



PSNA News

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

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Greetings Phytochemistry Society and Members!

I would like to thank all of you very much for your vote of confidence and I am very honored to have the opportunity to serve as the PSNA President for this fiscal year. Our current team includes new Treasurer Dharendra Kumar, returning Secretary Argelia Lorence, and President Elect Mark Berhow. We thank Emeritus President Frank Dayan and Emeritus Treasurer Daniel Owens for their efforts. We look forward to another exciting year for PSNA, and we look forward to building upon the foundation paved by our colleagues over the past 54 years. I am also happy to report that the Society has a healthy financial base which will provide the necessary resources for us to continue our mission which is 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.

My personal goals for the year are to revitalize our Society and encourage greater participation by ALL!!! We seek to elevate our membership and President-Elect Mark Berhow will lead our 2016 membership drive. We will also be working with Mark to better define the benefits of membership including numerous travel and merit awards for our early career scientists. If you are curious now, additional details concerning membership are on page 2 of this newsletter. We also seek to involve our younger scientists more and will encourage our 2015 young investigator award winners to unite and initiate an early career activist group. These (*a.k.a* many of you) are our future and will sustain our Society over the long term. Please let us know if you have any great ideas that will help mover our Society forward and/or if you would like to volunteer in any capacity.

We had a great annual conference this year at the University of Illinois with an impressive line-up of speakers, and you really missed-out if you

were unable to attend. See meeting report pg 6-13 of this newsletter. If you missed out this year you will have another chance as we are excited to inform you that planning is already underway for the 2016 PSNA Annual Conference. The 55th Annual Meeting of the Photochemical Society of North America will be convened in Davis, CA August 6-10, 2016 and the local organization will be led by our colleagues Li Tian and Florence Zakharov. See page 4 of this newsletter. Please mark your calendar and we look forward to seeing everyone in Davis.

Thank you again for your vote of confidence, and I invite you to get involved! I also welcome your feedback. Please feel free to contact me, or any of the officers, and we look forward to an exciting year working together to advance the phytochemical sciences!

All the best,
Lloyd W. Sumner
PSNA 2015-2016.



In this issue: The 2015 Meeting in Urbana-Champaign, Illinois
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The web PDF version can be downloaded from the website: www.pсна-online.org.



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WWW.PSNA-ONLINE.ORG



ADVISORY COUNCIL

Fred Stevens
fred.stevens@oregonstate.edu
Argelia Lorence
alorence@astate.edu
Cecelia McIntosh
mcintosh@etsu.edu
Dejan Nikolic
dnikol1@uic.edu
Deyu Xie
dxie@ncsu.edu

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. \$60 for regular members and \$30 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.pсна-online.org. Annual dues and changes of address should be sent to the PSNA Treasurer. Also check the PSNA website for regular updates.

The PSNA is an all volunteer organization which depends on its membership to run the organization. We appreciate the time and effort these volunteers are putting in to keep the organization up and running. As a member, please consider volunteering to serve on one of these committees. The PSNA can always use more help!

PSNA EXECUTIVES

President

Lloyd W. Sumner, Ph.D.
Noble Foundation
Plant Biology Division
2510 Sam Noble Parkway
Ardmore, OK 73401
Phone: 580-224-6710
lwsumner@noble.org

President Elect

Mark Berhow, Ph.D.
USDA, ARS, NCAUR
1815 N. University Street
Peoria, IL 61604
Phone: 309-681-6347
mark.berhow@ars.usda.gov
berhow@illinois.edu

Past President

Franck Dayan, Ph.D.
USDA, ARS, NPUR
University of Mississippi
University, MS 38677-8048
Phone: 622-915-1039
fdayan@olemiss.edu

Secretary

Argelia Lorence
Arkansas Biosciences Institute and
Department of Chemistry and Physics,
Arkansas State University,
P.O. Box 639, State University, AR,
72467, USA
alorence@astate.edu

Treasurer

Dhirendra Kumar, Ph.D.
423 Brown Hall Box 70703
East Tennessee St. Univ.
Johnson City, TN 37614 USA
Phone: 423-788-0143
kumard@etsu.edu

Editor-in-Chief, Reviews

Reinhard Jetter, Ph.D.
Departments of Botany and Chemistry,
University of British Columbia,
6270 University Blvd, Vancouver BC,
V6T 1Z4 Canada
reinhard.jetter@botany.ubc.ca



PSNA Executive Committee and Business Meeting Notes

August 8-9, 2015

Argelia Lorence, PSNA Secretary

Registration and fundraising: Mark Berhow and Elvira De Mejia served as the organizers of the 2015 meeting hosted at the University of Illinois in Urbana, IL. Mark Berhow reported 89 registered participants of which 61 presented posters at the meeting. Funds were secured from multiple sponsors leaving an approximate deficit of \$3K. This was due to the fact that despite advertising efforts this year we did not reach the 100 mark of people paying registration to the meeting.

Judging: In absence of David Gang, Chair of the Awards Committee, Cecilia McIntosh assisted by Argelia Lorence organized the judging process. It was discussed that being invited to give an oral presentation at the meeting is a form of recognition and therefore judging was focused on the posters presented by undergraduates, graduate students, and post-docs.

2016 Meeting: The 2016 PSNA meeting will take place August 6 to 10 at UC Davis. Li Tian and Florence Zakharov are serving as organizers. They have put an organizing committee in place: David Gang and Argelia Lorence organizing the Erin Conn Symposium; Lloyd Sumner and Mark Berhow organizing the Integrated Omics: Technology and Application Symposium; Deyu Xie and Xiaoya Chen organizing the Phytochemical Metabolism Symposium; Fred Stevens and Elvira De Mejia organizing the Functional Foods and Botanical Medicines Symposium; Phillip Zerbe and Dae-Kyun RO organizing the Synthetic Biology and Metabolic Engineering Symposium; Dorothea Tholl and Dan Kliebenstein organizing the Plant, Microbe and Insect Interactions Symposium, and Kent Chapman and Dharendra Kumar organizing the Phytochemical Signaling Symposium.

Future meeting discussion: Locations for the 2017 and 2018 meetings were also discussed. The 2017 meeting will be organized by Lloyd Sumner. Elvira De Mejia and Argelia Lorence proposed the city of Querétaro in Mexico as the venue for the 2018 meeting. Elvira De Mejia has already secured support from the President of *Universidad Autónoma de Querétaro* (Autonomous University of Queretaro). Argelia Lorence on the other hand has secured support from Arkansas State University that is expected to open a campus in Querétaro in 2016.

Young Investigator Award: A contract is currently in place with Elsevier. They provide \$10K for the winner of the award plus \$2K for his/her travel to the meeting. Past PSNA Presidents Tony Kutchan and Cecilia McIntosh were involved in the initial negotiation of this \$10K award, and the additional \$2K for travel was negotiated by Past President Fred Stevens. As a requirement of the award, the most recent winner Nicole Clay, was invited and already wrote a review article for *Phytochemistry*, a journal published by Elsevier. A new winner will be selected in the coming cycle so at this time PSNA is requesting applications from qualified candidates.

Transition of Information between Officers: To facilitate transition of information between PSNA officers and continuity Lloyd Sumner, current PSNA President, created a Google Drive where important documents are being stored.

Finances: Daniel Owens presented detailed financial records. All accounts are in black numbers. PSNA is in good standing with the IRS with a tax exempt status. Daniel Owens will not be able to continue serving as Treasurer. Election of a new treasurer was necessary.

Elections: Frank Dayan, the exiting PSNA president, informed the membership that Mark Berhow and Dharendra Kumar won the election for PSNA President and Treasurer, respectively. Mark Berhow assumes the role of PSNA Vice-President based on this result.

Membership engagement: It was discussed that engagement of the membership has to be improved and in order to do so Mark Berhow volunteered to be in charge of the Membership Committee.

PSNA Publications: Reinhard Jetter presented a report regarding the status of the various publications he coordinates on behalf of the society. He discussed that in the coming weeks we will complete the volume of *Recent Advances in Phytochemistry* that was prepared based on presentations from the Corvallis meeting. He also discussed the progress on the issue of *Phytochemical Reviews* that was organized based on the presentations from the Raleigh meeting. Eight group leaders committed to prepared manuscripts for that journal and of those two papers are already accepted and six more are in review. Papers are getting published online first and the hardbound issue will be ready until all papers are accepted. It was discussed that additional people are needed to serve as reviewers of manuscripts submitted to these publications. A committee formed by Fred Stevens, Dorothea Tholl, Mark Lange, Mark Berhow, Deyu Xie, Dejan Nikolic and Argelia Lorence have provided Reinhard Jetter with recommendations of candidates to invite as contributors for the next issue of *Phytochemical Reviews* based on the presentations from the Urbana meeting.

Awards: Names of candidates for Pioneer and Lifetime Achievement Awards we put forward. Official

nominations are needed. Final decisions on these nominations are made by the Executive Committee and the PSNA President.

Newsletter: Mark Berhow and Arge-
lia Lorence emphasized the need to
get content for the newsletter. Win-
ners of awards given by PSNA were

strongly encouraged to contribute
material for the newsletter. An addi-
tional idea put forward by Mark Ber-
how was to provide free registration
to the next meeting to the person(s)
that contributes multiple notes/
articles for the newsletter. Nicole
Clay volunteered to contribute to the

newsletter and has already provided
good ideas for the coming issues in-
cluding running a list of current job
openings of interest to the young
members of PSNA. Multiple award
winners have already provided ma-
terial that will be published in the
next two issues of the newsletter.



2016 Meeting of the PSNA to be held at the University of California at Davis, August 6 to 10, 2016

Dear PSNA members,

We are pleased to announce that the 55th annual meeting of the Phytochemical Society of North America (PSNA) will be held between **August 6 and 10, 2016** at **University of California, Davis** (UC Davis). The meeting will feature a special symposium celebrating the lifelong contribution of an outstanding natural product biochemist, Professor Eric Conn. Additional symposium topics include: Integrated omics: technology and applications; Phytochemical metabolism; Functional foods and botanical medicine; Synthetic biology and metabolic engineering; Plant, microbe, insect interactions; Phytochemical signaling. We are in the process of lining up an impressive list of invited speakers. There will also be ample opportunities for oral presentations selected from submitted abstracts. In addition to the

scientific discourse and interaction generated by the meeting, the PSNA also edits a volume of the journal *Phytochemical Reviews*, published annually by Elsevier, which will feature invited reviews from the talks presented at this meeting.

UC Davis is a land grant university that has a strong agricultural heritage and known for its teaching and research excellence (www.ucdavis.edu). Davis is a charming college town located 70 miles northeast of San Francisco, 11 miles west of Sacramento, 50 miles northeast of the wine country and 120 miles south of Lake Tahoe. For more information on regional attractions and activities, please visit Davis Chamber of Commerce (<http://www.davischamber.com/welcome-to-davis.html>) and DavisWiki (<https://localwiki.org/davis/>) pages.

Please stay tuned for more details of the conference, which will become available in future issues of the PSNA newsletters. Please also check www.pсна-online.org for updates on the 2016 PSNA conference.

We look forward to meeting you in Davis.

The Scientific Organizing Committee for the 2016 PSNA Meeting:

Dr. Li Tian, Chair, University of California, Davis

Dr. Florence Zakharov, co-Chair
University of California, Davis
Dr. Mark Berhow, USDA, ARS,
Peoria, Illinois

Dr. Kent Chapman, University of
North Texas, Denton

Dr. Xiaoya Chen, SIBS, Chinese
Academy of Sciences

Dr. David Gang , Washington State University
Dr. Dan Kliebenstein, University of California, Davis
Dr. Dharendra Kumar, East Tennessee State University
Dr. Argelia Lorence, Arkansas State University
Dr. Dae-Kyun Ro, University of Calgary
Dr. Fred Stevens, Oregon State University
Dr. Michael Sullivan, USDA, ARS, Madison, Wisconsin
Dr. Lloyd Sumner, Noble Foundation/University of Missouri
Dr. Dorothea Tholl, Virginia Tech
Dr. Deyu Xie, North Carolina State University
Dr. Philipp Zerbe, University of California, Davis



ELSEVIER



2016 Elsevier-PSNA Phytochemistry Young Researcher Award

Application deadline is April 1, 2016. Awarded by the PSNA, sponsored by Elsevier

The PSNA's most prestigious award for early-career phytochemists and plant molecular biochemists is the Elsevier-PSNA Phytochemistry Young Investigator Award, sponsored by the journal *Phytochemistry* from Elsevier. This biennial award will be awarded again in 2016 to an individual who has exhibited exceptional creativity in and dedication to the field of phytochemistry, plant biochemistry, or plant molecular biology.

The recipient will receive \$10,000 for proposed research and up to \$2,000 for travel and lodging to present a lecture at the 2017 PSNA meeting. The recipient will receive half of the prize money at the 2016 PSNA meeting and half upon submission of a substantive and original review paper to *Phytochemistry* within the next calendar year.

PSNA members are encouraged to nominate candidates and eligible candidates to submit applications to the Chair of the PSNA Awards Committee, Dr. David Gang, at gangd@wsu.edu. The deadline for receipt of nominations and applications is April 1, 2016.

Eligibility criteria

Applicants must be early career scientists in a research area related to phytochemistry, hold an independent position, and be a current PSNA member.

Instructions to apply

Applications should include a cover letter, CV, four-page research plan, budget, one-page budget justification, and three letters of recommendation.





**54th Annual Meeting of the Photochemical Society of North America
August 8 to 12, 2015
Illini Union Conference Center
The University of Illinois at Urbana-Champaign**

The PSNA had another great meeting at the University of Illinois in August. With an attendance of over 120 researchers and students, it was filled with great talks and posters.

The meeting was held on the campus of the University of Illinois, the state land grant university and home to an outstanding variety of agricultural and plant chemistry research over the years. The meeting was sponsored by the University's College of Agricultural, Consumer, and Environmental Sciences and the Departments of Food Science and Human Nutrition and Crop Science,

showing a deep support of the mission and goals of the PSNA by the University. Additional sponsors included Kraft Foods, Thermo Fisher Scientific Inc., Shimadzu Scientific Instruments, PerkinElmer Inc., Arkansas Center for Plant Powered Production, The University of Mississippi National Center for Natural Products Research, Alkemist Labs, and Mahmoud A. ElSohly, Ph.D.

The meeting venue was in the Illini Union, the student center for University. The facility was outstanding, the speakers and the posters and break rooms were right next to each

other allowing for a good "flow" between breaks and talks.

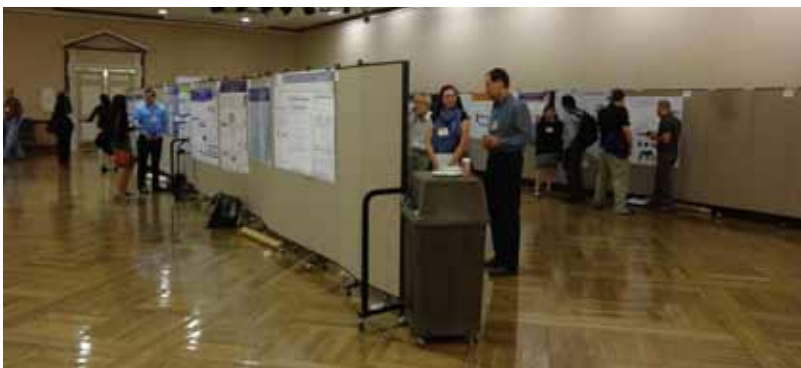
The program was very full which made for long days busy from 8 in the morning until 7 each evening. It consisted of seven symposiums covering phytochemical-based topics from plant-based "omics," lipids, metabolism, biosynthesis, chemical ecology, botanical medicines, nutritional & medicinal phytochemistry. The invited speakers included Miroslava Cuperlovic-Culf, National Research Council Canada, Moucton, New Brunswick; Dean DellaPenna, Department of Biochemistry and



PSNA Meeting Attendees on the University of Illinois Quad

Molecular Biology at Michigan State University; Kent Chapman, Department of Biological Sciences, University of North Texas; Pradeep Kachroo, Department of Plant Pathology, University of Kentucky; Xiao-Ya Chen, Institute of Plant Physiology and Ecology, Shanghai Institutes for Biological Sciences, Chinese Academy of Science; Joe Chappell, Department of Plant & Soil Science, University of Kentucky; Cecilia McIntosh, Department of Biological Sciences, East Tennessee State University; May Berenbaum, Department of Entomology, University of Illinois at Urbana-Champaign; Walter S. Leal, Department of Molecular and Cellular Biology, University of California at Davis; Jonathan Gershenzon, Department of Biochemistry, Max Plank Institute for Chemical Ecology; Eric Schmelz, Department of Biological Sciences, University of California at San Diego; Jyoti Shah, Department of Biological Sciences, University of North Texas; Richard van Breemen, Department of Medicinal Chemistry and Pharmacognosy, University of Illinois at Chicago; Ehab Abourashed, Department of Pharmaceutical Sciences, Chicago State University; Mary Ann Lila, Plants for Human Health Institute, North Carolina State University; and Jack Juvik, Department of Crop Sciences, University of Illinois.

The program also featured Elsevier-PSNA Award Speaker Nicole Clay, Department of Molecular, Cellular & Developmental Biology, Yale University and three Arthur Neish Award speakers- Martha Vaughan, USDA, ARS, Peoria, IL; Abe Koo, Dept. of Biochemistry, University of Missouri; and Philipp Zerbe, Department of Plant Biology, University of California, Davis. As usual the meeting also features a variety of speakers from the submitted abstracts from the meeting registrants.





Frank & Mary Loewis Travel Award Winners



Secretary Argelia Lorence and President Lloyd Sumner



Past President Franck Dayan



Awards Co-Chair Cecilia McIntosh



Meeting Co-Chair Mark Berhow



UI ACES Dean Neil Merchen

It also featured an exceptional set of over 60 posters featured in two early evening poster sessions on Sunday and Monday.

The Annual PSNA Awards Banquet was held at the University of Illinois Alice Cambell Alumni Center on Tuesday. The awards featured a PSNA Phytochemical Pioneer Award to Dr. Richard Dixon of North Texas State University for his work on phenolic biosynthesis processes in plants and a PSNA Lifetime Membership Award to Dr. Cecilia McIntosh of East Tennessee State University for her significant contributions to PSNA organization.

The PSNA was able to provide 22 Frank and Mary Loewis Travel Awards to attending students, as well as a four Best Poster Awards to graduate students and post docs.

Frank and Mary Loewis Travel Awards

Lucia Acosta-Gambou, Ebenezer Ajewole, Qing Cai, Alka Choudary, Felipe Christoff Wouters, Jagdeep Grover, Dimitre Ivanov, Verena Jeschke, Okiemute Rosa Johnson-Ajinwo, Richard Licayan, Samiddhi Senarante, Chintamani Thapa, Seyit Yuzuak, Timothy Audam, Jedaidah Chikufya, Rajarsh Ghosh, Sangam Kandel, Abdul Kareem Odesina, Md Mahbubur Rahman, Shannon Smith, Bal Krishna Thakuri, Vijay Tiwari

Best Poster Awards

Qian Li – Post Doc
 Okiemute Rosa Johnson-Ajinwo – Graduate
 Diego Luna-Vital – Graduate
 Kathleen King – Undergraduate

The Organizers would like to thank the outstanding work of Michelle Marquart and her team from the Center for Innovation in Teaching & Learning at the University of Illinois at Urbana-Champaign, for the great job in coordinating the meeting arrangements, taking care of the meeting website and registration, for organizing the shuttles between the hotels and generally for keeping the meeting on schedule and dealing with all the little problems that cropped up quickly and efficiently. This meeting could not have gone any smoother and it was due in large part to Michelle and here team. If you ever need to plan a meeting in central Illinois, you can do no better than to consider working with the Center for Innovation in Teaching & Learning at the University of Illinois at Urbana-Champaign. Phone: 217-244-8174, email: mmarqu2@illinois.edu.

PSNA 2015 Meeting Organizing Committee

Mark Berhow, USDA, ARS, Peoria, IL
 Franck Dayan, USDA, ARS, Oxford, MS
 Elvira DeMeija, University of Illinois at Urbana-Champaign
 David Gang, Washington State University
 Massuo Jorge Kato, University of Sao Paulo, Brazil
 Aruna Kilaru, East Tennessee State University
 Dharendra Kumar, East Tennessee State University
 Argelia Lorence, Arkansas State University
 Susan McCormick, USDA, ARS, Peoria, IL
 Shelly Nickols-Richardson, University of Illinois at Urbana-Champaign
 Dejan Nikolic, University of Illinois at Chicago
 J. Fred Stevens, Oregon State University
 Lloyd Sumner, The Noble Foundation, Ardmore, OK
 Dorothea Tholl, Virginia Technical University
 Li Tian, University of California at Davis
 Deyu Xie, North Carolina State University



Deyu Xie introduces Phytochemical Pioneer Richard Dixon



Elsevier-PSNA Award winner Nicole Clay



PSNA Lifetime Award Winner Cecilia McIntosh



PSNA Phytochemical Pioneer Richard Dixon

Best Poster Award Graduate Student: Okiemute Rosa Johnson-Ajinwo



My first day at the Guy Hilton Research Center (GHRC), was on a cold winter morning, 18th October, 2012, after an overnight flight from my home country in the Western part of the African continent, bounded by the Atlantic Ocean. I arrived at the Manchester international airport, UK, and proceeded in a taxi to Stoke-on-Trent city, and then to Keele University, before heading for the GHRC. The building is a two-storey, with numerous laboratories and offices. This was the beginning of my long hours of experiments and introduction into pharmacological studies, involving *in vitro* investigation.

The GHRC is one of the research arms of the Institute of Science and Technology in Medicine (ISTM), founded in 2006 and has eight key areas of research, including bioengineering and therapeutic use of stem cells, genetics and epigenetics, novel imaging and diagnostics, and neurosciences. Cutting-edge research, is carried out at the GHRC.

The research group I am part of is named the drug discovery group, and our focus is the discovery of novel drugs from natural products and from semi-synthesis. To achieve this goal, our work begins with phytochemistry and specifically pharmacognosy. Then we work through to the pharmacological activities of

the compounds of interest. The work is carried out in three main locations within the GHRC. We start in the chemistry laboratory, and then proceed to the cell culture laboratory and then to the analytics laboratory. Some other aspects of our research work are done at the Keele University main campus, where the malarial research group is located.

Our cancer research work has focused solely on ovarian cancer cell lines. Our aim is to obtain more potent compounds that could be used in the treatment of ovarian cancer. This cancer type is the second cause of death in the gynecological cancer class, due to late diagnosis, largely caused by lack of clearly defined symptoms. Investigations on natural products sources- mainly medicinal plants have been our primary target. We have found several compounds with potential for the treatment of ovarian cancer, either as monotherapeutic agents, or in combination with other conventionally used drugs. Further optimization of some of these compounds is on-going alongside research into more medicinal plants.

Best Poster Award Graduate Student: Diego Luna-Vital



I am a PhD student in Food Science at Universidad Autónoma de Querétaro in Querétaro, México and my advisor is Dr. Guadalupe Loarca-Pina. From January to December of 2015 I am doing research as a visiting scholar at the University of Il-

linois under the supervision of Dr. Elvira de Mejia. In both laboratories the research projects are directed to elucidate the mechanisms of action of bioactive compounds and phytochemicals present in dietary sources on reducing important diseases. My doctoral research project is focused on the characterization and evaluation of peptides present in the non-digestible fraction of the common bean in *in vitro* and *in vivo* colorectal cancer models. My findings so far indicate that these peptides inhibit HCT116 human colorectal cancer cells growth mainly through mitochondrial depolarization and DNA damage.

During this year's PSNA annual meeting I presented a poster regarding the antioxidant potential of the five major pure peptides present in the non-digestible fraction of common bean. In general terms, the peptides scavenged important radicals such as nitric oxide, the superoxide anion and the hydroxyl radical. Besides, they protected CCD-33Co normal colon cells survival from peroxide-induced oxidative stress, and reduced the intracellular concentration of reactive oxygen species. According to the correlation analysis, the antioxidant activity was increased in those peptides containing sulfur-containing amino acids in their sequence. The results suggest that the peptides, besides their anticancer potential, can selectively protect colon normal cells from oxidative stress.

**Best Poster Award
Undergraduate Student:
Kathleen King**



My honors thesis research is done in the laboratory of Dr. Cecilia Mc-Intosh at East Tennessee State University. The overall goal of our lab is to determine the key amino acid residues important for structure and function of flavonols specific 3-O-glucosyltransferase in *Citrus paradisi*, the grapefruit. The wild type protein uses flavonols as the substrate while the analogous protein in *Vitis vinifera* can accept both flavonols and anthocyanidins. This is being studied through the use of site directed mutagenesis. Each member of the lab is studying specific mutations to determine and characterize their effect on substrate and regio-specificity. These results are used to refine an *in silico* model of the 3-O-GT which then helps to pinpoint additional residues to test.

The specific mutation that I chose is R382W, arginine changed to tryptophan at position 382 of the enzyme. It is predicted that this mutation may cause change in substrate and regio-specificity in FcP3OGT to include anthocyanidins. The initial model of the R382W protein overlayed with the wild type shows a shift in many of the loop regions which have previously been suggested in our lab to be important for substrate binding. Western blot analysis suggests that optimal harvest time for this mutant protein is at 24 hours after induction. Initial activity screening of the

R382W mutant shows a continued preference for flavonols as well as a distinct increase in activity with flavanones. However, the GT in grapefruit glycosylates exclusively at the 3-OH position which flavanones do not possess. This initial screening is highly sensitive and can produce false positives so a normal screening assay will be done to confirm that activity seen is indeed occurring. If the increased activity with flavanones is confirmed, both the substrate and regio-specificity has been broadened with this mutation, although not as expected. Further biochemical characterization will be done to refine the *in silico* model. After graduation, I intend to pursue a graduate degree in interdisciplinary sciences.

**2015 Arthur Neish Award
Winner: Abraham J.K. Koo**



Division of Biochemistry & Interdisciplinary Plant Group, University of Missouri, Columbia

Abe did his undergraduate and Master of Science studies at Korea University in South Korea. He moved to Michigan State University (MSU) in 1999 to do his PhD under Dr. John Ohlrogge where he studied lipid metabolism in higher plants and wrote a dissertation on topics of fatty acid trafficking across the chloroplast membranes. Upon receiving his PhD degree in 2004, he joined Dr. Gregg Howe's group in Department of Energy-Plant Re-

search Laboratory (DOE-PRL) at MSU where he was first introduced to the field of jasmonate. During this time he identified enzymes involved in JA biosynthesis and published papers on long-distance JA signaling. A Phytochemistry review article that he had co-authored with his post-doctoral mentor was later awarded the Top Five Most-Cited Papers Award (from 2009 through 2013) by the journal publisher. He was also awarded the Anton Lang Memorial Award for Research Excellence by the DOE-PRL (2010) and in the same year was promoted to research assistant professor in the DOE-PRL. In 2012, he moved to University of Missouri to start his independent group as tenure-track assistant professor in the Division of Biochemistry. Since then he has been engaging in mentoring and leading his own research group as well as participating in departmental teachings. He has served in various committees and also served as ad-hoc reviewer for multiple journals including Nature Chemical Biology, Plant Cell, Plant Journal, Plant Physiology, and Phytochemistry.

**2015 Arthur Neish Award
Winner: Martha Marie Vaughan
Ph.D.**



Bacterial Foodborne Pathogens & Mycology Research Unit, USDA, ARS, NCAUR, Peoria, IL

Martha Vaughan is a molecular biologist with interdisciplinary training

in plant stress physiology, defense signaling, and secondary metabolism. Her research focuses on how climate affects crop-fungal pathogen interactions in a manner that influences downstream mycotoxin production and grain contamination. She has expertise in evaluating the response of plants to combined abiotic and biotic stress factors both above and belowground. Her work has led to the identification, molecular characterization and functional elucidation of novel defense metabolites. She has contributed to the understanding of how climate changes will effect crop susceptibility to *Fusarium* pathogens and mycotoxins. She has also been involved in the development of methods necessary to conduct climate change research including a plant culturing method that enables long term plant growth at a consistent level of drought. Through the evaluation of phenomena that naturally regulate mycotoxin production, such as phytochemicals, she seeks to identify sustainable and climate resilient strategies to eliminate mycotoxin contamination in grain and enhance food safety.

As a born and bred Hokie, Martha received both her BSc (2004) and PhD (2010) from Virginia Tech. She then conducted postdoctoral research with the USDA-ARS Chemistry Unit at the Center for Medical, Agricultural and Veterinary Entomology in Gainesville FL. In 2013, she joined the Bacterial Foodborne Pathogens & Mycology Research Team at the National Center for Agricultural Utilization Research in Peoria, IL to pursue research on the effects of climate change on mycotoxin contamination of grain crops.

2015 Arthur Neish Award Winner:
Philipp Zerbe
Department of Plant Biology, University of California, Davis



Philipp Zerbe is an Assistant Professor at the Department of Plant Biology, University of California at Davis. His research interests focus on the evolutionary diversification of terpenoid metabolism in various medicinal and other economically relevant plants, and the development of tools for the production of terpenoid bioproducts with human benefit. Dr. Zerbe received his PhD from the Ruhr-University Bochum, Germany (2007) under mentorship of Professor Elmar Weiler, studying the structural and functional interrelations of key enzymes in jasmonate biosynthesis. Prior to his position at the University of California, Davis, Dr. Zerbe worked as a Postdoctoral Fellow and later Research Associate with Professor Jörg Bohlmann at the Michael Smith Laboratories, University of British Columbia (Vancouver, Canada). Here, his research focused on the discovery of specialized diterpene pathways in coniferous trees and medicinal plants as part of two Genome Canada funded research consortia (SMarTForests, PhytoMetaSyn).





PSNA Website Job Posting

<http://www.pсна-online.org/jobs.html>

The PSNA Website posts job openings in plant science and phytochemical related fields. Job postings in plant sciences are FREE, if you have a open position please email the details of posting to info@psna-online.org and we will post them on the site for up to one year.

A short description of the current positions are listed below. For complete application details please visit the PSNA jobs webpage at <http://www.pсна-online.org/jobs.html>

Posted September 25, 2015. PhD Scholarships within metabolism of plant natural products and their role in plant adaptation to environmental challenges and use as food ingredients and medicines. Department of Plant and Environmental Sciences Faculty of Science University of Copenhagen Principal supervisor: Professor, DSc Birger Lindberg Møller. The Plant Biochemistry Laboratory of the Department for Plant and Environmental Science offers a number of three-year PhD stipends to be filled December 1st, 2015 or as soon as possible thereafter. The PhD projects are all going to be carried out as integrated projects in the research group working with elucidation of the biosynthesis (including enzyme mode-of-function at the single molecule level), turn-over, transport and biological functions of bio-active natural products in plants and their use as medicines, food flavors and spices. Prominent members of this class of compounds are the cyanogenic glucosides, diterpenoids and the phenylpropanoids vanillin and capsaicin. The PhD stipends are funded from an ERC Advanced Grant, by the VILLUM research center Plant Plasticity and by the UCPH Excel-

lence Program for Interdisciplinary Research. For complete application details please visit the PSNA jobs webpage at <http://www.pсна-online.org/jobs.html>

Posted September 21, 2015. EIGHT ASSISTANT PROFESSOR TENURE-TRACK POSITIONS The College of Agriculture at Purdue University, West Lafayette, Indiana. The College of Agriculture at Purdue University, West Lafayette, Indiana, invites applications from outstanding basic scientists for eight academic year tenure-track assistant professor positions that will comprise a college-wide cluster hire in fundamental plant biology. Candidates utilizing modern methods to address important questions in plant biology including but not limited to genomics and molecular genetics, computational modeling, biosensor/imaging, synthetic biology and metabolism are all encouraged to apply. We are interested in individuals working on molecular, organismal or ecosystem levels, and in model systems, crops, or natural systems. We envision that the majority of candidates will be considered for positions in the Department of Botany and Plant Pathology and the Department of Biochemistry. Positions are also available in the Department of Agronomy, the Department of Entomology, the Department of Forestry and Natural Resources, and the Department of Horticulture and Landscape Architecture for individuals conducting basic plant science research but with an interest in application of their research in more applied contexts.

For complete application details please visit the PSNA jobs webpage at <http://www.pсна-online.org/jobs.html>

Posted September 15, 2015. Position Description for RESEARCH SCIENTIST Botanisol LLC Position Summary: A six-month, full-time Research Scientist position on the WSU campus is available in an exciting new startup company, Botanisol LLC, that is moving a promising new drug lead toward clinical trials. The Research Scientist will oversee and perform laboratory experiments to isolate compounds responsible for specific and potent biological activities of plant extracts and then further characterize these compounds. The Research Scientist will be assisted in these duties by a Laboratory Technician (also employed by Botanisol), and will coordinate bioassay analysis of active fractions and compounds with a collaborating academic lab. The Research Scientist and Laboratory Technician will use supercritical fluid extraction and chromatography-based approaches to isolate and purify the active components from plant tissue samples that have potent biological activity. The Research Scientist will then use high resolution mass spectrometry-based techniques to characterize and identify specific active components in the extracts generated by the optimized extraction procedures.

For complete application details please visit the PSNA jobs webpage at <http://www.pсна-online.org/jobs.html>

Posted September 15, 2015. Position Description for LABORATORY TECHNICIAN Botanisol LLC. Position Summary: A six-month, half-time Laboratory Technician position on the WSU campus at Pullman is available in an exciting new startup company, Botanisol LLC, that is moving a promising new drug lead toward clinical trials. The Laboratory Technician will perform laboratory experiments to isolate the compounds responsible for the active properties of plant extracts and

then further characterize these compounds. The Laboratory Technician will work with a Research Scientist (also employed by Botanisol) to operate supercritical fluid chemical extraction apparatus to isolate and purify the active components from plant tissue samples that have potent biological activity.

For complete application details please visit the PSNA jobs webpage at <http://www.psna-online.org/jobs.html>

Posted September 15, 2015. School of Integrative Plant Science Faculty Position Opening: Plant Metabolomics School of Integrative Plant Science 412 Mann Library Cornell University Ithaca, NY 14853 607-255-4075 607-255-4471 (fax) plantscience.cals.cornell.edu. POSITION: The School of Integrative Plant Science at Cornell University is seeking applicants for a 9-month tenure-track position in Plant Metabolomics with an expected primary affiliation in the Section of Plant Biology and with research and teaching responsibilities at the level of Assistant/Associate Professor. The successful candidate will develop an internationally-recognized and well-funded research program in Plant Metabolomics that leverages technological innovation and high-resolution instrumentation to elucidate metabolic pathways and identify critical plant primary or secondary compounds. Possible research areas include, but are not limited to: (1) identification of metabolic networks, evaluation of metabolic flux and regulatory control points, and integration of such information in a 'systems' context; (2) the phylogenetic diversity of plant primary and secondary compounds; (3) plant metabolites in an environmental and ecological context, e.g. in relation to biotic or abiotic stress; and (4) the potential for utilization of such compounds in biomedical or nutra-

ceutical applications or for the improvement of crops. The successful candidate will teach an undergraduate course and develop a graduate-level course in Plant Metabolomics. For complete application details please visit the PSNA jobs webpage at <http://www.psna-online.org/jobs.html>

Posted August 19, 2015. Postdoctoral Position to Study Lipid-Mediated Signaling in Moss The Kilaru Laboratory in the Department of Biological Sciences at the East Tennessee State University is seeking a Postdoctoral Research Associate for an NSF-funded project to study lipid-mediated stress responses in moss *Physcomitrella patens*. The specific focus of the project is to elucidate the mechanisms by which fatty acid ethanolamides or N-acyl ethanolamines (NAEs) mediate responses to drought. The project involves quantification of NAE metabolites, biochemical characterization of NAE metabolic pathway, and generation and transcriptomic analysis of NAE mutants, in response to drought. Responsibilities of the position include, but are not limited to, design and implementation of experiments, data analysis and interpretation, and preparing manuscripts for publication. The successful candidate will have a Ph.D. in a relevant discipline with a strong background in analytical biochemistry, particularly in lipid identification and quantification. Experience in molecular biology and related fields, protein biochemistry and working with moss is desired. Knowledge in plant stress physiology and lipid metabolism, as manifested by publications, is crucial. Ideal candidate is expected to be highly motivated, creative and independent with excellent skills in communication (written and oral), ability to demonstrate leadership, and oversee routine lab management and maintenance tasks. The postdoc-

toral associate is also encouraged to develop projects of her or his own interest and will have opportunities to attend conferences and workshops essential for career development.

For complete application details please visit the PSNA jobs webpage at <http://www.psna-online.org/jobs.html>

Posted August 17, 2015. PLANTS FOR HUMAN HEALTH INSTITUTE, NCSU Tenure Track Faculty Positions Closing Date: October 1, 2015 (or until suitable candidate is found) The PHHI is one arm of an integrated research team at the North Carolina Research Campus (NCRC) in Kannapolis, North Carolina which hosts, in addition to NCSU, six other UNC system universities as well as Duke University. Currently we are inviting applications for faculty with research in the areas of Regenerative Medicine, Translational Nutrition and Food Allergies/ Immunology.

1. Regenerative Medicine (Position 00104960) We are seeking applicants at the assistant/associate/full professor level to conduct research in the arena of phytoactive compounds and wound healing/regeneration. The successful candidate is expected to develop a transdisciplinary research program to explore strategies for modulating skin elasticity regeneration of organs and tissues with plant-based phytochemical interventions. Research focus will be relevant to the cosmetics and skin allergy fields, and will interface with related industries and clinical operations. This faculty member is also expected to interact closely with other faculty in a team approach to explore novel plant compounds for these applications.

2. Translational Nutrition and Food Sciences (Position 00104962) We are seeking applicants at a senior (associate or full professor) level to develop a broad-based research program on the interface between nu-

trition and health protective phytochemicals (phytoactive compounds) in edible plants. The successful candidate will be expected to develop a nutritional translation laboratory which would include both analytical and pilot scale functional food processing instrumentation. The candidate will interface with existing resident faculty on campus in the arenas of pharmacogenomics, phytochemical analysis, bioavailability, systems biology, postharvest and metabolomics in order to assess new plant-based discoveries for human health and expedite translation into food or supplement/product deliverables for clinical, consumer, and developing world applications.

3. Food Allergies/Immunology (Position 00104961) We are seeking applicants and the assistant/associate/full professor level to conduct research in the arena of food allergies (e.g. peanut, milk, soy, etc.) and use of phytoactive strategies to attenuate allergenicity or human sensitivity to allergies. The successful candidate will apply in vitro, animal, and/or clinical systems approaches to build and test predictive models of allergenicity, and investigate mechanisms of phytoactive compound interactions with allergenic proteins in food products as well as in post-digestive complexes. The selected individual will interact closely with other faculty groups in a team approach to discern mechanisms of action related to attenuation of the allergic response.

For complete application details please visit the PSNA jobs webpage at <http://www.psna-online.org/jobs.html>

Posted August 17, 2015. Three PhD program funded research positions at the North Carolina Research Campus in Kannapolis, NC.

PhD Candidate – Banana Genomics and Metabolomics. We are seeking a highly motivated PhD student to join the Plant Pathways Elucidation Project (www.p2ep.org) based at the North Carolina Research Campus in Kannapolis, NC. The Plant Pathways Elucidation Project (P2EP) is a dynamic, multi-institutional, public/private research initiative which leverages plant systems biology (with platforms of genomic sequencing, annotation, association mapping, gene expression analysis, comprehensive breeding populations, and metabolomics) to mine plant-based solutions for human health. Overall, the P2EP seeks to elucidate the metabolic pathways involved in the production of nutritionally -important phytochemical compounds (phytoactives) in economically important, functionally-relevant crops, in addition to other relevant traits of interest, such as disease resistance and drought tolerance. The successful candidate will be enrolled in NC State University's Department of Horticultural Science, and will be partially supported through the Dole Nutrition Research Institute.

PhD Candidate – Pineapple Genomics and Metabolomics. We are seeking a highly motivated PhD student to join the Plant Pathways Elucidation Project (www.p2ep.org) based at the North Carolina Research Campus in Kannapolis, NC. The Plant Pathways Elucidation Project (P2EP) is a dynamic, multi-institutional, public/private research initiative which leverages plant systems biology (with platforms of genomic sequencing, annotation, association mapping, gene expression analysis, comprehensive breeding populations, and metabolomics) to mine plant-based solutions for hu-

man health. Overall, the P2EP seeks to elucidate the metabolic pathways involved in the production of nutritionally -important phytochemical compounds (phytoactives) in economically important, functionally-relevant crops, in addition to other relevant traits of interest, such as disease resistance and drought tolerance. The successful candidate will be enrolled in NC State University's Department of Horticultural Science, and will be partially supported through the Dole Nutrition Research Institute.

PhD Candidate –Blueberry Genomics and Metabolomics We are seeking a highly motivated PhD student to join the Plant Pathways Elucidation Project (www.p2ep.org) based at the North Carolina Research Campus in Kannapolis, NC. The Plant Pathways Elucidation Project (P2EP) is a dynamic, multi-institutional, public/private research initiative which leverages plant systems biology (with platforms of genomic sequencing, annotation, association mapping, gene expression analysis, comprehensive breeding populations, and metabolomics) to mine plant-based solutions for human health. Overall, the P2EP seeks to elucidate the metabolic pathways involved in the production of nutritionally -important phytochemical compounds (phytoactives) in economically important, functionally-relevant crops, in addition to other relevant traits of interest, such as disease resistance and drought tolerance. The successful candidate will be enrolled in NC State University's Department of Food, Bioprocessing and Nutritional Sciences.

For complete application details please visit the PSNA jobs webpage at <http://www.psna-online.org/jobs.html>

Posted April 21, 2015. Postdoctoral Scholars – “Dimensions US-Biota São Paulo: chemically mediated multi-trophic interaction diversity across tropical gradients” Position Summary: Three Postdoctoral Scholar positions are available immediately in the Institute of Chemistry at the University of São Paulo, and/or in the Institute of Biology at the University of Campinas. We seek talented and highly motivated scientists with a keen interest in the study of plant-insect interactions in tropical forests. The ecology and evolution of herbivores and parasitoids associated with the rich genus *Piper* (Piperaceae) will be studied via experiments, observational data, and mathematical models. The work includes quantification of interactions between metabolite diversity, taxonomic diversity, and herbivory, as well as mechanisms of herbivore sequestration and biotransformation of secondary metabolites. The successful candidate will join a group that is continuing long term research on chemical diversity and insect interaction diversity among *Piper* plants. The collaborative project involves partnership with Lee Dyer (University of Nevada Reno, USA) and several colleagues. NSF (USA) and FAPESP (Brazil) fund the project for the period 2015-2020. Postdoctoral fellowships are available for 24 months renewable for an additional 12 months. The stipend from FAPESP is R\$ 6.143,40/month (about US\$ 2,000/month).

For complete application details please visit the PSNA jobs webpage at <http://www.psna-online.org/jobs.html>

Posted April 20, 2015. Botanicals R&D Manager We deliver radiant skin through naturally-derived specialty ingredients! Do you have a passion for innovation, science and beauty? Are you a botanical extract expert? Are you an influential lead-

er capable of mentoring, developing and coaching a team of chemists to develop breakthrough technologies for the skin care market? If so, consider The Lubrizol Corporation – a Berkshire Hathaway company as our Botanicals R&D Manager for the Active Organics site in Lewisville, Texas! Active Organics is positioned to play a critical role in meeting the aggressive growth expectations of our global skin care business – do you have what it takes? Role Summary: As the R&D Manager for Active Organics, you will lead a team focused on the discovery of novel plant-based / natural active ingredients for our skincare organization and its customers. As a member of the global Skin Care R&D leadership team, you will ensure Active Organics’ R&D groups and projects are aligned with and support the global Skin Care business strategy.

For complete application details please visit the PSNA jobs webpage at <http://www.psna-online.org/jobs.html>

Posted April 14, 2015. Postdoctoral Position in Plant Development The Running laboratory in the Department of Biology at the University of Louisville is seeking a Postdoctoral Research Associate for an NSF-funded project to study developmental processes in the moss *Physcomitrella patens*. The postdoc will work primarily in the field of protein prenylation, which we have previously shown to have key roles in moss development, with implications for cell differentiation, environmental responses, and evolutionary mechanisms. The project involves generating novel moss mutants, characterizing mutants using microscopy and cell biology techniques, identifying prenylation target proteins, and testing the effect of prenylation deficiency in this model species. The postdoc will also have

the freedom to develop independent projects. The successful candidate will have a Ph.D. in a relevant discipline, experience in molecular biology and related fields, and a record of publication.

For complete application details please visit the PSNA jobs webpage at <http://www.psna-online.org/jobs.html>

Posted April 10, 2015. Colorado State University’s Department of Bioagricultural Sciences and Pest Management seeks a Professor or Associate Professor in Applied Plant Physiology and Biochemistry, Herbicide Resistance of weeds and crops in Colorado. Applicants whose experience has focused primarily on the biochemistry and physiology of herbicide resistance -- linking genes, through biochemical and physiological mechanisms, to metabolic function and phenotypes that are resistant to herbicides are highly encouraged to apply. Reqs.: Ph.D. in plant biochemistry/physiology or closely related areas, outstanding record of research accomplishments, evidence of successful interdisciplinary research collaborations, and interest in teaching in applied plant biochemistry and physiology. For complete application details please visit the PSNA jobs webpage at <http://www.psna-online.org/jobs.html>

Posted April 10, 2015. Postdoctoral Researcher Position in Metabolomics/Transcriptomics The Pterocarpan Defense Response of Soybean A Postdoctoral Researcher position is available in the laboratory of Dr. Nik Kovich, Davis College of Agriculture, Natural Resources and Design, in conjunction with the Interdisciplinary Program in Genetics and Developmental Biology, at West Virginia University. The Postdoc will conduct cutting-edge research on Soybean’s pterocarpan defense

response using a wide-variety of approaches including GWAS, transcriptome and metabolome profiling. The Kovinich lab is equipped with molecular biology and analytical chemistry equipment, and is located in close proximity to the metabolomics resources such as an Illumina MiSeq, UHPLC, quadrupole and orbitrap LC-MSns. The ideal applicant will be a recent Ph.D. graduate in molecular biology, biochemistry, biotechnology, or other relevant disciplines. The ideal candidate would have experience conducting RNA isolation using phenol-based methods, metabolite analysis using HPLC-PDA-MSn, and multivariate analysis of transcriptome and/or metabolome datasets. Candidates should possess good written and verbal English skills, be capable of working independently, and have demonstrated the ability to work as part of an interactive group. The candidate will interact with other faculty members of the WVU BioNano Research Facility and the Genomics Core Facility. The annual salary is competitive and commensurate with experience. The initial appointment is two years, but is renewable. The position is available Winter 2016, but arrangements could be made for early or delayed start for the right person. Applications will be reviewed until the position is filled.

For complete application details please visit the PSNA jobs webpage at <http://www.psna-online.org/jobs.html>

Posted October 6, 2015. Cornell University Assist./Assoc. Professor in Plant Metabolomics The School of Integrative Plant Science at Cornell University (<http://sips.cals.cornell.edu/>) is searching for a strong candidate for a tenure track position at the assistant or associate Professor level in Plant Metabolomics. Application review will begin on October

9, 2015. The successful candidate will develop an internationally-recognized and well-funded research program in Plant Metabolomics that leverages technological innovation and high-resolution instrumentation to elucidate metabolic pathways and identify critical plant primary or secondary compounds. Possible research areas include, but are not limited to: (1) identification of metabolic networks, evaluation of metabolic flux and regulatory control points, and integration of such information

in a systems context; (2) the phylogenetic diversity of plant primary and secondary compounds; (3) plant metabolites in an environmental and ecological context, e.g. in relation to biotic or abiotic stress; and (4) the potential for utilization of such compounds in biomedical or nutraceutical applications or for the improvement of crops.

For complete application details please visit the PSNA jobs webpage at <http://www.psna-online.org/jobs.html>

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USDA, ARS, NCAUR
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Peoria, IL 61604
Phone: 309-681-6347
mark.berhow@ars.usda.gov

Desmond Slade

dslade@olemiss.edu

PSNA Newsletter Committee

Argelia Lorence (Chair)

Arkansas Biosciences Institute
Dept of Chemistry and Physics,
Arkansas State University,
P.O. Box 639
State University, AR, 72467, USA
alorence@astate.edu

Mark Berhow (Publisher)

Phone: 309-681-6347
mark.berhow@ars.usda.gov

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gangd@wsu.edu

Celia McIntosh

mcintosh@etsu.edu

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sonja@wsu.edu

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tmkutchan@danforthcenter.org

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