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### EDUCATION

- 1980-1985 Ph.D. 1985, in Pharmacology  
Johns Hopkins University School of Medicine  
Baltimore, Maryland
- 1976-1980 B.A. 1980, in Chemistry, with honors, German minor  
Oberlin College, Oberlin, Ohio

### PROFESSIONAL EXPERIENCE

- 2014-present Matthias C. Lu Collegiate Professor of Pharmacy
- 2014-present Visiting Professor, Tongji School of Pharmacy, Huazhong University of Science and Technology, Wuhan, China
- 2000-present Professor of Medicinal Chemistry and Pharmacognosy  
College of Pharmacy, University of Illinois at Chicago, Chicago, IL
- 2002-present Academic Director, Mass Spectrometry, Metabolomics and Proteomics Facility,  
Research Resources Center, University of Illinois at Chicago, Chicago, IL
- 2010-present Director, Mass Spectrometry, Metabolomics and Proteomics Facility, University  
of Illinois Cancer Center, IL
- 2011-present Director, UIC/NIH Center for Botanical Dietary Supplements Research,  
University of Illinois at Chicago, Chicago, IL
- 2001-present Assistant to the Director of the Research Resources Center, University of Illinois  
at Chicago, Chicago, IL
- 2010-present Editorial Board, *Assay and Drug Development Technologies*
- 2010-present Editor-in-Chief emeritus, *Combinatorial Chemistry & High Throughput  
Screening*
- 2013-present Regional Editor, *Biomedical Chromatography*
- 2010-2012 Assistant Head for Curricular Affairs, Department of Medicinal Chemistry and  
Pharmacognosy, University of Illinois at Chicago, Chicago, IL
- 2006-2013 Editorial Board, *Biomedical Chromatography*
- 1997-2010 Editor-in-Chief, *Combinatorial Chemistry & High Throughput Screening*
- 1994-2000 Associate Professor of Medicinal Chemistry  
College of Pharmacy, University of Illinois at Chicago, Chicago, IL
- 1986-1993 Assistant Professor of Chemistry, Member of the Biotechnology Faculty  
Director of the Mass Spectrometry Laboratory for Biotechnology Research

- North Carolina State University, Raleigh, NC.
- 1985-1986 Postdoctoral Fellow. Middle Atlantic Mass Spectrometry Laboratory, NSF Regional Instrumentation Facility, Johns Hopkins University School of Medicine, Baltimore, MD. (Laboratory of Catherine Fenselau and Robert Cotter)  
Visiting Assistant Professor of Chemistry  
North Carolina State University, Raleigh, NC.
- 1980-1985 Predoctoral research, Dept. of Pharmacology Johns Hopkins University School of Medicine. Baltimore, MD. Dissertation: "Electrophilic Reactions of 1-O-Acyl Glucuronides." (Advisor, Catherine Fenselau)
- 1979-1980 Honors research, Department of Chemistry, Oberlin College  
Oberlin, OH. Synthesis of spirocyclic lactones as analogs of insect pheromones
- 1979 Research assistant, Department of Pharmacology, Toxicology Center, Univ. of Iowa, Iowa City, IA. Quantitation of metabolites of diphenylhydantoin in human serum using GC/MS. (Laboratory of L.J. Fischer)

## HONORS AND AWARDS

NIH Predoctoral Fellowship, 1980-1984  
Phi Lambda Upsilon (Chemistry Honor Society)  
Award for Outstanding Paper at the Third North American Meeting of the International Society for the Study of Xenobiotics. San Diego, CA, October 21-25, 1990  
Named by the Editors of Spectroscopy as one of 19 "Bright Young Stars" in analytical spectroscopy. ("Perspectives on 10 Years in Spectroscopy," Spectroscopy, **10**, 52-61, 1995)  
Invited speaker, 11th International Carotenoid Conference, Leiden, The Netherlands, 1996  
Invited speaker, International Convention on Pharmaceutical Sciences Commemorating the 50<sup>th</sup> Anniversary of the Pharmaceutical Society of Korea. Seoul, Korea, 2001  
Outstanding Paper Award, 88th American Oil Chemists Society Annual Meeting & Expo. Seattle, WA, May 11-14, 1997  
Linus Pauling Institute Seminar Series Speaker. Oregon State University, Corvallis, OR, February 16, 2006  
University Scholar Award. University of Illinois, 2003-2006  
AOAC Presidential Task Force on Dietary Supplements, 2009-2011  
AOAC International Harvey W. Wiley Award, 2008  
AOAC International Outstanding Dietary Supplement Methods Panel Chair, 2010  
Invited speaker, Charles E. Dohme Memorial Symposium, Johns Hopkins University School of Medicine. November 20, 2013

## PUBLICATIONS

### 1. Papers

1. Cotter RJ, van Breemen R, Yergey J, Heller D. Thermal, laser, and fast atom desorption. Int. J. Mass Spectrom. Ion Proc. **46**, 395-8 (1983).
2. van Breemen RB, Snow M, Cotter RJ. Time resolved laser desorption mass spectrometry, I. Desorption of preformed ions. Int. J. Mass Spectrom. Ion Phys. **49**, 35-50 (1983).

3. Gibson W, van Breemen R, Fields A, LaFemina R, Irmiere A. D,L- $\alpha$ -Difluoromethylorinithine inhibits human cytomegalovirus replication. *J. Virology*. **50**, 145-54 (1984).
4. van Breemen RB, Tabet J-C, Cotter RJ. Characterization of oxygen-linked glucuronides by laser desorption mass spectrometry. *Biomed. Mass Spectrom.* **11**, 278-83 (1984).
5. van Breemen RB, Fenselau C. Acylation of albumin by 1-O-acyl glucuronides. *Drug Metab. Dispos.* **13**, 318-20 (1985).
6. van Breemen RB, Fenselau CC, Dulik DM. Activated Phase II metabolites: Comparison of alkylation by 1-O-acyl glucuronides and acyl sulfates. in *Biological Reactive Intermediates III*, ed. by JJ. Kocsis, DJ. Jollow, CM. Whitmer, JO Nelson, and R. Snyder. pp. 423-9, Plenum Publishing Corp., New York, 1986.
7. van Breemen RB, Fenselau C. Reaction of 1-O-acyl glucuronides with 4-p-(nitrobenzyl)pyridine. *Drug Metab. Dispos.* **14**, 197-201 (1986).
8. van Breemen RB, Fenselau C, Mogilevsky W, Odell GB. Reaction of bilirubin glucuronides with serum albumin. *J. Chromatogr.* **383**, 387-92 (1986).
9. van Breemen RB, Fenselau C, Cotter RJ, Curtis A.J., Connolly G. Derivatives of dicyclopentadiene in ground water. *Biomed. Environ. Mass Spectrom.* **14**, 97-102 (1987).
10. Fenselau C, van Breemen R, Bradow G, Stogniew M. Acyl-linked glucuronides as reactive metabolites. *Fed. Proc.* **46**, 2436-9 (1987).
11. van Breemen RB, Martin LB, Schreiner AF. Comparison of electron impact, desorption chemical ionization, field desorption, and fast atom bombardment mass spectra of nine monosubstituted Group VI metal carbonyls. *Anal. Chem.* **60**, 1314-8 (1988).
12. van Breemen RB, Stogniew M, Fenselau C. Characterization of acyl-linked glucuronides by electron impact and fast atom bombardment mass spectrometry. *Biomed. Environ. Mass Spectrom.* **17**, 97-103 (1988).
13. van Breemen RB. Fast atom bombardment mass spectrometry with B/E linked scanning of ether- and thiophenol-linked glucuronides. In *Cellular and Molecular Aspects of Glucuronidation*, ed. by G. Siest, J. Magdalou, B. Burchell, vol. 173, pp. 211-9, Colloque INSERM/John Libbey Eurotext Ltd., 1988.
14. van Breemen RB, Le JC. Enhanced sensitivity of peptide analysis by fast atom bombardment mass spectrometry using nitrocellulose as a substrate. *Rapid Commun. Mass Spectrom.* **3**, 20-4 (1989).
15. van Breemen RB, Martin LB, Schreiner AF. Formation of Negative ions of monosubstituted Group VIB pentacarbonyls during fast atom bombardment mass spectrometry. *Org. Mass Spectrom.* **25**, 3-8 (1990).
16. Goodlett DR, Armstrong FB, Creech RJ, van Breemen RB. Formylated peptides from cyanogen bromide digests identified by fast atom bombardment mass spectrometry. *Anal. Biochem.* **186**, 116-20 (1990).
17. van Breemen RB, Wheeler JJ, Boss WF. Identification of carrot inositol phospholipids by fast atom bombardment mass spectrometry. *Lipids*, **25**, 328-334 (1990).

18. Freeman HS, van Breemen RB, Esancy J F, Hao Z, Ukponmwan DO, Hsu WN. Fast atom bombardment and desorption chemical ionization mass spectrometry in the analysis of involatile textile dyes. *Textile Chemist and Colorist*, **22**, 23-28 (1990).
19. Martin LB, Schreiner AF, van Breemen RB. Characterization of cisplatin adducts of oligonucleotides by fast atom bombardment mass spectrometry. *Anal. Biochem.* **193**, 6-15 (1991).
20. van Breemen RB, Martin LB, Le JC. "Continuous-flow fast atom bombardment mass spectrometry of oligonucleotides." *J. Am. Soc. Mass Spectrom.* **2**, 157-163 (1991).
21. van Breemen RB, Canjura FL, Schwartz SJ. High-performance liquid chromatography-continuous-flow mass spectrometry of chlorophyll derivatives. *J. Chromatogr.* **542**, 373-383 (1991).
22. van Breemen RB, Bartlett MG, Tsou Y, Culver C, Swaisgood H, Unger SE. Degradation of peptide drugs by immobilized digestive proteases. *Drug Metab. Dispos.* **19**, 683-690 (1991).
23. van Breemen RB, Canjura FL, Schwartz SJ. Identification of chlorophyll derivatives by mass spectrometry. *J. Agric. Food Chem.* **39**, 1452-1456 (1991).
24. Freeman HS, Hao Z, Sokolowska-Gajda J, van Breemen RB. Matrix selection in the FAB mass spectrometric analysis of synthetic dyes. *Dyes and Pigments*, **16**, 317-327 (1991).
25. van Breemen RB, Huang C-H, Bumgardner CL. Continuous-flow fast atom bombardment and field desorption mass spectrometry of oligomers of 3,3,3-trifluorophenylpropyne. *Anal. Chem.* **63**, 2577-2580 (1991).
26. Bumgardner CL, Huang C-H, van Breemen RB. Characterization of oligomers of 3,3,3-trifluoro-1-phenylpropyne and 1-phenylpropyne by mass spectrometry. *J. Fluor. Chem.* **56**, 175-187 (1992).
27. Schmitz HH, van Breemen RB, Schwartz SJ. Applications of fast atom bombardment mass spectrometry (FAB-MS) and continuous-flow FAB-MS to carotenoid analysis. *Methods Enzymol.* **213**, 322-336 (1992).
28. van Breemen RB, Davis RG. Rates of peptide proteolysis measured using liquid chromatography and continuous-flow fast atom bombardment mass spectrometry. *Anal. Chem.* **64**, 2233-2237 (1992).
29. van Breemen RB, Schmitz HH, Schwartz SJ. Continuous-flow fast atom bombardment liquid chromatography/mass spectrometry of carotenoids. *Anal. Chem.* **65**, 965-969 (1993).
30. Saljoughian M, Williams PG, Morimoto H, Goodlett DR, van Breemen RB. Tritiated diimide: A regio- and stereo-selective tritium labeling reagent. *J. Chem. Soc., Chem. Commun.* 414-416 (1993).
31. Oommen TV, Petrie EM, van Breemen RB, Haney CA. Analysis of furanic compounds from cellulose aging by GC-MS, and attempts to correlate with degree of polymerization. CIGRE Paper 110-02, CIGRE Symposium on Diagnostic and Maintenance Techniques. Berlin, Germany, April 19-21. 1993.
32. Blackburn RK, van Breemen RB. Degradation of the cyclic peptide antibiotic lysobactin by immobilized digestive proteases. *Drug Metab. Dispos.* **21**, 573-579 (1993).
33. van Breemen RB, Tsou Y, Connolly G. Oxidation of dicyclopentadiene in surface water. *Biol. Mass Spectrom.* **22**, 579-584 (1993).

34. Spanos GA, Schwartz SJ, van Breemen RB, Huang C-H. High-performance liquid chromatography with light-scattering detection and desorption chemical-ionization tandem mass spectrometry of milk fat triacylglycerols. *Lipids*, **30**, 85-90 (1995).
35. van Breemen RB, Schmitz HH, Schwartz SJ. Fast atom bombardment tandem mass spectrometry of carotenoids. *J. Agric. Food Chem.* **43**, 384-389 (1995).
36. van Breemen RB, Jiang O, Tidwell RR, Hall JE, Brewer TG. Fast atom bombardment tandem mass spectrometry of the anti-parasitic agent pentamidine and its oxygenated metabolites. *J. Mass Spectrom.* **30**, 549-556 (1995).
37. van Breemen RB. Electrospray liquid chromatography-mass spectrometry of carotenoids. *Anal. Chem.* **67**, 2004-2009 (1995).
38. Thomas VR, Schreiner AF, van Breemen R, Xie TY, Chen CL, Gratzl JS. Photolytic dechlorination of 4-chlorophenol using an ArF\* excimer laser. *Holzforschung*, **49**, 139-145 (1995).
39. van Breemen RB. Advances in carotenoid analysis: Electrospray liquid chromatography-mass spectrometry using C<sub>30</sub> reversed phase HPLC. *Carotenoid News*, **5**, 8-9 (1995).
40. van Breemen RB, Huang CH, Lu ZZ, Rimando A, Fong HHS, Fitzloff JF. Electrospray liquid chromatography/mass spectrometry of ginsenosides. *Anal. Chem.* **67**, 3985-3989 (1995).
41. van Breemen RB. Innovations in carotenoid analysis using liquid chromatography/mass spectrometry. *Anal. Chem.* **68**, 299A-304A (1996). \*This paper was featured on the cover page of this issue of Analytical Chemistry.
42. van Breemen RB, Huang C-H. High performance liquid chromatography-electrospray mass spectrometry of retinoids. *FASEB J.* **10**, 1098-1101 (1996).
43. van Breemen RB, Huang C-H, Tan Y, Sander LC, Schilling AB. Liquid chromatography/mass spectrometry of carotenoids using atmospheric pressure chemical ionization. *J. Mass Spectrom.* **31**, 975-981 (1996).
44. Shen L, Pisha E, Huang Z, Pezzuto JM, Krol E, Alam Z, van Breemen RB, Bolton JL. Bioreductive activation of catechol estrogen-ortho-quinones: Aromatization of the B ring in 4-hydroxyequilenin markedly alters quinoid formation and reactivity. *Carcinogenesis*, **18**, 1093-1101 (1997).
45. van Breemen RB, Huang C-H, Nikolic D, Woodbury CP, Zhao YZ, Venton DL. Pulsed ultrafiltration electrospray mass spectrometry: A new method for screening combinatorial libraries. *Anal. Chem.* **69**, 2159-2164 (1997).
46. Zhao YZ, van Breemen RB, Nikolic D, Huang C-R, Woodbury CP, Schilling A, Venton DL. Screening solution-phase combinatorial libraries using pulsed ultrafiltration/ electrospray mass spectrometry. *J. Med. Chem.* **40**, 4006-4012 (1997).
47. Shen L, Qiu S, van Breemen RB, Zhang F, Chen Y, Bolton JL. Reaction of the Premarin metabolite 4-hydroxyequilenin semiquinone radical with 2'-deoxyguanosine: Formation of unusual cyclic adducts. *J. Am. Chem. Soc.* **119**, 11126-11127 (1997).
48. van Breemen RB. Liquid chromatography/mass spectrometry of carotenoids. *Pure Appl. Chem.* **69**, 2061-2066 (1997).

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