

BRANDIE MICHELLE EHRMANN

University of North Carolina at Chapel Hill
Department of Chemistry
Mass Spectrometry Facility
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EDUCATION:

Florida State University, Tallahassee, FL **2005-2010**
Ph.D. in Analytical Chemistry
Dr. Alan Marshall
Dissertation title: Investigation and Characterization of Asphaltenes and Asphaltene Co-precipitates and their Role in Emulsion Formation/Stabilization (i-177)

University of North Carolina at Greensboro, Greensboro, NC **2000-2004**
B.S. in Chemistry, ACS certified

EMPLOYMENT EXPERINECE:

University of North Carolina at Chapel Hill **2015-present**
Department of Chemistry
Mass Spectrometry Facility
Director

- Maintenance all experimental mass spectrometers, separation systems, and other laboratory equipment
- Supervise and train students on the usage of mass spectrometers and other laboratory equipment
- Responsible for the management of the facility's budget and purchasing
- Collaborate with other faculty members on new experiments using mass spectrometry
- Conduct collaborative research with colleague in the department

University of North Carolina at Greensboro **2010-2014**
Department of Chemistry and Biochemistry
Triad Mass Spectrometry Laboratory
Mass Spectrometry Research Operations Manager

- Maintenance all experimental mass spectrometers, separation systems, and other laboratory equipment
- Supervise and train students on the usage of mass spectrometers and other laboratory equipment
- Established the Triad Mass Spectrometry Laboratory through oversight and guidance on layout, equipment needed, etc.
- Responsible for the management of the facility's budget and purchasing

- Collaborate with other faculty members on new experiments using mass spectrometry
- Supervise teaching labs that required the use of mass spectrometers
- Conduct collaborative research with colleague in the department

RESEARCH EXPERIENCE:

Graduate Research Assistant with Dr. Alan G. Marshall, Department of Chemistry and Biochemistry, Florida State University, 2005-2010

Areas of study include:

- Analysis of Crude Oils, Asphaltenes, and Emulsions
- Kendrick Mass Analysis
- SARA Method of Fractionation for Crude Oils
- Application of van Krevelen diagrams to Crude oils
- Electrospray Ionization and Atmospheric Pressure Photo-Ionization

Undergraduate Research Associate with Dr. Nadja B. Cech, Department of Chemistry and Biochemistry, University of North Carolina at Greensboro, 2003-2005

Areas of Study include:

- Fundamentals of Electrospray Ionization
- Development of LC-MS for the quantification & separation of natural plant extracts

HONORS AND AWARDS:

Hoffman Teaching Merit Fellowship, Florida State University 2004-2005

PROFESSIONAL AFFILIATIONS:

Iota Sigma Pi since 2012
American Society for Mass Spectrometry since 2005
American Chemical Society 2005-2011

LEADERSHIP AND DEPARTMENTAL INVOLVEMENT:

Participated in graduate student recruitment, Florida State University 2005-2008
FSU Chemistry/Biochemistry Faculty-Student Relations Committee 2007-2008
Regional Science Fair Judge 2007

TEACHING EXPERIENCE:

Mass Spectrometry Training Course, UNC-Greensboro 2011-2014

- Design and deliver training to undergraduate, masters, PhD, & post-doctoral students interested in mass spectrometry
- Administer a course conclusion examination
- Implement user on-hands training

Teaching Assistant, General Chemistry II, Florida State University 2005

- Prepared and taught lab lectures
- Administered grades
- Revised/modified Honors lab manual

Teaching Assistant, Introduction to Analytical Chemistry, 2005
Florida State University

- Prepared and taught lab lectures
- Encouraged further interest in chemistry degrees among high achieving students
- Administered grades

Chemistry Tutor

- Tutored students in High School Chemistry, General Chemistry, and Analytical Chemistry 2005-2008

INSTRUMENTAL SKILLS:

- ThermoScientific Q Exactive Plus mass spectrometer
- Prosolia DESI (desorption electrospray ionization) 2D ionization source
- ThermoScientific LTQ Orbitrap XL
- ThermoScientific LTQ Fourier Transform Ion Cyclotron Resonance mass spectrometer
- Waters Synapt G2
- Thermo TSQ Quantum Access (triple quad mass spectrometer)
- Applied Biosystems 4700 MALDI TOF-TOF
- Waters Acquity ultra-high performance liquid chromatography system (UPLC)
- Shimadzu gas chromatograph-mass spectrometer (GC-MS) (QP-2010)
- Agilent HPLC (1100 series)
- Custom built high-field micro-electrospray ionization FT-ICR mass spectrometers
 - 9.4 T
 - 14.5 T
- Thermo Finnigan LCQ and LTQ mass spectrometers
- Agilent Autosampler
- CE Elantech (Thermo) Elemental Analyzer (CHNS-O)

COMPUTER SKILLS:

- Microsoft Works (Excel, Word, PowerPoint, Outlook, and Publisher)
- Xcalibur
- MassLynx
- MarkerLynx
- SigmaPlot
- Internet Explorer, Firefox, Google Chrome
- PREDATOR (formally MIDAS-Molecular Ion Data Acquisition System)
- Elemental Formula Calculator

PEER REVIEWED PUBLICATIONS:

- Lucchesi, Valentina; Hurst, Dow; Shore, Derek; Bertini, Simone; Ehrmann, Brandie; Allarà, Marco; Lawrence, Lyle; Ligresti, Alessia; Minutolo, Filippo; Saccomanni, Giuseppe; Sharir, Haleli; Macchia, Marco; Di Marzo, Vincenzo; Abood, Mary; Reggio, Patricia; Manera, Clementina **CB2-Selective cannabinoid Receptor Ligands: Synthesis, Pharmacological Evaluation, and Molecular Dynamics Investigation of 1,8-naphthyridine-2(1H)-on-3-carboxamides** *J Med Chem*, **2014**, *57* (21), 8777-8791. *referred*
- Alfaro, Clint; Uwakweh, Agbo-Oma; Todd, Daniel; Ehrmann, Brandie; Cech, Nadja. **Investigations of Analyte-Specific Linear Dynamic Range Limitations in Atmospheric Pressure Ionization Mass Spectrometry** *Anal Chem*, **2014**, *86* (21), 10639-10645. *referred*
- Wagoner, Kaira M., Lehmann, Tovi, Cech, Nadja B, Ehrmann, Brandie M. and Wasserberg, Gideon. **Identification of Morphologic and Chemical Markers of Dry- and Wet-Season Conditions in Female *Anopheles gambiae* Mosquitoes** *Parasite Vector*, **2014**, *7* (1), 1-27. *referred*
- El-Elimat, Tamam; Figueroa, Mario; Ehrmann, Brandie M.; Cech, Nadja B.; Pearce, Cedric J.; Oberlies, Nicholas H. **High-Resolution MS, MS/MS, and UV Database of Fungal Secondary Metabolites as a Dereplication Protocol for Bioactive Natural Products** *J Nat Prod*, **2013**, *76* (9), 1709-1716. *referred*
- Junio, Hiyas A.; Todd, Daniel A.; Etefagh, Keivan A.; Ehrmann, Brandie M.; Kavanaugh, Jeffrey S.; Horswill, Alexander R.; Cech, Nadja B. **Quantitative analysis of autoinducing peptide I (AIP-I) from *Staphylococcus aureus* cultures using ultrahigh performance liquid chromatography-high resolving power mass spectrometry** *J Chromatogr B* **2013**, 930, 7-12. *referred*
- Ayers, S.; Ehrmann, B. M.; Adcock, A. F.; Kroll, D. J.; Carcache de Blanco, E. J.; Shen, Q.; Swanson, S. M.; Falkinham, III, J. O.; Wani, M. C.; Mitchell, S. M.; Pearce, C. J.; Oberlies, N. H. **Peptaibols from Two Unidentified Fungi of the Order Hypocreales with Cytotoxic, Antibiotic, and Anthelmintic Activities** *J. Peptide Sci.* **2012**, *18* (8), 500-501. *referred*
- Ayers, S.; Ehrmann, B. M.; Adcock, A. F.; Kroll, D. J.; Wani, M. C.; Pearce, C. J.; Oberlies, N. H. **Thielavin B methyl ester: a cytotoxic benzoate trimer from an unidentified fungus (MSX 55526) from the Order Sordariales** *Tetrahedron Lett.*, **2011**, *52* (44), 5733-5735. *referred*
- Mazzoleni, L.R., B.M. Ehrmann, X. Shen, A.G. Marshall, and J.L. Collett, **Water-Soluble Atmospheric Organic Matter in Fog Water: Exact Masses and Chemical Formula Identification by Ultrahigh Resolution FT-ICR Mass Spectrometry**, *Environ Sci. Tech.*, **2010**, *44* (10), 3690–3697. *referred*
- Bae, S. S.; Ehrmann, B. M.; Etefagh, K. A., Cech, N. B. **A Validated Liquid Chromatography/Electrospray Ionization-Mass Spectrometry (LC/ESI-MS) Method for Quantification of Spilanthol in *Spilanthes acmella* (L.) Murr.** *Phytochem. Anal.* **2010**, *21*, 438-443. *referred*
- Ehrmann, Brandie M.; Henriksen, Trine; Cech, Nadja B. **Relative importance of basicity in the gas phase and in solution for determining selectivity in electrospray ionization mass spectrometry.** *J. Amer. Soc. Mass Spectrom.* **2008**, *19* (5), 719-728. *referred*

PRESENTATIONS:

- Sica, Vincent; Oberlies, Nicholas; Ehrmann, Brandie; Raja, Huzefa; El-Elimat, Tamam **Applying Desorption Electrospray Ionization to Streamline the Discovery of Bioactive Compounds from Fungi** 65th Southeast Regional Meeting of the American Chemical Society, Atlanta, GA, United States, November 13-16 (2013).
- Alfaro, Clint M.; Ehrmann, Brandie M.; Todd, Daniel A.; Cech, Nadja B. **Insights Into Factors that Limit the Linear Dynamic Range in Electrospray Ionization Mass Spectrometry Analysis of Flavonoids**, 61st ASMS Conference on Mass Spectrometry, Minneapolis, MN, June 9-13 (2013).
- Jarmusch, Scott A.; Figueroa, Mario; Ehrmann, Brandie M.; Shymanovich, Tatsiana; Faeth, Stanley H.; Oberlies, Nicholas H.; Scheerer, Jonathan R.; Cech, Nadja B. **Analysis of Bioactive Loline Alkaloids in *Achnatherua robustum* and *Lolium pretense* by High Resolution Mass Spectrometry**, 61st ASMS Conference on Mass Spectrometry, Minneapolis, MN, June 9-13 (2013).
- El-Elimat, Tamam; Ehrmann, Brandie M.; Cech, Nadja B.; Pearce, Cedric J.; Oberlies, Nicholas H. **High Resolution MS, MS/MS and UV Library of Fungal Secondary Metabolites as a Dereplication Protocol for Bioactive Natural Products**, 64th Southeast Regional Meeting of the American Chemical Society, Raleigh, NC, November 14-17 (2012).
- Jarmusch, Scott A.; Ehrmann, Brandie M.; Saari, Susanna; Shymanovich, Tatsiana; Faeth, Stanley H.; Cech, Nadja B. **Comparison of Mass Spectrometric Ionization Techniques for Analysis of Bioactive Loline Alkaloids**, 64th Southeast Regional Meeting of the American Chemical Society, Raleigh, NC, November 14-17 (2012).
- Ehrmann, Brandie M.; Robbins, Winston K; Rodgers, Ryan P.; Marshall, Alan G. **Asphaltene Co-Precipitate Molecular Evolution as a Function of Soxhlet Extraction Period, Illuminated by (+/-) ESI FT-ICR MS**, 58th ASMS Conference on Mass Spectrometry, Salt Lake City, UT, May 23-27 (2010)
- Mazzoleni, Lynn R.; Shen, Xinhua; Ehrmann, Brandie; Collett, Jeffrey L. **Characterization of Atmospheric Organic Matter by Ultra-high Resolution FT-ICR Mass Spectrometry: Assignment of 2000 Unique Empirical Formula**, DOE Atmospheric Science Program Science Team Meeting, Santa Fe, NM, February (2009)
- Ehrmann, Brandie M.; Juyal, Priyanka; Rodgers, Ryan P.; Marshall, Alan G. **An Investigation of Emulsion Interfacial Material by Ultrahigh Resolution FT-ICR Mass Spectrometry**, 9th Ann. Int'l. Conf. on Petroleum Phase Behavior & Fouling, Victoria, B.C, Canada, June 15-19 (2008)
- McKenna, A.M.; Ehrmann, B.M.; Juyal, P.; Purcell, J.M.; Schaub, T. M.; Rodgers, R.P. and Marshall, A.G., **Petroleum Compositional Information Revealed by High Resolution FT-ICR Mass Spectrometry**, Symp. on Advances in Analytical Methods in Petroleum Exploration, Production, and Characterization; FACSS 2008, Reno, NV, September 28-October 2 (2008)
- Marshall, A.G.; Blakney, G.T.; Ehrmann, B.M.; Hendrickson, C.L.; Juyal, P.; Mapolelo, M.M.; McKenna, A.; Purcell, J.M. Schaub, T.M. and Rodgers, R.P., **Fourier Transform Ion Cyclotron Resonance Mass Spectrometry: The Most Powerful Tool for Compositional Characterization of Petroleum and Its Relatives**, 9th Int'l. Conf. on Petroleum Phase Behavior & Fouling, Victoria, B.C., Canada, June 15-19 (2008)

- Rodgers, R.P.; Tan, X.; Ehrmann, B.M.; Juyal, P.; McKenna, A.M.; Purcell, J.M.; Schaub, T.M.; Gray, M.R. and Marshall, A.G., **Asphaltene Structure Determined by Mass Spectrometry**, 9th Int'l Conf. on Petroleum Phase Behavior and Fouling, Victoria, B.C. Canada, June 15-19 (2008)
- Marshall, A.G.; Ehrmann, B.M.; Juyal, P.; Mapolelo, M.M.; McKenna, A.M.; Purcell, J.M.; Schaub, T.M. and Rodgers, R.P., **Compositional Characterization of Heavy Hydrocarbon Resources by Ultrahigh-Resolution Fourier Transform Ion Cyclotron Resonance Mass Spectrometry.**, 236th ACS National Meeting, Philadelphia, PA, August 17-21 (2008)
- Ehrmann, Brandie M.; Juyal, Priyanka; Rodgers, Ryan P.; Marshall, Alan G. **Characterization of Asphaltene Emulsion Interfacial Material by Ultrahigh Resolution FT-ICR Mass Spectrometry**, 56th ASMS Conf. on Mass Spectrometry & Allied Topics, Denver, CO, June 1-5 (2008)
- Rodgers, R.P.; Ehrmann, B.M.; Juyal, P.; Mapolelo, M.M.; McKenna, A.M.; Purcell, J.M.; Schaub, T.M. and Marshall, A.G., **Petroleomics: Chemistry from the Underworld**, 56th ASMS Conf. on Mass Spectrometry & Allied Topics, Denver, CO, June 1-5 (2008)
- Ehrmann, Brandie M.; Juyal, Priyanka; Rodgers, Ryan P.; Marshall, Alan G. **Emulsion Characterization by Ultrahigh Resolution FT-ICR Mass Spectrometry**, 235th Amer. Chem. Soc. Nat'l. Mtg. (Joint with AIChE), New Orleans, LA April 6-10 (2008)
- Rodgers, R.P.; Purcell, J.M.; McKenna, A.M.; Ehrmann, B.M.; Schaub, T.M. and Marshall, A.G., **Recent Advances in Petroleum Analysis by High Resolution FT-ICR Mass Spectrometry," Symp. on Chemistry of Petroleum and Emerging Technologies**, 235th Amer. Chem. Soc. Natl. Mtg (Joint with AIChE), New Orleans, LA, April 6-10 (2008)
- Marshall, A.G.; Rodgers, R.P.; Schaub, T.M.; Hendrickson, C.L.; Smith, D.F.; Purcell, J.M.; Juyal, P.; Mapolelo, M. and Ehrmann, B.M., **Petroleomics: Chemistry of the Underworld: Symp. on Advances in Analytical Methods for Characterization of Complex Petroleum and Biofuel Molecules**, Pittsburgh Conf. Achievement Award Symp. for Neil Kelleher, PittCon 2008, New Orleans, LA, March 2-6 (2008)
- Ehrmann, Brandie M.; Rodgers, Ryan P.; Marshall, Alan G. **Low Resolution Mass Analysis of Asphaltene Structures—Archipelago vs. Island**, 55th ASMS Conference on Mass Spectrometry, Indianapolis, IN, June 3-7 (2007)
- Rodgers, R.P., Purcell, J.M.; Ehrmann, B.M.; Smith, D.F.; Juyal, P. and Marshall, A.G., **FT-ICR MS Sheds Light on Nature's Complexity**, 4th Conf. on Small Molecule Science (CoSMoS), Chapel Hill, NC, July 30-August 1 (2007)
- Rodgers, R.P.; Ehrmann, B.M.; Juyal, P.; Purcell, J.M.; Gray, M.R. and Marshall, A.G., **Asphaltene Structure Determined by Mass Spectrometry: Island vs. Archipelago Models**, 8th Int'l Conf. on Petroleum Phase Behavior & Fouling, Pau, France, June 10-14 (2007)
- Ehrmann, Brandie M.; Rodgers, Ryan P.; Marshall, Alan G. **Combined High and Low Resolution Mass Spectrometry for Determination of Molecular Structures of Asphaltene Compound**, 6th N. Amer. FT-ICR MS Conf., Tahoe City, CA, April 1-5 (2007)
- Rodgers, R.P.; Juyal, P.; Purcell, J.M.; Kim, D.-G.; Smith, D.F.; Ehrmann, B.M.; Hendrickson, C.L. and Marshall, A.G., **FT-ICR Mass Spectrometry's Role in the**

Evolution of World Oil Production, 6th N. Amer. FT-ICR MS Conf., Tahoe City, CA, April 1-5 (2007)

- Ehrmann, Brandie M.; Schaub, Tanner M.; Salmon, Sara L.; Dettman, Heather D.; Rodgers, Ryan P.; Marshall, Alan G. Detailed **Characterization of GPC Fractionated Athabasca Asphaltenes by FT-ICR Mass Spectrometry**, 54th ASMS Conference on Mass Spectrometry, Seattle, WA (2006)