to updates from the future meetings committee.

10) We need to make a change in the constitution to accommodate a more than one year term for president. Ideally as president elect, president, and past president, one serves a three year term as president. In practice, this tends to be a one year frantic term. We need to encourage more activity in the president elect and past president by defining jobs for them. Hopefully the job of president won't be as tied to putting on the annual meeting.

11) For newsletter we need input from the membership for newsletter, especially material concerning the meeting. Ideally, the newsletter needs to come out more often during the year.

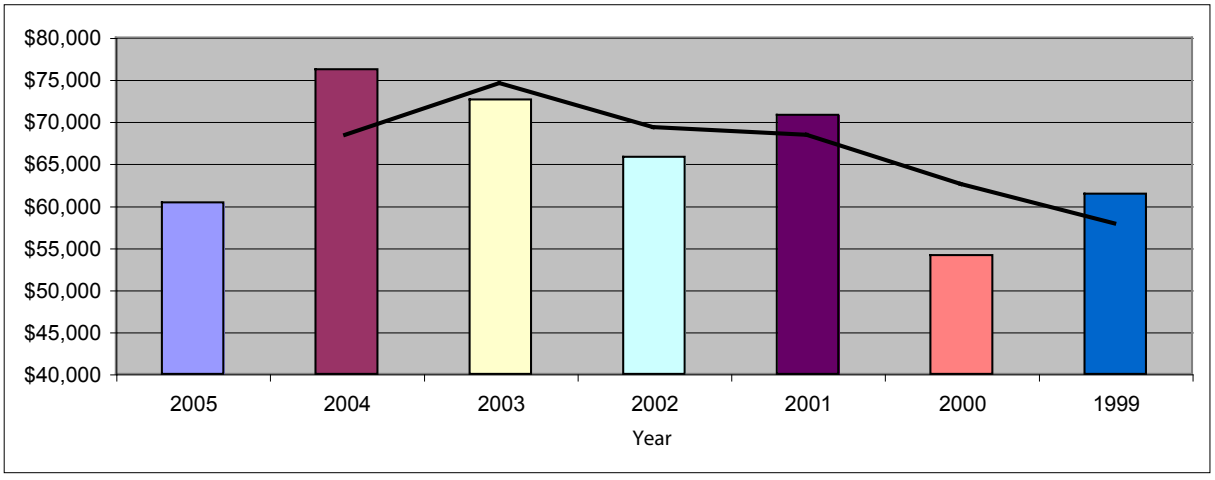
12) The PSNA needs to continue to appeal to both the chemistry and biology aspects of the field.

13) Future meetings: After a great deal of discussion on this subject, it was apparent that the society had not been getting the future meetings lined up in a timely fashion. This issue needs to be addressed by the executive committees

14) Issues to be dealt with immediately: change or not change the name, proposed changes in constitution, what direction PSNA will take in regards to our proceedings, to reshape the advisory board, and to establish and fill the proposed six committees. It is key to get things done to move forward to revitalize PSNA and build membership.

Phytochemical Society of North America
Treasurers Report (January 1 1999 to December 31, 2004)

Assets:	**2005**	**2004**	**2003**	**2002**	**2001**	**2000**	**1999**
Liquid							
1st National Checking	$1,000.00						
1st National MM	$1,000.00						
1st National Neish	$1,000.00						
Checking	$4,381.69	$19,068.37	$16,010.64	$5,850.73	$4,205.80	$2,620.09	$4,073.65
Money Market	$32,774.65	$37,190.37	$19,839.79	$36,319.58	$41,316.83	$26,951.12	$32,375.89
Money Market Neish	$20,232.26	$19,974.33	$36,782.52	$23,654.99	$25,258.39	$24,571.29	$24,960.33
Liquid Subtotal	**$60,388.60**	**$76,233.07**	**$72,632.95**	**$65,825.30**	**$70,781.02**	**$54,142.50**	**$61,409.87**
Annual Change	**-$15,844.47**	**$3,600.12**	**$6,807.65**	**-$4,955.72**	**$16,638.52**	**-$7,267.37**	
Investments							
Mutual Fund	$117.35	$114.30	$114.11	$114.10	$113.50	$109.60	$103.49
Mutual Fund MMA	$11,453.34	$10,812.99	$10,528.59	$9,077.46	$10,543.00	$11,476.74	$11,796.32
Investment Subtotal	**$11,570.69**	**$10,927.29**	**$10,642.70**	**$9,191.56**	**$10,656.50**	**$11,586.34**	**$11,899.81**
Total Assets	**$71,959.29**	**$87,160.36**	**$83,275.65**	**$75,016.86**	**$81,437.52**	**$65,728.84**	**$73,309.68**
Annual Change	**-$15,201.07**	**$3,884.71**	**$8,258.79**	**-$6,420.66**	**$15,708.68**	**-$7,580.84**	



Total Finanacial Assets of the PSNA 1999-2005

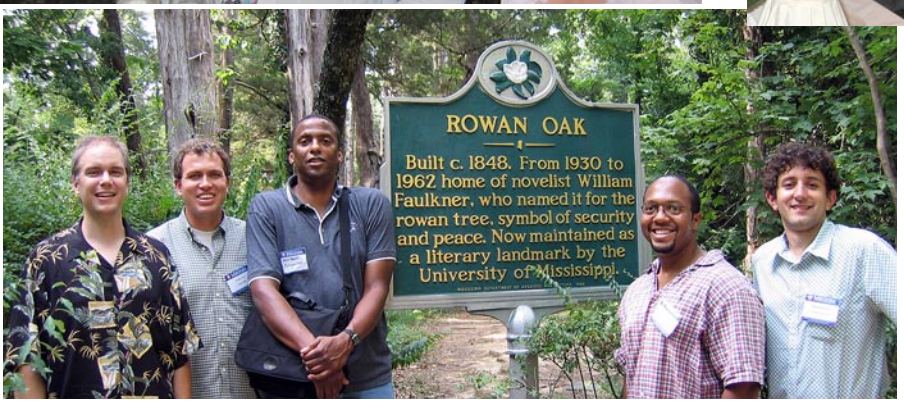
Membership Summary

Country	2000	2001	2002	2003	2004	2005	2006
USA	227	224	236	156	152	175	
Canada	63	46	45	33	35	38	
Germany		23	23	13	10	8	
Japan		18	16	10	9	9	
Mexico	14	9	17	14	13	6	
Other	104	51	49	27	33	24	
	408	**371**	**386**	**253**	**252**	**260**	130*
Member Type							
Regular	336	305	321	213	215	200	
Student	45	37	39	13	12	30	
Emeritus	16	17	15	16	15	19	
Life	11	12	11	11	10	11	
Total	**408**	**371**	**386**	**253**	**252**	**260**	

Phytochemical Society of North America
Interim report (Jan to June 2006)

Assets:	
Liquid	
First National Bank Checking	$4,244.12
First National Bank Neish	$33,834.36
First National Bank Savings	$21,270.07
AmSouth Bank Checking	$0.00
AmSouth Bank Money Market Neish	$0.00
AmSouth Bank Money Market	$0.00
Bank of America Checking	$4,383.27
Bank of America Money Market Neish	-$15.00
Bank of America Money Market	-$15.00
Liquid subtotal	$63,701.82
Investments	
Mutual Fund	$118.33
Mutual Fund MMA	$11,671.42
Investments subtotal	$11,789.75

* membership drive underway



Scenes from the 2006 Meeting of the PSNA in Oxford, Mississippi

The Phytocemical Society of North America
Nomination of Officers

It is essential to the continued function of this society that we have members that are willing to serve a three year terms as officers. For this we need to consider nominations carefully as to their dedication to both the principles and workings of the society. The key position is that of President. According to our consitution and bylaws the society must nominate and elect a member to serve on the executive board for three years, as President Elect, President, and Past President. as members it is our duty to provide the Executive Committee with nominations from the membership for this key position. Also as members, it should be our duty to accept nomination and election to serve in this office. Please consider this carefully and help the nomination committee with suggestions. Your nomination can be either anonymous or signed.

For President I nominate:

(Name, affiliation)

Due to their contributions to the field of Phytochemistry (a brief statement on their research work would be most helpful):

Also the Secretary is nearing the end of his three year term and the Executive Committee is seeking nominations for this three year position.

For Secretary I nominate:

(Name, affiliation)

Please send your nominations to:

Mark Berhow
PSNA Secretary
USDA, ARS, NCAUR
1815 N. University St.
Peoria, IL 61604
email:berhowma@ncaur.usda.gov
info@psna-online.org
www.psna-online.org

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Phytochemical Society of North America
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Please fill in the following application and return to the Treasurer with your dues payment. We are also in the process of updating the PSNA website, so please respond to the question regarding posting information on the website and give information on your personal web page if you wish it to be included. Once your application has been processed, you will receive newsletters and special mailings. You are also eligible for PSNA member discounts on the Recent Advances in Phytochemistry series. Please make check or money order payable to the Phytochemical Society of North America. Payment must be made in U.S. dollars, drawn on a U.S. bank. Traveler's Checks or Canadian Postal Money Orders, payable in U.S. dollars, are also acceptable. We are unable to accept payment via credit card. We hope to rectify this in the near future in our revised website.

Dues schedule: Life (or emeritus) member - no charge
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