

The van Breemen Group and Chicago Mass Spectrometry Laboratory 2017 Newsletter

Highlights of 2016

July, 2017
Volume 6, Issue 1

We were featured in the news by the *Wall Street Journal* (29 February 2016) and as the cover article of *Momentum* (2016; Vol. 6) which is an international magazine published by Shimadzu. Both articles featured our work with

natural products. Our group published 14 papers during 2016 (up from 10 papers in 2015) and again presented 20 papers at meetings. Other highlights included graduating a postdoctoral fellow (Alyssa Tonsing-Carter), adding a

new postdoctoral fellow (Amanda Lee), graduating three Ph.D. students (Caleb Nienow, Ke Huang and Guannan Li), and welcoming two new graduate students (Jialin Liu and Alan Wong). Read on for additional details.

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van Breemen Lab Group 2016 photo wearing our new “MASS SPECTRE” T-shirts. *Left to right:* Jialin Liu, Luying Chen, Ruth Muchiri, Lingyi Huang, Daniel Nosal, Kamil Gierszal, Richard van Breemen, Michael Rush, Dejan Nikolic, Alyssa Tonsing-Carter, Amanda Lee, Emily Rue, and Alan Wong. Not pictured, Tristesse Burton and Zane Hauck.

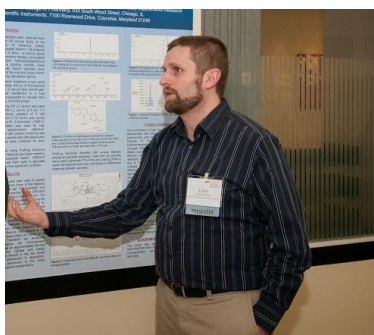
Featured on the back of the shirt (see photo on the right) is a design inspired by the James Bond motion picture “SPECTRE” and the camera iris theme from the opening credits. In the center of the iris is a production tandem mass spectrum of xanthohumol (obtained using a Shimadzu IT-TOF mass spectrometer). Special thanks to Alan Wong for designing the T-shirt.



Lab Member News 2016

2016 Ph.D. Graduates

Three of our graduate students successfully defended their dissertations in 2016. The first was Caleb Nienow, whose dissertation was entitled, "Serum metabolome and proteome effects of phyto-estrogenic dietary supplements in postmenopausal women." Caleb is now working for Shimadzu in the Chicago area.



Next to graduate was Ke Huang, whose dissertation was entitled, "In vitro investigation of metabolism, bioactivation, and botanical-drug interactions of licorice." Ke first worked for Bristol-Myers Squibb and is now at WuXi Biologics in China.

Our third Ph.D. graduate was Guannan Li, and the title of her dissertation was, "Safety of botanical dietary supplements – licorice: in vitro investigation of drug-botanical interactions." Guannan works for Agilent in Santa Clara, CA.



Ke Huang



Guannan Li

New Graduate Students

Alan Wong joined our group during the fall of 2016. Previously, he had earned a B.S. in biochemistry from Northwestern University and gained natural products expertise working at Planta Analytica in Milford, CT. In our lab, he is investigating high-energy CID MS/MS fragmentation pathways of natural products and quantitative analysis of estrogen metabolites.

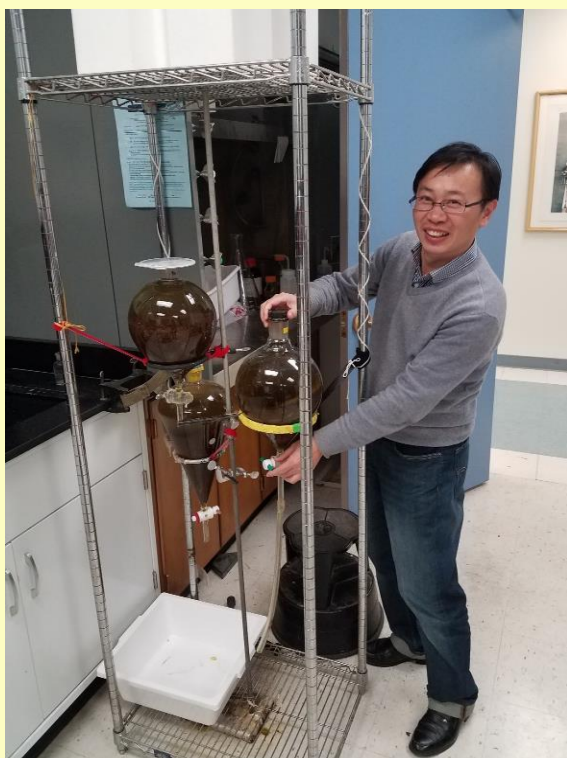


Alan Wong



Jialin Liu

Jialin Liu joined our group after earning her B.A. in chemistry from the University of Minnesota. Her research concerns the intestinal permeabilities and bioavailabilities of botanical natural products.



Prof. Jianming Ju, a visiting scholar from Jiangsu Province Academy of Traditional Chinese Medicine in Nanjing, China, helped us during 2016 with our studies on the metabolism of licorice compounds.

New Postdoctoral Fellow



Taking over for Alyssa Tonsing-Carter on the Botanical Center drug-botanical interactions project is postdoctoral fellow Amanda Lee. A 2016 graduate in chemistry and biochemistry from the University of Maryland, College Park, Amanda studied with Prof. Catherine Fenselau, who had been Prof. van Breemen's mentor. She brings to the group expertise in proteomics mass spectrometry.

Alyssa Tonsing-Carter joined our lab in 2015 after receiving her Ph.D. in pharmacology from Indiana University. Supported by our NIH/NCCIH T32 training grant, Alyssa carried out studies of drug-botanical interactions within the Botanical Center. In 2016, she became the new program manager for the UIC Botanical Center administrative core where she is helping to coordinate center activities including our clinical trials.



Awards and Grants

At the 18th Annual UIC College of Pharmacy Graduate Student Awards event in 2016, three of our laboratory group members received cash awards. Zane Hauck



Zane Hauck receives a scholarship during the UIC College of Pharmacy Research Day 2016. Pictured with Zane are Prof. Jimmy Orjala and Prof. van Breemen.

and Guannan Li both received W.E. van Doren Scholarships, and Michael Rush received the Charles L. Bell award. Michael also wrote a successful F31 predoctoral F31



Guannan Li receives a medicinal chemistry scholarship during Research Day 2016. Pictured with Guannan are Prof. Pavel Petukhov and Prof. van Breemen.



Michael Rush receives the Charles L. Bell award on Research Day.

grant proposal to the NIH, which will fund the rest of his graduate studies at UIC.

Graduate student Yongchao Li received a predoctoral travel award to present a paper at the 8th Mass Spectrometry Applications to the Clinical Lab (MSACL) in Palm Springs, CA.

Meetings, Seminars and Press

Our group presented 20 talks, seminars and posters at national and international meetings in 2016, just as we had in 2015. We presented 7 papers at the 64th Conference on Mass Spectrometry and Allied Topics in San Antonio, TX, and 4 papers at the 55th Phytochemical Society of North America meeting in Davis, CA.



Current lab members and former post-doc Elisabeth Walker (2nd from left) at the Alamo during ASMS 2016 in San Antonio, TX.



Napa wine country en route to the PSNA 2016 conference at the Univ. California at Davis (from left: Richard van Breemen, Dejan Nikolic, Tristesse Burton, & Michael Rush).

The remaining presentations included a conference at the Shanghai Chensan Plant Science Research Center and seminars at a variety of locations including Auburn University and the Food and Drug Administration.



April 12, 2016 seminar visit hosted by Prof. Angela Calderon (former post-doc in our laboratory) at the Auburn University School of Pharmacy.



FDA visit on November 3, 2016, and meeting with UIC alumni Chongwoo Yu (PhD our lab 2002), Nan Zhang, Richard van Breemen, Tien Mien (Albert) Chen, Yang Yang, Sang Chung, and Ja Hye Myung.



Visiting Yanan Yang (Ph.D. 2004) at the Agilent booth during ASMS.

Links to some notable press coverage of our lab during 2016.

Wall Street Journal Feb. 29, 2016

<http://www.wsj.com/articles/what-you-should-know-about-how-your-supplements-interact-with-prescription-drugs-1456777548>

“How your supplements interact with prescription drugs.”

Highlights the preclinical and clinical research on drug-botanical interactions in our NIH-funded Botanical Center. Includes quotes from interview.

Shimadzu International Journal, MOMENTUM, 2016; Volume 4: 4-11. Cover article.

https://www.shimadzu.eu/sites/default/files/momentum_vol.04_2016.pdf

“Inspiration from natural sources, spotlight on the work of Richard van Breemen.”

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We're on the Web!
<http://www.uic.edu/labs/breemen/>

2016 Publications

Since 1999, our lab has published between 10 and 20 papers per year. During 2016, we published 14 peer-reviewed papers and book chapters as indicated below.

1. Zhou Q, Chen T, Zhang W, Bozkanat M, Li Y, Xiao L, van Breemen RB, Christman JW, Sznajder JI, Zhou G. Suppression of Von Hippel-Lindau protein in fibroblasts protects against bleomycin-induced pulmonary fibrosis. *Am. J. Respir. Cell Mol. Biol.* 2016; 54: 728-739.
2. Kataria Y, Deaton RJ, Enk E, Jin M, Petrauskaite M, Dong L, Goldenberg JR, Cotler SJ, Jensen DM, van Breemen RB, Gann PH. Retinoid and carotenoid status in serum and liver among patients at high-risk for liver cancer. *BMC Gastroenterol.* 2016; 16(1):30 doi: 10.1186/s12876-016-0432-5.
3. Sprouse AA, van Breemen RB. Pharmacokinetic interactions between drugs and botanical dietary supplements. *Drug Metab. Dispos.* 2016; 44: 162-171.
4. Hauck ZZ, Huang K, Li G, van Breemen RB. Determination of bisphenol A-glucuronide in human urine using ultrahigh-pressure liquid chromatography/tandem mass spectrometry. *Rapid Commun. Mass Spectrom.* 2016; 30: 400-406.
5. Newsome AG, Li Y, van Breemen RB. Improved quantification of free and ester-bound gallic acid in foods and beverages by UHPLC-MS/MS. *J. Agric. Food Chem.* 2016; 64: 1326-1334.
6. Imai A, Lankin DC, Nikolić D, Ahn S, van Breemen RB, Farnsworth NR, McAlpine JB, Chen SN, Pauli GF. Cycloartane triterpenes from the aerial parts of *Actaea racemosa*. *J. Nat. Prod.* 2016; 79: 541-554.
7. Hauck ZZ, Feinstein DL, van Breemen RB. LC-MS-MS analysis of brodifacoum isomers in rat tissue. *J. Anal. Toxicol.* 2016; 40: 304-309.
8. Feinstein DL, Akpa BS, Ayee MA, Boullerne AI, Braun D, Brodsky SV, Gidalevitz D, Hauck Z, Kalinin S, Kowal K, Kuzmenko I, Lis K, Marangoni N, Martynowycz MW, Rubinstein I, van Breemen R, Ware K, Weinberg G. The emerging threat of superwarfarins: history, detection, mechanisms, and countermeasures. *Ann. N. Y. Acad. Sci.* 2016; 1374: 111-122.
9. Kondratyuk TP, Adrian JA, Wright B, Park EJ, van Breemen RB, Morris KR, Pezzuto JM. Evidence supporting the conceptual framework of cancer chemoprevention in canines. *Sci. Rep.* 2016; May 24, 6: 26500. doi: 10.1038/srep26500.
10. Stahlhut RW, van Breemen RB, Gerona RR, Taylor JA, Welshons WV, vom Saal FS. Comment on "Optimal exposure biomarkers for nonpersistent chemicals in environmental epidemiology." *Environ. Health Perspect.* 2016; 124: A66. doi: 10.1289/ehp.1511057.
11. Moyano AL, Li G, Boullerne AI, Feinstein DL, Hartman E, Skias D, Balavanov R, van Breemen RB, Bongarzone ER, Månsson JE, Givogri MI. Sulfatides in extracellular vesicles isolated from plasma of multiple sclerosis patients. *J. Neurosci. Res.* 2016; 94: 1579-1587.
12. Li G, Nikolic D, van Breemen RB. Identification and chemical standardization of licorice raw materials and dietary supplements using UHPLC-MS/MS. *J. Agric. Food Chem.* 2016; 64: 8062-8070.
13. Rush MD, Walker EM, Burton T, van Breemen RB. Magnetic microbead affinity selection screening (MagMASS) of botanical extracts for inhibitors of 15-lipoxygenase. *J. Nat. Prod.* 2016; 79: 2898-2902.
14. van Breemen RB, Wright B, Li Y, Nosal D, Burton T. Standardized grape powder for basic and clinical research. In *Grapes and Health*. Ed. By Pezzuto JM. Springer International Publishing, Basel, Switzerland, pp 17-26, 2016. ISBN 978-3-319-28993-9