



Bernhard Vogler
Associate Professor

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A. Personal Statement

I have been working in the area of analytical organic chemistry for more than 30 years. I have applied a combination of NMR spectroscopy, mass spectrometry and reverse phase liquid chromatography to identify components of plant extracts as well as essential oils that showed activity against important human pathogens or targeted cancer cells. For many years I have collaborated with colleagues in Biochemistry and Natural Products Research, Food Chemistry, Agricultural Chemistry, Polymer Chemistry, and Inorganic Chemistry. I have trained numerous undergraduate and graduate students in the areas of analytical organic chemistry as well as in organic synthesis. Recently I have been also been involved in efforts to detect smallest amounts for fluorinated compounds, such as PFOS, using LC-MS, as well as was involved in Metabolomics toward Tyrosinemia. In the proposed project I will assist with identification and quantitation of the compounds of the targeted metabolic cycles.

Professional Preparation

University of Tuebingen	Tuebingen, Germany	Diploma	1983
University of Tuebingen	Tuebingen, Germany	PhD, Organic Chemistry	1988
Tohoku University	Sendai, Japan	Postdoctoral Researcher	1988-1990

Appointments

University of Alabama in Huntsville, Associate Professor	2008-today
University of Alabama in Huntsville, Assistant Professor	2001-2007
University of Hohenheim, Stuttgart Germany, NMR Manager	1990-2000

Memberships:

1987-present	American Chemical Society
1983-present	German Chemical Society

C. Contribution to Science

I am working for 30+ years along the lines of organic analytical chemistry. While at the beginning there was a heavy emphasis on natural products, the position at the University of Hohenheim also exposed me early on to the identification of chemicals from biological systems. As a common thread to my work I always had been challenged by either smallest amount of material, and/or characterization of mixtures. Exemplary of this work are the publications I co-authored with Drs Kraus, and Spring, Hohenheim, working on triterpenes and sesquiterpene lactones, respectively; as well as the publications with Dr Renz, Hohenheim, working on Vitamin B12 Biosynthesis that included labelling studies, Dr Heide, working on Novobiocin biosynthesis, and Dr Lingens, working on the biodegradation of chlorinated aromatic compounds. As a consequence I had been the first to use **HPLC-NMR** in combination with **HPLC-MS** successfully for the characterization of natural products. After relocating to the US more and more emphasis was on mixture analysis in form of **GC-MS**, Dr Setzer as co-author, and **HPLC-MS** characterizations, Dr Walker as co-author. Here in Huntsville, I expanded my analytical scope to polymer chemistry, Drs Rho and Scholz, However, I did continue to collaborate with

colleagues from Biochemistry, as my work with Dr. Shriver (protein NMR), and Dr McFeeters (labelling studies) indicates, and now my collaboration with Dr Rutledge manifests. Finally, recently, I have been supporting Dr Wu in her attempt to find solutions to our wastewater problem, which goes along with the need to characterize perfluorinated acids (PFOS) in the ppt to ppbb range, mostly via **HPLC-MS**.

Synergistic Activities

1. Serve as the director of the University's **Research and Creative Experience for Undergraduates (RCEU)** since 2003. Currently the program manages about 45 student projects every summer, in total we have served more than 400 students and researchers. This led to about \$ 300,000 in outside (NASA-Alabama Space Grant Consortium). **My roles include:** Fundraising; performing outreach to raise awareness of the program to students, maintaining a web-server with all of the projects, organizing break-out professional development sessions, which include: Research Ethics; UA System Copyright and Patent Policy, Professional Discourse, Creating Effective Posters, Preparing for Graduate School, Information Literacy, Scholarships and Fellowships.
2. Serve since 2004 as the **Chemistry Olympiad** coordinator for the North Alabama Section of the American Chemical Society. This allowed 1000+ students to participate in the local section competitions, held in March, and about 15 students to participate in the national competition, held in April. Over the years, four students from our section were able to make it into the top 20 students in the US. **My roles include:** Organizing exams, recruiting schools, travel to schools outside of Huntsville and administer the exams, recruit student helpers for exams.
3. Serve since 2014 as one of the co-sponsors and coordinators for the Alabama chapter of **You Be the Chemist challenge** in Alabama in collaboration with chemists from a local BASF-plant. **My activities include:** growing the Challenge in Alabama by finding new schools to participate, setting up, attending and judging local competitions. I vet questions for the local competition.
4. Serve since 2015 as a mentor for the **Research and Engineering Apprenticeship Program (REAP)** of the Army Educational Outreach Program (AEOP). **My roles include:** Coordinate with other mentors, currently four on campus, and other programs (LSAMP), so serve 16 students annually. I create personalized research for three students annually in my lab. Three of my students and seven students overall participated in our North Alabama Regional Science Fair (NARSEF), held in March, and Alabama Science Engineering Fair (ASEF), held in April. One student participated in the Intel Science Fair in Phoenix 2018 as a result of participating in the program.
5. Serve as the **Assistant director of the UAH NMR facility** since 2002. **My activities include:** Overseeing the budget of the facility, daily operation, performing maintenance and repairing of instruments. Recruitment of industrial customers to off-set cost of the facility by outside funding. Over the last fifteen years, we have brought in about \$ 25,000-30,000 annually without overhead into the NMR facility.

Publications

2020

91. Removal of meropenem from environmental matrices by electrochemical oxidation using Co/Bi/TiO₂ nanotube electrodes. Amir Ahmadi, Bernhard Vogler, Yang Deng and Tingting Wu, Environ. Sci.: Water Res. Technol., 2020,6, 2197-2208.

2019

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89. Comparison of Methods of Extraction and Antimicrobial Activity of Six *Ocimum* Species against Human Pathogens. Manjula Bomma, Florence Okafor, S.R. Mentreddy, Leopold Nyochembeng, William Setzer, Bernhard Vogler. *Journal of Agriculture and Life Sciences* Vol. 5, No. 2, December 2018, pp 61-70.
88. Enhancement of Copper Catalyst Stability for Catalytic Ozonation in Water Treatment Using ALD Overcoating, Wenwen Yang, Zheng Lu, Bernhard Vogler, Tingting Wu, and Yu Le. *ACS Appl. Mater. Interfaces*, 2018, 10 (50), pp 43323–43326.
- 2017**
87. Metallic ion leaching from heterogeneous catalysts: an overlooked effect in the study of catalytic ozonation processes Wenwen Yang, Bernhard Vogler, Yu Lei and Tingting Wu *Environ. Sci.: Water Res. Technol.*, 2017.
86. Harvest of Freshwater Microalgae *Nannochloropsis* Sp. Using Organic Solvents by Tuning the Cell Surface Hydrophobicity with low pH. Chen Zhang, Bernhard Vogler, Yu Lei, James E. Smith Jr in preparation.
85. Bacterial Production of Site Specific ¹³C Labeled Phenylalanine and Methodology for High Level Incorporation into Bacterially Expressed Recombinant Proteins Bhargavi Ramaraju, Hana McFeeters, Bernhard Vogler, Robert L. McFeeters* *Journal of Biomolecular NMR*, January 2017, Volume 67, Issue 1, pp 23–34
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84. Bioresource Technology; Rapid Acid and Surfactant Mediated Liquid-Liquid Lipid Extraction from Unconcentrated Microalgal Suspension: James Edwin Smith, Jr, Ph.D.; Chen Zhang, MSE; Bernhard Vogler, Ph.D.; Yu Lei, Ph.D.
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82. Composition of the Floral Essential Oil of *Magnolia grandiflora* L. (Magnoliaceae): Intraspecific and Floral Maturity Variations. Purva C. Davé, Bernhard Vogler & William N. Setzer, *Journal of Essential Oil Bearing Plants*. Volume 15, Issue 5, 2012, 694
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80. Prenylated isoflavonoids from *Rhynchosia edulis*. Ogungbe IV, Hill GM, Crouch RA, Vogler B, Nagarkoti M, Haber WA, Setzer WN *Natural Product Communications* [2011, 6(11):1637-1644]
79. "Chemical Compositions of the Leaf Essential Oils of *Aralia spinosa* from Three Habitats in Northern Alabama," P. Davé, B. Vogler and W. Setzer, *American Journal of Plant Sciences*, Vol. 2 No. 3, 2011, pp. 507-510.
- 2011**
78. In Vitro Absorption of Dietary trans-resveratrol from Boiled and Roasted Peanuts in Caco-2 Cells." Yvonne Chukwumah, Lloyd Walker, Bernhard Vogler, and Martha Verghese, *Journal of Agricultural and Food Chemistry*, 2011, 59, 12323-9.
77. Identification and quantification of flavonoids and ellagic acid derivatives in therapeutically important *Drosera* species by LC-DAD, LC-NMR, NMR, and LC-MS, *Analytical and Bioanalytical Chemistry*, Zehl, Martin; Braunberger, Christina; Conrad, Juergen; Crnogorac, Marija; Krasteva, Stanimira; Vogler, Bernhard; Beifuss, Uwe; Krenn, Liselotte *Anal Bioanal Chem.* 400(8): 2565-2576, 2011.
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76. The chemical composition and antimicrobial activity of the leaf oil of *Cupressus lusitanica* from Monteverde, Costa Rica, Sara L Hassanzadeh, Jessika A Tuten, Bernhard Vogler, William N Setzer, *Phcog Res* 2010;2:19-21.
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68. Chapter 9 Characterization of Natural Products
Bernhard Vogler William N. Setzer In *Natural Products from Plants*
67. Chapter 10 Bioassays for Activity
William N. Setzer and Bernhard Vogler. In *Natural Products from Plants*
66. Biologically Active Natural Product for the 21st Century, LAD Williams Editor.
Advancements in the Structure Elucidation by NMR. Bernhard Vogler
65. "Bioactive principles in the bark of *Pilidiostigma tropicum*". Setzer WN, Rozmus GF, Setzer MC, Schmidt JM, Vogler B, Reeb S, Jackes BR, Irvine AK. *J Mol Model* (Online). 2006 Apr 7.
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64. Isolation of cupanoside, a novel cytotoxic and antibacterial long-chain fatty alcohol glycoside from the bark of *Cupania glabra*. Setzer WN, Vogler B, Schmidt JM, Petty JL, Haber WA. *Planta Med.* 2005 Jul;71(7):686-8.
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