Curriculum Vita

Michael E. Sigman, Ph.D.

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Current Affiliation (Title)

University of Central Florida (UCF), Department of Chemistry; Professor
National Center for Forensic Science, UCF, Director

Education:

1982 B.S., Chemistry, Southwest Missouri State University, Springfield, MO.
1986 Ph.D., Organic Chemistry, The Florida State University, Tallahassee, FL.
1986-87 NIH Postdoctoral Fellow, University of Illinois, Urbana, IL.
1987-90 NIH Postdoctoral Fellow, University of Chicago, Chicago, IL.

Employment:

1989-90 Dow Chemical USA, Midland, MI.
1990-2002 Oak Ridge National Laboratory, Oak Ridge, TN.
2002-present University of Central Florida, Orlando, FL.
Department of Chemistry and National Center for Forensic Science
2002 – 2007: Associate Professor, untenured
2007 – 2013: Associate Professor, tenured
2013 – Present: Professor
2013 – Present: Director, National Center for Forensic Science

Honors, Awards and Fellowships:

1986 Graduate Research Award in Chemistry, The Florida State University
1986-89 National Institutes of Health Postdoctoral Fellowship
1996 ORNL Significant Event Award (Methylated Sol-Gel Sorbents patent submission)
1997 R&D 100 Award, Methylated Sol-Gel Sorbents.
2007-08 Teaching Incentive Program (UCF-TIP) Award, University of Central Florida
2010-11 Research Incentive Award (UCF-RIA), University of Central Florida

Professional Service:

1995-99 University of Puerto Rico DOE/EPSCoR External Advisory Committee
1995-99 University of Tennessee, Department of Civil and Environmental Engineering (Adjunct Associate Professor)
1996 "Mechanistic Environmental Photochemistry," ACS National Meeting, Chicago, IL; Aug. 20-24 (symposium co-organizer).
1999-00 Department of Chemistry External Advisory Committee, University of Montana.
1999 "Photochemistry in the Southeast," Southeastern Regional Meeting of the ACS, Knoxville, TN (symposium co-organizer**).**
2000-02 Chemical Sciences Division Council, Chair, Oak Ridge National Laboratory.

2002 DOE/BES National Workshop "Basic Research Needs for Countering Terrorism," Chair on Chemical Threats, Bethesda, MD, Feb. 28 - March 1.
2002-03 Forensic Science MS Program, University of Central Florida. Lead author on proposal for program implementation. Program implemented Fall 2003-present
2003-12 Served as Forensic Science MS program co-director for the Analysis Track
2005-10 Scientific Working Group on Fire and Explosion, Ignitable Liquids Reference Collection and Database Committee – NCFS Coordinator.
2007-10 University of Central Florida Research Council, College of Sciences Representative. (Chair 2009-2010)
2010- Reviews in Analytical Chemistry, Editorial Board
2014-15 Organization of Scientific Area Committees, National Council for Forensic Science (member)

Professional Memberships:

American Chemical Society 1982 - present

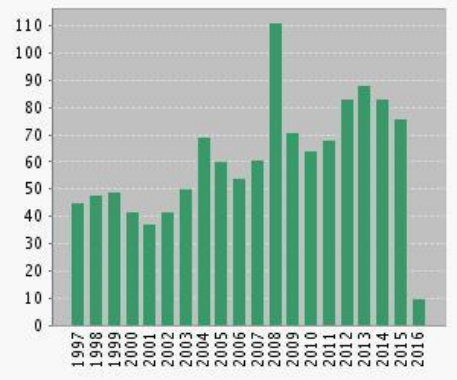
Courses Taught at UCF:

CHS 3501 Introduction to Forensic Science (*Lecture, Team Taught*)
CHS 3511 Forensic Trace Analysis (*Lecture and Laboratory, Team Taught*)
CHS 3530 Forensic Analysis of Controlled Substances (*Lecture and Laboratory, Lead Instructor and Team Taught*)
CHS 4537 Forensic Laboratory Quality Assurance (*Lecture*)
CHS 5502 Survey of Forensic Science (*Web*)
CHS 6548 Analysis of Explosives and Accelerants (*Web*)

Research Students at UCF:

Undergraduate Research Students:	40
M.S. Students Directed	11
MS Degrees Completed	9
PhD Students Directed	9
PhD Degrees Completed	7
Current Group	2 PhD, 2 MS

Publications:



Total Citations of Peer-Reviewed Publications: ***1360*** *(Web of Science, April. 2016)*
H-Index=21
*Notes: Corresponding author denoted by **
*Discipline convention is to place student performing most directed laboratory studies as first author, author responsible for intellectual content and principal author is denoted by **

Peer-Reviewed Scientific Papers:

1. Leffler,* J. E., Sigman, M. E. and Lindley, S. M. "Supercritical Carbon Dioxide: Behavior of π^* and β Solvatochromic Parameters in Media of Different Densities," *J. Am. Chem. Soc.* **1985**, *107*, 1471.

2. Leffler,* J. E. and Sigman, M. E. "Supercritical Carbon Dioxide 2. π^* and the Dielectric Function for Supercritical Carbon Dioxide Media at Various Densities," *J. Phys. Chem.* **1986**, *90*, 6063.

3. Leffler,* J. E. and Sigman, M. E. "Supercritical Carbon Dioxide 3. The Decomposition of Phenylazotriphenylmethane in Supercritical Carbon Dioxide," *J. Org. Chem.* **1987**, *52*, 1165.

4. Leffler,* J. E. and Sigman, M. E. "Supercritical Carbon Dioxide: The *cis* to *trans* Relaxation and the , n-π^* Transition of 4-(Dimethylamino)-4'-nitroazobenzene," *J. Org. Chem.* **1987**, *52*, 1165.

5. Leffler,* J. E., Sigman, M. E. and Barbas, J. T. "Supercritical Carbon Dioxide 5. Carboxyinversion Reactions of Diacyl Peroxides. Alkyl Group Rearrangement and Carbon Dioxide Exchange," *J. Org. Chem.* **1987**, *52*, 1754.

6. Schuster,* G. B., Sigman, M. E. and Autrey, T. "Aroylnitrenes with Singlet Ground States: Photochemistry of Acetyl-Substituted Aroyl and Aryloxycarbonyl Azides," *J. Am. Chem. Soc.* **1988**, *110*, 4297.

7. Sigman, M. E. and Closs,* G. L. "Free Energy and Structure Dependence of Intramolecular Triplet-Energy Transfer in Organic Model Compounds," *J. Phys. Chem.* **1991**, *95*, 5012-5017.

8. Sigman,* M. E., Zingg, S. P., Pagni, R. M. and Burns, J. H. "Photochemistry of Anthracene in Water," *Tetrahedron Lett.* **1991**, *32*(41), 5737-5740.

9. MacInnis, J. M., McDonald, K. A., Sigman, M. E. and Greenbaum,* E. "Simultaneous Measurement of Photosynthetic Oxygen Evolution and Carbon Dioxide Assimilation Under Anaerobiosis," *Photochem. Photobiol.* **1992**, *58*, 718-723.

10. Barbas, J. T., Sigman,* M. E., Buchanan, A. C., III and Chevis, E. A. "Photolysis of Substituted Naphthalenes on SiO_2 and Al_2O_3," *Photochem. Photobiol.* **1993**, *58*(2), 155-158.

11. Zingg, S. P. and Sigman,* M. E. "Influence of an SiO_2/Cyclohexane Interface on the Photochemistry of Anthracene," *Photochem. Photobiol.* **1993**, *57*(3), 453-459.

12. Sigman,* M. E. and Rives, S. "Prediction of Atomic Ionization Potentials I-III Using an Artificial Neural Network," *J. Chem. Inf. Comput. Sci.* **1993**, *34*, 617-620.

13. Sigman,* M. E. and Zingg, S. P. "Anthracene Photochemistry in Aqeous and Heterogeneous Media," in *Aquatic and Surface Photochemistry*, Helz, G. R.; Zepp, R. G.; Crosby, D. G. Ed.s, Lewis Publishers, Boca Raton, FL; **1994**, pp 197-207.

14. Dabestani,* R. T., Ellis, K. J. and Sigman, M. E. "Photodecomposition of Anthracene on Dry Surfaces: Products and Mechanism," *J. Photochem. Photobiol. A Chem.* **1994**, *86*, 231-239.

15. Dabestani,* R. T., Nelson, M. and Sigman, M. E. "1,3-di-2,2'-Naphthylpropane as a Fluorescent Probe for Silica Surfaces," *J. Photochem. Photobiol. A Chem.* **1995**, *92*, 201-206.

16. Dai, S., Sigman,* M. E. and Burch, E. L. "Preparation of a Photochromic Glass Doped with Methylviologen Radical Cation *via* a Sol-Gel Process," *Chem. Mater.* **1995**, *7*(11), 2054-2057.

17. Sigman,* M. E., Chevis, E. A., Brown, A., Barbas, J. T., Dabestani, R. T. and Burch, E. L. "Enhanced Photoreactivity of Acenaphthylene in Water: A Product and Mechanism Study," *J. Photochem. Photobiol. A Chem.* **1996**, *94*, 149-155.

18. Barbas, J. T., Sigman, M. E. and Dabestani,* R. T. "Photochemical Oxidation of Phenanthrene Sorbed on Silica Gel," *Environ. Sci. Technol.* **1996**, *30*(5), 1776-1780.

19. Dabestani,* R., Nelson, M. and Sigman, M. E. "Photochemistry of Tetracene Adsorbed on Dry Silica: Products and Mechanism," *Photochem. Photobiol.*, **1996**, *64(1)* (1996) 80-86.

20. Schutt, W. S., Li,* Y. and Sigman, M. E. "Fluorometric Investigation of Reactions Between Ozone and Excited State Aromatic Compounds on Silica Gel," *Anal. Chim. Acta* **1996**, *319*, 369.

21. Sigman,* M. E., Barbas, J. T., Chevis, E. A. and Dabestani, R. T. "Spectroscopy and Photochemistry of 1-Methoxynaphthalene on SiO_2", *New J. Chem.* **1996**, *20*, 243-248.

22. Barbas, J. T., Sigman,* M. E., Arce, R. and Dabestani, R. T. "Spectroscopy and Photochemistry of Fluorene at a Silica Gel/Air Interface," *J. Photochem. Photobiol. A Chem.* **1997**, *109*, 229-236.

23. Shi, Z., Sigman,* M. E., Ghosh, M. M. and Dabestani, R. T. "Photolysis of 2-Chlorophenol Dissolved in Surfactant Solutions," *Environ. Sci. Technol.* **1997**, *31*, 3581.

24. Trivelpiece, A. W., Sigman,* M. E. and Dindal, A. B. "Methylated Sol-Gel Sorbent," R&D-100 Award Submission (1997).

25. Sigman,* M. E., Buchanan, A. C., III and Smith, S. M. "Application of Advanced

Oxidation Process Technologies to Extremely High TOC Containing Aqueous Fluids," *J. Adv. Oxid. Technol.* **1997**, *2*, 415.

26. Dabestani, R. T. and Sigman,* M. E. "Phototransformation of Polycyclic Aromatic Hydrocarbons on a Non-Semiconductive Surface Such as Silica," in *Proc., 3rd International Titanium Dioxide Photocatalytic Purification of Water and Air Conference*, Orlando, FL, Sept. 23-26, 1997, *3* (1997) 67.

27. R. T. Dabestani,* K. J. Reszka, and M. E. Sigman, "Surface Catalyzed Electron Transfer from Polycyclic Aromatic Hydrocarbons to Methyl Viologen Dication: Evidence for Ground-State Charge Transfer Complex Formation on Silica Gel", *J. Photochem. Photobiol. A: Chem.* **1998**, *117*, 223.

28. R. T. Dabestani* and M. E. Sigman "Phototransformation of Polycyclic Aromatic Hydrocarbons on a Non-Semi-conductive Surface Such as Silica" *J. Adv. Oxid. Technol.* **1998**, *3*, 315**.**

29. Reyes, C., Sigman,* M. E., Arce, R., Barbas, J. T. and Dabestani, R. T. "Photochemistry of Acenaphthene at a Silica Gel/Air Interface," *J. Photochem. Photobiol. A Chem.* **1998**, 112, 277.

30. Sigman,* M. E., Schuler, P. F., Ghosh, M. M. and Dabestani, R. T. "Mechanism of Pyrene Photochemical Oxidation in Aqueous and Surfactant Solutions", *Environ. Sci. Technol.*, **1998**, *32*, 3980.

31. Sigman,* M. E.; Ma, C.-Y. "Operational Guideline: Teflon Dry Surface Wipe Collection and In-Injection Port Thermal Desorption Analysis of Trace Levels of Organic Explosives," ORNL/TM-**1999**/315.

32. Sigman,* M. E.; Ma, C.-Y. "In-Injection Port Thermal Desorption For the Analysis of Trace Explosives Evidence," *Anal. Chem*., **1999**, *71*, 4119.

33. Reyes, C.A.; Medina, M.; Crespo-Hernandez, C.; Cedeno, M. Z.; Arce, R.; Rosario, O.; Steffenson, D. M.; Ivanov, I. N.; Sigman, M. E.; Dabestani,* R. "Photochemistry of Pyrene on Unactivated and Activated Silica Surfaces", *Environmental Science & Technology*; **2000**; *34(3)*; 415-421.

34. Dabestani,* R.; Higgin, J.; Steffenson, D.; Ivanov, I. N.; Sigman, M. E. "Photophysical and Photochemical Processes of 2-Methyl, 2-Ethyl, and 2-tert-Butylanthracenes on Silica Gel. A Substituent Effect Study*" J. Phys. Chem. B.* **2000**, *104*, 10235.

35. Sigman,* M. E.; Barbas, J. T.; Corbett, S.; Chen, Y.; Ivanov, I.; Dabestani. R. "Photochemical Reactions of trans-Stilbene and 1,1-Diphenylethylene on Silica Gel: Mechanisms of Oxidation and Dimerization," *J. Photochem. Photobiol. A: Chem.* **2001**, *138*, 269-274.

36. Sigman,* M. E.; Ma, C.-Y. "Detection limits for GC/MS Analysis of Organic Explosives,"

J. Forensic Sci. **2001**, *46*, 6-11.

37. Ilia N. Ivanov, Reza Dabestani,* A. C. Buchanan, III, and Michael E. Sigman "Fluorescence Decay Study of Anisotropic Rotations of Substituted Pyrenes Physisorbed and Chemically Attached to a Fumed Silica Surface," *J. Phys. Chem. B,*; **2001**, *105(42)*, 10308-10315.

38. Sigman,* M. E.; Ma, C. Y.; Ilgner, R. H. "Performance Evaluation of an In-Injection Port Thermal Desorption/Gas Chromatographic/Negative Ion Chemical Ionization Mass Spectrometric Method for Trace Explosive Vapor Analysis," *Anal. Chem.* **2001**, *73(4)*, 792.

39. Ilona Kretzschmar, Cynthia M. Friend,* and Michael E. Sigman "Effect of Coadsorbed Species and Temperature on Competitive Reaction Channels for Nascent Radicals: c-$C_3H_7CH_2SH$ on Mo(110)-(6 H 1)-O A," *J. Phys. Chem. B*, **2002**, *106 (3)*, 663 B672.

40. Michael E. Sigman, Shelly Read, John T. Barbas, Ilia Ivanov, Edward W. Hagaman,* A. C. Buchanan, III Reza Dabestani, and Phillip Britt "Rapid Molecular Motion of Pyrene and Benzene Moieties Covalently Attached to Silica Surfaces," *J. Phys. Chem. A* **2003**, *107*, 3450-3456.

41. Gapeev, A., Sigman, M. and Yinon,* J. "Liquid Chromatography/Mass Spectrometric Analysis of Explosives: RDX Adduct Ions," *Rapid Comm Mass Spectrom.* **2003**, *17*, 943-948.

42. Min Huang, Jehuda Yinon, and Michael E. Sigman* "Forensic Identification of Dyes Extracted from Textile Fibers by Liquid Chromatography Mass Spectrometry (LC-MS)," *J. Forensic Sci.* **2004**, *49(2)*, 238-249.

43. R. A. Gardner, J.-G. Delcros, F. Konate, F. Breitbeil III, B. Martin, M. Sigman, M. Huang, and O. Phanstiel* IV "N^1-Substituent Effects in the Selective Delivery of Polyamine-Conjugates into Cells Containing Active Polyamine Transporters," *J. Med. Chem.* **2004**, *47(24)*, 6055-6059.

44. M. R. Williams, D. Fernandes, C. Bridge, D. Dorrien, S. Elliot and M. Sigman* "Adsorption Saturation and Chromatographic Distortion Effects on Passive Headspace Sampling with Activated Charcoal in Fire Debris Analysis," *J. Forensic Sci*. **2005**, *50(2*), 316-325.

45. M. Huang, R. Russo, B. G. Fookes and M. E. Sigman* "Analysis of Fiber Dyes by Liquid Chromatography Mass Spectrometry (LC-MS) with Electrospray Ionization: Discriminating Between Dyes with Indistinguishable UV-Visible Absorption Spectra," J. Forensic Sci **2005**, 50(3), 526-534.

46. M. E. Sigman,* P. Armstrong, J. M. MacInnis, M. Williams "The Equilibrium Partitioning Model Applied to RDX-Halide Complex Formation in Electrospray Ionnization Mass Spectrometry," *Anal. Chem.*, **2005**, *77*, 7434 - 7441.

47. M. E. Sigman,* C. D. Clark, "2D Correlation Spectroscopy Techniques Applied to Ion Trap MS/MS Analysis: Nitroaromatics." *Rapid Commun Mass Spectrom.,* **2005**, 19, 3731 - 3726.

48. M. E. Sigman*, P. Armstrong "Analysis of Oxidizer Salt Mixtures by ESI-MS," *Rapid Commun Mass Spectrom.,* **2006**, 20, 427 - 432.

49. M. E. Sigman,* M. Williams "Covariance Mapping in the Analysis of Ignitable Liquids by Gas Chromatography/Mass Spectrometry*," Anal. Chem.,* **2006,** 78, 1713 - 1718.

50. Bridge, C. M.; Powell, J.; Vomvoris, K. L.; MacInnis, J. M.; Williams, M. R.; Sigman*, M. E. "Characterization of Automobile Float Glass with Laser Induced Breakdown Spectroscopy (LIBS) and Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS)," *Applied Spectroscopy*, **2006**, *60(10),* 1181-1187.

51. M. E. Sigman*, C. Douglas Clark, R. Fidler, C. L. Geiger and C. A. Clausen "Analysis of Triacetone Triperoxide (TATP) by GC-MS and GC-MS/MS By Electron and Chemical Ionization," *Rapid Commun. Mass Spectrom.* **2006**, 20, 2851-2857.

52. M. R. Williams, M. E. Sigman "Performance Testing of Commercial Containers for Collection and Storage of Fire Debris Evidence," *Journal of Forensic Science,* **2007**, *52(3),* 579-585.

53. M. E. Sigman,* M. R.Williams, and R. G. Ivy "Comparative Analysis of Gasolines by Covariance Mapping and Gas Chromatography – Mass Spectrometry," *Anal. Chem.* **2007**, *79(9),* 3462-3468.

54. C M. Bridge, J Powell, K L Steele, M. E. Sigman*, "Forensic Comparative Glass Analysis by Laser-Induced Breakdown Spectroscopy," *Spectrochimica Acta, B*: **2007**, *62*, 1419-1425.

55. M. E. Sigman,* C. D. Clark, T. Caiano, R. Mullen "Analysis of Triacetone Triperoxide (TATP) and Synthetic Intermediates by ESI-MS, *Rapid Commun. Mass Spectrom.,* **2008**, *22*, 84-90..

56. M. E. Sigman*, M. R. Williams, J. A. Castelbuono., J. G. Colca, C. Douglas Clark "Ignitable Liquid Classification and Identification Using the Summed-Ion Mass Spectrum" *Instrumentation Sci. Technol.* **2008**, 36, 375 - 393.

57. A. M. Stearman*, E. Stierlin , M. E. Sigman, D. W. Roubik, and D. Dorrien "Stradivarius in the Jungle: Traditional Knowledge and the Use of "Black Beeswax" Among the Yuquí of the Bolivian Amazon", *Human Ecology*, **2008,** *36*, 149-159.

58. Michael E. Sigman*, C. Douglas Clark, Kimberly Painter, Chatham Milton, Ekaterina Simatos, Jessica L. Frisch, Meghan McCormick and Julie L. Bitter "Analysis of Oligomeric Peroxides by Tandem Mass Spectrometry" *Rapid Commun. Mass Spectrom.* **2009**, 23, 349 - 356.

59. A. Pal, C. D. Clark, M. E. Sigman, D. K. Killinger* "Differential absorption lidar CO2 laser system for remote sensing of TATP related gases," *Applied Optics* **2009**, 48(4), B145-B150.

60. Williams, M. R.; Moody, C.; Arceneaux, L.-A.; Rinke, C.; White, K.; Sigman, M.E; "Analysis of black writing ink by electrospray ionization mass spectrometry," *Forensic Sci. Int.* **2009**, 192, 97 – 103.

61. Matthew Weidman, Matthieu Baudelet, Santiago Palanco, Michael Sigman, Paul J. Dagdigian, Martin Richardson "Nd:YAG-CO2 Dual-Pulse Laser Induced Breakdown Spectroscopy of Organic Films" *Optics Express*, **2010**, 18, 259 - 266.

62. Erin McIntee, Emilie Viglino, Stephanie Kumor, Caitlin Rinke, Liqiang Ni,, and Michael E. Sigman*, "Nonparametric Permutation Test for Discrimination of Float Glass Samples Based on LIBS Spectra." *Journal of Chemometrics*, **2010,** 24, 312-319.

63. Erin McIntee, Emilie Viglino, Caitlin Rinke, Stephanie Kumor, Liqiang Ni,, and Michael E. Sigman*, "Comparative Analysis of Automotive Paints by Laser Induced Breakdown Spectroscopy (LIBS) and Nonparametric Permutation Tests," *Spectrochimica Acta, B.*, **2010,** 65, 542 - 548.

64. Rebecca L. Fidler Albo, Tamra Legron, Michael J. Gittings, Mark R. Elie, Erin Holland Saitta, Michael E. Sigman, Cherie L. Geiger*, Christian Clausen" Degradation of Triacetone Triperoxide (TATP) Using Mechanically Alloyed Mg/Pd" *Propellants Explos. Pyrotech.* **2010**, 35, 100 – 104.

65. Waddell E. E.; Song E. T.; Rinke C. N.; Williams M. R.; Sigman* M. E. "Progress Toward the Determination of Correct Classification Rates in Fire Debris Analysis" *J. Forensic Sci.* ***2013 Mar 29. doi: 10.1111/1556-4029.12159***.

66. Williams, M. R.; Sigman*, M. E.; Lewis, J.; McHugh Pitan, K. "Combined Target Factor Analysis and Bayesian Soft-Classification of Interference-Contaminated Samples: Forensic Fire Debris Analysis," *Forensic Sci. Int.*, **2012**, 222, 373 - 386.

67. Rinke, CN; Williams MR; Brown C; Baudelet M; Richardson M; Sigman ME* " Discriminant analysis in the presence of interferences: Combined application of target factor analysis and a Bayesian soft-classifier," *Analytica Chimica Acta*, **2012**, 13, 753:19-26.

68. Waddell, EE; Williams, MR; Sigman, ME* "Progress Toward the Determination of Correct Classification Rates in Fire Debris Analysis II: Utilizing Soft Independent Modeling of Class Analogy (SIMCA)," J. Forensic Sci. **2014**, 59(4), 927-935.

69. Waddell, EE; Frisch-Daiello, J; Williams, MR; Sigman ME*, "Hierarchical Cluster Analysis of Ignitable Liquids", J. Forensic Sci. **2014**, 59(5), 1198-1204.

70. Jessica L Frisch-Daiello, Erin E Waddell, Mary R Williams, Michael E. Sigman* "Application of self-organizing feature maps to analyze the relationships between ignitable liquids and selected mass spectral ions" Forensic Science International **2014**, 236, 84-89.

71. Heather A. Zimmerman, John J. Schultz, Michael E. Sigman, "Preliminary Validation of Handheld X-Ray Fluorescence (HHXRF) Spectrometry; Distinguishing Osseous and Dental Tissue from Non-Bone Material of Similar Chemical Composition," J. Forensic Sci. **2014**, 60(2), 382 - 390.

72. Zimmerman, H. A.; Meizel-Lambert, C.J.; Schultz, J.J., Sigman, M. E. "Chemical Differentiation of Osseous, Dental and Non-skelatal Materials in Forensic Anthropology using Elemental Analysis", Science and Justice, **2015**, 55, 131 – 138.

73. Lopatka, M.; Sigman, M. E.; Sjerps, M. J.; Williams, M. R.; Vivo-Truyols, G. "Class-conditional feature modeling for ignitable liquid classification with substantial substrate contribution in fire debris analysis", Forensic Sci. International. (**2015**), 252, 177 – 186.

74. Dana-Marie K. Dennis, Mary R. Williams, Michael E. Sigman "Assessing the evidentiary value of smokeless powder comparisons", Forensic Sci. International (**2016**) Vol. 259, p179–187.

75. Sigman, M. E.; Williams, M. R., "Assessing Evidentiary Value in Fire Debris Analysis by Chemometric Approaches", Forensic Sci. International, **2016,** in press, DOI: http://dx.doi.org/10.1016/j.forsciint.2016.03.051 .

Book Chapters

1. Dabestani,* R.; Sigman, M. E. "Spectroscopy and Photochemical Transformation of Polycyclic Aromatic Hydrocarbons at Silica and Alumina-Air interfaces," in Molecular and Supramolecular Photochemistry, Ramamurthy, V. and Schanze, K. Ed.s, Marcel Dekker, NewYork, **2000**, pp 1-30.

2. Pagni,* R. M. and Sigman, M. E. "The Photochemistry of PAHs and PCBs in Water and on Solids," in *Handbook of Environmental Chemistry, Vol. 2, Part L: Environmental Photochemistry*, P. Boule, Editor, Springer-Verlag, Heidelberg, Germany, **1998**, Chapter 6, pp 140-179.

3. Lewis, L. A.; Sigman, M. E. "Forensic Analysis of Dyes in Fibers via Mass Spectrometry" in Forensic Analysis on the Cutting Edge: New Methods for Trace Evidence Analysis, Robert D. Blackledge, Ed., Wiley, New York, 2007, pp. 197-220.

4. Rinke, C.; Sigman, M.E. "Applications of Laser Spectroscopy in Forensic Science," in "Laser Spectroscopy for Sensing: Fundamentals, Fechniques and Applications", Dr Matthieu Baudelet (ed), Woodhead Publishing, manuscript being processed **2011**.

5. Sigman, M. E.; Clark, C. D. "Analysis of Triacetone Triperoxide Explosive by Mass Spectrometry", Applied Mass Spectroscopy Handbook, Wiley, New York, in press **2011**.

6. Sigman, M. E. "Evidentiary Value and Cognitive Bias in Forensic Science", Monograph from 1st International Congress on Evaluation of Tecnical and Legal Operational Police (I CONGRESO INTERNACIONAL DE EVALUACION TECNICA Y JURIDICA DE LA OPERATIVA POLICIAL), April 15 – 17, 2015, Jerez de la Frontera, Spain, **submitted.**

Final Project Reports (Peer-Reviewed)

1. Michael E. Sigman*, Ph.D. (Principal Investigator), Erin M. McIntee, M.S., Candice Bridge, Ph.D. "Application of Laser-Induced Breakdown Spectroscopy to Forensic Science: Analysis of Paint Samples" Award number 2006-DN-BX-K251, Office of Justice Programs, National Institute of Justice Department of Justice.

2. Michael E. Sigman*, Ph.D. (Principal Investigator) "Application of Laser-induced Breakdown Spectroscopy to Forensic Science: Analysis of Paint and Glass Samples" Award number 2004-IJ-CX-K031, Office of Justice Programs, National Institute of Justice Department of Justice.

3. Michael E. Sigman* (Principal Investigator), C. Douglas Clark "Characterization of Triacetone Triperoxide (TATP) Synthetic By-Products for Source and Route Determination" Award No. 2006-DN-BX-K009, Office of Justice Programs, National Institute of Justice Department of Justice.

4. Michael E. Sigman*, Ph.D. (Principal Investigator) and Mary R. Williams, M.S. "NIJ Support of NCFS Research and Activities (2005 – 2009): Physical Evidence Projects" Award(s): 2005-MU_MU-K044 and 2005-MU_MU-K044 Supplement I, Office of Justice Programs, National Institute of Justice Department of Justice.

5. Michael E. Sigman*, Ph.D. (Co-PI), Mary R. Williams, M.S., Carrie Whitcomb, M.S. (PI) " NCFS Support of SWGDE and T/SWGFEX Projects/Activities – T/SWGFEX Portion" Award No. 2008-IJ-CX-K401, Office of Justice Programs, National Institute of Justice Department of Justice.

6. Michael E. Sigman*, Ph.D. (Principal Investigator) and Mary R. Williams, M.S. "Application of Chemometrics and Fast GC-MS Analysis for the Identification of Ignitable Liquids in Fire Debris Samples" Award No. 2008-DN-BX-K069, Office of Justice Programs, National Institute of Justice Department of Justice.

7. Michael E. Sigman (PI) and Mary R. Williams, "Degraded Ignitable Liquids Database: An Applied Study of Weathering and Bacterial Degradation on the Chromatographic Patterns of ASTM E 1618 Ignitable Liquid Classes" Award No. 2011-DN-BX-K539, Office of Justice Programs, National Institute of Justice Department of Justice.

Patents:

1. Dennis K.Killinger, Michael Sigman, Michael Maston, Keith Williams, "Optical and Laser Differential Absorption Remote Detection of TATP Peroxide Based Explosives", US 7,755,041 B2, Issued **7-13-2010**.

2. Michael E. Sigman, Mary R. Williams, "Systems and Methods for Identifying Substances Contained in a Material", US 8,063,359 B2, Issued **11-22-2011**.

3. Christian Clausen, III, Cherie L. Geiger, Michael Sigman, Rebecca Fidler, "Safe, In situ Methodologies for the Destruction of Triacetone Triperoxide and Other Explosive Peroxides" US 8,062,442 B1, Issued **11-22-2011**.

4. Christian Clausen, III, Cherie Geiger, Michael Sigman, Regecca Fidler, "Degradation of TATP, TNT, and RDX Using Mechanically Alloyed Metals", US 8,092,622 B1, Issued **1-10-2012**.

5. Michael E. Sigman, Mary R. Williams, "Systems and Methods for Identifying Classes of Substances", US 9,244,045 B2, Issued 1-26-2016.

Expert Testimony and Depositions:

1. State of Florida vs. Casey Marie Anthony, Case Number 48-2008-CF-015606-O. Deposition given Nov. 3, 2010.

2. State of Florida vs. Casey Marie Anthony, Case Number 48-2008-CF-015606-O. Testimony given June 22, 2011.

Presentations:

1. Sigman, M. E. "Investigation of a Proposed Intermediate in the Decomposition of Diacyl Peroxides," Missouri Academy of Science Paper Competition, Apr. 1982.

2. Sigman, M. E. "Spanning the Beta-Elimination Spectrum," Florida State University, Mar. 1984.

3. Sigman, M. E. "Time Resolved CIDNP," Florida State University, Nov. 1985.

4. Sigman, M. E. "Singlet-Triplet Equilibration in Diphenyl Carbene," Florida State

University, Jan. 1985.

5. Sigman, M. E. "Investigation of Supercritical Carbon Dioxide as a Medium for Organic Reactions," Graduate Student Research Award Presentation, Florida State University, Apr. 1986.

6. Sigman, M. E. "Investigation of Supercritical Carbon Dioxide as a Medium for Organic Reactions," University of Illinois, Nov. 1986.

7. Sigman, M. E., Closs, G. L., Piotrowiak, P., MacInnis, J. M. and Fleming, G. R. "Intramolecular Triplet Energy Transfer: The Effects of Distance and Driving Force on the Rate of Energy Transfer," Gordon Research Conference on Electron Donor/Acceptor Interactions, Aug. 1988.

8. Sigman, M. E. "Solvent Classification by the Solvatochromic Technique, Application to Supercritical Carbon Dioxide," Spring Green Conference, Wisconsin, Feb. 1988.

9. Sigman, M. E. and Closs, G. L. "Intramolecular Triplet Energy Transfer: The Effect of Driving Force on the Rate of Energy Transfer," Inter-American Photochemical Society Meeting, Clearwater Beach, FL, Jan. 1989.

10. Sigman, M. E., Zingg, S. P., Pagni, R. M. and Dworkin, A. S. "Aqueous Photochemistry of Anthracene: Mechanisms of Photooxygenation," Inter-American Photochemical Society Meeting, Clearwater Beach, FL, Jan. 1991.

11. Barbas, J. T. and Sigman, M. E. "Photodecomposition of Substituted Naphthalenes on SiO_2 Surfaces," 203rd National American Chemical Society Meeting, San Francisco, CA, Apr. 5-10, 1992.

12. Sigman, M. E. "Mechanisms of Polynuclear Aromatic Hydrocarbon Photooxidation in Environmental Systems," DOE Traveling Lecture Series, Southwest Missouri State University, Springfield, MO, Mar. 11, 1992.

13. Sigman, M. E. "Mechanisms of Polynuclear Aromatic Hydrocarbon Photooxidation in Environmental Systems," DOE Traveling Lecture Series, Hampton University, Hampton, VA, Apr. 15, 1992.

14. Dabestani, R. T., Barbas, J. T. and Sigman, M. E. "Photochemistry of Acenaphthylene on Silica Surface: Mechanism and Products," 16th International Photochemistry Conference, Vancouver, Canada, Aug. 1-6, 1993.

15. Dabestani, R. T., Barbas, J. T. and Sigman, M. E. "Photodecomposition of Acenaphthylene on the Surface of SiO_2," American Society for Photobiology Meeting, Chicago, IL, June 26-30, 1993.

16. Sigman, M. E. and Dabestani, R. T. "Polynuclear Aromatic Hydrocarbon Aqueous Photochemistry: Mechanisms and Products," 16th International Photochemistry

Conference, Vancouver, B.C., Canada, Aug. 1-6, 1993.

17. Sigman, M. E. and Barbas, J. T. "Photochemistry of Substituted Naphthalenes at an SiO_2/Air Interface," 5th Inter-American Photochemical Society Meeting, Clearwater Beach, FL, Jan. 2-6, 1993.

18. Barbas, J. T. and Sigman, M. E. "Photolysis of Acenaphthylene on Silica Surfaces," 5th Inter-American Photochemical Society Meeting, Clearwater Beach, FL, Jan. 2-6, 1993.

19. Barbas, J. T., Sigman, M. E. and Davestani, R. T. "The Photo-Oxidation of Aromatic Compounds on Silica Surfaces," Georgia Academy of Sciences Meeting, Atlanta, GA, Apr. 29-30, 1994.

20. Barbas, J. T., Sigman, M. E. and Dabestani, R. T. "The Photolysis of Naphthalene on Silica Surfaces," Georgia Academy of Sciences Meeting, Atlanta, GA, Apr. 29-30, 1994.

21. Sigman, M. E. and Dabestani, R. T. "Direct Photolysis of Polycyclic Aromatic Hydrocarbons in Dilute Aqueous Solutions," 6th Emerging Technologies in Hazardous Waste Management Meeting, Atlanta, GA, Sept. 19-21, 1994.

22. Sigman, M. E., Barbas, J. T. and Dabestani, R. T. "Photodecomposition of Substituted Naphthalenes at Inorganic-Oxide/Air Interfaces," National American Chemical Society Meeting, San Diego, CA, Mar. 13-18, 1994.

23. Sigman, M. E., Dabestani, R. T. and Barbas, J. T. "Aqueous Photochemistry of Acenaphthylene: The Role of the Hydrophobic Effect," 6th Inter-American Photochemical Society Meeting, Clearwater Beach, FL, Jan. 1-5, 1994.

24. Barbas, J. T., Sigman, M. E. and Dabestani, R. T. "The Photo-Oxidation of Naphthalenes on Silica Surfaces," 6th Inter-American Photochemical Society Meeting, Clearwater Beach, FL, Jan. 1-5, 1994.

25. Dabestani, R. T., Ellis, K. J. and Sigman, M. E. "Photochemistry of Anthracene on a Dry Silica Surface: Products and Mechanism," 6th Winter Inter-American Photochemical Society Conference, Clearwater, FL, Jan. 1-5, 1994.

26. Dabestani, R. T., Ellis, K. J. and Sigman, M. E. "A Mechanistic Study of Photodecompositiion of Anthracene on Dry Surfaces," 7th Winter Inter-American Photochemical Society Conference, Clearwater Beach, FL, Jan. 1-5, 1994.

27. Dabestani, R. T., Ellis, K. J. and Sigman, M. E. "Photochemistry of Anthracene on Dry Surfaces: Products and Mechanism," 20th National American Chemical Society Meeting, San Diego, CA, March 13-18, 1994.

28. Sigman, M. E., Dabestani, R. T. and Barbas, J. T. "Photochemical Depletion of Polycyclic Aromatic Hydrocarbons in Dilute Aqueous Solutions," 7th Inter-American Photochemical Society Meeting, Clearwater Beach, FL, Jan. 1-5, 1995.

29. Sigman, M. E. and Dabestani, R. T. "Photochemistry of Polycyclic Aromatic Hydrocarbons Under Environmentally Relevant Conditions," 24th Annual American Society for Photobiology Meeting, Atlanta, GA, June 15-20, 1996.

30. Dabestani, R. T. and Sigman, M. E. "Phototransformation of Polycyclic Aromatic Hydrocarbons at Silica/Air Interface," Southeast Regional American Chemical Society Meeting, Greenville, SC, Nov. 10-13, 1996.

31. Sigman, M. E., Barbas, J. T. and Dabestani, R. T. "Contrasting Mechanisms of Photochemical Oxidation at Silica/Air Interfaces: 1-Methoxynaphthalene and Phenanthrene," 212th National American Chemical Society Meeting, Orlando, FL, Aug. 25, 1996.

32. Dabestani, R. T., Higgins, J. J. and Sigman, M. E. "Spectroscopy and Photochemistry of 2-Substituted Anthracene on Dry Silica," 9th Winter Inter-American Photochemical Society Meeting, Clearwater, FL, Jan. 1, 1997.

33. Dabestani, R. T. and Sigman, M. E. "Photodegradation of Polycyclic Aromatic Hydrocarbons at Silica/Air Interface," Florida Section of the American Chemical Society Meeting, Orlando, FL, May 2-3, 1997.

34. Dabestani, R. T., Higgins, J. J. and Sigman, M. E. "Spectroscopy and Photochemistry of 2-Tert-Butylanthracene at Silica/Air Interface," 213th National American Chemical Society Meeting, San Francisco, CA, Apr. 13, 1997.

35. Sigman, M. E., Arce, R., Rayes, C., Barbas, J. T. and Dabestani, R. T. "Environmental Organic Photochemistry: PAH Photolysis at Solid-Air Interfaces," 213th National American Chemical Society Meeting, San Francisco, CA, Apr. 13, 1997.

36. Sigman, M. E., Dindal, A. B., Ilgner, R. H., Smith, S. M., Jenkins, R. A., Guerin, M. R. and Buchanan, A. C., III. "Sol-Gel Derived Sorbents for Sampling and Analysis of Volatile and Semivolatile Organics in Air," 37th ORNL-DOE Conference on Analytical Chemistry in Energy Technology, Gatlinburg, TN, Oct. 7-9, 1997.

37. M. E. Sigman "Explosives Analysis", Fire and Explosion Technical Working Group for Laboratory Analysts (LAB-TWG), Orlando, FL. Aug 11-12, **1998.** (invited participant)

38. M. E. Sigman, "Applications of Advanced Oxidation Technologies to Extremely High TOC Aqueous Systems," Pan-American Workshop on Commercialization of Advanced Oxidation Technologies, London, Ontario, Canada, June 27-30, 1998.

39. M. E. Sigman, A. C. Buchanan III, S. M. Smith, "UV-AOP Treatment of Extremely High TOC Containing Aqueous Solutions," 2nd Annual Green Chemistry & Engineering Conference: Global Perspectives, Washington, D.C., June 30 - July 2, 1998.

40. Sigman, M. E. "Photochemical Degradation of 1-Methoxynaphthalene on Silica,"

Department of Chemistry, Clemson University, December 3, 1998.

41. Sigman, M. E.; Dabestani, R. T. "PAH Molecular Pairing On Silica-Gel Surfaces," Southeastern Regional Meeting of the American Chemical Society, Knoxville, TN, October, 1999.

42. N. Ivanov, R. Dabestani, M. E. Sigman "Generation of singlet oxygen by direct excitation of silica. A time resolved study," 218th ACS National Meeting, New Orleans, LA, Aug. 22-26, 1999

43. Sigman, M. E. "Environmental Organic Photochemistry: PAH Photochemical Degradation," Department of Chemistry, University of Tennessee at Chattanooga, September 3, 1999.

44. Sigman, M. E. "PAH Environmental Photochemistry," Combined Southeast and Southcentral Regional Meeting of the American Chemical Society, New Orleans, LA, 2000.

45. Sigman, M. E. "Chemistry of Complex Orgnaic Energy Resources: Molecular Dynamics in Model Systems Having Constrainded Lateral Diffusion," Eleventh DOE/BES Heterogeneous Catalysis and Surface Science Meeting, Rockville, MD, Aug. 16-18, 2000.

46. Sigman, M. E.; Smith, G. C.; Ilgner, R. H; Jones, D. C.; Ma, C. Y.; "Analytical Chemistry of Finding Explosives with Honey Bees," 220th National Meeting of the American Chemical Society, Washington D.C., Aug. 20-24, 2000.

47. Sigman, M. E.; Ma, C. Y.; Ilgner, R. H. "Trace Analalysis of Organic Explosives by GC/MS," 49th Meeting of the American Society for Mass Spectrometry, Chicago, IL, May27-31, 2001.

48. Sigman, M. E. "GC/MS Analysis of Organic Explosives," First Annual TWGFEX Symposium on Fire and Explosion Debris Analysis and Scene Investigation, Aug. 2001.

49. Sigman, M. E.; "Basic Research Needs for Countering Terrorism: Chemical Threats," DOE/BES Workshop on "Basic Research Needs for Countering Terrorism," Report of the Sub-Chair for Chemical Threats, Bethesda, MD, Feb. 28 - March 1, 2002.

50. Sigman, M. E. "Sample Introduction for GC Analysis of Explosives by Thermal Desorption." 2nd Annual Technical Working Group on Fire and Explosion (TWGFEX) Symposium B House fires to Homeland Security," Orlando, FL, October 15-18, 2002.

51. Huang*, M.; Yinon, Y.; Sigman, M. E. "Forensic Identification of Dyes Extracted from Textile Fibers by Liquid Chromatography-Mass Spectrometry (LC-MS)," American Academy of Forensic Science 55th National Meeting, Chicago, IL, Feb. 18-23, 2003.

52. Sigman*, M. E.; Dabestani, R.; Hagaman, E. "Photochemical and Spectroscopic Studies of PAH Motion at Interfaces," 125th National Meeting of the American Chemical Society, New Orleans, LA; March 23-27, 2003.

53. M. Sigman and R. H. Ilgner, "Thermal Desorption GC/MS Analysis of Organic Explosives," Federation of Analytical Chemistry and Spectroscopy Societies, October 20, 2003, Ft. Lauderdale, FL.

54. Min Huang, Michael Sigman, "Fiber Dye Identification by Liquid Chromatography-Mass Spectrometry (LC-MS)," Federation of Analytical Chemistry and Spectroscopy Societies, October 20, 2003, Ft. Lauderdale, FL.

55. M. Sigman, "Physical Evidence Research National Center for Forensic Science," International Association of Bomb Technicians and Investigators Annual Meeting, October 23, 2003, Tampa, FL.

56. M. Sigman, "Accelerants and Explosives Research at NCFS," Technical Working Group on Fire and Explosion Annual Meeting, November 17, 2003, Orlando, FL.

57. M. Sigman and R. H. Ilgner, "Analysis of Organic Explosives by Thermal Desorption GC/MS," Florida American Chemical Society Meeting, May 8, 2003, Orlando, FL.

58. M. Sigman, "Physical Evidence Research National Center for Forensic Science," Florida Department of Law Enforcement Annual Chemistry Discipline Meeting, October 6, 2003, Daytona Beach, FL.

59. M. R. Williams, D. Fernandez and M. E. Sigman "Performance Testing of Commercial Containers for Collection and Storage of Fire Debris Evidence," American Academy of Forensic Science 56th Annual Meeting, Dallas, TX, February 16-21, 2004.

60. M. Huang, J. Yinon and M. E. Sigman "Fiber Dye Identification by High Performance Liuid Chromatography - Mass Spectrometry (HPLC-MS)," American Academy of Forensic Science 56th Annual Meeting, Dallas, TX, February 16-21, 2004.

61. A. Gapeev, J. Yinon and M. E. Sigman "LC/MS of Explosives: RDX Characterization through Impurity Profiles," American Academy of Forensic Science 56th Annual Meeting, Dallas, TX, February 16-21, 2004.

62. M. E. Sigman, A. Gapeev, R. H. Ilgner "Matrix Effets on Explosives Recovery and Detection," American Academy of Forensic Science 56th Annual Meeting, Dallas, TX, February 16-21, 2004.

63. M. R. Williams, D. Fernandes, C. Bridge, D. Dorrien, S. Elliott, M. E. Sigman "Adsorption Saturation and Chromatographic Distortion Effects on Passive Headspace Sampling With Activated Charcoal in Fire Debris Analysis," American Academy of Forensic Science 57th Annual Meeting, New Orleans, LA, February 21-26, 2005.

64. M. E. Sigman, M. Huang, B. Hornsby "Evaluation of Solvent Systems and Mobile Phases for the Extraction and Identification of Fiber Dyes by Liquid Chromatography Mass Spectrometry (LC-MS)," American Academy of Forensic Science 57th Annual Meeting, New Orleans, LA, February 21-26, 2005.

65. M. E. Sigman, M. R. Williams, D. Fernandes "Reliability Testing of Commercial Containers for Fire Debris Evidence STorage," American Academy of Forensic Science 57th Annual Meeting, New Orleans, LA, February 21-26, 2005.

66. M. E. Sigman "Silent Witness: Evidence That Does Not Forget," University of Central Florida LIFE Presentation, March 1, 2005, University of Central Florida, Orlando, FL.

67. M. E. Sigman "Physical Evidence Research at the National Center for Forensic Science," Forensic Resource Network – Crime Laboratory Improvement Program National Conference, September 20-22, 2004, Tampa, FL.

68. M. E. Sigman, M. Huang "Forensic Fiber Dye Analysis by LC-MS," 31st Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Portland, OR, October 3-7, 2004.

69. A. Campiglia, M. Sigman "Application of Fluorescence Line Narrowing Spectroscopy to Forensic Fiber Examination," 31st Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Portland, OR, October 3-7, 2004.

70. M. E. Sigman, "Characterization of Emulsions, Slurries and Watergels and Plastic Bonded Explosives," FBI Academy, Quantico, VA, January 19, 2005.

71. M. E. Sigman, "Characterization of Emulsions, Slurries and Water-gels and Plastic Bonded Explosives," 17th Sanibel Conference on Mass Spectrometry – Mass Spectrometry in Forensic Science and Counterterrorism, Clearwater Beach, FL, January 28 – February 1, 2005.

72. M. E. Sigman "The Equilibrium Partitioning Model Applied to RDX-Halide Adduct Formation in ESI-MS," Florida American Chemical Society Meeting, May 5-8, 2005, Orlando, FL.

73. M. Williams, M. E. Sigman "Activated Carbon Saturation and Chromatographic Distortion in Fire Debris Analysis", Florida American Chemical Society Meeting, May 5-8, 2005, Orlando, FL.

74. D. Dorrien, M. E. Sigman "Analytical Approaches to Fiber Analysis for A Forensic Fiber Database," Florida American Chemical Society Meeting, May 5-8, 2005, Orlando, FL.

75. M. E. Sigman "Equilibrium Partitioning Model Applied to RDX-Halide Adduct Formation in ESI-MS," 230th National Meeting of the American Chemical Society Meeting, August 28 – September 1, 2005, Washington, DC.

76. Michael E. Sigman, Candice Bridge, Kate Vomvoris and Jean MacInnis, "LIBS: A New Tool for Forensic Science," 2006 LACSEA, Optical Society of America, Incline Village, NV, February 9, 2006.

77. Katie L. Vomvoris; Candice Bridge; Zachary M. Parker; Jean MacInnis; Michael Sigman "The Analysis of Commercial Blasting Agents by Laser Induced Breakdown Spectroscopy (LIBS), With Emphasis on Methods for Heterogeneous Samples" AAFS 58th Annual Meeting, February 20-25, 2006, Washington State Convention & Trade Center, Seattle, Washington.

78. Dorrien, D. M.; Sigman M. E. "Single Fiber Dye Analysis by Liquid Chromatography Mass Spectrometry (LC-MS) with SWGMAT Dye Extraction Protocols," American Academy of Forensic Sciences Annual Meeting, Seattle, Washington, February 20-25, 2006.

79. Michael E. Sigman; Mary Williams "Covariance Mapping as an Aid to Ignitable Liquids Classification and Rapid Database Searching" AAFS 58th Annual Meeting, February 20-25, 2006, Washington State Convention & Trade Center, Seattle, Washington.

80. Candice M. Bridge; Joseph Powell; Katie Vomvoris; Jean MacInnis; Michael E. Sigman, "Characterization of Automobile Float Glass With Laser Induced Breakdown Spectroscopy (LIBS) and Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS)" AAFS 58th Annual Meeting, February 20-25, 2006, Washington State Convention & Trade Center, Seattle, Washington.

81. Michael E. Sigman "Application of Laser-Induced Breakdown Spectroscopy (LIBS) to Forensic Science: Analysis of Float Glass Samples," General Forensics Technical Working Group, National Institute of Justice, Washington, DC, May 10, 2006.

82. Candice M. Bridge; Joseph Powell; Katie Vomvoris; Jean MacInnis; Michael E. Sigman, "Characterization of Automobile Float Glass With Laser Induced Breakdown Spectroscopy (LIBS) and Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS)," Florida American Chemical Society Meeting (FAME 2006) , May 11-13, 2006,Renaissance Orlando Hotel Airport, Orlando, FL.

83. Michael E. Sigman, Mary Williams "Comparative Analysis of Complex Mixtures by Covariance Mapping", Florida American Chemical Society Meeting (FAME 2006) , May 11-13, 2006,Renaissance Orlando Hotel Airport, Orlando, FL.

84. Kristi George, Julie Bitter and Michael E. Sigman "Explosive Recovery Off of Solid Matrices Over Time," Florida American Chemical Society Meeting (FAME 2006) , May 11-13, 2006,Renaissance Orlando Hotel Airport, Orlando, FL.

85. Katie L. Steele, Candice M. Bridge and Michael E. Sigman "The analysis of Commercial Blasting Agents By Laser Induced Breakdown Spectroscopy (LIBS), with Emphasis on Methods for Heterogeneous Samples," Florida American Chemical Society Meeting (FAME 2006) , May 11-13, 2006,Renaissance Orlando Hotel Airport, Orlando, FL.

86. Mary R. Williams, Rebecca Ivy and Michael E. Sigman "Covariance Mapping in the Analysis of Ignitable Liquids by Gas Chromatography-Mass Spectrometry." Florida American Chemical Society Meeting (FAME 2006) , May 11-13, 2006,Renaissance Orlando Hotel Airport, Orlando, FL.

87. Sigman, M.E., Bridge, C., Steele, K., MacInnis, J. M "Forensic Applications of Laser-Induced Breakdown Spectroscopy: Comparative Glass Analysis," LIBS 2006, Montreal, Canada, September 5-8, 2006.

88. Julie Bitter , Kristi George, C. Douglas Clark and Michael E. Sigman "Explosives Recovery Off of Solid Matrices Over Time," Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Orlando, FL , September 24-28, 2006.

89. C. Douglas Clark and Michael E. Sigman "Optimized Analysis of Triacetone Triperoxide by GC-MS," Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Orlando, FL , September 24-28, 2006.

90. Candice Bridge Michael E. Sigman, Joseph Powell, Katie Steele, Jean MacInnis, and Mary Williams "Glass Sample Discrimination by Laser Induced Breakdown Spectroscopy (LIBS)," Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Orlando, FL , September 24-28, 2006.

91. Katie Steele, Michael E. Sigman, Candice Bridge, Jean MacInnis, and Zach Parker "The Analysis of Commercial Blasting Agents by Laser Induced Breakdown Spectroscopy(LIBS), With Empasis on Methods for Heterogeneous Samples," Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Orlando, FL , September 24-28, 2006.

92. Derek Dorrien and Michael E. Sigman "Single Fiber Dye Analysis by Liquid Chromatography Mass Spectrometry (LC-MS) With SWGMAT Dye Extraction Protocols," Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Orlando, FL , September 24-28, 2006.

93. Michael E. Sigman "Analysis of Inorganic Oxidizer Salts by ESI-MS," Federation of Analytical Chemistry and Spectroscopy Societies Meeting, Orlando, FL , September 24-28, 2006.

94. Richardson, M.; Brown, C.; Fisher, M.; Bernath, R.; Sigman, M. "Femtosecond Interaction Studies for Stand-off LIBS," LIBS 2006 – Laser Induced Plasma Spectroscopy and Applications, Montreal, Canada, September 5-9, 2006.

95. Sigman, M. E.; Bridge, C.; Steele, K.; MacInnis, J. M. "Forensic Applications of Laser-Induced Breakdown Spectroscopy: Comparative Glass Analysis," LIBS 2006 – Laser Induced Plasma Spectroscopy and Applications, Montreal, Canada, September 5-9, 2006.

96. Sigman, M. E. "2D Correlation Mass Spectrometry," SERMACS 2006 – Southeastern

Regional Meeting of the American Chemical Society, Augusta, GA, November 1-4, 2006.

97. M. E. Sigman, M Williams, R Ivy, J Castelbono, "New Approaches to Interpreting Fire Debris Analysis Data," Technical Working Group for Fire and Explosions (TWGFEX) Annual Meeting, Orlando, FL, Nov. 29, 2006.

98. M. E. Sigman "Characterization of Triacetone Triperoxide (TATP) Synthetic By-Products for Source and Route Determination," NIJ 2007 General Forensics R&D Grantees Meeting, San Antonio, TX, February 20, 2007.

99. Erin McIntee, Candice Bridge, Lt. Joseph Powell and Michael E. Sigman* "Application of Laser-Induced Breakdown Spectroscopy to Forensic Science: Analysis of Paint Samples," NIJ 2007 General Forensics R&D Grantees Meeting, San Antonio, TX, February 20, 2007.

100. M. E. Sigman, Katie L. Steele, Charles D. Clark, "Discrimination of C-4 Plastic Explosives by GC/MS Analysis of Impurities Associated with the Manufacturing Process of RDX," American Academy of Forensic Sciences Annual Meeting, San Antonio, TX, February 19-24, 2007.

101. M. E. Sigman, Candice M. Bridge, "Glass Sample Discrimination by Laser Induced Breakdown Spectroscopy (LIBS)," American Academy of Forensic Sciences Annual Meeting, San Antonio, TX, February 19-24, 2007.

102. M. E. Sigman, Douglas Clark, "Optimized Analysis of Triacetone Triperoxide by GC/MS," American Academy of Forensic Sciences Annual Meeting, San Antonio, TX, February 19-24, 2007.

103. Mary R. Williams, M. E. Sigman, Rebecca G. Ivy, "Individualization of Gasoline by Gas Chromatography/Mass Spectrometry and Covariance Mapping," American Academy of Forensic Sciences Annual Meeting, San Antonio, TX, February 19-24, 2007.

104. A. D. Campiglia*, M. Rex, M. E. Sigman "Fluorescence Line Narrowing Spectroscopy: A new Tool for Forensic Fiber Examination," Florida Annual Meeting and Exposition FAME 2007, American Chemical Society, Orlando, FL, May 10-12, 2007.

105. C. D. Clark, M. E. Sigman, "Optimized Analysis of Triacetone Triperoxide by GC-MS", Florida Annual Meeting and Exposition FAME 2007, American Chemical Society, Orlando, FL, May 10-12, 2007.

106. J. L. Frisch, M. E. Sigman, "Differentiation of Cotton Fabrics Using LC-ESI-MS of Extracted Oligosaccharides," Florida Annual Meeting and Exposition FAME 2007, American Chemical Society, Orlando, FL, May 10-12, 2007.

107. E. McIntee, C. Bridge, M. E. Sigman "Application of Laser-Induced Breakdown Spectroscopy to Forensic Science: Analysis of Paint Samples," Florida Annual Meeting and Exposition FAME 2007, American Chemical Society, Orlando, FL, May 10-12, 2007.

108. K. Steele, M. E. Sigman and C. D. Clark "Discrimination of Composition C-4 Plastic Explosives by GC/MS, ESI/MS and Direct Insertion Probe (DIP)," Florida Annual Meeting and Exposition FAME 2007, American Chemical Society, Orlando, FL, May 10-12, 2007.

109. J. A. Van Note, M. R. Williams, M. E. Sigman, "Analysis of Pen Inks by Liquid Chromatography-Mass Spectrometry with Electrospray Ionization," Florida Annual Meeting and Exposition FAME 2007, American Chemical Society, Orlando, FL, May 10-12, 2007.

110. C. D. Clark, M. E. Sigman "Analysis of Triacetone Triperoxide (TATP) for Synthetic Route Characterization", Trace Evidence Symposium, NIJ and FBI Laboratory Division, Clearwater Beach, Florida, August 13-16, 2007.

111. E. McIntee, C. Bridge and M. E. Sigman "Analysis of Automobile Paints by Laser-Induced Breakdown Spectroscopy (LIBS)" Trace Evidence Symposium, NIJ and FBI Laboratory Division, Clearwater Beach, Florida, August 13-16, 2007.

112. S. Linker, H. Miller, R. Smith, M. M. Houck, M. E. Sigman "United States Transferable Fiber Census," American Academy of Forensic Sciences, Washingron D.C., Feb. 18 – 23, 2008.

113. J. A. Castelbuono, M. R. Williams, J. G. Colca, C. E. Chasteen, M. E. Sigman, "Identification of Ignitable Liquids in the Presence of Interfering Products in Fire Debris Analysis," American Academy of Forensic Sciences, Washingron D.C., Feb. 18 – 23, 2008.

114. C. D. Clark, T. Caiano, R. Mullen, M. E. Sigman "Analysis of Triacetone Triperoxide (TATP) for Information on the Synthetic Route and Precursor Identity," American Academy of Forensic Sciences, Washingron D.C., Feb. 18 – 23, 2008.

115. E. M. McIntee, C. Bridge, J. D. Powell, M. E. Sigman " Evaluation of Laser-Induced Breakdown Spectroscopy as a Contributing Technique in the Analysis of Automobile Paint Samples," American Academy of Forensic Sciences, Washingron D.C., Feb. 18 – 23, 2008.

116. M. E. Sigman "Forensic Analysis of Triacetone Triperoxide," 1st International Symposium on Improvised Explosives, Rosh Hanikra, Israel, May 18-22, 2008.

117. M. E. Sigman " Ignitable Liquids Reference Collection and Database," European Network of Forensic Scientists, Fire and Explosion Technical Working Group 11th Annual Meeting, Rome, Italy, September 16 – 20, 2008.

118. C. Bridge, M. Richardson, M. E. Sigman "Chemometric Analysis of LIBS Data for Organic Analytes," LIBS 2008, Berlin, Germany, September 21 – 26, 2008.

119. Painter, KL; Clark, CD; McCormick, M; Sigman, M "Forensic Analysis of Triacetone Triperoxide (TATP) for Information on the Synthetic Route and Precursor Identity," 61st Annual Meeting of the American Academy of Forensic Sciences, Feb. 16 – 21, 2009,

Denver, CO.

120. Williams MR; Sigman, M "Automated Searching of Ignitable Liquids Database by Summed Ion Spectra," 61st Annual Meeting of the American Academy of Forensic Sciences, Feb. 16 – 21, 2009, Denver, CO.

121. Moody, CM; Williams, MR; Sigman M; Arceneaus, LA; Rinke, C; White, K "Analysis of Black Pen Inks by Electrospray Ionization Mass Spectrometry," 61st Annual Meeting of the American Academy of Forensic Sciences, Feb. 16 – 21, 2009, Denver, CO.

122. Sigman, ME; Clark, CD "Analysis of Triacetone Triperoxide (TATP)" 85th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 14 – 16, 2009, Orlando, FL.

123. McHugh, KM; Kazaros, CB; Castelbuono, JA; Williams, MR; Sigman, ME "Automated Searching of Ignitable Liquids Database by Summed Ion Spectra with Complementary Statistical Analysis", (Oral Presentation) 85th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 14 – 16, 2009, Orlando, FL

124. Painter, K; Clark, CD; McCormick, M; Sigman, ME "Forensic Analysis of Triacetone Troperoxide (TATP) for Information on the Synthetic Route and Precursor Identity," 85th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 14 – 16, 2009, Orlando, FL

125. McHugh, KM; Kazaros, CB; Castelbuono, JA; Williams, MR; Sigman, ME "Automated Searching of Ignitable Liquids Database by Summed Ion Spectra with Complementary Statistical Analysis", (Poster Presentation) 85th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 14 – 16, 2009, Orlando, FL.

126. Moody, CM; Arceneaux, LA; Rinke, CN, White, KM; Williams, MR; Sigman, ME "Analysis of Black Pen Inks by Electrospray Ionization Mass Spectrometry (ESI-MS)," 85th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 14 – 16, 2009, Orlando, FL.

127. Frisch, JL; Clark, CD; Sigman, ME "Tandem Mass Spectrometry of Oligomeric Open-Chaine Peroxides," 85th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 14 – 16, 2009, Orlando, FL.

128. Sigman, ME "Forensic Analysis of Triacetone Triperoxide (TAT)," Annual Meeting of the Technical Working Group on Fire and Explosives (TWGFEX), September 13 – 14, 2009, Orlando, FL .

129. Sigman, ME; Clark, CD "Detection and Forensic Analysis of Triacetone Triperoxide (TATP) in Uninitiated and Initiated Samples" 62nd Annual Meeting of the American Academy of Forensic Sciences, Feb. 22 – 27, 2010, Seattle, WA.

130. Sigman, ME; Williams, MR "A study of Complex Mixtures from Fire Debris by Summed Ion Spectra" 62nd Annual Meeting of the American Academy of Forensic Sciences, Feb. 22 – 27, 2010, Seattle, WA.

131. McHugh, K; Williams, MR; Sigman ME "Automated Searching of an Ignitable Liquids Library of Summed Ion Spectra by Target Factor Analysis" 62nd Annual Meeting of the American Academy of Forensic Sciences, Feb. 22 – 27, 2010, Seattle, WA.

132. White KM; Williams, MR; Sigman, ME "Statistical Analysis of Visible Absorption Spectra and Mass Spectra Obtained from Dyed Acrylic Fibers" 62nd Annual Meeting of the American Academy of Forensic Sciences, Feb. 22 – 27, 2010, Seattle, WA.

133. Sigman, ME "Application of Chemometrics and GC-MS Analysis for the Identification of Traces of Ignitable Liquids in Fire Debris Samples (2008-DN-BX-K069)" The NIJ Conference, June 14 – 16, 2010, Arlington, VA.

134. Rinke, CN; Brown, C; Clark, CD; Baudelet, M; Richardson, M; Sigman, M "Substrate Independent Discrimination of Organic and Explosive Materials via Target Factor Analysis of Their Molecular Optical Signature" International Symposium on Spectral Sensing Research (ISSSR), June 21 – 23, 2010, Springfield, MO.

135. Sigman, ME "Chemometrics Applications in LIBS Discussion Panel " LIBS 2010, Sept. 13 – 17, 2010, Memphis, TN.

136. Sigman ME, Williams MR "Application of Target Factor Analysis to the Classification of Ignitable Liquids from Fire Debris " 37th Federation of Analytical Chemistry and Spectroscopy Society Meeting, Oct. 17 – 21, Raleigh, NC.

137. Caitlin Rinke, Christopher Brown, Matthieu Baudelet, Martin Richardson, Michael E. Sigman "A New Paradigm for Substrate Independent Discrimination of Organic and Explosive Materials by Target Factor Analysis of Molecular Optical Signatures", Chemical and Biological Defense Science and Technology Conference (CBD S&T), Orlando, FL, Nov. 15, 2010.

138. Michael E. Sigman and C. Douglas Clark "Analysis of Crude Product from the Synthesis of Triacetone Triperoxide (TATP) Explosive", 10th International Symposium on the Analysis and Detection of Explosives (ISADE), Canberra, Australia, Nov. 21 – 25, 2010.

139. Sigman, M. E.; Williams, M. R. "National Center for Forensic Science and Technical Working Group for Fire and Explosions Databases", 63nd Annual Meeting of the American Academy of Forensic Sciences, Feb. 21 – 26, 2011, Chicago, IL.

140. Waddell, E.; Rinke, C; Williams, M. R.; Sigman, M. E. " Chemometric Assisted Detection and Classification of Ignitable Liquids in Fire Debris", 63nd Annual Meeting of the American Academy of Forensic Sciences, Feb. 21 – 26, 2011, Chicago, IL.

141. Lewis, J.; Williams, M. R.; Sigman, M. E. "Identification of Ignitable Liquid Classes by

Target Factor Analysis of Total Ion Spectra", 63nd Annual Meeting of the American Academy of Forensic Sciences, Feb. 21 – 26, 2011, Chicago, IL.

142. Williams, M. R.; Sigman, M. E. "Advancing Fire Debris Analysis through Chemometrics: An Overview of Research at the National Center for Forensic Science;" 63nd Annual Meeting of the American Academy of Forensic Sciences, Feb. 21 – 26, 2011, Chicago, IL.

143. Williams, M. R.; Lewis, J.; Waddell, E. E.; Rinke, C. N. "Advancing Fire Debris Analysis Through Chemometrics"; Pittsburg Conference and Exposition, March 13 – 18, 2011, Atlanta, GA.

144. White, K. M.; Williams, M. R.; Sigman, M. E. "Chemometric Discrimination of Textile Fibers Treated with Structurally –similar Dye Pairs"; Pittsburg Conference and Exposition, March 13 – 18, 2011, Atlanta, GA.

145. Rinke, C. N.; Waddell, E. E.; Sigman, M. E.; Williams, M. R. "Chemometric Assisted Detection and Classification of Ignitable Liquids in Fire Debris:, Pittsburg Conference and Exposition, March 13 – 18, 2011, Atlanta, GA.

146. Sigman, ME "Ignitable Liquids Reference Collection Panel: Present Research", NIJ Conference, Washington D.C., June 21, 2011.

147. Mary R. Williams; Michael Sigman,"Fire Debris Software" 64th Annual Meeting of the American Academy of Forensic Sciences, Feb. 20 – 25, 2012, Atlanta, Ga.

148. Caitlin Rinke, Erin Waddell, Mary R. Williams, Michael Sigman, and Emma Song, "ASTM Classification of Ignitable Liquids and Residues by Chemometric Techniques." 64th Annual Meeting of the American Academy of Forensic Sciences, Feb. 20 – 25, 2012, Atlanta, Ga.

149. Michael E. Sigman, Caitlin Rinke, Liqiang Ni, Katie M. White, "Nonparametric Permutation Hypothesis Testing: Applications to Physical Evidence." 64th Annual Meeting of the American Academy of Forensic Sciences, Feb. 20 – 25, 2012, Atlanta, Ga.

150. Michael E. Sigman, "Efforts towards Development of a Shared International Database of Ignitable Liquids for use in Fire Debris Analysis," Netherlands Forensic Institute, The Hague, Netherlands, April 26, 2012.

151. Michael E. Sigman, "Nonparametric Permutation Hypothesis Testing: Applications to Physical Evidence," University of Malaga, Malaga, Spain, May 2, 2012.

152. Michael E. Sigman, "Matrix Independent Analyte Identification and Classification," University of Cadiz, Cadiz, Spain, May 4, 2012.

153. Erin E. Waddell, Mary R. Williams, Michael E. Sigman "Chemometric-Assisted Detection and Classification of Ignitable Liquid Residue in Fire Debris," 88th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 17 – 19, 2012, Palm

Harbor, FL.

154. Michael E. Sigman, Catlin N. Rinke, Mary R. Williams, "Application of a Nonparametric Permutation Test for the Analysis of LIBS Spectra for Glass Samples," 88th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 17 – 19, 2012, Palm Harbor, FL.

155. Caitlin N. Rinke, Michael E. Sigman, "Discriminant Analysis in the Presence of Interferences: Combined Application of Target Factor Analysis and a Bayesian Soft Classifier. 88th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 17 – 19, 2012, Palm Harbor, FL.

156. Erin E. Waddell , Caitlin N. Rinke, Emma T. Song, Mary R. Williams, Michael E. Sigman, "ASTM Classification of Ignitable Liquids and Residues by Chemometric Techniques", European Academy of Forensic Sciences, The Hague, Netherlands, Aug. 20 – 24, 2012.

157. Michael E. Sigman, Mary R. Williams, Jennifer Lewis and Kelly McHugh-Pitan "Ignitable Liquid Residue Classification by Combined Target Factor Analysis and Bayesian Soft Classification", European Academy of Forensic Sciences, The Hague, Netherlands, Aug. 20 – 24, 2012.

158. Mary Williams and Michael E. Sigman, "National Center for Forensic Science and Technical Working Group for Fire and Explosions Databases", European Academy of Forensic Sciences, The Hague, Netherlands, Aug. 20 – 24, 2012.

159. Michael E. Sigman, Liqiang Ni, "Nonparametric Permutation Hypothesis Testing: Application ot forensic Physical Evidence," SciX 2012 (39th Annual Meeting of FACSS), Kansas City, MO, September 30 – October 5, 2012.

160. Matthieu Baudelet, Yuan Liu, Matthew Weidman, Michael Sigman; Martin Richardson "Fifty Years of LIBS and No Limits for Analysis," SciX 2012 (39th Annual Meeting of FACSS), Kansas City, MO, September 30 – October 5, 2012.

161. Michael E. Sigman, Caitlin Rinke "Discriminant Analysis in the Presence of Interferences: Combined Appliation of Target Factor Analysis and a Bayesian Soft-Classifier," SciX 2012 (39th Annual Meeting of FACSS), Kansas City, MO, September 30 – October 5, 2012.

162. Dana-Marie K. Dennis, Michael E. Sigman, Mary R. Williams "Classification of Smokeless Powders by Cluster Analysis," American Academy of Forensic Sciences 65th Anniversary Meeting, Washington, DC, February 18 – 23, 2013.

163. Mary R. Williams, Michael E. Sigman, Dee A. Turner, John V. Goodpaster " Expansion of the ILRC Daatabase: Addition of Weathered and Biologically Degraded Liquids" American Academy of Forensic Sciences 65th Anniversary Meeting, Washington, DC, February 18 – 23, 2013.

164. Erin E. Waddell, Mary R. Williams, Michael E. Sigman "Comparison of SIMCAA with LDA and QDA for the Identification and Classification of Ignitable Liquid Residues," American Academy of Forensic Sciences 65th Anniversary Meeting, Washington, DC, February 18 – 23, 2013.

165. Dee A. Turner, John V. Goodpaster, Mary R. Williams, Michael E. Sigman "A Comprehensive Study of Weathering and Microbial Degradation of Ignitable Liquids," American Academy of Forensic Sciences 65th Anniversary Meeting, Washington, DC, February 18 – 23, 2013.

166. Michel E. Sigman, Mary R. Williams "Soft Classification by Combined Target Factor Analysis and Bayesian Decision Theory," American Academy of Forensic Sciences 65th Anniversary Meeting, Washington, DC, February 18 – 23, 2013.

167. Erin E. Waddell, Mary R. Williams, Michael E. Sigman "Comparison of Chemometric Methods for the Detection and Classification of Ignitable Liquid Residues in Fire Debris", 89th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 9 – 11, 2013, Palm Harbor, FL.

168. Mary R. Williams, Erin Waddell, Jessica L. Frisch-Daiello, Michael E. Sigman, "Hierarchical Cluster Analysis of Ignitable Liquids", 89th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 9 – 11, 2013, Palm Harbor, FL.

169. Dana-Marie K. Dennis, Erin E. Waddell, Mary R. Williams, Michael E. Sigman, "Classification of Smokeless Powders by Cluster Analysis", 89th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 9 – 11, 2013, Palm Harbor, FL.

170. Heather A. Zimmerman, John J. Schultz, Michael E. Sigman, "Use of Handheld X-ray Fluorescence (HHXRF) spectrometry and Multivariate Statistical Analysis for Distinguishing Osseous and Dental Tissue from Non-Bone Materials in Forensic Anthropology", 89th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 9 – 11, 2013, Palm Harbor, FL.

171. Alejandra Flores, Michael E. Sigman, "Application of Statistical Methods of Analysis to Highly Similar Absorption Spectra from Textile Fibers", 89th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 9 – 11, 2013, Palm Harbor, FL.

172. Jessica L. Frisch-Daiello, Mary R. Williams, Michael E. Sigman "Application of Self-Organizing Feature Maps to Analyze the Relationship Between Ignitable Liquids and Selected Mass Spectral Ions", 89th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 9 – 11, 2013, Palm Harbor, FL.

173. Michael E. Sigman, Mary R. Williams "Ignitable Liquid Residue Classification by Combined Target Factor Analysis and Bayesian Soft Classification", 89th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 9 – 11, 2013, Palm Harbor, FL.

174. Shandricka Stephenson, Alejandra Flores, Michael E. Sigman, "Analysis of Similar Visible Absorption Spectra from Textile Fibers", 89th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 9 – 11, 2013, Palm Harbor, FL.

175. Mary R. Williams, Michael E. Sigman, "Fire Debris: Research and Database Initiatives at NCFS", American Academy of Forensic Sciences 66th Annual Scientific Meeting, Seattle, WA, February 17-22, 2014.

176. Michael E. Sigman, Erin Waddell, Jessica L. Firsch-Daiello, Mary R. Williams "Hierarchical Cluster Analysis of Ignitable Liquids", American Academy of Forensic Sciences 66th Annual Scientific Meeting, Seattle, WA, February 17-22, 2014.

177. Dana-Marie Dennis, Michael E. Sigman, Mary R. Williams "Cluster Analysis of Smokeless Powders and Classification by Discriminant Analysis", 90th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 8 – 10, 2014, Palm Harbor, FL.

178. Michael E. Sigman, Mary R. Williams "Chemometric Approaches to Fire Debris Analysis" 90th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 8 – 10, 2014, Palm Harbor, FL.

179. Alegandra Flores, Michael E. Sigman, "Application of Statistical Methods of Analysis for the Forensic Comparison of Highly Similar Absorption Spectra from Textile Fibers", 90th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 8 – 10, 2014, Palm Harbor, FL.

180. Mary R. Williams, Michael Sigman, "Degradation of Ignitable Liquids", 90th Annual Florida American Chemical Society Meeting and Exposition (FAME), May 8 – 10, 2014, Palm Harbor, FL.

181. Alejandra Flores; Michael E. Sigman, PhD; Andres D. Campiglia, PhD, "Examination of Statistical Methods for Forensic Analysis of Highly Similar Absorbance Spectra From Textile Fibers", American Academy of Forensic Sciences 67th Annual Scientific Meeting, Orlando, FL, February 16-21, 2015.

182. Quashanna Price; Mary R. Williams, MS; Michael E. Sigman, PhD, "Fourier-Transform Infrared Spectroscopy Investigations of Smokeless Powders", American Academy of Forensic Sciences 67th Annual Scientific Meeting, Orlando, FL, February 16-21, 2015.

183. Jessica H. Kindell, BS; Mary R. Williams, MS; Michael E. Sigman, PhD, "Weathering and Microbial Degradation of Ignitable Liquids", American Academy of Forensic Sciences 67th Annual Scientific Meeting, Orlando, FL, February 16-21, 2015.

184. Dana-Marie K. Dennis, BS; Jessica L. Frisch-Daiello, PhD; Mary R. Williams, MS; Michael E. Sigman, PhD, "Smokeless Powders Database at the National Center for Forensic Science", American Academy of Forensic Sciences 67th Annual Scientific Meeting, Orlando, FL, February 16-21, 2015.

185. Michael E. Sigman, PhD; Mary R. Williams, MS, "Application of Likelihood Ratios in Fire Debris Analysis", American Academy of Forensic Sciences 67th Annual Scientific Meeting, Orlando, FL, February 16-21, 2015.

186. Michael E. Sigman, "Statistical Approaches to Decision Making in Fire Debris Analysis", Pittsburgh Conference (PITTCON), New Orleans, LA, March 8 – 12, 2015.

187. Martin Lopatka, Michael E. Sigman, Gabriel Vivo-Rtuyols, Marjan J. Sjerps, and Mary R. Williams, "Class-Conditional Feature Modeling for Ignitable Liquid Classification with Substantial Substrate Contribution in Fire Debris Analysis", Pittsburgh Conference (PITTCON), New Orleans, LA, March 8 – 12, 2015.

188. Michael E. Sigman, "Evidentiary Value", 1st International Congress on Evaluation of Tecnical and Legal Operational Police (I CONGRESO INTERNACIONAL DE EVALUACION TECNICA Y JURIDICA DE LA OPERATIVA POLICIAL), April 15 – 17, Jerez de la Frontera, Spain.

189. Michael Sigman and Mary Williams, "Assessing evidential value in fire debris analysis through chemometric approaches", 7th European Academy of Forensic Science Conference, Prague, Czech Republic, September 6 – 11, 2015.

190. Mary R. Williams MS* and Michael E. Sigman, "How Forensic Databases Aid Forensic Scientists", 7th European Academy of Forensic Science Conference, Prague, Czech Republic, September 6 – 11, 2015.

191. Michael E. Sigman and Mary R. Williams, "Challenges for Implementing a New Paradigm in Fire Debris Analysis and Reporting", American Academy of Forensic Sciences 68th Annual Scientific Meeting, Las Vegas, NV, February 22 – 27, 2016.

192. Dana-Marie Dennis, Mary R. Williams and Michael E. Sigman, "Investigative Predictions of Smokeless Powder Manufacturers", American Academy of Forensic Sciences 68th Annual Scientific Meeting, Las Vegas, NV, February 22 – 27, 2016.